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"LET KNOWLEDGE GROW FROM MORE TO MORE
AND THUS BE HUMAN LIFE ENRICHED."

A New Survey of Universal Knowledge

ENCYCLOPÆDIA BRITANNICA

Volume 13

JEREZ DE LA FRONTERA TO LIBERTY PARTY



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ENCYCLOPÆDIA BRITANNICA

Volume 13

JEREZ DE LA FRONTERA *TO* LIBERTY PARTY

JEREZ DE LA FRONTERA (formerly XERES). a town of southern Spain. in the province of Cádiz, near the right bank of the river Guadalete, and on the Seville-Cadiz railway. about 7 mi. from the Atlantic coast Pop (1940), 65.166 (mun , 89,525). Jerez is built in the midst of a fertile plain. It has been variously identified with the Roman Municipium Seriense; with Asido. perhaps the original of the Moorish Sherish; and with Hasta Regia, a name which may survive in the designation of La Mesa de Xsta, a neighbouring hill. Jerez was taken from the Moors by Ferdinand III of Castile (1217–1252); but it was twice recaptured before Alphonso X finally occupied it in 1264. Towards the close of the 14th century it received the title *de la Frontera, i e.,* "of the frontier." common to several towns on the Moorish border. Characteristic features of Jerez are the *bodegas,* or wine-lodges, for the manufacture and storage of sherry. and the vineyards. The old English nord *sherris* is the 16th century pronunciation of the name Jerez. Few towns of southern Spain display greater commercial activity than Jerez. During the civil mar of 1936–39, it fell into the control of Gen. Francisco Franco's insurgents shortly after the outbreak of hostilities.

JEREZ DE LOS CABALLEROS, a town of south-western Spain, in the province of Badajoz, situated on two heights overlooking the river Ardila, a tributary of the Guadiana, 12 mi. E. of the Portuguese frontier. Pop. (1940) 12,486 (mun., 16,154). The town is said to have been founded by Alphonso IX of Leon in 1229; in 1232 his son St. Ferdinand gave it to the knights templar. Hence the name *Jerez de los Caballeros,* "Jerez of the knights." Vasco Núñez de Balboa, discoverer of the Pacific, was born here. The old town is surrounded by a Moorish wall with six gates; the newer portion is well built, and planted with orange and other fruit trees.

JERICHO, an ancient town of importance in the Dead sea valley, 5 mi. N. of the Dead sea. According to the account given in Joshua it was the first Canaanite city to be attacked by the Israelites. The view has recently been put forward, based on the excavations, that Jericho was destroyed in the 14th century B.C. and that it was already a heap of ruins in the time of Joshua. Its refortification was due to Hiel, a man of Bethel (1 Ki. xvi. 34), and is depicted later as the headquarters of a prophetic school (2 Ki. ii.). Elisha cured the poisonous waters of its spring, now known as *'Ain es-Sultān.* It was at Jericho that the Babylonians scattered Zedekiah's army (2 Ki. xxv.) and brought to an end the kingdom of Judah. In the New Testament Jericho comes to mind in the stories of blind Bartimeus, the publican Zacchaeus of small stature, and the good Samaritan. Bacchides and Aristobulus took it and Pompey encamped here on his way to Jerusalem. Herod and Vespasian severally caused panic among the inhabitants and flight at their approach. Herod made it his winter residence, built a palace, baths, theatre and a fortress, and in Jericho he died. The city changed its site several times. The mound of *Tell es-Sultān,* excavated by Sellin 1907–09, covers the site of the Canaanite city. The Roman, Herodian and Crusaders cities were on different sites.

Modern.—Jericho, the site of the crusaders' city, lies 825 ft. below sea level; pop. (1952) 41,593. It became part of Jordan in 1948. It has a Russian hospice, Greek church, Latin chapel and several hotels. It is a popular resort for officials and the richer Arabs of Jerusalem. Palms, oranges, bananas, figs, etc.. grow and ripen earlv.

See C. F. Lehmann-Haupt, "Jericho," *Klio.* 14 (1914) 264; C. Watzinger, "Jericho: Die Ergebnisse der Ausgrabungen" (*z.* D.M.G.) (1926), 131 seq., W. J. Phythian-Adams, "Israelite Tradition and the Date of Joshua." *Pal. Expl.* Fund *Quart. Stat.* (1927) 34 seq. (E. Ro.)

JERITZA, MARIA (1888–), soprano, born at Brno, Moravia, made her début at Olmiitz in 1909, and sang for the Vienna *Volksoper* and then appeared at the Imperial Opera House, Vienna, 1912, where she sang until she went to the United States. Her American début was made at the Metropolitan Opera House in 1921 as Marietta in *Die tote Stadt* by Erich Korngold. There she repeated her Viennese successes. Her most notable rôles were in *La Tosca, Die tote Stadt, Tannhauser, Fedora, Thai's, Der Rosenkavalier* and *Turandot.* She retired from the Metropolitan Opera company in 1932. Her autobiography, *Sunshine and Music,* appeared in 1924.

JERKIN, a short close-fitting jacket, made usually of leather, and without sleeves, the typical male upper garment of the 16th and 17th centuries. In architecture the term "jerkin-roofed" is applied to a form of gable end, the gable being cut off half way up the roof and sloping back like a "hipped roof" to the edge.

JEROBOAM is the name, in the Bible, of two kings of northern Israel.

JEROBOAM I (10th century B.C.) son of Nebat, was a *corvée* overseer under Solomon, who incurred the suspicion of the king as an instrument of the popular democratic and prophetic parties. He fled to Egypt, but was recalled by the northern tribes on the refusal of Rehoboam (*q.v.*), son of Solomon, to accept the constitutional terms offered to him at his accession. To counteract the political influence of the sanctuary of the house of David at Jerusalem, he established (or perhaps, rather, especially favoured) the bullcults of Bethel and Dan, a step which the later historian regarded as responsible for all the religious failings and political disasters of the north. The inevitable war between Jeroboam and Rehoboam seems to have gone at first in favour of the south, but the power of Judah was permanently checked by an Egyptian invasion under Sheshonk, who captured a number of cities in Palestine (not including Jerusalem) and exacted an enormous tribute from Rehoboam.

JEROBOAM II (8th century B.C.), son of Joash, was the last of the great kings of Israel, after whose death the country fell into confusion and ultimate servitude. Aided, perhaps, by Assyrian pressure from the east, he brought to an end the long struggle between Syria and Israel, and definitely established the superiority of the latter over Damascus. The record in II Kings xiv, 23–25 states that his kingdom extended from the borders of Hamath on the Orontes to the Dead sea, and it seems clear that he recovered territory in Transjordania which had long been in the hands of Damascus. Two cities in that district are apparently mentioned in Amos vi, 13—Karnaim and Lo-debar—as having been recently captured in 760. The reign of Jeroboam II saw the greatest success and outward prosperity that Israel had known since the days of Solomon, though the social conditions depicted by Amos meant a national corruption that could end only in disaster. (T. H. R.)

JEROME, SAINT (EUSEBIUS HIERONYMUS) (*c.* 347–*c.* 420), one of the four great doctors of the western church and the most learned of the Latin Fathers, was born between 340 and 350 of well-to-do parents at Stridon, probably in the environs of Aquileia and Emona (modem Ljubljana, Yugos.). His education, begun at home, was continued in Rome when Jerome was about 12. There he studied grammar, rhetoric and philosophy. A serious scholar, enamoured of Latin literature, he frequented the catacombs, strayed from virtue in ways undefined but surely magnified on later reflection, and near the end of his Roman education was baptized (c. 366), probably by Pope Liberius.

The next 20 years were spent in travel and impermanent residences. The first stage was Treves in Gaul; why he went to Treves and how long he stayed are not known, but it is known that while there Jerome was profoundly attracted to monasticism. Possibly as early as 369 he was back in the vicinity of Stridon. In Aquileia he was linked with an ascetical elite grouped around Bishop Valerianus. When the group disbanded for ill-defined reasons (c. 373), Jerome decided on a trip through the east, apparently a pilgrimage to Jerusalem. Upon reaching Antioch (374), fatigued by travel and weakened by inner conflict, he rested as guest of the priest Evagrius, and there he may have composed his earliest extant work, De *septies percussa.* There also, in mid-Lent 375, during a near-fatal illness, he had his celebrated dream, in which dragged before a tribunal of the Lord, he was accused of being a Ciceronian rather than a Christian, was severely lashed, and vowed never again to read or possess pagan literature. Long afterward, in controversy with Rufinus, he minimized the dream's importance, but for years it kept him from reading the classics for pleasure, and at the time it was a genuine spiritual crisis. One of its fruits was his first exegetical work, an allegorical commentary on Obadiah, disowned 21 years later as a youthful production of fervent ignorance.

In 375 Jerome began a two-year search for peace as a hermit in the desert of Chalcis. The experience was valuable but not altogether successful. A novice in spiritual life, he had no expert guide: Latin in tongue, he was confronted with Syriac and Greek; lonely, he begged for letters; a gourmet with a weak stomach, he found desert food a penance; desperate for peace, he was racked by passion. Yet he was genuinely happy. His response to temptation was incessant prayer and fasting; he learned Hebrew from a Jewish convert, studied Greek seriously, had manuscripts copied for his library and his friends, and carried on a brisk correspondence. The crisis came when Chalcis echoed with a conflict which in the wake of Arianism rent the orient: the schism at Antioch (episcopal succession disputed among Meletius of Antioch [*q.v.*], Paulinus and Vitalis), with its attendant Trinitarian and Christological dissensions. Suspected of Sabellianism (see SABELLIUS) and dunned for his Credo, insisting that in oneness with the see of Peter lay the answer but unable to evoke a response from Pope Damasus, his peace shattered and his heart bitter, Jerome quit the desert for Antioch.

In Antioch his host, Evagrius, won Jerome for the party of Paulinus. Recognizing his importance, Paulinus decided to ordain him. Jerome accepted (378) on two conditions: his monastic aspirations would not be prejudiced and priestly functions would not be forced on him. He attended the exegetical lectures of Apollinaris of Laodicea, even visited the Nazarenes of Beroea to examine their copy of a Hebrew gospel purporting to be the original of Matthew. Antioch may then have seen his first polemic, *Altercatio* Luciferiani et orthodoxi, whose context is the Luciferian refusal to recognize the pardon which the Council of Alexandria (362) granted to the bishops who had signed the inadequate formula of Rimini.

Still in pursuit of Scripture, Jerome spent almost three years (379–382) in Constantinople. An enthusiastic disciple of Gregory of Nazianzus (*q.v.*), he came to know Gregory of Nyssa (*q.v.*) and Amphilochius of Iconium on the occasion of the Council of Constantinople (381). Under such influences his grasp on Greek improved; he developed an ardent admiration for Origen's exegesis; he turned into Latin 14 homilies of Origen on Jeremiah, 14 on Ezekiel and 9 on Isaiah; he wrote two commentaries on the vision of the Seraphim in Isaiah 6. Here too he translated Eusebius' *Chronicon* and continued it to the year 378.

But the most decisive influence on Jerome's later life was his return to Rome (382–385) as secretary to Pope Damasus. Two loves occupied his spare hours: scholarly work on the Bible, and intense propagation of the ascetic life. On Damasus' initiative he wrote some short exegetical tracts and translated two sermons of Origen on the Song of Songs; more importantly. he revised the Old Latin version of the Gospels on the basis of the best Greek manuscripts at his command, and he made his first, somewhat unsuccessful revision of the Old Latin Psalter on a few Septuagint manuscripts. In the house of Marcella on the Aventine, he held classes for a monastic-minded circle of noble Roman widows and virgins (*e.g.,* Paula and her daughters Blesilla and Eustochium). He taught them the Hebrew text of the Psalms; orally and in letters he answered their biblical problems; and he was their master in spirituality as well. It was in these conditions that he wrote against Helvidius his defense of Mary's perpetual virginity (383) and attacked his foe's subsidiary thesis, the equality of virginity and marriage. But his monastic apostolate and his relationship with the ascetic coterie, his pitiless castigation of Roman clergy, of lax monks and hypocritical virgins, even his correction of the Gospel text provoked such a storm of criticism and calumny, especially after Damasus' death (Dec. 11, 384), that in Aug. 385 Jerome left "Babylon" in bitter indignation and made his way to the Holy Land.

In company with virgins led by Paula, Jerome made a pilgrimage, at once religious and archaeological, through all of Palestine and the monastic centres of Egypt; he spent almost a month with the famed exegete Didymus (*q.v.*) in Alexandria. The summer of 386 found him settled in Bethlehem. There Paula finished, by 389, a monastery for men under Jerome's direction, three cloisters for women under her own supervision, and a hostel for pilgrims. There Jerome lived, with brief exceptions, until his death in 419 or 420.

The literary legacy of those 34 years is the outgrowth of contemporary controversies. Jerome's passion for Scripture. and his involvement in monastic life. The controversies were varied. The anti-Origen movement in the east, fanned by St. Epiphanius (*q.v.*),

turned Jerome not only against Origen, whose 39 sermons on Luke he had translated in 389, but against his friends Bishop John of Jerusalem *(Contra Ioannem Hier.,* 396) and Rufinus *(Adv. libros Rufini,* 401, 402). His petulance in early correspondence with St. Augustine (394–405), stemming from the African's strictures on Jerome's biblical efforts, imperiled their mutual respect. Even his catalogue of Christian authors, *De viris illustribus* (392), was written to counter pagan pride in pagan culture. Against the monk Jovinian, who asserted the equality of virginity and marriage, Jerome wrote a polemic *(Adv. Iovinianum,* 393) frequently brilliant but needlessly crude, excessively influenced by Tertullian, at times unduly harsh toward marriage. Against the priest Vigilantius, Jerome dictated in one night a warm defense of monasticism, clerical celibacy and especially certain practices connected with the cult of martyrs *(Contra Vigilantium,* 406). The Pelagian problem, transplanted to Palestine with the personal appearance of Pelagius (*q.v.*), called forth Jerome's finest controversial work *(Dial adv. Pelagianos,* 415); here his use of fictitious interlocutors makes his arguments uncommonly impersonal.

Jerome's biblical production in Bethlehem includes two introductory tools: *Liber locorum,* a useful translation and adaptation of Eusebius' work on Palestinian toponymy; and *Liber interpretationis nominum hebraicorum,* an alphabetical list. with quite fanciful etymologies, of Hebrew proper names in the Bible. Continuing his revision of the Old Latin version of the Septuagint in accordance with Origen's Hexaplar text (an edition with the Hebrew text. in Hebrew and Greek characters, and four different Greek versions arranged in six parallel columns), he took in hand Ecclesiastes, Proverbs, the Song of Songs. Chronicles (Paralipomenon) and Job, and to his Roman revision of the Psalms added Origen's diacritical notes. Between 391 and 405 he produced his Latin translation of the Old Testament on the basis of the original text. a remarkable effort considering the slender instruments at his disposal and the opposition his project provoked. Jerome's Bethlehem commentaries suffer at times from hasty composition, excessive dependence on predecessors and predilection for allegorical interpretation. The *Liber hebraicarum quaestionum in Genesim* gives an important place to geography, etymology and rabbinic tradition. He wrote short glosses on the Psalter and more scientific explanations of Psalms 10–16. The commentary on Ecclesiastes *(c.* 387) is a milestone in exegesis, because it is the first original Latin commentary that takes advantage of the Hebrew text. Perhaps Jerome's best commentaries are on the minor and major prophets. As for the New Testament, he explained Matthew, accenting the literal sense; he interpreted Paul (Philemon, Galatians, Ephesians, Titus), with the stress on the allegorical; he recast the chiliastic commentary of Victorinus of Pettau on the Apocalypse Many of his letters are tracts on exegetical problems; and he wrote homilies to his monks on texts of Scripture.

Jerome's ascetical interests at Bethlehem are mirrored not only in his controversies (Jovinian, Vigilantius) but in his charming life of Malchus, the monk captured by Bedouins: his biography of Hilarion, with its miracles and journeyinps; his translation of Coptic ascetical works (*e.g.,* the rule of Pachomius); homilies to his monks; and a significant segment of his correspondence.

Jerome's characteristic is his extensive erudition, especially his control of the classics. the Bible and Christian tradition. He is the learned scholar rather than the deep thinker, a sound traditionalist and not a speculative theologian, more competent as editor than as exegete. His career is a turbulent wedding of scholarship and asceticism, his correspondence an exciting source for historian, Scripture student and theologian. His influence has been far-reaching and profound, on the early middle ages in particular: primarily through the Vulgate, but importantly too as exegete and humanist, and because he transmitted much of Greek thought to the west. Despite his excesses in exegesis, it may be that his most lasting lesson to posterity is his insistence, by word and work, that a fruitful intelligence of Scripture must be rooted in the literal sense.

St Jerome's feast day is Sept 30.

Collections of Jerome's works include: D. Vallarsi, 11 vol. (1734–42), reprinted in J. P. Migne, *Patrologia latina,* vol, xxii–xxx; J. Haussleiter, I. Hilberg, S. Reiter, in *Corpus scriptorum ecclesiasticorum latinorum,* vol. xlix (revision of Victorinus on Apocalypse), liv–lvi (letters), lix (Jeremiah); G. Morin, in *Corpus christiunorum, series latina,* vol. lxxviii (homilies). English translations are: F. *A.* Wright, *Select Letters of St. Jerome,* Loeb Classical library (1933); W. H. Fremantle, "St. Jerome: Letters and Select Works," in *A Select Library of the Nicene and Post-Nicene Fathers,* vol. vi (1912); C. C. Mierow, *Letters of St. Jerome,* "Ancient Christian Writers Series" vol. xxxi–xxxii (1960).

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JEROME, JEROME KLAPKA (1859–1927), English author, was born on May 2, 1859. He was educated at Marylebone grammar school, and was a clerk, schoolmaster and actor, before he settled down to journalism. He made his reputation as a humourist in 1889 with *Idle Thoughts of an Idle Fellow* and *Three Men in a Boat.* He was co-editor (1892–97) of the *Idler* with Robert Barr, and editor (1893–97) of *To-Day.* His one-act play, *Barbara,* was produced at the Globe theatre in 1886, and was followed by others, but his greatest success was scored with *The Passing of the Third Floor Back* (1907), with Forbes-Robertson in the principal role.

Jerome died on June 14, 1927.

JEROME EMILIANI, SAINT (GIROLAMO MIANI or EMILIANI) (1486–1537), founder of the Somaschi, one of the Counter-Reformation orders of clerks regular which specialized in the care of orphans. was born of noble parents in Venice. He became an officer in the Venetian army to fight the League of Cambrai (1508) and was taken prisoner at Castelnuovo near Treviso (1511). He turned to prayer in captivity and attributed his escape to divine assistance. Ordained in 1518, he returned to Venice in 1527, and, encouraged by Gian Pietro Carafa (afterward Paul IV), he devoted himself to the relief of the suffering that followed the invasion of northern Italy and the sack of Rome that year. He opened a hospital at Verona (1531) and the house of Somasca (near Bergamo) from which his order took its name (1532). In Bergamo he founded Italy's first home for penitent prostitutes. He died at Somasca on Feb. 8, 1537, having caught typhus while tending sufferers in Bergamo.

He was canonized in 1767 and made patron of orphans and abandoned children in 1928. His feast is kept on July 20.

The Somaschi date their foundation from 1528, and began a community life under the Augustinian rule in 1532. The order was approved by Paul III in 1540 and finally confirmed in 1568. It spread through Italy and in the 20th century to Switzerland and central America.

See G Landini, *S. Girolamo Miani* **(1947).** (M. Dk)

JEROME OF PRAGUE (d. 1416), an early Bohemian church-reformer and friend of John Hus (Huss). After beginning his studies at the University of Prague, Jerome proceeded to Oxford in 1398. There he became greatly impressed by the writings of Wycliffe. He soon proceeded to the University of Paris and afterward continued his studies at Cologne and Heidelberg. returning to Prague in 1407. At Paris his advocacy of the views of Wycliffe brought him into conflict with John Gerson. Jerome became a friend of Hus, and took part in all the controversies of the university. When in 1408 a French embassy to King Wenceslaus of Bohemia proposed that the papal schism should be terminated by the refusal of the temporal authorities further to recognize either of the rival popes, Wenceslaus summoned the members of the university, and as Wenceslaus for a time favoured the Germans, Hus and Jerome, as leaders of the Bohemians, were threatened with death by fire.

In 1410. Jerome went to Buda, where King Sigismund of Hungary resided, and, though a layman, preached before the king denouncing strongly the rapacity and immorality of the clergy. Sigismund shortly afterward received a letter from the archbishop

of Prague accusing Jerome. He was imprisoned for a short time. Appearing at Vienna, he was again brought before the ecclesiastical authorities. He nas accused of spreading Wycliffe's doctrines, and his general conduct at Oxford, Paris, Cologne, Prague and Ofen nas censured. Jerome voned that he would not leave Vienna until he had cleared himself from the accusation of heresy He then secretly left Yienna, declaring that this promise had been forced on him. He went first to Vottau in Moravia, and then to Prague. In 1412 the representatives of Pope Gregory XII offered indulgences for sale at Prague. the object being to raise money for the pope's campaign against King Ladislaus of Naples. At a meeting of the members ot the university both Hus and Jerome spoke strongly against the sale of indulgences The fiery eloquence of Jerome obtained for him greater success even than that of Hus, particularly among the younger students. Shortly afternard Jerome proceeded to Poland. He again met nith opposition from the Roman Church.

During his stay in northern Europe Jerome received the neas that Hus had been summoned to appear before the council of Constance He wrote to his friend advising him to do so and adding that he would also proceed there to afford him assistance. Contrary to the advice of Hus he arrived at Constance on April 4, 1415. Advised to go immediately to Bohemia. he succeeded in reaching Hirschau, only 25 mi from the Bohemian frontier. He was here arrested and brought back in chains to Constance, where he was examined by judges appointed by the council. His courage failed him in prison and, to regain his freedom, he renounced the doctrines of Wycliffe and Hus. He declared that Hus had been justly executed and stated in a letter addressed on Aug. 12, 1415 to Lacek, lord of Kravář—the only literary document of Jerome that has been preserved— that "the dead man (Hus) had written many false and harmful things." Full confidence was not placed in Jerome's recantation. He claimed to be heard at a general meeting af the council, and this was granted to him. He now again maintained all the theories which he had formerly advocated, and, after a trial that lasted only one day, he was condemned to be burnt as a heretic. The sentence was immediately carried out on May 30, 1416, and he met his death with fortitude.

See all works dealing with Hus; and indeed all histories of Bohemia contain detailed accounts of the career of Jerome. *The Lives of John Wicliffe, Lord Cobham, John Huss, Jerome of Prague and Zizka* by William Gilpin (1765) still has a certain value.

JERROLD, DOUGLAS WILLIAM (1803–1857), English dramatist and man of letters, was born in London on Jan 3, 1803. His father. Samuel Jerrold, actor, was at that time lessee of the little theatre of Wilsby near Cranbrook in Kent, but in 1807 he removed to Sheerness. Dec. 1813 the son joined the guardship "Xamur," and served as midshipman until the peace of 1815. He saw nothing of the war save a number of wounded soldiers from Waterloo; but till his dying day there lingered traces of his early passion for the sea. The peace of 1815 ruined Samuel Jerrold; there was no more prize money. On Jan. 1, 1816, he removed with his family to London, where the ex-midshipman began the world again as a printer's apprentice, and in 1819 became a compositor in the printing-office of the *Sunday Monitor*.

Jerrold soon began to write for the press, and then for the stage. His first piece was a comedy *More Frightened than Hurt* (Sadler's Wells, 1821), and he was presently engaged by Davidge at the Coburg theatre to produce dramas and farces at a few pounds a week. In 1829 he made a resounding success with the three-act melodrama, *Black-eyed Susan* (Surrey theatre). He now achieved a salary of £5 a week as dramatic writer, and was independent enough to refuse to do adaptations *The Bride of Ludgate* (Dec. 8, 1831) was the first of a number of his plays produced at Drury Lane. The other patent houses threw their doors open to him also (the Adelphi had already done so), and in 1836 Jerrold became co-manager of the Strand theatre with W. J. Hammond, his brother-in-law. The venture was not successful, and the partnership was dissolved. While it lasted Jerrold wrote his only tragedy, *The Painter of Ghent*, and himself appeared in the title-rôle. He continued to write sparkling comedies till 1854, the date of his last piece. *The Heart of Gold*.

Meanwhile he was a contributor to the *Monthly Magazine, Blackwood's*, the *New Monthly*, and the *Athenaeum*. To *Punch*, the publication which of all others is associated with his name, he contributed from its second number in 1841 till within a few days of his death.

Jerrold founded and edited for some time, though with indifferent success, the *Illuminated Magazine, Jerrold's Shilling Magazine*, and *Douglas Jerrold's Weekly Newspaper;* and under his editorship *Lloyd's Weekly Newspaper* rose from almost nonentity to a circulation of 182,000. Douglas Jerrold died at his house, Kilburn Priory. in London, on June 8, 1857.

Among the best known of his numerous works are: *Men of Character* (1838), including "Job Pippin: The man who couldn't help it," and other sketches of the same kind; *Cakes and Ale* (2 vols., 1842), a collection of short papers and whimsical stories; some more serious novels—The *Story of a Feather* (1844), *The Chronicles of Clovernook* (1846), *A Man made of Money* (1849), and *St. Giles and St. James* (1851); and various series of papers reprinted from *Punch—Punch's Letters to his Son* (1843), *Punch's Complete Letter-writer* (1845), and the famous *Mrs. Caudle's Curtain Lectures* (1846).

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See also *The Wit and Opinions of Douglas Jerrold* (1858), ed. W. B. Jerrold.

His eldest son, **WILLIAM BLANCHARD JERROLD** (1826–1884), was editor of *Lloyd's Weekly Newspaper* from 1857 to 1883. During the Civil War in America he strongly supported the North, and several of his leading articles were reprinted and placarded in New York by the federal government. Four of his plays were successfully produced on the London stage, the popular farce *Cool as a Cucumber* (Lyceum, 1851) being the best known.

Among his books are *A Story of Social Distinction* (1848), *Life and Remains of Douglas Jerrold* (1859), *Up and Down in the World* (1863), *The Children of Lutetia* (1864), *Cent per Cent* (1871), *At Home in Paris* (1871), *The Best of all Good Company* (1871–73), *Life of Napoleon III* (1874), and *The Life of George Cruikshank* (1882).

JERSEY, EARLS OF. Sir Edward Villiers (*c.* 1656–1711), son of Sir Edward Villiers (1620–89), of Richmond, Surrey, was created Baron Villiers and Viscount Villiers in 1691 and earl of Jersey in 1697. His grandfather, Sir Edward Villiers (*c.* 1585–1626). master of the mint and president of Munster, was half-brother of George Villiers, 1st duke of Buckingham. and of Christopher Villiers, 1st earl of Anglesey; his sister was Elizabeth Villiers, the mistress of William III, and afterward countess of Orkney. Villiers was knight-marshal of the royal household in succession to his father; master of the horse to Queen Mary; and lord chamberlain to William III and Queen Anne. In 1696 he represented his country at the congress of Ryswick; he was ambassador at The Hague. and after 1697 in Paris. In 1699 he was made secretary of state for the southern department, and on three occasions he was one of the lords justices of England. After his dismissal from office by Anne in 1704 he was concerned in the Jacobite schemes. He died on Aug. 25, 1711.

The 2nd earl was William (*c.* 1682–1721), son of the above, an adherent of the exiled house of Stuart. The 3rd earl was the latter's son William (d. 1769), who succeeded his kinsman John Fitzgerald (*c.* 1692–1766) as 6th Viscount Grandison. The 3rd earl's son, George Bussy, the 4th earl (1735–1805), was the "prince of Rlaccaronies" at the court of George III. The 4th earl's son! George, 5th earl of Jersey (1773–1859), married Sarah Sophia (1785–1867), daughter of John Fane, 10th earl of Westmorland, and granddaughter of Robert Child, the banker. She inherited her grandfather's wealth, including his interest in Child's bank! and with her husband took the name of Child-Yilliers. Victor Albert George Child-Villiers (b. 1845) succeeded his father George Xugustus (1808–59), as 7th earl of Jersey in 1859. He was governor of New South Wales in 1890–93. The ninth earl,

grandson of the above, succeeded his father on Dec. 31, 1923.

JERSEY, largest and most southerly of the British Channel Islands. Area 44.87 sq.mi. Resident pop. (1951 census) 57,296. Jersey lies in the bay formed by the west coast of Normandy and the north coast of Brittany. It is about 100 mi. southward from Weymouth and only 12 mi. west of Normandy. The capital is St. Helier (*q.v.*). From high granite cliffs in the north the island slopes down to sandy bays in the south. This southward tilt and the Gulf Stream give it exceptionally mild winters, and subtropical plants flourish. The average annual rainfall is only 32.7 in., and in 1951 it enjoyed 2,024 hr. of sunshine, 48.4% of the possible maximum.

The island's basic industry is agriculture. Small farms grow early potatoes for the English market, followed in the same fields by tomatoes. This double cropping is made possible without soil exhaustion by the use of vraic, a local seaweed, as manure. Jersey cows are world famous as cream producers. The breed is carefully protected, importation of living cattle being forbidden.

The tourist trade rivals agriculture, the beauty of the island sometimes attracting 250,000 summer visitors. Jersey airport is the third busiest in the Cnited Kingdom. Frequent planes arrive from London, Southampton, Bristol, Cardiff and Dinard and in summer from Exeter and Dublin also. Steamers put in daily from Southampton or Weymouth and weekly from St. Malo.

Neanderthal men about 100.000 years before Christ used their flint implements in Jersey's caves. Iberians about 2000 B.C. left seven dolmens (chamber tombsj, of which one, the Hougue Bie, is considered the finest in Europe. Hoards of pre-Roman Gaulish coins have been found, as well as Roman coins in abundance; however, there is no trace of Roman buildings. The Normans, who annexed the island in A.D. 933, made a lasting impression. Some of the country folk even today speak an old form of Norman-French, which William the Conqueror might have understood, but which Victor Hugo found incomprehensible. The *Grand Coutumier de Normandie* is still the substructure of Jersey's law, and curious ancient Norman legal customs survive. Jersey was not annexed to England when the Norman duke conquered that country in 1066. For 140 years more it remained part of Normandy and was ruled from Rouen. Only when France conquered Normandy in 1204 did Jersey have to evolve a home rule constitution of its own. It possessed 12 elected magistrates called jurats, and they at first formed its government under a warden appointed by the king. In the 16th century they began to call in for consultation the rectors and *conne'tables* (civic heads) of the 12 parishes, and thus was formed a local parliament called the states *(les États)*.

Constant French invasions made it necessary that Jersey should be strongly fortified. Mont Orgueil is an impressive example of castle-building. Begun under John, as siegecraft progressed century by century new walls and bastions were added. The only successful French invasion took place in 1450, when, during the Wars of the Roses. Queen Margaret. consort of Henry VI, offered the islands to her cousin, Pierre de Brézé, seneschal of Normandy, in return for help for her party. His lieutenant surprised Mont Orgueil, and held Jersey for five years, but was at last ejected by the Yorkist vice-admiral. Other fortifications are Grosnez, Elizabeth castle, St. Aubin's fort and 18 martello towers; in 1815 Fort Regent was added. Later the Germans tried to make Jersey an *unangreifbaren Festung* during World War II.

No one knows how Christianity filtered into the island; but by the 11th century 12 small chantry chapels had developed into parish churches. These were enlarged and altered so often that little of the original structure remains. The Reformation reached Jersey from France in a fiercely Calvinistic form, but in 1620 James I enforced episcopal ordination and the use of a French translation of the English prayer book.

In the Civil War Puritan Jersey supported parliament, and Sir Philip de Carteret, the royalist lieutenant governor, was besieged in Elizabeth castle. where he died. But Sir George Carteret, his nephew, recovered the island for the king and held it for eight years. Twice Charles II took refuge with him, once as prince of Wales and once as king. In 1651 however parliament reconquered the island. After the Restoration Charles presented a huge silver mace to the island to be carried before the bailiff "as a proof of his affection towards the Island, where he twice found a safe retreat, when excluded from his other dominions."

Through the 18th and early 19th centuries ferocious political feuds rent the island. **A** democratic party called the Magots and a conservative one called the Charlots fought vindictively. Later the parties changed their names to Rose and Laurel, respectively. But today party politics are unknown.

French was the island's language until the middle of the 19th century; but the influx of English residents has made the use of English general.

In World War II German troops occupied Jersey from July 1, 1940, till May 9. 1945. The liberation brought changes in the constitution. The jurats, no longer elected by popular vote but by an electoral college, are now confined to their original duties as judges. They and the rectors have been removed from the states, which now contain 12 senators elected for nine years and 12 *connktables* and 28 deputies elected for three, all by universal suffrage. Income tax in 1951 was 4*s.* in the pound with no purchase tax or death duties.

Jersey has its own'copper coinage. Until 1876 it took 13 Jersey pennies to make a shilling, but in that year the value of the penny was changed to that of the English one. Land is still measured in *verge'es* ($2\frac{1}{4}$ *verge'es* = 1 ac.). Dry goods are measured by the *cabot* (about half a bushel).

Jerseymen have made their mark in more than one sphere of life; among them were Robert Wace, the 12th-century Anglo-Norman poet; Roger Walden, the 14th-century treasurer of England and archbishop of Canterbury; Sir George Carteret, treasurer of the navy; John Lempriere of the *Classical Dictionary;* Sir Philip de Carteret the circumnavigator; the painter Sir John Millais; Lily Langtry the actress and beauty; and Harry Vardon the golfer. *(See* also CHANNEL ISLANDS; ST. HELIER.)

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JERSEY CITY, a city and seat of Hudson county, northeastern New Jersey, U.S., located on a peninsula between the Hudson and Hackensack rivers directly opposite Manhattan Island. It is connected to New York city by ferries and auto tunnels and is a major vehicular route to that city also via the three-mile long Pulaski skyway, carrying vehicles to the entrance of the Holland tunnel. Railroads have extensive terminal installations and marshaling yards there, constituting one of the greatest railhead concentrations in the world. The Morris canal, a part of the national inland waterways system has its terminus there also. The population in 1960 was 276.101 (for comparative population figures *see* table in NEW JERSEY: *Population).* Jersey City is within the area designated by the census bureau as the Jersey City standard metropolitan statistical area (Hudson county), with a population (1960) of 610,734.

The site of Jersey City was first visited by Henry Hudson in 1609 and was settled by the Dutch trappers operating in the area in 1618. About 1630 the site was formally purchased from the Leni-Lenape Indians by Michiel Pauw and by 1650 a permanent settlement had been established. In 1664 the British seized it briefly, returned it to the Dutch, and then took it back permanently in 1674 as part of the spoils in the Seven Years' War then raging. In 1804 Anthony Dey and a number of his associates founded the Town of Jersey. which name later (in 1820) was reconstituted as Jersey City. Between 1834 and 1873 it grew tremendously and rapidly absorbed several surrounding communities so that in 1874 it was formally chartered as a city. In the middle of the 19th century the foremost ceramics industries located there, as did the P. Lorillard Tobacco company, then a dealer in snuff.

Its major industrial activities include paper products, containers, paints, oil refining, chemicals, locomotives, apparel, tanks, toys

and asbestos products. It is also a seaport of some note, being part of the complex known as the Port of New York.

Jersey City, which, aiter the state legislature had passed enabling legislation at the behest of Gov. Woodrow Wilson in 1913, had become the first large city in the eastern G.S. to adopt the commission form of government, voted in 1960 to replace it with a mayor and council. It is the site of St. Peters college, a Roman Catholic school of liberal arts for men, established in 1872, as well as of Jersey City State college, founded in 1921, which specializes in training public school teachers. Also located there is Seton Hall College of Medicine and Dentistry and a municipal medical centre which includes the Margaret Hague Maternity hospital.

(D. N. A.; M. P. M.)

JERUSALEM, the traditional capital of the Holy Land, and formerly the seat of the government of Palestine under League of Nations mandate to Great Britain (1922–48), was divided, as a result of the armistice agreements of 1949, between the state of Israel and the Hashemite Kingdom of Jordan. The Israeli part houses the government of that country. In 1946 the population of the city was estimated at 164,440. After division, the population of the Israeli part sank to 83.984 in 1948 but rose to 166.301 in 1961. The Arab part contained an estimated 57.450 in 1959.

The city stands on a rocky plateau consisting of thin beds ot hard siliceous chalk (*misse*) which overlie a thick bed of soft white limestone (*meleke*). The plateau projects southward from the main line of the Judaean hills, at an average altitude of 2.500 ft. above the Mediterranean and 3.800 ft. above the level of the Dead sea. On the east. the valley of the Kidron separates this plateau from the ridge of the Mount of Olives, which is 100 to 200 ft. higher, while the valley of Ben Hinnom bounds Jerusalem on the west and south, meeting the valley of Kidron near the lower pool of Siloam. Both valleys fall rapidly as they approach their point of junction. Originally, the plateau was intersected by a deep valley, called Tyropoeon by Josephus, which followed a course first southeast and then west of south, and joined the two main valleys of Kidron and Hinnom at Siloam. Another shorter valley, taking an easterly direction, joined the Tyropoeon; while a third ravine passed across the northern part of the Haram enclosure and fell into the valley of the Kidron. The exact form of these three interior valleys, which had an important influence on the construction and history of the city, was being gradually revealed by archaeological and geological exploration begun aiter World War II.

During the summer months the heat on the plateau is tempered by a sea breeze, and there is usually a sharp fall of temperature at night; but in spring and autumn the oppressive east and southeast winds blow across the heated depression of the Ghor. A dry season, lasting from May to October, is followed by a rainy season. Snow falls two years out of three. The mean annual temperature at Jerusalem is 62.8" F., the maximum 112° F. and the minimum 2j° F. The mean monthly temperature is lowest (47.2° F.) in February and highest (76.3" F.) in August. The mean annual rainfall is about 22.4 in., the precipitation occurring mostly from November to April.

Many factors have contributed to the traditions of holiness associated with this city. When Jerusalem fell to David, at the beginning of the 10th century B.C., it was already considered holy; Melchizedek was the "priest of the most high God" in Jerusalem (referred to as Salem in Genesis) long before the conquest. When the Jews were in exile it became the idealized city, and on their return it was the capital of their traditions. The events of Christ's life are closely identified with the city and the immediately surrounding area which have for centuries been considered sacred by all branches of Christianity. The Moslems hold the city sacred for two main reasons. It is the site of the sacrifice of Abraham, venerated as the first Moslem, and it is the site of Prophet Mohammed's ascension. Consequently. the Arabs usually designate Jerusalem by names expressive of holiness, such as Beit el-Makdis and El Mukaddis or briefly El Kuds; *i.e.*, "the Sanctuary."

The Ancient City.—The history of Jerusalem goes back to the Old Stone Age and the earliest signs of human activity are of the Pleistocene period. In the vicinity of Jerusalem 48 prehistoric surface stations have been found, divided as follows: Paleolithic period, 16; Mesolithic, 2; Neolithic, 23; Chalcolithic, 7. Many flint weapons have been found near Jerusalem. About 1400 B.C., before Joshua's invasion of the country, the city was a vassal of Egypt. Among the Tel el Amarna tablets there are about seven which are from Urusalim, as the city was then called (the name, once thought to mean "peace," is now understood to mean "the foundation of the [God] Shalem," a well-known west Semitic deity), which speak of coming attack and ask for Egyptian aid. The Egyptians seem to have maintained a garrison there. While yet an insignificant hill fort, it served as an outpost for the mighty Pharaoh with whom Abdi Kiba. the king, corresponded in the cuneiform script, the highest form of polite letters of the age. It lay close to the desert and its soldiers could traverse the wilderness of Judaea in a day and reach the trade routes they were bound by treaty to defend. Jerusalem could control the desert but was, and is, influenced by it, for the desert reaches almost to its walls. It became important at an early date as a fortress at the side of the trade routes that ran from Hebron to Bethel and Shechem. or branched from the Bethel road to Jericho and across Jordan, or ran along the western side of the Dead sea. When the Israelites invaded the country, however, the city was in the hands of the Jebusites. At the division, it fell in the portions of Judah and Benjamin. the tribal boundary passing through the city, which was not completely captured till seven years after David's accession. On the eastern hill: on the site of the Jebusite Zion. David placed the royal city, and, north of this, he chose a place for the Temple which his son Solomon was to build. Across the Tyropoeon valley, on the western hill. was the civil town. This is the view generally accepted, but there are scholars who contest these identifications. In 1870 the excavations of Sir A. Warren showed that the Tyropoeon valley passed under the southwestern corner of the present Haram area. Probably the Holy of Holies stood over the rock in the so-called Mosque of Omar. Solomon fortified the city with a wall, the "old wall" of Josephus. After his death, Jerusalem was plundered by Shishak (Sheshonk) of Egypt and suffered a further loss of prestige by Jeroboam's rebellion. which alienated ten tribes and left the house of David with only Judah, Benjamin and some of the Levites. In Amaziah's reign (*c.* 790 B.C.), Jehoash (Joash), king of Israel, captured Jerusalem and broke down part of its wall (II Kings xiv, 8–14) which, how-ever, Uzziah, son of Amaziah (c. 780–740 B.C.) repaired. When Jûdah became a tributary of Assyria, Hezekiah improved the defenses of his capital and arranged for a water supply, foreseeing the impending attack. This came in 701 but failed. In 586 Jerusalem was destroyed by Nebuchadnezzar, king of Babylon; the fortifications were dismantled and the Jews taken into captivity. Cyrus, king of Persia, allowed the Jews to, return in 538 B.C.

Nehemiah's Work.—About 445 Nehemiah rebuilt the walls. The line of the walls of Nehemiah has been much disputed. He lists in the north wall the Sheep gate, the Fish gate and the Old gate (which some read as the Mishneh gate); in the west the Valley gate; in the south the Dung gate and Fountain gate; in the east the Horse gate. Among the other constructions in the wall he lists the Armoury. the Broad wall, the Tower of the Ovens and the Towers of the Hundred and Hananel. Hananel stood northwest of the Temple and later formed the basis first of the citadel of Simon Maccabaeus and afterward of Herod's Antonia. Nehemiah speaks of the tomb of David; this is now usually identified with the rock-cut tombs found in the city of David during the excavations of R. 1 (1914). Twelve years after Alexander's peaceful entry into Jerusalem in 332 B.C., Ptolemy I of Egypt partially demolished the fortifications, which remained in ruins until their restoration by Simon II (219–199 B.C.). The new walls were soon overthrown. In 168 B.C. Antiochus Epiphanes destroyed them again when he captured Jerusalem and laid the Temple waste. The city now sank to the lowest state since the captivity. Antiochus brought in a Greek garrison and built for them a citadel, the Akra, which commanded the eastern hill and the city of David. The site of the Akra is much disputed; the position at the northeastern corner of the western hill of the Old city is the most acceptable. Judas Maccabaeus recaptured Jerusalem but the

Akra defied him. The Jews erected walls to cut it off from the city and Temple. The Akra fell to Simon Maccabaeus who demolished it and alsa lowered the hill on which it stood to prevent the Temple from being dominated again. To replace the Akra he built another citadel. mentioned above. About this time a second or outer wall was built to the north of the first wall. Pompey besieged and took Jerusalem in 65 B.C. and in 54 Crassus plundered. the Temple.

Herod the Great's *Changes.*—In 37 B.C. Herod the Great became king and, having secured almost despotic power, proceeded to make such radical architectural changes that Jerusalem became a new city. Herod's great aim was to found a dynasty and make his kingdom remarkable culturally and politically. "Twice had Israel the opportunity of becoming a great world pomer and on both occasions the nation deliberately rejected it" (F. J. Foakes Jackson. Biblical History of the Hebrews, p. 216 [Cambridge, 1921]); and the same author draws a striking parallel between Solomon and Herod: "both were men of exceptional ability . . . both made the Temple of Jerusalem a wonder of the world; both had strong sympathy with foreign ideas; both cherished great schemes for the aggrandizement of the nation which were regarded in Israel as contrary to its true destiny." Herod sought to achieve his ends by turning to Rome. as Solomon had turned to Tyre. Herod had diplomatically enjoyed the favour first of Xntony and then of Augustus. Herod determined to do for Jerusalem what Augustus had done for Rome: transform it into a city of marble. His chief enterprises were the following: (1) he completely rebuilt the Temple from its foundations, doubling the area of the enclosure—a great part of the Haram malls date from his day; (2) he restored the fortifications and added to their strength by constructing the great fort of Antonia, northwest of the Temple; (3) he raised a magnificent palace. defended by three great towers, named Mariamne. Hippicus and Phasaelus, on the western hill—the Tower of David, by the present Jaffa gate, is on the foundations of one of these towers; (4) he erected a theatre; and (j) he erected a gymnasium. His successor Archelaus (4 B.C.–A.D. 6) lost much of Herod's pomer which passed to the procurators. under one of whom, Pilate, Jesus was crucified. The church of the Holy Sepulchre (see SEPULCHRE, THE HOLY) is now considered to mark the site of Jesus' burial; the Via Dolorosa to mark the route he trod carrying his cross; and the Grotto of Gethsemane to be the cave where he lived with his disciples and was betrayed. There are numerous other places in the city traditionally connected with Jesus' life. Of other buildings in Jerusalem, *e.g.*, the Xystus or stone chamber where the Sanhedrin (see SYNEDRIUM) met, little is known.

Herod Agrippa (41–44) built a third wall, the course of which has been traced by excavations of the Hebrew university's archaeological department.

Titus and *Hadrian.*—The Romans would not allow the work to continue and when Titus besieged Jerusalem in A.D. 70 the wall was not complete. Titus, attacking from the west, captured successively the third and second walls, Antonia, the Temple and the upper city. It is probable that his orders for the complete destruction of the Temple and fortifications, with the exception of the three towers, were not carried out. The Roman garrison which he left remained at Jerusalem until the Jewish War of Freedom under Bar Cocheba in 132. Following the defeat of the Jews, Jerusalem was then devastated more completely than it had been by Titus. The site was plowed over and a new city, Aelia Capitolina, so-called in honour of (Aelius) Hadrianus, was built over the ruins. From this Jews were excluded, but Christians who were of gentile extraction might enter. Temples were dedicated to Bacchus, Venus and Serapis and over the former sanctuary a shrine of Jupiter Capitolinus was reared. A boar, the symbol of the 10th legion. was placed over the southern gate. Other buildings then constructed were the theatre, the public baths, the Tetranymphon, the Dodecapylon and the Quadra. For two centuries little is known of Jerusalem. In 326 Constantine ordered Bishop Macarius to recover the sites of the crucifixion and the burial of Jesus. Two great churches were built, one of which, the church of the Holy Sepulchre, stood where its present namesake stands. Of the Basilica of the Eleona the foundation only remains. In 460 the empress Eudocia repaired the walls and extended them so as to include Siloam; she also built churches, one of which. above the Siloam pool, was recovered by F. J. Bliss (1896–98), and another, over the reputed tomb of St. Stephen, north of the Damascus gate, was discovered in 1874 and is called the church of St. Anne.

Justinian's basilica, with adjacent hospitals for the sick and for pilgrims, built in the 6th century, is described by Procopius. In 614 Chosroes II of Persia captured Jerusalem and damaged many buildings, including the church of the Holy Sepulchre. Heraclius defeated Chosroes and re-entered Jerusalem in 629. In 637 Omar ousted the Romans but was careful not to harm the city. He built a wooden mosque which the caliph Abd ul-Malik rebuilt in 688; this mosque is el-Aksa Abd ul-Malik also constructed the Dome of the Rock (Lubbet es-Sahra, or Mosque of Omar). In 1099 the crusaders, under Godfrey of Bouillon, entered Jerusalem and a terrible carnage ensued. Jerusalem became the capital of the Latin kingdom (see CRUSADES) until Saladin reconquered it in 1187 and repaired the walls. Soon after 1167 Benjamin of Tudela visited Jerusalem and left a description of the city in his Itznerary. Excepting in 1229–39 and 1243–44 Jerusalem remained in Moslem hands until its capture (1917) by Lord Allenby. In 1517 Selim I of Turkey took Jerusalem from the Egyptians. The present configuration of the walls is due to him.

The **Modern** City.—Prior to 1858 Jerusalem was wholly confined within its 16th-century walls. After 1858 the modern building period began with Jewish religious quarters, especially Meah-Shearim. Later, Catholic and Greek Orthodox monasteries and quarters were added.

After World War I, Jerusalem was the capital of the British-mandated territory of Palestine. New Jewish quarters, with many buildings equipped with modern accommodation, were erected, such as Rehavia, Beth Hakerem and Talpioth. Somewhat older are the German and Greek suburbs near the railway station on the plain of Rephaim. Modern Arab quarters were built at Talbieh and on the way to Mt. Scopus.

The years after 1920 completely changed the aspect of Jerusalem. An excellent water supply system was built which pumps water from the plains near the seacoast up the steep elevation on which Jerusalem is built. The ancient water supply, leading from the springs of Birket el-Arub to Solomon's pools. was modernized and a second reservoir was made at Romema. Electric power was introduced, macadamized motor roads were built and great public buildings were added to the city. Modern principles of town planning were taken into consideration and a special effort was made to embellish the barren rocks with trees and gardens. The Hebrew university on Mt. Scopus. near the Mount of Olives, was formally opened on April 1, 1925. The university possessed a number of large and representative buildings. among them a library, the greatest library in the near east.

After World War II, according to the partition resolution of the United Nations (1947), Jerusalem was to be internationalized; however. in the fighting which broke out immediately afterward and which developed into the Israel-Arab war, the Old city passed into the hands of Jordan and the New city, including the Greek and German colonies, into those of Israel. In the course of the operations the Jewish quarter of the Old city was destroyed and the Wailing Wall became inaccessible to the Jews. The New city was cut off from the coast and bombarded by the Arab legion: however, the opening of a road to the west enabled the besieged Jewish population to hold out. In 1948 the second truce put an end to the fighting. In 1950 the Israeli government, including the parliament and ministries, was transferred to Jerusalem. The city remained divided, the only connection between the two parts being the place known as the Mandelbaum gate, passage through which is restricted by the laws of both countries.

After 1948 the Israeli part of the city was enlarged westward and many new constructions were completed or undertaken. These include the planned government quarter (ha-Qiryah), the convention centre, the Chief Rabbinate and several new hotels on King George V street. The city was extended into the hills and

valleys to the west, in the direction of Ein Karem and the new medical centre there. In 1954 the remains of Theodor Herzl, the founder of Zionism. were transferred to Jerusalem and a national cemetery was established around his tomb. As a result of the armistice line, the buildings of the university on Mt. Scopus were cut off from the Israeli part of Jerusalem and remained a demilitarized zone inside the Arab area. The university built a new campus west of the city, and was gradually transferring its institutions there in the late 1950s. The new campus includes buildings to house the administration and the departments of Jewish studies. humanities, economics and law. chemistry. botany, etc.; a new library and an institute of archaeology were being constructed and a synagogue. a student's hostel, an amphitheatre and a stadium had been added to the campus by 1958.

With all its modern buildings Jerusalem keeps its aspects of a holy city. Special care was taken to adjust the new quarters to the character of the city. The beautiful stone, used in buildings throughout. helped to unify the impression in spite of the difference between the broad modern boulevards in the newer sections and the narrow and covered streets in the ancient section within the walls.

Jerusalem is the seat of ecclesiastical authorities of many faiths. It is the third holy city of Islam. ranking immediately after Mecca and Medina; it is the residence of the chief rabbis of the Jewish community, one for the Ashkenazic and one for the Sephardic branch of Judaism; and. among the many Christian dignitaries. there is a Roman Catholic patriarch. a Greek Orthodox patriarch, an Armenian patriarch, the Franciscan guardian of the Holy Land, the Anglican bishop. etc. The number of synagogues. churches, monasteries and mosques bears witness to the universal importance of Jerusalem. as does the variety of races and creeds intermingling in its crowded thoroughfares.

In the Israeli part of the city industries are being fostered by the Jerusalem Economic Corporation. Ltd.. set up by the ministry of development. There are approximately 100 new factories producing antibiotics, shoes. blown glass, pencils and textiles. They are concentrated mainly in the new industrial centre near Jaffa road. the city's principal thoroughfare.

In the Arab part of the city, the new buildings are primarily hospitals to care for the large influx of Arabs into the section after partition. These refugees are living in large compounds and are housed in tents.

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(H. Ko.; H. M. J. L.; M. A.-Y.)

JERUSALEM, SYNOD OF (1672). By far the most important of the many synods held at Jerusalem is that of 1672; and its confession is the most vital statement of faith made in the Greek Church during the past 1.000 years. It refutes article by article the confession of Cyril Lucaris. which appeared in Latin at Geneva in 1629, and in Greek. with the addition of four "questions." in 1633. Lucaris, who died in 1638 as patriarch of Constantinople, had corresponded with western scholars and had imbibed Calvinistic views.

The great opposition which arose during his lifetime continued after his death. Against Calvinism the synod of 1672 aimed its rejection of unconditional predestination and of justification by faith alone, also its advocacy of what are substantially the Roman doctrines of transubstantiation and of purgatory; against the Church of Rome. however. it renamed the rejection of the *filioque,* affirming once more that the Holy Spirit proceeds from the Father only. The 18 canons of the synod are also known as the "Confession of Dositheus" (the president).

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JERUSALEM ARTICHOKE: *see* ARTICHOKE.

JESPERSEN, JENS OTTO HARRY (1860–1943). Danish philologist. n-as born at Randers on July 16. 1860. In 1893 he was appointed professor at the University of Copenhagen. From 1909 to 1910 he lectured at Columbia university. New York. His most important works are *Progress in Language* (1894); *Phonetics* (1897–99); *Growth and Structure of the English Language* (1905; Prix Volney, 1906); *Lehrbuch der Phonetik* (1913); *Language, Its Nature, Development und Origin* (1922); *Philosophy of Grammar* (1924); and an autobiography in Danish. He died in Roskilde. Den.. April 30. 1943.

JESSE, in the Bible. the father of David (*q.v.*), and as such often regarded as the first in the genealogy of Jesus Christ (cf. Isa. xi, 1. 10). Hence the design representing the descent of Jesus from the royal line of David. which was formerly a favourite ecclesiastical ornament. is called a "tree of Jesse." From a recumbent figure of Jesse springs a tree bearing in its branches the chief figures of the line of descent, and terminating in the figure of Jesus. or of the Virgin and Child. There are remains of such a tree in the church of St. Mary at Abergavenny, carved in wood, and supposed to have once stood behind the high altar. Jesse candelabra were also made. At Laon and Amiens there are sculptured Jesses over the central west doonvays of the cathedrals. The design was chiefly used in windows. The great east window at Wells and the window at the west end of the nave at Chartres are fine examples.

JESSEL, SIR GEORGE (1824–1883), English judge noted for his success in expediting the work of the court of appeal and in helping assure the successful application of the Judicature acts of the late Victorian era. was born in London. Feb. 13. 1824, the son of Zadok Aaron Jessel, a Jewish coral merchant. George Jessel was educated at a school for Jews at Rew, and at University college, London. He entered as a student at Lincoln's Inn in 1842 and was called to the bar in 1847. becoming queen's counsel in 1865. Jessel entered parliament as Liberal member for Dover in 1868. and attracted Gladstone's attention by two learned speeches on the Bankruptcy bill that was before the house in 1869. xi-ith the result that in 1871 he was appointed solicitor general. His reputation at this time stood high in the chancery courts: on the common law side he was unknown, and on the first occasion upon which he came into the court of queen's bench to move on behalf of the crown, there was very nearly a collision between him and the bench.

In 1873 Jessel succeeded Lord Romilly as master of the rolls. From 1573 to 1881 Jessel sat as a judge of first instance in the rolls court, being also a member of the court of appeal. In 1881 the Judicature act of that year made the master of the rolls the ordinary president of the first court of appeal, relieving him of his duties as a judge of first instance. In the court of appeal Jessel presided almost to the day of his death. He sat for the last time on March 16. 1883, and died on March 21.

As a judge of first instance Jessel was a revelation to those accustomed to the proverbial slowness of the chancery courts and of the master of the rolls who preceded him. He disposed of the business before him with rapidity combined with correctness of judgment. and he not only had no arrears himself, but was frequently able to help other judges to clear their lists. His knowledge of law and equity was wide and accurate, and his memory for cases and command of the principles laid down in them extraordinary. In the rolls court he never reserved a judgment. not even in the Epping forest case. in which the evidence and arguments lasted 22 days (1jo witnesses being examined in court. while the documents went back to the days of King John), and in the court of

appeal he did so only twice, and then in deference to the wishes of his colleagues. Never during the 19th century was the business of any court performed so rapidly, punctually and satisfactorily as it was when Jessel presided.

Jessel was master of the rolls at a momentous period of legal history. The Judicature acts, completing the fusion of law and equity, were passed while he was judge of first instance, and were still new to the courts when he died. His knowledge and power of assimilating knowledge of all subjects, his mastery of every branch of law with which he had to concern himself, as well as of equity, together with his willingness to give effect to the new system, caused it to be said when he died that the success of the Judicature acts would have been impossible without him. His faults as a judge lay in his disposition to be intolerant of those who endeavoured to persist in argument after he had made up his mind; but though he was peremptory with the most eminent counsel, young men had no cause to complain of his treatment of them.

Jessel's career marked an epoch on the bench, owing to the active part taken by him in rendering the Judicature acts effective, and also because he was the last judge capable of sitting in the house of commons. a privilege of which he did not avail himself. He was the first Jew who, as solicitor general, took a share in the executive government of his country, the first Jew who was sworn a regular member of the privy council and the first Jew who took a seat on the judicial bench of Great Britain.

See the *Times* (London) (March 23, 1883); Sir Charles Jessel, "An Eminent Victorian Lawyer," *Blackwood's Magazine* (Jan. 1926); Sir Arthur Lehman Goodhart, *Five Jewish Lawyers of the Common Law* (1949). (S. *Tt.*; X.)

JESSORE, a municipality and district in the Rajshahi division of East Pakistan. The town is on the Bhairab river, 68 mi. N.E. of Calcutta, India, with which it is connected by rail. The line continues through Jessore southwestward to Khulna. Pop. of Jessore (1951) 24.146. It is the seat of one of the arts colleges of Rajshahi university.

JESSORE DISTRICT (area. 2.603 sq.mi.; pop. [1951], 1,707,896) lies in the centre of the Ganges delta. It is an alluvial plain, intersected by rivers and watercourses, which in the south spread out into large marshes. The rivers of Jessore have ceased to be true deltaic rivers. Some, such as the Madhumati, have active currents. but others have degenerated, except in the rains. into chains of long, almost stagnant, pools. They have silted up and lost their connection with the parent streams. The staple crop of Jessore is rice. The principal industry is the manufacture of sugar from date palms.

JESTER, a provider of "jests" or amusements, a buffoon, especially a professional fool at a royal court or in a nobleman's household. (See FOOL.)

JESUATI, a religious order founded by Giovanni Colombini of Siena in 1360. Colombini had been a prosperous merchant and a senator in his native city, but, coming under ecstatic religious influences, abandoned secular affairs and his wife and daughter (after making provision for them) and, with a friend of like temperament, Francesco Miani, gave himself to a life of apostolic poverty. penitential discipline, hospital service and public preaching. When Urban V returned from Avignon to Rome in 1367, Colombini craved his sanction for the new order and a distinctive habit. Before this was granted he had to clear the movement of a suspicion. that it was connected with the heretical sect of Fraticelli, and he died on July 31. 1367, soon after the papal approval had been given. The guidance of the new order, whose members (all lay brothers) gave themselves entirely to works of mercy, devolved upon Miani. Paul V in 1606 arranged for a small proportion of clerical members, and later in the 17th century the Jesuati became so secularized that the order was dissolved by Clement IX in 1668.

See T. Kennedy. "John Columbine. Blessed" in the *Catholic Encyclopaedia*; Max Heimbucher, *Orden u. Kongregationen,* ii, 240.

JESUITS, the name commonly given to the members of the Society of Jesus. (See JESUS, SOCIETY OF.)

JESUS, SOCIETY OF, a Catholic religious order, founded in 1540 by St. Ignatius of Loyola. It is a mendicant order of clerks regular. Its members rely on alms for their support. They have for their end the spiritual perfection not only of themselves but of others. In the beginning Ignatius used the Spanish term *Compañia* to express the soldierly spirit of loyalty to the captain, Jesus. This name was Latinized by Ignatius into that of *Societas.* Pope Paul III, in 1540, ruled that the official title should be Societas Jesu. The word "Jesuit." originating in the preceding centuries, was fixed on Ignatius' companions as a term of reproach and contempt. Gradually it was accepted by the society and acquired an honourable meaning. The two understandings of the name have persisted so that the Jesuits have always been regarded by some as a society to be feared and condemned and by others as the most laudable and esteemed religious order in the Catholic Church.

FOUNDATION AND INSTITUTE

The establishment of the Society of Jesus as a religious order evolved in the mind of Ignatius of Loyola (see LOYOLA, ST. IGNATIUS OF) through a term of years and a series of clarifications. Born in 1491 in the ancestral castle of Guipuzcoa, Ignatius was early inducted into the career of the soldier. In 1521, campaigning for the defense of Navarre against the French, he was struck down by a cannon ball at Pampeluna. The period of inactivity that necessarily followed turned him from military pursuits to religious aspirations. His definite conversion dated from his pilgrimage to Montserrat and his life as a recluse at Manresa where he was inspired with the ideas which later were formulated in the Spiritual Exercises. His first apostolic impulse was for labour in the Holy Land, whither he went in 1523. Visioning more clearly, however. he realized that education and companions were required to execute his plans for God's greater glory. He devoted 11 years to study at Barcelona, Alcalá, Salamanca and finally at Paris. Through these student years, his extraordinary zeal and charity often caused him to be persecuted and imprisoned, but upon examination he was always vindicated.

At Paris he attracted to himself six brilliant young university students: Peter Faber, a Savoyard; Francis Xavier of Navarre; Diego Laynez, Alphonso Salmerón, Nicholas Bobadilla, Spaniards; and the Portuguese Simon Rodriguez. In 1534 these seven bound themselves by vows to poverty, chastity and to a pilgrimage to Jerusalem. Three others had joined the brotherhood by 1536, namely. Claude Le Jay, a Savoyard, and the Frenchmen Jean Codure and Paschase Broet. Being prevented by the war between Venice and the Turks from going to the Holy Land, the companions, who with papal permission had been ordained, ment to Rome in order to place themselves at the disposal of the pope. They consulted among themselves through months as to their future mode of life. Thus far, they followed no rule and were subject to no communal authority. They saw the necessity of obedience to an authority and of seeking means to perpetuate their brotherhood. In 1539 Ignatius drew up a *Formula* instituti, which contained the fundamentals of the order they wished to found and which, after some hesitation. Paul III approved on Sept. 27, 1540, in the bull Regimini militantis ecclesiae. The membership was limited to 60, a limitation removed by Julius 111, Paul's successor. In April 1541 Ignatius was chosen general of the new order.

The concept of the society is briefly expressed in two documents composed by Ignatius: the Spiritual Exercises and the *General Examen* (see LOYOLA, SAINT IGNATIUS OF). The latter, intended for persons proposing to join, is a brief statement of the aims and requirements of the society. The former is a concise memorandum for the guidance of a director and an exercitant in the performance of a carefully planned series of reflections, meditations, affective aspirations. self-examinations and resolutions. The aim of the Spiritual Exercises is: (1) the purification of the soul from disordered affections and worldly standards; (2) the discovery of the Divine Will before making a choice of a state of life; (3) the consecration of the person's mind and will to the service of the Creator under the leadership of Jesus Christ. They are divided into four periods, designated as "weeks." The

Spiritual Exercises, in a sense) are to the society what the rule (*regula*) is to the older religious orders. From them have been derived the ascetical teaching and practice of the members as well as methods of their apostolate.

Corresponding to the "Foundation." or fundamental considerations with which the *Exercises* begin. that "man is created to praise, reverence: and serve God our Lord, and so doing to save his soul!" is the opening declaration of the *General Examen:* "The aim of this Society is not only to seek with the aid of the Divine grace the salvation and perfection of one's own soul but with the aid of the same earnestly to labour for the salvation and perfection of one's neighbor." Distinctive. in comparison with the older orders. is the definiteness with which Ignatius relies upon the exterior and interior sacrifices required by the apostolate itself as a primary means of sanctification.

From the maximal orientation of the Ignatian apostolate to the "greater glory of God" stems the Ignatian universalism, by which the society is traditionally the exponent of the "Catholic" or universal idea of the Catholic Church. At the same time the person-to-person following of Christ taught by the *Exercises* encourages the vigorously humanistic trend that characterizes Jesuit asceticism, preaching and educational methods.

Ignatius' realism. based on his experience, prescribed for the society a "common" manner of living (*Examen,* i, 60). The strictness of the rule of pol-erty is derived more from the rigid requirements of common ownership and dependence upon superiors than from any striking outward observances; while chastity is safeguarded by intensive cultivation of the inner life. Obedience, while practically indispensable for the efficacy of an organized spiritual campaign, is filial, not servile: and is definitely limited by the boundaries of the Constitutions, the canonical structure of the church and the requirements of conscience and the moral law. The unique emphasis laid upon this virtue in the Ignatian scheme derives from Ignatius' insistence upon its transcendental aspect, by which obedience to a fellow human being. whose personal limitations are frankly acknowledged, is made the means of interiorly consecrating the noblest part of man's nature, his will and judgment, to the Creator from Whom he has received them.

Ignatius made many innox-ations in the form of the religious life of which the principal ones were: (1) he dropped many medieval practices, such as penances of rule. a common uniform or "habit" and the recitation of the liturgical office in choir in favour of greater mobility and greater adaptability; (2) he abandoned the capitular or democratic form of government common in previous orders in favour of a monarchical regime in which most members would never have a voice; and (3) he introduced "simple" vows from which the members could be more readily dispensed by the Holy See. should such a dispensation be judged advantageous for the individual or the society. than from the customary "solemn" vows.

Even before papal approbation was given to the society. the first members were employed in delicate and dangerous missions by the pope. Ignatius remained at Rome. sending frequent instructions to the dispersed brethren and receiving their reports. In 1541 he had been empowered to draw up Constitutions for the new order. He experimented for six years, tentatively reducing the principles of the *Formula instituti* to practice. In 1547 he began to elaborate the text of the Constitutions and was ably assisted by his secretary Juan Polanco. In 1j51 the first draft of the Constitutions was finished and was submitted to leading members of the society for examination. Ignatius revised the Constitutions according to their suggestions and in 1jj2 began to introduce them throughout the order, although as yet they did not have legal force. During the last four years of his life (1552–56), Ignatius further revised and perfected his text. The first genersl congregation of the order (1j58), after some slight changes, approved the Constitutions as the fundamental law of the society.

The Constitutions are a part of the "Institute of the Society of Jesus" which, in addition. contains also various papal documents approving the order and enumerating its privileges, legislation of general congregations. regulations of the generals, etc. The Constitutions recognize three grades in the society: scholastics, coadjutors and professed. Aspirants, besides conforming to canon law requirements. should have constancy of character, virtue, prudence and, if they are to be priests, learning. The aspirant goes through a brief "first probation." This familiarizes him with the spirit of the order and affords a prayerful opportunity to stabilize his vocation. Two years of "noviceship" follow. devoted to his ascetical development under a skilled novice master. To test his vocation the novice devotes himself to the *Spiritual Exercises* for 30 days and is assigned to menial occupations. If approved he takes the usual religious vows of poverty, chastity and obedience. 'Ihese vows are "simple" in the sense explained above. Scholastics are those who have taken such vows and are destined for studies. For about nine years the scholastic studies literature, the sciences. philosophy and theology, two or three years' teaching under carefully supervised conditions usually intervening between the last tn-o courses. Following his ordination to the priesthood, he passes through a further year. the tertianship, devoted again to asceticism and another 30-day retreat.

If he has evidenced a special fitness for the society's work, he is now admitted to the profession. The "professed" constitute the society in its fullest sense. They may hold any office. They alone participate in general congregations. They make solemn religious vows and, in addition. a special vow of obedience to the pope. They also promise neither to desire nor to seek any dignity in or out of the order. Others are admitted among the "formed spiritual coadjutors." Except for their exclusion from the very highest offices, these engage in all the activities of the society. St. Ignatius advises that from among them rectors be usually selected. They bind themselx-es only by simple vows. Occasionally, because of special talents. some of these are raised to the profession. The society also recognizes "temporal" coadjutors (lay brothers) who have for their duties domestic and kindred occupation.. and live in community.

The general congregation is the supreme governing and legislative body in the society. It meets on the death of a general to elect his successor: also for extraordinary business. Though the general presides at its sessions. he is subject to it. Its personnel includes the provincials with two delegates from each province elected by the respective provincial congregations. The general is chosen for life and, except for certain constitutional limitations, has complete authority and power in the society. He is aided by a group of "assistants." each representing a definite geographical section of the world. These assistancies are divided into provinces, each presided over by a provincial. The latter is responsible for the province and assigns men to their tasks but he may not interfere with the autonomy of the several houses or colleges. Provincials and local superiors are appointed by the general. He is kept informed of what goes on by official reports which he periodically gets from them and other officials in each house, college and province.

The work of the society is practically coextensive with the needs and ideals of the apostolic ministry. Secular business and political activity are expressly forbidden. Administration of the sacraments, preaching! missionary. charitable and educational work are the proper province of the Jesuit priest.

EARLY HISTORY

The history of the Society of Jesus is clearly divided into two periods, 1540–1773 and from 1814. They are separated by the suppression (1773–1814) when the society was dissolved by Clement XIV; during the suppression a small group maintained corporate existence in Russia.

The first century of the order's history was marked by rapid expansion, by the performance of the duties of the apostolic ministry and also by strong opposition from non-Catholics and even from some Catholics. During the early years of the generalate of St. Ignatius (1541–56) the members engaged in the ministry, traveled from place to place at the request of ecclesiastical and secular rulers. putting energy into the Catholic reform by preaching and catechetical instruction. Two members were dispatched to Ireland by the pope. others to Poland and Germany; the best theologians were sent to the Council of Trent.

As numbers increased and colleges were founded (the first at Gandia in Spain in 1546), a more stable organization mas evolved. In Catholic countries the main effort went into colleges and seminaries where religious formation was imparted and instruction in literature; philosophy and theology was given. Especially noteworthy were the Roman college, founded at Rome in 1551 as a model seminary, and the German college, founded at Rome in 1552 for the education of German priests to replace those who had gone over to Lutheranism. In addition to teachers, the early Jesuits produced preachers and catechists who devoted themselves especially to the care of the young, the sick, of prisoners, fallen women and soldiers. Spiritual retreats based on the *Spiritual Exercises* of Ignatius were used as a means of reform for individuals. In countries where Catholicism was threatened by Protestantism, the early Jesuits took up key positions, usually in colleges. in order to stop the defections from the Roman Church. In the judgment of many, they gave the Catholic resistance a confident spirit which it had lacked until their appearance.

In the meantime the society had entered the foreign mission field with equal vigour. Leaving Lisbon in 1541, Francis Xavier founded in south India what was destined to be the working model of modern Catholic missions to pagans. By 1j46 he had reached the Moluccas and in 1549 he entered Japan. He died in 1552 without having been able to penetrate into China. Other Jesuit missionaries went to the Congo in 1547 and to Morocco in 1548. In 1549 Manuel da Nobrega began the more successful mission of Brazil. Missionaries dispatched by Ignatius reached Ethiopia in r,.;;. At his death (1556) the founder left 1.000 religious in about 100 houses and divided into 12 provinces. The society at the time hsd taken firmest root in Italy. Spain and Portugal. The India mission was manned by a relatively large number of memhers.

Under the two following generals. Diego Laynez (1558–65) and Francis Borgia (1565–72), the order's positions in France and Germany were strengthened. Peter Canisius, a Hollander, became the leader of the Counter-Reformation in German-speaking lands; Edmond Auger and Antonio Possevino distinguished themselves on the Catholic side in France. Borgia, who had at one time been viceroy of Catalonia, pushed the development of the missions, especially in Mexico and Peru. Rome saw the construction of the Gesh, the central church of the society, and the inauguration of the sodalities of the Blessed Virgin Mary. In 1566 Spanish Jesuits began to evangelize the Indian tribes of Florida; Father Peter Martinez, the first Jesuit martyr of North America. was slain in that year when landing on the coast at a point in northern Florida. His fate did not discourage Fathers Segura and Quiros who attempted to found a mission in Virginia in 1570. There in Feb. 1571 they, together with six other Jesuits. were slain by the natives. Needs of the apostolate in other parts of New Spain led to the withdrawal of missionaries from Florida. The generalate of the Belgian Everard Mercurian (1573–80) saw the end of Spanish preponderance in the government of the order and the beginning of the English mission (1578).

The long generalate of the Italian Claudio Aquaviva (1581–1615) marks one of the high points in the history of the order. Although only 37 at the time of his election, Aquaviva with exceptional prudence and resourcefulness overcame grave internal and external difficulties. The energetic Franciscan pope Sixtus V thought of changing the Constitutions of St. Ignatius, but never actually took the step. More dangerous were the machinations of discontented members, who had powerful support especially in Spain. Two extraordinary genera1 congregations (1595 and 1608) supported Aquaviva and succeeded in bringing most of the disaffected members back into line. In France the society was the object of repeated attacks. In 1594, after the attempt on the life of Henry IV by Châtel, it was arbitrarily proscribed but regained its rights in 1608. It was banned from the republic of I'enice in 1606 because of its observance of a papal interdict and was not readmitted until 16j6. The publication in 1588 by Luis Molina of his *Concordia*, a treatise on the relationship between divine grace and human freedom, led to a serious theological struggle with the Dominican fathers. This dispute was taken up by a papal commission *De auxiliis divinae gratiae* which decided that each side could hold its own doctrine but must not attack that of its opponents as unorthodox.

Under Aquaviva the membership of the society grew from about 5.000 to over 13,000, the number of provinces from 21 to 32 and the number of colleges was increased by more than 200. Matteo Ricci introduced the society into China and beginnings were also made in the Philippines. Indochina, the near east, Canada and Paraguay. where in 1609 the first of the famous reductions was established. In Japan the Christian cause had a setback in 1597 but continued to advance until 1614. In Europe the position of the society as a leader in ecclesiastical and humanistic education was strengthened. Efforts to bring the Protestants back into the Church of Rome were also increased.

While directing this advance. Aquaviva was ever concerned to preserve and strengthen the original spirit of the order. The society counted among its members at the time: Peter Canisius, Robert Bellarmine (*qq.v.*), Aloysius Gonzaga, Alphonsus Rodriguez, Peter Claver and Bernardino Realini. In addition, Jesuits shed their blood for the faith in India, where one of the martyrs, Rudolph Aquaviva, was a cousin of the general; in Japan, where the government undertook the extermination of the flourishing Christian communities; in England where the society was falsely accused of involvement in the Gunponder plot (1605); and in France during the Wars of Religion. This was also the period of the great Jesuit spiritual writers: Alphonsus Rodriguez. Alvarez de Paz. Luis de la Puente, Antoine le Gaudier and the other exponents of the Jesuit school. More noteworthy was a galaxy of theologians of the first rank: Francisco Toledo, Francisco Suárez. Gabriel Vazquez. Gregorio de Yalencia, Diego Ruiz de Montoya, Molina, Jacob Gretzer. Leonard Lessius and many others.

With the generalate of the Roman Mutius Vitelleschi (1615–45), the rapid expansion of the society came to an end. The order continued to grow during its second century but at a slower tempo. This was the period of French predominance in politics and culture. *le grand siècle.* Many French Jesuits stood out: Pierre Coton and François Annat as confessors of the kings; Julian Maunoir, Vincent Huby and Jean François Régis as home missionaries: Dionysius Petavius. Antoine Sirmond and Philippe Labbe as savants and theologians; Louis Lallemant as founder of the French school of Jesuit spirituality. In Canada and New York state, eight French Jesuits. Isaac Jogues, Jean de Brébeuf and their companions were martyred by the Iroquois. They were canonized in 1930. With the rise of Jansenism (*q.v.*), the outlook in France darkened. In Belgium the society continued to prosper and in 1643 Belgian Jesuits began the publication of the celebrated *Acta sanctorum.* It was under Father Vitelleschi that the first English-speaking priests arrived in North America. A group of Jesuits, headed by Father Andrew White, went out with the Maryland colonial expedition of 1634. Gov. Thomas Dongan of New York introduced Jesuits into that colony in the 1680s.

Vitelleschi's immediate successors ruled briefly: Vincent Caraffa (1646–49), Francis Piccolomini (1649–51), Alexander Gottifredi (1652) and Goswin Nickel (1652–64); Father Nickel was a German. the others Italians. During this period the colleges continued to prosper but trials were not lacking. In Poland the Jesuits suffered from the Cossacks, who martyred Andrew Bobola in 1657; and also from the Swedes. In Ireland they had much to suffer under Cromwell. In France Pascal's *Provincial Letters,* a masterpiece of sarcasm and invective and filled with distortions and false charges, was the bitter fruit of Jansenistic opposition to the society. Indeed it nas the opening of a long campaign against the alleged laxity of Jesuit moral theology.

John Paul Oliva, a Genoese, was next general (1644–81) and governed the order with energy and success. During this period many Jesuits were much in the public eye: François de la Chaise in France; Johann Eberhard Nidhard in Austria and Spain; Edward Petre in England; Charles Vota in Germany and Poland; Antônio Yieira in Portugal; Paolo Segneri, Daniello Bartoli and Pietro Pallavicino in Italy; Ferdinand Yerbiest in China and John de Britto in India. The nationalism and absolutism of the time caused troubles in France and in the foreign missions; in England the imaginary plot concocted by Titus Oates led to the execution

of a group of Jesuits, eight of whom have been beatified by the church. The charges of laxism in moral theology continued and led to the condemnation of some propositions maintained by Jesuit moralists under Alexander VIII and Innocent XI in 1665, 1666 and 1679. In Italy home missions were conducted with success while the work of spiritual retreats prospered in France. Also in France Claude de la Colombiere (1641–82) was the counselor of St. Marguerite Marie Alacoque (*q.v.*) in launching the modern devotion to the Sacred Heart of Jesus.

After the brief rule of the Belgian Charles de Noyelle (1682–86), the Spaniard Thyrsus Gonzblez (1687–1705) succeeded to the generalate. Although he had had no experience in government and was known for some views which were contrary to those generally held in the society, he was elected because of the pressure brought on the electors by the reigning pontiff, Innocent XI. Gonzblez was an outspoken opponent of the regalistic pretensions of the French king, Louis XIV. This led that monarch to withdraw all French Jesuits in 1688 — including the French assistant general — from Rome, while he forbade all correspondence with the general. Gonzblez considered himself obliged by his election to free the society from certain moral doctrines, which, although not official, were commonly held. His efforts to publish a tract on the matter involved him in disputes with his subjects and with the Roman curia. His *Fundamentum theologiae moralis* finally did appear and the action of the general was, on the whole. approved by the 15th general congregation (1696–97). Michelangelo Tamburini (1706–30) was able to re-establish internal harmony but his generalate was troubled by the wars of the period and by the revival of Jansenism in France. Still more trying was the condemnation by papal decree of the Chinese and Malabar rites, certain traditional practices permitted to their converts by the missionaries as non-religious in character. This led to an unfavourable reaction on the part of the Chinese emperor K'ang Hsi (1662–1722) and to charges of disobedience to the Holy See against the Jesuit missionaries. The controversy, which was publicly conducted, dealt a severe blow to the reputation of the society.

SUPPRESSION AND RESTORATION

During the generalates of the Bohemian Francis Retz (1730–50) and the Italians Ignatius Visconti (1751–55), Aloysius Centurioni (1755–57) and Lorenzo Ricci (1758–73) the adversaries of the society made it clear that they sought its total destruction. The leaders of the opposition were Italian and French Jansenists, Gallican leaders of the French *parlements,* philosophers like Voltaire and the Encyclopaedists and the ministers of state of the "enlightened despots."

The decades preceding the suppression were not a time of either spiritual or intellectual decadence in the society. The number of members increased and in 1756 the assistancy of Poland was erected. While in the far east recovery from the condemnation of the rites was slaw, the missions in Latin America flourished. In the intellectual field the Jesuits hesitated to take up the study of the natural sciences and to adopt modern experimental methods. But by the middle of the 18th century, they accepted both and counted among their members men eminent in all the scientific branches cultivated at the time, so much so, indeed, that the years preceding the suppression were actually years of intellectual revival in the society. R. Boscovich, N. Sarrabat, Augustin von Hallerstein, L. B. Castel, Christian Mayer and Max Hell were leaders in the scientific field. In the study of Sanskrit, in which Robert de' Nobili had been the pioneer, Ernst Hanxleden (1681–1732) distinguished himself. In 1767 Gaston Coeurdoux (d. 1779) showed that Sanskrit, Greek and Latin have common roots and concluded that they are related. Others of note are Girolamo Tiraboschi. Hermann Josef Hartzheim, M. Hansiz, Lorenzo Hervás and G. F. Berthier and the other editors of the *Journal de Trévoux.* In the field of spiritual literature the struggle against Quietism (*q.v.*) had had an unfavourable effect, but Jesuits like Jean-Pierre de Caussade did what they could to remedy the evil.

The assault on the order reached its critical phase in the lands where for 200 years and more it had been strongest, in Spain, France and Portugal. The reasons behind this reversal of policy are to be sought in the anticlerical and anti-Roman attitude of the ministers of the governments. The suppression of the society is probably best seen as a prelude to the French Revolution. The political leaders of the epoch rightly felt that profound changes were inevitable. An attack on the church was thought to offer the best hope for the security of the political status quo. The Jesuits, because of their intimate connection with the Holy See, seemed to offer the best immediate target.

In Portugal José de Carvalho, marquês de Pombal and powerful first minister of Joseph I (1750–77), opened the attack. After a defamatory campaign directed particularly against the Jesuits of the Portuguese colony of Brazil, the government arrested and shipped to the Papal States nearly all the Jesuits of Portugal and its possessions (1759–61). In France the occasion for the dissolution of the order was the bankruptcy of the treasurer of the mission of Martinique in the West Indies. The French *parlements* took occasion from this unhappy episode to condemn the Constitutions and doctrine of the society and to close its colleges (1761–63). The crown was forced to approve these measures (1764) and to suppress the order in France and its possessions. In Spain Charles III in 1767 decreed the expulsion of all Jesuits from the homeland and the colonies for reasons "which he kept locked in his royal breast." Naples, Sicily and Parma, which were ruled by members of the Spanish royal family, followed this example the following year. The summary expulsion of the Jesuits from Spain and Portugal and their possessions was a catastrophe from which it took these missions decades to recover.

The governments of Portugal, France and Spain were not content with the extinction of the Jesuits in their own territory. They banded together to force the pope to suppress the society throughout the world. Clement XIII resisted their efforts despite the threat to form national churches independent of Rome. Clement XIV finally yielded in 1773 and by the brief *Dominus ac Redemptor* abolished the order. He asserted that he did so because the society could no longer attain the ends for which it had been founded, and for other reasons which he kept secret, as well as to restore true and lasting peace to the church.

The suppressed Jesuits devoted themselves, where it was permitted them, to the sacerdotal ministry or to a life of study. During the French Revolution 23 laid down their lives for the faith and have been beatified by the Holy See. Fifty-five former Jesuits were, in the course of time, raised to the episcopacy, among them Archbishop John Carroll, the founder of the Catholic Church in the United States. Political circumstances, notably the opposition of Catherine II, prevented the canonical execution of the brief of suppression in Russia. The small group of Jesuits who continued the corporate existence of the society there obtained the secret approbation of Pope Pius VI in 1783 and public recognition under Pope Pius VII in 1801.

The demand that the Jesuits take up their former work, especially in the field of education and in the missions, became so insistent that in 1814 Pius VII re-established the society throughout the church. He said that he would consider himself guilty of a very grave sin if in such difficult times he should fail to make use of the auxiliaries which divine Providence was offering him. In England and the United States, the surviving former Jesuits had already been readmitted by the superiors in Russia. In 1805 Robert Molyneux, Charles Sewall and Charles Neale had reinaugurated the society in America with the consent and encouragement of Archbishop Carroll.

The restored order was governed in its early years by Thaddeus Brzozowski (1814–20), who had been general superior in Russia from 1805. The Russian government, however, prevented his going to Rome. Brzozowski was succeeded by the Italian Aloysius Fortis (1820–29), who guided the order through a period of internal and external crisis. But the principal rebuilder of the society was Johannes Philipp Roothaan (1829–53), who in 1803, as a youth of 18, had left his native Holland in order to become a Jesuit in Russia. He became general in 1829 and laboured earnestly to infuse the Ignatian spirit into the educational and missionary activity of the order, which was spreading with a speed which rivaled that of its early years. He was especially insistent

on the use of the Spiritual Exercises as a source of inspiration.

Both Roothaan and his successor, the Belgian Peter Beckx (1853–87), witnessed repeated persecution of various sections of the order. Indeed the history of the restored society is dotted with such episodes as the following incomplete summary will make clear. In 1818 the Dutch rulers of Eelgium expelled the society; in 1820 it was excluded from Russia; in 1829 the colleges in France were closed. The Portuguese and Spanish Jesuits were expelled in 1834 and 1835 respectively. In 1847, after the Sonderbund War, the Swiss Jesuits were exiled. In 1848 the society was proscribed in Austria and parts of Italy. The Jesuits were expelled from Colombia in 1850 and from Ecuador two years later. Spain excluded them again in 1868 and Germany during the *Kulturkampf* in 1872. In 1873 many houses in Italy were confiscated while France again proscribed the order in 1880 and 1901. It was expelled from Portugal in 1910 and from Spain. 1932–3j. Jesuits lost their lives during disturbances in Spain in 1822, 1836 and 1932–3j; in Paris in 1871, and in Mexico in 1927. There were also martyrdoms in the missions: in China in 1860, 1900–02; in Syria in 1859–60 and in Madagascar in 1583 and 1896.

Later generals of the society mere the Swiss Anthony M. Anderledy (1887–92j, the German Francis X. Wernz (1906–14), the Pole Vladimir Ledóchowski (1915–42) and the Belgian John Baptist Janssens (1946–). The order has grown steadily and under Father Ledóchowski attained both in numbers and variety of works a development which it had never known before in its history. Noteworthy was the great expansion in all English-speaking countries, especially in the United States. In Germany the society suffered severely under the Nazi regime both before and during World War II. A considerable number of Jesuits were imprisoned and some were executed.

In 1956 there were 33,287 Jesuits of whom 16.890 were priests; they were divided into 8 assistancies and over 80 provinces and vice-provinces. There were more than 30 missions with a personnel of j.815. After World War II the missions in China. for the most part, were dissolved by the Communist regime which expelled or imprisoned the missionaries. In other parts of the world the missionary effort continued, notably in India, the Congo, Madagascar. Japan and Java.

Education is the principal occupation of Jesuits in the missions as well as in Europe and America. In addition to colleges, the society directs many universities, especially in the United States—Georgetown, Fordham, Boston college, Detroit; Loyola (Chicago), Narquette. St. Louis. Loyola (New Orleans), Seattle; Santa Clara, San Francisco and Loyola (Los Angeles). The Jesuits operate colleges in Great Britain at Glasgow, Liverpool, Leeds. London, Preston. Spinkhill, Stonyhurst and Wimbledon. Since 1896 they have maintained Campion hall as a part of Oxford university. The Irish Jesuits have colleges at Clongowes Wood, Dublin. Galway, Limerick and Mungret. Significant too are the seminaries for the formation of the pastoral clergy (Gregorian university. Oriental and Biblical institutes and some national colleges in Rome; Comillas in Spain and Innsbruck in Austria). At Mundelein, the seminary of Chicago. the Jesuits have charge in large measure of the spiritual and intellectual formation of the seminarians. They have charge also of important seminaries in Mexico and South America. Closed spiritual retreats have developed rapidly during the 20th century with more than 150 retreat houses in operation. The social apostolate has also developed in the 20th century, especially in the United States where so-called "labour schools" were established in many industrial centres. The sodalities of the Blessed Virgin Mary have grown. In the United States under Father Daniel A. Lord they influenced an important segment of the Catholic young people of the nation. The Apostleship of Prayer. founded at Vals in France in 1844, is also a spiritual force of world-wide scope. Jesuits edit more than 1.000 periodicals which range from propaganda bulletins to scientific reviews. They also take an increasingly active part in radio and television.

In countries under Communist domination, the activities of the Jesuits have been radically limited. Not a few members have been imprisoned and the outlook is dark. Elsewhere the society continues to grow.

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JESUS CHRIST, the Founder of Christianity and. according to the teachings of Christianity, the Son of God and the Lord and Saviour of the world.

The term "Jesus Christ" thus designates a historical person who lived in Palestine during the reigns of the Roman emperors Augustus and Tiberius. but it also designates one who has been the object of Christian faith and worship for almost 20 centuries. These two designations may be distinguished, indeed they must be; but they cannot be separated. For almost everything we know about the historical person comes from the reports of those who addressed faith and worship to Him. The portraits of Jesus in the Gospels are the testimony of "faith to faith." It is therefore impossible to write a biography of Jesus in the conventional sense of the word. Rather we are compelled to draw a picture of a picture, to describe Him on the basis of the way He was remembered by the believing community that took His name. How satisfactory is such a picture of a picture? That depends in part upon the credence one is ready to assign to the sources, and how much credence to which of the sources. Yet the amount of biographical information that the sources provide is very slight, whether or not we take them all as literal accounts of what really happened. We can know more about the life of many ancient Caesars and many modern prize fighters than we can know about the life of Jesus of Nazareth.

The description that follows is necessarily a picture of a picture. Although it seeks to piece together much of what can be pieced together of the story of Jesus' life and teachings, it is concerned even in that attempt to describe His mission and message as the primitive Christian community saw them and bore witness to them in the Gospels. As a result. what Jesus Christ meant to the Christian community in the period surrounding and following the composition of the Gospels must form an integral part of any such description. But the full implications of His life and work did not come upon the church suddenly and in a flash. A long development of devotion and of theology has sought to clarify what He was and what He meant. If the subject of this descrip-

tion is to be the historical person in the full dimension of His historical influence, the controversies attendant upon that development must form part of the description, including the modern controversies which have issued in perspectives and conclusions like those represented here.

THE LIFE AND CAREER OF JESUS IN THE GOSPELS

The principal source of information about the life of Jesus is the record of the four evangelists, Matthew, Mark, Luke and John. There are, in addition, other Christian writings and a few non-Christian writings that should be consulted.

Source Problem

Each of the four Gospels is written from a perspective and for a purpose, even though the perspective and the purpose may not always be easy to discern today.

The Gospel of Matthew appears to have been written with a Jewish audience in mind; that would account for the way it quotes and interprets the Old Testament and for the way it describes the relation between Jesus and the Jews. Mark is usually taken to be the earliest of the four Gospels, interested primarily in the mighty deeds of Jesus and only secondarily in His teachings; a very old and credible tradition traces it to the memoirs of the apostle Peter. Luke is addressed chiefly to gentiles, as the author indicates in his preface. Both Luke and Matthew seem to have used Mark, either in its present form or in an earlier form. In addition, both used other sources—the sayings of Jesus, transmitted and perhaps collected in some form. and some narratives of Jesus' infancy. The Gospel bearing the name of John is an independent production, reporting sayings of Jesus in the form of discourses that differ from the accounts of the other three Gospels, which, because they have so much material in common, are called "synoptic." Most New Testament scholars have regarded John as the last Gospel to be written, but various archaeological discoveries in the 20th century served to confirm the report of the ancient church that it was written during the 1st century. Even after those discoveries, however, the authorship of the Fourth Gospel remained a subject of controversy.

This variety among the Gospels can be taken to mean that in every story recounted by the evangelists we must ask: what circumstances in the early church would help to explain the way this story was being told? Thus the denunciations recorded in Matt. xxiii make sense when viewed against the background of conflicts between the new Christian sect and its parent, Judaism. Some of the statements put into the mouth of John the Baptist by the Gospel of John (i, 20–28) may be an indication of the controversies between early Christians and some who supposed John to have been the Christ. What we have in the Gospels would then be what the church itself was saying and teaching, ascribed to the historical Jesus. But it may also be that this very act of ascribing was simultaneously an act of remembering: as the primitive Christian community passed through experiences analogous to those its Lord had known, it called to remembrance all that He had said and done. So, at least, the early Christians seem to have believed (John xiv, 26). Long before any of the Gospels had been written, these stories and sayings were being told and remembered, often in response to a particular need or problem in the church *(see* Acts xx, 35). Thus the historical event called Jesus Christ and the response of the church to that event are so intertwined in the Gospels as we have them that only occasionally and only tentatively can scholars claim to be in a position to ascribe a particular saying solely to either source. As Martin Dibelius in his book *Jesus* says, therefore, "discussion as to whether a particular saying is 'genuine' is often idle because on neither side are the arguments decisive. In general the historian will do well to look at the tradition as a whole" (trans. by Charles B. Hedrick and Frederick C. Grant, copyright 1949. W. L. Jenkins, The Westminster Press. Used by permission. German ed., Walter de Gruyter & Co., Berlin).

Chronology.—The setting of the Gospels makes it extremely difficult to deal with chronological problems in the Iife of Jesus. Even if the Fourth Gospel is accepted as accurate, with its framework of Jewish feasts (John ii, 13; v. 1; vi, 4; x, 22; xii, 1), it remains unclear whether the evangelist intended each of these references to mean a different festival. The arrangement of the material in the other Gospels around these festivals leaves many problems unsolved, since none of the Gospels follows any but the loosest chronological sequence except in the Passion story. An indication of the difficulty in the chronology of the Gospels is the contention of church fathers like Clement of Alexandria, Origen and Tertullian, on the basis of Luke iv, 19, that the ministry of Jesus lasted only about a year—this in spite of the fact that these church fathers possessed and accepted all four Gospels. Nevertheless, some modern scholars are ready to concede that John's account probably comes closest to describing the actual span of events, and that a period of two or three years, more or less, seems to be right for the public ministry of Jesus. Yet these same scholars point to the conflict between the chronology of John and the narratives of the synoptic Gospels; *e.g.,* in the story of Jesus cleansing the temple. The synoptic Gospels put it into the events of Jesus' last week (Matt. xxi, 12 ff., and parallels), where it fits very well into the narrative. John, on the other hand, seems to say that it occurred near the beginning of Jesus' career (John ii, 13–17). Some harmonists have gone so far as to suggest that Jesus cleansed the temple twice, even though the story is told only once in any one Gospel. This problem is only one illustration of the fact that the fundamental need in any ordinary biography, the chronological outline, is lacking for a biography of Jesus.

Other Sources.—To the modern reader, accustomed to think of the important role that Jesus has played in the history of the world during the past centuries, it may be surprising to realize that few of His contemporaries even took notice of Him. The Jewish historian Josephus (*q.v.*) seems to refer to Him, although at least one of the passages mentioning Jesus is a later addition, possibly even a Christian forgery. The Roman historian Tacitus and the Roman man of letters Pliny the Younger (*qq.v.*) make mention of Jesus in discussing the treatment of the early Christians. A dubious passage in the Roman historian Suetonius (*q.v.*) may mean "Jesus Christ" by "Chresto," though it is quite clear that he did not understand it that way. The major purpose served by these non-Christian references to Jesus is to stress how provincial and limited a role He actually played in His own lifetime. They may also help to refute the contention, advanced quite seriously by some critics at the end of the 19th century, that Jesus never actually lived at all and that the story of Jesus was the Christian elaboration of a myth about a god who appeared on earth for a while in human form. A more impressive collection of source material is that gleaned from early Christian sources in addition to the Gospels. Since the Gospels are a compilation of materials used in Christian preaching, teaching and worship, it is understandable that some of these materials should have escaped compilation. A few of them seem very genuine. Thus the "pericope of the adulterous woman," inserted into the 8th chapter of St. John in some manuscripts, has the ring of genuineness about it, even though it may not have formed an original part of any of the Gospels. There are other stories—*e.g.,* the infancy stories of the apocryphal Gospels—that are fantastic and quite alien to what we find in the four Gospels. Yet even they shed light on the sifting out of which the four Gospels emerged.

The Beginnings of Jesus

The most obscure portion of Jesus' life is the part before He became "about thirty years of age" (Luke iii, 23), including as it does the formative stage of His development.

Birth and Boyhood.—Neither Mark nor John supplies any data at all about the birth and childhood of Jesus. Both Matthew and Luke begin their narratives with a brief account of the early years, but except for the Virgin Birth and the reference to Bethlehem there is almost no correspondence between them. Matthew describes an angelic visit to Joseph, Luke angelic visits to Elizabeth and to Mary. Matthew has the Magi, Luke the shepherds. Matthew narrates the flight to Egypt, Luke the story of the boy

Jesus in the Temple. Because of stylistic differences between the first two chapters of Luke and the rest of the Gospel, some interpreters maintain that the first two chapters came from an early source, perhaps from the mother of Jesus herself (*cf.* Luke ii, 19, 51). Many modern critics, on the other hand, have placed little credence in these infancy stories. They even contend that Jesus mas actually born in Nazareth as the son of Joseph and Mary. Although they find indirect support in some Syriac versions of Matt. i, 16. they are forced to admit that in the main this contention is a historical construction, based upon a particular view of how the picture and story of Jesus developed in the early church. Despite difficulty in squaring the report of Luke ii, 1. with other records of Roman history, interpreters tend to agree that Jesus was probably born in 4 B.C., the discrepancy being due to a mistake made in the 6th century by Dionysius Exiguus, who established the mode of reckoning the Christian era. Even if He was born in Bethlehem, it was as "Jesus from Nazareth of Galilee" (Matt. xxi. 11) that He was known. since it was there that He was reared. Beyond that, all we have to go on is the tantalizing statement of Luke ii, 52, "And Jesus increased in wisdom and in stature [or in age], and in favour with God and man."

Relation to Predecessors. — Because we know so little about the early life of Jesus, we are at a loss to give definite answers regarding the possible influence of His predecessors and contemporaries upon Him. Students of Palestinian Judaism frequently classify Jesus among the "people of the land" (*am-ha-arets*), those silent and devout folk who were expecting the deliverance of the Lord to come out of Zion. Others have painstakingly examined parallels between His teachings and the ethical admonitions of Jewish teachers in the period between the Old Testament and the New Testament. For example, every petition of the Our Father has its counterparts in pre-Christian Jewish literature, and so have many other statements in the Gospels. In the absence of any information regarding possible contacts between Jesus and His predecessors, historians are compelled to reason back from the Gospels to possible antecedents. This procedure, hazardous at best, is made even less reliable by the fluid state of the Jewish oral tradition in Jesus' day; for it is no longer possible to determine the precise date of sayings and ideas that were eventually incorporated into the Talmud and the Midrash (*qq.v.*).

From Talmud and Midrash, as well as from other Jewish sources, we can nevertheless derive information regarding the state of Jewish teaching in the times of Jesus. Some of this information supplements the reports of the Gospels. The Gospels speak of three main groups among the Jewish teachers: the Sadducees, the Scribes and the Pharisees; the latter two are often grouped together. The principal difference among them mas in their attitude toward the oral tradition that had developed in Judaism since the days of the prophets. The Scribes and Pharisees were those who had elaborated the prescriptions and prohibitions of the Old Testament into a complex code of behaviour. The conventional Christian picture of them is certainly incomplete, and it has often been called a distortion. Jesus clashed with them over the importance of external conformity with such a code of behaviour as contrasted with the true relation to God demanded by the prophets. The Sadducees were conservative defenders of the Mosaic law against the innovations of the oral tradition. Jesus is described as having clashed with them over issues like the resurrection of the dead. Another group, only mentioned but not described in the Gospels (Luke vi, 15), were the Zealots, dedicated to the overthrow of the Romans and the restoration of the kingdom of Israel. Jesus' reinterpretation of His messianic mission was set in antithesis to this political cause. A special problem in measuring Jesus' relation to His contemporaries is the question of the ascetic community described in the Dead sea scrolls. Some writers have found parallels betn-een the "Teacher of Righteousness" spoken of there and the picture of Jesus in the Gospels. It has even been suggested from time to time that Jesus was an initiate of the secret Essene community, so that its esoteric practices and doctrines are the source of His teachings. But New Testament scholars representing the greatest possible variety of theological viewpoints have repudiated this suggestion on purely historical as well as on religious grounds.

Somewhat more plausible is the suggestion, made even before the discovery of the Dead sea scrolls, that John the Baptist came under the influence of the Essene community. Here, too. scholars are forced to reason backward; and it is. of course, entirely possible that a common source in the history of Israel influenced both (see Judges xiii. 4. 5). But there is considerable affinity between the ascetic life of John as described in the Gospels and the ascetic ideals of the Essenes. That affinity, in turn. raises the ancient question of how much John the Baptist influenced the early teaching of Jesus. Mark's account (Mark i, 14, 15) may even indicate that Jesus regarded Himself as the successor of John in the proclamation of John's message, but all are agreed that almost immediately the teachings of Jesus went far beyond that message. In part, the whole question is related to the matter of John's attitude toward Jesus. The Gospels unanimously seek to minimize any suggestion that John may have thought of himself as the Christ or have encouraged such thoughts in others. It is clear from the Gospels that such thoughts there were (Luke iii, 15); and the story recorded in Matt. xi. 1–6, is, in the opinion of some interpreters, the remnant of a tradition quite different from that suggested in passages like Matt. iii. 11, 12. Whatever may have been John's own attitude toward Jesus, the narrative of Acts xix, 1–7, and the protestations of John i, 8, 20, both suggest what other sources corroborate, that a sect of disciples of John the Baptist continued alongside early Christianity for a considerable time. But it seems from the sources we have that John's message pointed beyond himself to someone else. Early Christians. including some of those who had followed John, found that someone in Jesus.

The Career of Jesus

Inauguration. — It was at the hands of John the Baptist that Jesus received the baptism that launched His public ministry. It seems from the reports of the synoptic Gospels — John's Gospel says nothing about the baptism of Jesus — that in connection with this event a call came to Jesus to undertake His mission, analogous to the call of the prophets in the Old Testament (*e.g.*, Isa. vi, 1). But thereupon He also experienced a challenge to His vocation, elaborated in most detail in Matt. iv, 1–11, and told so vividly there that the account seems to have come from the recollection of Jesus Himself. The temptation to use His miraculous power for selfish ends, to put the providence of God to the test and to lay claim to temporal power represented a continual threat to His career. Significantly, these were also the ways His vocation was continually being misunderstood by both His supporters and His enemies; they were the ways the church was in danger of misunderstanding its own vocation as well. After being inaugurated through His baptism and temptation: Jesus began His career as a religious teacher in Galilee. The problem of chronology, referred to earlier, complicates the task of determining the locale of Jesus' public ministry. From the narrative of the synoptic Gospels it would seem that He confined His work chiefly to Galilee until after His decision that He "must go to Jerusalem" (Matt. xvi, 21). But if the feasts mentioned in John represent three or four separate visits to Jerusalem, the work in Galilee must be divided into several units. separated by tours of Judaea. In any case it is fair to say that the major part of His public life was spent in Galilee, even though its denouement took place in Judaea.

From the outset Jesus performed the twofold work of teaching and working miracles. These miracles were of various sorts, the usual classification being: miracles of healing, nature miracles, the raising of the dead and the expulsion of demons. Although the performance of extraordinary deeds was a phenomenon not unknown among the Jews of the day (see Luke xi, 19), the manner and the number of Jesus' miracles were sufficiently unusual to call forth the marvel and the hostility reported throughout the Gospel accounts. His own attitude toward these manifestations of divine power was not a simple one. Thus Luke's Gospel can portray Him as pointing to them for the validation of His mission (Luke vii, 22) and as minimizing their importance (Luke x, 20); and John's Gospel can make miracles the immediate cause

of faith (John ii, 23) as well as the basis for a complete misunderstanding of Jesus' mission (John vi, 15). This same ambivalence, apparently originating in Jesus Himself and already at work in the early church, has characterized the Christian interpretation of the miracle stories since; for a long time they were used to support the church's claims about Christ, but since the 18th century they have had to depend upon those claims for whatever support they have received. The findings of modern science have caused interpreters of the New Testament to concern themselves at length with the philosophical problem of miracles — what they are and whether they are possible in a universe of order. Such problems were not the business of the writers of the New Testament. The word they used most often for miracles was "sign"; unlike the miracle mongers who compiled the apocryphal Gospels, their main emphasis was not alone upon the supernatural character of these mighty deeds, but upon the fact that they were intended as signs of the coming kingdom of God. And the greatest such "sign" was Jesus Himself (see Luke ii, 12).

The miracles of healing and those of exorcism, the expulsion of demons, fall into a special category. Despite evident parallels between the healing miracles of the Gospels and stories of healing in non-Christian literature, it seems that most of the stories of healing had the function of calling attention to the wholeness or "salvation" that the coming kingdom of God was to bring. Similarly, the miracles of exorcism were no mere display of supernatural power. Often they form part of a healing story; at least once, in the enigmatic account of the Gerasenes (Mark v, 1 ff.), exorcism is an element in a "nature miracle." But it appears that the stories of exorcism often served to bring out the church's proclamation that Jesus had come to bind and to destroy the powers of hell. Hence the tormented cry of the Gerasene demoniac (Mark v. 7), acknowledging that Jesus was the "Son of the Most High God." It has become almost a commonplace in much of modern New Testament criticism to regard demoniac possession as a form of insanity or epilepsy. This explanation, like most others of its kind, solves some problems but creates others; and it tends to ignore the aforementioned function of the miracles of exorcism in the theological plot of the Gospels.

Closeness to God. — The obverse side of Jesus' exorcist activity is the emphasis of the Gospels upon His closeness to God. Perhaps the most prominent expression of that closeness was His life of prayer. It was remembered that He had prayed alone (Mark i, 35), and sometimes all night (Luke vi, 12). Several of His prayers were remembered and quoted, notably the Our Father (Matt. vi, 9–13) and the prayer before His Passion (John xvii), which may be an elaboration of the synoptic report regarding prayer in Gethsemane. The story in Luke xi, 1, suggests that there was apparent in His praying an unusual closeness to God, which came to notice in other ways as well. Both His teachings (Matt. vii, 29) and His actions (Mark i, 27) gave the impression of "authority"; *i.e.*, of an independent commission from God that carried with it the power of its execution. His attitude toward even the most sacred traditions of His people (*e.g.*, Luke vi. 5) rested upon an insight into the will of God not granted to everyone. Many of the titles attributed to Him in the Gospels, whatever their origin, were indications of His divine character. Other men are portrayed as rendering to Him an adoration that belongs properly to God alone. But it is important to remember that all these actions, titles and powers were predicates attached to that Christ who was known and remembered historically, and not vice versa. Not even the Fourth Gospel, with its eloquent prologue, gives a warrant for describing the earthly days of Jesus as merely an episode in the cosmic career of an unearthly being. Rather. His deity was disclosed to those who saw Him or remembered Him in His historical career, and the story of Caesarea Philippi indicates that such a disclosure was incomplete without an awareness of the Cross (Matt. xvi, 16, 21).

The Message of Jesus

As a worker of miracles, Jesus was also a teacher. Although Mark emphasized His deeds and John His teachings (without any reference either to exorcism or to parables), all four Gospels deal with both activities.

The Form of Jesus' Teachings. — Many of Jesus' best-remembered teachings were cast in the familiar Jewish form of parables, brief glimpses into the ways of God and of His kingdom presented as stories. Although some have attempted to question the accounts of Jesus' parables, it is the consensus of most students that, allowing for the way the parable stories were transmitted in the oral tradition, this form of teaching must go back to Jesus Himself. Nor does it appear to be a rationalization of the failures which the church was experiencing in its missionary efforts when Jesus is quoted as saying that the purpose of these parables was simultaneously to reveal and to conceal (Matt. xiii. 10–17) Just this had been the purpose and the experience of the prophets since Isaiah. It would seem that in the preaching and teaching of the early church the same parable was sometimes used to teach two different lessons, and that the same saying was sometimes attached to more than one parable. Something similar also seems to have happened to the sayings that Christian teaching used to interpret the miracle stories.

In addition to the parables, the Gospels contain other kinds of teaching, notably precepts of admonition and instruction and chains of discourses; the best-known of the latter are the Sermon on the Mount (Matt. v–vii) and the discourses in John. Here. too, it is important to keep in mind the role of early Christian teaching in the formation of the Gospels. Thus a comparison of the Sermon on the Mount in Matthew with the Sermon on the Plain in Luke vi, 20–49, creates the impression that the evangelists have strung various sayings together into a single discourse, or that they found them strung together that way in the tradition. The discourses in John, which make use of certain events in the narrative as their basis, are much more unified, being the development of a single theme. It was common in the 19th century to dismiss the discourses in John as the fabrication of an imaginative author, and to point to a supposed analogy in the way Plato embellished the simple picture of Socrates drawn by Xenophon. But as that conception of the Socratic question has proved to be an oversimplification, so this interpretation of John gave way in the 20th century to a growing realization that the Fourth Gospel preserves a tradition of authentic teachings of Jesus in a form and content different from, but not necessarily irreconcilable with, the tradition evident in the synoptic Gospels. Apparently the primitive church remembered Jesus as having taught both ways.

The Themes of Jesus' Teaching. — The attempt of the 19th century to reduce Jesus' teachings to a single and simple "essence of Christianity" was similarly replaced by an effort to do justice to the full scope of His message. When, for example, the Gospels represent Him as calling God "Father," this is not an assertion of the modern liberal and ancient Greek teaching that God is the universal Father of the human race, but a declaration concerning Jesus' relation to God and the relation of those whom God had chosen through Him. The God whom Jesus proclaimed and revealed was the forgiving Father in the parable of the prodigal son (Luke xv, 11 ff.), but He was also the wrathful King in the parable of the unmerciful servant (Matt. xviii, 23 ff.). Rather than mitigating the holiness of God and the severity of His judgment as described in the Old Testament. Jesus made the requirements of God's will even more stringent (Matt. v–vii). Through His message God was addressing man with a threat, a demand and a promise, all at the same time. Paradoxically, both the rigour and the tenderness of God received greater emphasis in His proclamation than they had before.

Partly this was due to the close connection in Jesus' message between the picture of God and the announcement of the kingdom of God. "The kingdom of God is like. . . " — these words form the introduction to many of the parables in which Jesus described the kingly activity of God. By "kingdom" He seems to have meant not principally the realm of God, but the reign of God: not a country or territory, but a divine activity and a relation. It is therefore foreign to Jesus' teaching when Christians speak of their "building the kingdom." Clearly, He directed His hearers to that which was to come when He spoke to them about the kingdom. They did not and could not take possession of the kingdom now.

In this sense it is valid to describe Jesus' view of the kingdom as futuristic. But there are also statements in the Gospels, and not merely in the Fourth Gospel, that have no meaning unless this coming kingdom. not yet here. were already breaking in here. Jesus Himself appears in the Gospels as the herald. but also as the sign and the bringer of the kingdom. Jesus brought the kingdom, and the kingdom was bringing Jesus: this is the only way to suinmarize the relation between Jesus' coming and the coining of the kingdom according to the Gospels. Therefore He could say to His enemies that the kingdom mas "in the midst of you" (Luke xvii, 21, not "within you"). for He himself was the sign of the kingdom in their midst. God's reign was working in hidden ways, but one day soon it would come out of its hiding. Until then only some were privileged to know "the secrets of the kingdom of heaven" (Matt. xiii, 11). Hence it was with the announcement of the kingdom that Jesus began His public preaching (Mark i, 15).

Joined directly to this announcement of the kingdom in that. earliest account of Jesus' preaching was the invitation to repent and to believe the Gospel. Repentance meant a change of mind, a break with the past and a new direction. The promises of the kingdom were not for those who boasted of their moral goodness before God, but for those who were genuinely sorry for their sins (Luke xviii, 9–14). Some of the strongest words in the Gospels are those in which Jesus denounced the pride of religious men in His time, with their claims upon God and the inner corruption of their hearts (Matt. xxiii, 2j–28). Because such claims and such corruption were not restricted to Jesus' contemporaries, these denunciations and this invitation to repentance and faith formed a continuing part of the Christian witness. One of the purposes of Jesus' stress upon the severity of God's demands was to bring about the kind of awareness out of which true repentance would issue. But the call to repentance was also an invitation to "believe the Gospel." The kingdom was a gift of God's good pleasure (Luke xii, 32), and the God who laid His demands upon men was also the God whose purpose it was to forgive men their sins. Hence the only response proper to His invitation and His generosity was the response of faith, described by Jesus as resembling the trust of children (Mark x, 15).

Thus the primary commandment was to believe in God and to love Him. Next to this commandment, Jesus put the "second commandment" (Mark xii, 31) of love toward the neighbour. In enjoining such love, Jesus insisted that outward performance did not suffice. Not merely murder, but even hate was prohibited; not merely adultery. but evil lust (Matt. v, 21–30). What was revolutionary about Jesus' ethic of the kingdom was this insistence, coupled as it was with His primary emphasis upon the mercy and righteousness of God. Many other themes appear in the Gospels. Jesus spoke of marriage, of religious and cultic duties, of prayer and thanksgiving. of spiritual blindness and the illumination of God. But if there were such things as themes in His teachings, it is around God, the kingdom of God and the call to repentance, faith and love for the neighbour that His message appears to have been centred.

The Mission of Jesus

His Sense of Vocation. — In the Gospels Jesus is described as having had the sense that God had called Him for a special duty, but the descriptions of that sense of duty are not uniform. This has led New Testament scholars to concern themselves with the problem of development in the messianic consciousness of Jesus. Two questions are uppermost in that problem: Is the identification of Jesus as the Messiah in the Gospels principally a construction by the later church, read back into the career of Jesus? If not. when and under what circumstances did Jesus come to think of Himself as the appointed Messiah? Luke's Gospel even makes this identification a part of its infancy narratives (Luke ii, 11. 26), while John's Gospel credits it to Andrew, the first of the disciples to be called (John i. 41). The title "Messiah" came from the Old Testament, but had undergone further development in the period immediately preceding the time of Jesus; even then, however, it was by no means as prominent among Jews as Christians often tend to suppose. Among many of the common people the title had come to represent their hope for deliverance—deliverance from sin, or at least from the Romans, That hope. coupled as it was with imaginative expectations of radical changes in the order of things. seems to have arisen with new fervour each time a new national or religious leader appeared. The coming of Jesus as a religious teacher and worker of miracles aroused speculation whether He might not be the promised one (Matt. xvi, 14). The story of the entry into Jerusalem told by all four Gospels (see Matt. xxi. 1 ff.) and the account of the feeding of the five thousand in John's Gospel (John vi, i4. 1j) both disclose the character of the popular hope as Jesus stirred it up once more.

But Jesus not only stimulated this hope. He also reinterpreted it. In the expectations of Israel there were many elements. two of which were: the expectations of the Messiah. the Son of David, who would restore the lost glory of his father's kingdom; and the idea, summarized most fully in Isa. liii, that God's purposes for Israel could not achieve their fulfillment except through the suffering of God's servant. It is not altogether clear how closely or how often these two elements had ever been combined in previous versions of the messianic ideal, but the reactions of Jesus' contemporaries and disciples would suggest that the combination was rarely if ever a part of Israel's hope. From the sources it is evident that such a combination eventually determined Jesus' own conception of His mission. Immediately after the great messianic disclosure at Caesarea Philippi (Matt. xvi, 16) Jesus goes into a discussion of the crucifixion (Matt. xvi. 21 ff.). The combination, significantly. comes out most clearly in one of the post-Resurrection scenes (Luke xxiv, 26, 27), where the disciples learned to identify the Davidic king with the Suffering Servant. It may be the intent of the Gospels to say that fear of the political interpretation of the Messiah led Jesus to disclose His messianic mission to His disciples only gradually. until the course of the terminal events at Jerusalem should make any such political interpretation impossible. But some scholars have taken the Gospels to be saying that the full meaning of His messianic vocation only came upon Jesus over a period of time, and that part of this meaning was His realization that the Messiah had to suffer and die. The difficulty with this notion of development is the difficulty already noted in any attempt to fix chronological sequence in the career and inner life of Jesus.

A special problem in the interpretation of Jesus' vocation is the so-called "messianic secret." Among the first to recognize Jesus as the Christ in the Gospels were the demons (Luke iv, 41), whom He then charges to keep silent. Mark attaches an admonition of silence to both Caesarea Philippi (Mark viii, 30) and the transfiguration (Mark ix, 9). In Matthew and even more in John, on the other hand, Jesus is quite overt about His declarations (see John iv, 25, 26). Which of these portrayals more accurately represents the usual attitude of Jesus toward the matter of His messianic character? Some critics maintain on the basis of this and other evidence that Jesus never thought of Himself as the Messiah at all: He suppressed the messianic hopes of others as much as He could; but as part of the process of glorification that took place in the memories of His followers after His death. the disciples ascribed to Him messianic claims which He had never made for Himself. The majority of interpreters, however. trace the identification of Messiah and Suffering Servant to Jesus Himself, even though they differ widely on the extent to which that identifitation remained Jesus' private secret until near the end. At least in part, the answer to these and related questions will depend upon one's attitude not only toward the Bible. but toward Jesus Himself. For those Christians whose view of Jesus is determined by the decisions on dogma made by the ancient church, the question should read: how did the limited human nature of Jesus Christ in the days of His sojourn on earth share in that full awareness of His mission from the Father which was a continual part of His unlimited divine Nature? According to His divine nature, He was omniscient and always knew Himself to be the Christ, whether or not this awareness was always complete in His human nature. Passages like Mark xiii, 32, would then have to apply only to His human nature, not to the person of Christ as

a whole.

His Expectations. — As already mentioned, part of the messianic ideal which Jesus' contemporaries cherished was the expectation that a radical change was in the offing, to affect not only political and national destiny, but the arrangement of the universe itself. Jewish apocalyptic literature gave vivid voice to this expectation in language that often finds echoes in the Gospels. About 1900 these echoes began to be the subject of debate among students of the New Testament. One party maintained that Jesus shared the apocalyptic beliefs of His time and that He confidently expected the end of the world to come in the near future. Accordingly, His death was the way He expected the coming of the end to be set in motion. Other students of the Gospels claimed that the eschatology of Jesus, His view of the last things on earth. was a "realized eschatology." This means that the dramatic language of His apocalyptic utterances was intended to describe the "end" of human history — not the end understood as termination, but the end understood as purpose, the appearance in human history of that which interprets, redeems and judges it. In other words, Jesus was not talking about a finish so much as He was talking about a continuing feature of life seen under the judgment of God. A third way to interpret these utterances has been to say that in Jesus' own message both elements were present. Those in which "end" meant primarily "termination" found their way chiefly into the synoptic Gospels, while John's Gospel contains those that speak of the "end" as the continuing judgment of God. Again, a decision among these interpretations depends upon one's picture of Jesus. Orthodox Christian doctrine, both Catholic and Protestant, forbids any interpretation that would either ascribe error to Christ's expectations or deny the ultimate termination of human history.

The title "Son of Man" was one of the symbols appearing in Jewish apocalyptic, and the Gospels frequently put it into the sayings of Jesus. Sometimes it merely takes the place of the personal pronoun "I," as is evident from a comparison of Matt. xvi, 13, with Luke ix, 18, and from other sets of parallel passages. At other times it is merely equivalent to "man," which may indeed have been the original term in sayings like Mark ii, 28. In some passages it may even refer, as it perhaps did in Ps. viii, 4, to man in his lowliness. But in some places it clearly carries the connotation it acquired in Jewish apocalyptic, possibly under the influence of Persian thought. of God's representative, anointed to bring in His kingdom. This connotation was most prominent in sayings like Matt xxiv. 27. 30, and it may be that Jesus used it deliberately to avoid the political overtones that were so difficult to avoid in the title "Messiah." "Son of Man" appears in the Gospels approximately 80 times, carrying one or several of these connotations. The fact that Jesus used the title in the third person certainly does not prove, as some have contended. that He did not regard Himself as the Son of Man; this was merely general Semitic usage, prevalent in Arabic even today. The implications of terms like "kingdom," "Son of Man" and "end" are therefore more complex than has often been realized, combining meanings that later interpreters have falsely set into antithesis with one another.

The Influence of Jesus

During the course of His public ministry Jesus called forth a variety of reactions among His contemporaries, ranging all the way from worship to hatred; but it seems that the hatred grew more intense toward the end of His career.

Acceptance. — The Gospels make it clear that Jesus, like John the Baptist, attracted considerable attention and support among the Jewish people. The chief grounds for this were His miracles and His teaching. In part He seems to have been voicing a resentment of their religious leaders that was quite widespread; in part His teachings appeared to confirm the hopes of the people for deliverance. But beyond all such factors there was His "authority" (Matt. vii. 28, 29), which He manifested in both His words and His deeds, causing the people to conclude that a special action of God was taking place in their midst as a harbinger of even greater actions to follow. There is no reason to doubt the accuracy of the reports in all four Gospels regarding the ardour and enthusiasm with which He was received. Accepting the division into three years suggested by the narrative of John's Gospel, some students of the Gospels have put the height of Jesus' popularity into the second of the three years. But as has been pointed out, the evidence is inadequate for this or almost any other chronological hypothesis. In the Gospel accounts, the story of the entry into Jerusalem may well represent the zenith of Jesus' acceptance among the people — all the more ironic because of the events that immediately followed.

Concerning the attitude and relation of Jesus to non-Jews we know very little. His use of a Samaritan in the familiar parable of Luke x. 30–35, and the later reports of his other contacts with this hated semi-Jewish people suggest that He had made an impression upon the memory of His followers by His freedom from the sort of parochialism that had often marked His people. What He said about "the rulers of the Gentiles" (Matt. xx. 25) indicates how geographically limited His career was. The people spoken of in John xii, 20, were not pagan Greeks, but Hellenistic Jews or perhaps Jewish proselytes of Greek descent. In other contacts with non-Jews He is reported to have healed the daughter of the Syrophenician woman (Mark vii, 24 ff.) and the servant of the centurion (Matt. viii, 5 ff.); in both these stories the evangelist quotes Jesus as commenting upon the unusual faith He had found outside the Jewish religious community. Whether in this connection (so Matt. viii. 11) or some other (so Luke xiii. 29), Jesus envisioned what the prophets had also predicted, that the kingdom of God would be universal, not restricted to the Jewish people; but apparently He saw that this would happen only after His death. In the closing scene of Matthew's Gospel (Matt. xxviii, 19) as well as in the opening scene of the Acts (Acts i. 8) the risen Lord is portrayed as commanding that His followers bear witness to Him throughout the Gentile world. But despite these and other indications of Jesus' personal perspective, it was as an adherent of Judaism that He lived and among Jews that He was both accepted and rejected.

The Disciples. — In addition to the general support and acceptance He gained in the Jewish populace, Jesus also won the loyalty of a group of followers. The size of the group seems to have varied; for example, Luke refers in two successive chapters to the twelve (Luke ix, 1) and to the seventy (Luke x, 1). Other places in the Gospels also indicate that the term "disciple" could refer to the broader circle of Jesus' followers, but more usually it meant the chosen twelve. The lists of their names in the Gospels all put Peter's name first and Judas' last. with some variations between these two The twelve were (Mark iii, 16–19). Simon Peter. James and John. Andrew, Philip, Bartholomew. Matthew, Thomas, James the son of Alphaeus, Thaddaeus, Simon the Cananaean and Judas Iscariot. These same twelve, with the replacement of Judas Iscariot by Matthias (Acts i, 26), also became the "apostles" (*q.v.*).

What role did Jesus envision for them? The answer to that question is dependent upon whether or not Jesus intended to establish a church. as the words of Matt. xvi, 18, 19, say. While some New Testament critics have doubted the authenticity of these words. Protestants generally have taught that Jesus did indeed intend to found the church. but not the specific form of its outward organization. Churches of Catholic persuasion — Roman, Orthodox and Anglican — have seen in this passage their charter as churches, claiming direct descent from the apostles in the line of ordaining bishops. Among them there has been controversy about the position Jesus here accords Peter among the disciples (see also John xxi, 15–18) because of the implication of that position for the status of Peter's successors among the bishops. The Gospels represent the twelve as Jesus' constant companions, as the audience for many of His discourses and as the messengers He trained to continue His work of preaching and teaching. Like the acceptance of Jesus by the common people, their loyalty to Him was inconstant; and in the hour of His defeat they forsook Him.

Opposition. — The hostility to Jesus appears to have stemmed from diverse motives. He had repeatedly manifested an independ-

ence and "authority" in relation to the law of the Old Testament that was heretical to the religious leaders of His people. Some of them saw their position threatened by the support He had among the people. The vigorous denunciations He had directed against injustice and hypocrisy had undoubtedly earned Him the hatred of others, while the cleansing of the temple was a dramatic indication to them of how far He was willing to go.

From a report preserved in John xi. 47 ff.. it appears that Jesus' miracles, His proclamation of the coming kingdom and the attention He was receiving had become politically embarrassing to the Jewish leaders, who enjoyed considerable local autonomy under Roman rule and were fearful of losing it if there were an insurrection. It also seems plausible that the people turned against Him because of His consistent refusal to lead such an insurrection. Jesus Himself believed that the will of His Father for the kingdom could not come to pass except by His death, and He went up to Jerusalem to die in obedience to that will. Hence it is true that the Cross was imposed upon Him by His enemies. but it is also true that He voluntarily took upon Himself the death of the Cross (John x, 18).

The Cross

Compared with the sparse accounts of Jesus' early years and with the occasional glimpses of His public ministry, the reports in the Gospels of His closing days are quite detailed and lengthy, an indication of the importance which the earliest Christian congregations attached to the events of His Passion and death. Although there is more chronological sequence to the narratives of these events than there is anywhere else in the Gospels, there are also major problems of chronology. Probably the chief one is the fact that after centuries of harmonization it still remains unclear from a comparison of John's account with those of the synoptic Gospels on just what day of the Jewish calendar Jesus died.

His Last Days.—Differ though they may in many details, the Gospels all begin their report of Jesus' last week with the story of His triumphal entry into Jerusalem on the Sunday of 'that week, celebrated in Christian liturgy as Palm Sunday. The synoptic Gospels represent Him as spending the week teaching and disputing with the Jews; because of its purpose, Matthew's Gospel contains the fullest account of these disputes. As the time of crisis drew near, Jesus gathered the twelve for the Last Supper. Despite the great difficulties in chronology, many interpreters have come to conclude with Joachim Jeremias that the Last Supper took place within the framework of a Jewish Passover meal, where Jesus sought to prepare the disciples for what was to come. The church remembered this as the occasion when the new covenant was celebrated, a covenant established when Jesus offered up the sacrifice of that body and blood which the church received in this Supper. John's Gospel has no account of this institution, but has a lengthy series of discourses, unique to it, in which Jesus gave the disciples His last will and testament, together with the promise of the Holy Spirit.

All four Gospels tell us that one of the twelve, Judas Iscariot, put himself at the service of the enemies of Jesus as an informer. Christian piety and preaching have elaborated upon the story of Judas the traitor in an effort to probe his motives—greed, or disappointment over the failure of Jesus to inaugurate the kingdom, or a desire to precipitate the kingdom by violence. In the New Testament the only elaborations of the story are the accounts of his remorse and his violent end. Jesus is portrayed as having known that Judas would betray Him and as predicting that all the other disciples would forsake Him. To their protestations of loyalty He replied with the further prediction that Peter would deny Him three times, a prediction that Peter remembered (Mark xiv, 66–72) and that the church remembered when it was facing the temptation of apostasy and denial. From the room where the Last Supper was held Jesus and the disciples proceeded to the garden of Gethsemane, where He prepared Himself for the coming ordeal by praying and submitting His will to that of His Father. Into the garden then came Judas; leading a band of men to arrest Jesus and arraign Him before the authorities. In spite of their earlier insistence that they would not forsake Him and their initial show of boldness, the disciples fled; and Jesus was led away to be tried.

The trial of Jesus was twofold, religious and civil. First the religious authorities of His own people examined Him on the charge that He had disobeyed the traditions of the Old Testament and made blasphemous claims about Himself. They adjudged Him guilty. Although the punishment prescribed for the sin of blasphemy was death (Lev. xxiv, 16), the Jews did not execute the punishment; historians disagree about whether they had a right to mete out capital punishment. Instead they referred the case of Jesus to the civil authorities, and it became necessary for Him to have a second trial before the Roman procurator, Pontius Pilate. Like Judas. Pilate has been the subject of Christian speculation, some later accounts even telling of his conversion to Christianity. Closer to historical accuracy appears to be the view that against his better judgment he yielded to the pressures of the populace and of their leaders for reasons of political expediency, giving the command that Jesus be crucified. Students of both Jewish and Roman law have raised questions regarding the legality of Jesus' trial on the grounds that prescribed conditions for the trial of a capital offense were not present. Another question that has frequently been raised, usually in the context of Jewish-Christian relations, is whether the Jews or the Romans were primarily responsible for Jesus' death. Christian theology and piety at their most profound have generally replied that the joint action of Jew and gentile in the crucifixion of Jesus is a symbol of the guilt of the entire human race.

His End.—Jesus' death came by crucifixion, a cruel and painful method of execution reserved for slaves and abject criminals. It was preceded by various tortures and indignities, recited in great detail by the evangelists. The fondness and the reverence with which the early Christians dwelt upon the scene of the crucifixion can be seen from the last words of Jesus reported in the Gospels; the usual number of these is seven, but there are many variations in the text. The awe with which they recalled the scene is evident from the portents associated with the death of Jesus—the earthquake, the darkness and the rending of the veil in the Temple. The evangelists also associated the several events of the crucifixion story with prophecies of the Old Testament. They tell us that the body of Jesus was not permitted to hang on the cross overnight on account of Jewish law (Deut. xxi, 23) and that He was buried the same day He died.

The Resurrection

The Cross was not the end of Jesus, but God rescued Him from death: such was .the universal conviction and consensus of the early Christians. The witness of the New Testament to that conviction is unified as to the fact, but not as to the details of the fact. Thus our earliest witness, St. Paul, says nothing about the reports of the empty tomb, which we find in all four Gospels. There are many other problems—literary, historical and theological—connected with the reports of the Resurrection. But apologists for Christianity have maintained that none of these problems is as formidable as the problem of explaining the rise of the Christian Church if there were no Resurrection. The transformation of the fleeing disciples into bold confessors was an even greater miracle than the Resurrection of Jesus Christ from the dead. Throughout the Gospel story, and nowhere more than here, it is necessary to keep faith and history together, the event and faith in the event. On the one hand, it is impossible to explain the faith without some event; on the other hand, the event of Christ's Resurrection was not known to anyone but believers in Him. No unbeliever. with the special exception of Paul on the road to Damascus, ever saw the risen Christ. It is therefore, as Karl Adam says in The Son of Cod, "perverse to apply the standards of the modern historian to the evangelists' account of the Resurrection. Their aims are not historical but dogmatic and missionary" (trans. by Philip Hereford, pp. 229–230, Sheed and Ward, Inc., New York. 1934). Thus the question of whether or not Jesus actually rose from the dead is a question beyond the province of the technical historian to answer either way with finality,

but he can report that such was the faith of the entire early church.

The appearances of Jesus after the Resurrection form the concluding unit of the Gospels, but the earliest catalogue of them is the one Paul repeats from an earlier tradition in I Cor. xv. Interpreters are not in agreement whether the purpose of this catalogue is to establish the historicity of the Resurrection or to support Paul's claim to apostolic authority as the last one to whom the risen Lord had appeared (I Cor. xv, 8). It is also very difficult to determine the relation between Paul's catalogue and the traditions represented in the various Gospels. just as it is to harmonize the account in St. John with that of the other Gospels. Therefore we cannot say on the basis of the New Testament how many such apparitions there were, the traditional number of 12 being quite arbitrary. Some scholars have even sought to distinguish two traditions, one of appearances in Galilee and the other of appearances in Judaea. But this much is clear, that the apparitions came to all the apostles, because "apostle" came to mean "appointed witness of the Resurrection" (see Acts i. 22). The sermons in the early chapters of the Book of Acts make clear how central a part of apostolic preaching the proclamation of the Resurrection was, based upon personal experience of the risen Christ (*see* Xcts iv, 33).

Of all the post-Resurrection appearances, perhaps the most representative is that reported in Luke xxiv. 13 ff.; for it provides a link between the events narrated in the Gospels and the rise of the apostolic church. That link is the so-called "Gospel of the forty days" after Easter, during which the eyes of the disciples were opened (Luke xxiv. 31). Apparently this meant new insight into the meaning of the Old Testament Scriptures as a testimony to Christ (Luke xxiv. 27) and a realization of what He had intended in the institution of the Last Supper (Luke xxiv. 3j). It also meant a reconception of the scope of Jesus' mission to include "all nations" (Matt. xxviii, 19), despite remnants of the earlier conception (Acts i. 6). These and other insights the early church traced to the 40 days after the Resurrection. Christians are not agreed about whether the "Gospel of the forty days" is preserved only within the New Testament (so most Protestants) or whether part of it has been transmitted to subsequent generations of the church as part of tradition, to be promulgated by the church under the guidance of the Holy Spirit (so Roman Catholics and Orthodox). Finally, according to a tradition reported in authentic New Testament writings only by Luke in his Gospel (Luke xxiv. j0-j3) and in Xcts i. 9–11—it also occurs in the "long ending" of Mark (Mark xvi. 19)—Jesus "ascended" to heaven and disappeared from their midst. Yet His presence was known and worshiped in the church through the activity of the Holy Spirit, fulfilling the promise that Christ would be with the church until the consummation of this age (Matt. xxviii. 20).

THE PICTURE OF CHRIST IN THE EARLY CHURCH: THE APOSTLES' CREED

Even before our Gospels were written. Christians were reflecting upon the meaning of what Jesus had been and what He had said and done. It is a mistake, therefore, to suppose that such reflection is a later accretion upon the simple message of the Gospels On the contrary, the early Christian communities were engaged in witness and worship from the very beginning. The forms of that witness and worship were also the forms of the narratives in the Gospel accounts. . From this fact it follows that to understand the Gospel accounts regarding Jesus we must consider the faith of the early church regarding Christ. In this sense it is valid to maintain that there is no distinction between "the Jesus of history" and "the Christ of faith," and that the only way to get at the former is by the latter. Christology, the doctrine about Christ. is then as old as Christianity itself.

To comprehend the faith of the early church regarding Christ, we must turn to the writings of the New Testament, where that faith found embodiment. It was also embodied in brief confessions or creeds. but these have not been preserved for us complete in their original form. What we have are fragments of those confessions or creeds in various books of the New Testament, snatches from them in other early Christian documents and later forms of them in Christian theology and liturgy. The so-called Apostles' Creed is one such later form. It did not achieve its present form until quite late; just how late is a matter of controversy. But in its earliest ancestry it is very early indeed, perhaps dating back to the 1st century. And its confession regarding Christ is probably the earliest core. around which later elaborations of it were composed. Allowing for such later elaborations, we may say that in the Apostles' Creed we have a convenient summary of what the early church believed about Christ amid all the variety of its expression and formulation. The creeds were a way for Christians to explain what they meant by their acts of worship. When they put "I believe" or "We believe" at the head of what they confessed about God and Christ, they meant that their declarations rested upon faith, not merely upon observation.

PRE-EXISTENCE

The statement "I believe!' also indicated that Christ was deserving of worship and faith, and that He was therefore on a level with God. At an early date, possibly as early as the words of Paul in Phil. ii, 6–11, Christian theology began to distinguish three stages in the career of Jesus Christ: His pre-existence with the Father before all things; His Incarnation and humiliation in "the days of His flesh" (Heb. v, 7) and His glorification, beginning with the Resurrection and continuing forever.

Probably the most celebrated statement of the pre-existence of Christ is the opening verses of the Gospel of St. John. Here Christ is identified as the incarnation of that Word (Logos) through which God made all things in the beginning. a Word existing in relation to God before the creation. The sources of this doctrine have been sought in Greek philosophy, both early and late. as well as in the Jewish thought of Philo and of the Palestinian rabbis. Whatever its source. the doctrine of the Logos in John is distinctive by virtue of the fact that it identifies the Logos with a specific historical person. Other writings of the New Testament also illustrate the faith of the early Christians regarding the pre-existence of Christ. The opening chapters of both Colossians and Hebrews speak of Christ as the pre-existent one through whom all things were created, therefore as distinct from the created order of things in both time and pre-eminence; the preposition "before" in Col. i, 17, apparently refers both to His temporal priority and to His superior dignity. Yet before any theological reflection about the nature of this pre-existence had been able to find terms and concepts, the early Christians were worshiping Christ as divine. Phil. ii, 6–11, may be a quotation from a hymn used in such worship. Theological reflection told them that if this worship was legitimate, He must have existed with the Father "before all ages."

Jesus Christ.—By the time the text of the creed was established, this was the usual designation for the Saviour. Originally, of course, "Jesus" had been His given name, meaning "Yahweh saves" or "Yahweh will save" (see Matt. i, 21), while "Christ" was the Greek translation of the title "Messiah." Some passages of the New Testament still used "Christ" as a title (*e.g.*, Luke xxiv, 26; II John, 7), but it is evident from Paul's usage that the title became simply a proper name very early. Most of the Gentiles took it to be a proper name. and it was as ',Christians" that the early believers were labeled (Acts xi, 26). In the most precise language, the term "Jesus" was reserved for the earthly career of the Lord; but it seems from liturgical sources that it may actually have been endowed with greater solemnity than the name "Christ." Within a few years after the beginnings of the Christian movement, Jesus. Christ, Jesus Christ and Christ Jesus could be used almost interchangeably, as the textual variants in the New Testament indicate. Only in modern times has it become customary to distinguish sharply among them for the sake of drawing a line between the Jesus of history and the Christ of faith. and this only in certain circles. The theologians and people of many churches still use phrases like "the life of Christ," because "Christ" is primarily a name. It is difficult to imagine how it could be otherwise when the Old Testament implications of the title have become a secondary consideration in its use—a process already evident

within the New Testament.

God's Only Son.—The declaration that Jesus Christ is the Son oi God is one of the most universal in the New Testament, most of whose books refer to Him that way. The Gospels do not quote Him as using the title for Himself in so many words, although sayings like Matt. xi. 27, come close to it There are some instances where the usage of the Gospels appears to echo the more general implications of divine sonship in the Old Testament as a prerogative of Israel or of the true believer. Usually, however, it is evident that the evangelists, like Paul, meant some special honour by the name. The evangelists associated the honour with the story of Jesus' baptism (Matt. iii, 17) and transfiguration (Matt. xvii. 5). Paul with the faith in the Resurrection (Rom. i, 4). From this association some have argued that "Son oi God" in the New Testament never referred to the pre-existence of Christ. But it is clear in John and in Paul that this implication was not absent, even though it was not as prominent as it became soon thereafter What made the implication of pre-existence more prominent in later Christian use of the term "Son of God" was the clarification of the doctrine oi the Trinity, where "Son" was the name for the eternal Second Person (Matt. xxviii. 19). As the Gospels show, the application of the name "Son of God" to Jesus was offensive to the Jews, probably because it seemed to smack of gentile polytheism. This also made it all too intelligible to the pagans, as early heresies indicate. Facing both the Jews and the Greeks. the apostolic church confessed that Jesus Christ was "God's only Son": the Son of God, in antithesis to Jewish claims that the Eternal could have no sons; the only Son, in antithesis to Greek myths of divine procreation.

Our Lord.—As passages like Rom. i. 4, show, the phrase "Jesus Christ our Lord" was one of the ways the apostolic church expressed its understanding of what He had been and done. Luke even put the title into the mouth of the Christmas angel (Luke ii, 11). From the way the name "Lord" (Kyrios) was employed during the 1st century it is possible to see several implications in the Christian use of it for Christ. The Christians meant that there were not many divine and lordly beings in the universe, but only one Kyrios (I Cor. viii. 5, 6). They meant that the Roman Caesar mas not the lord of all, as he was styled by his worshipers, but that only Christ was Lord (Rev. xvii, 14). And they meant that Yahweh, the covenant God oi the Old Testament, whose name they pronounced as "Lord," had come in Jesus Christ to establish the new covenant (see Rom. x, 12, 13). Like "Son of God," therefore, the name Kyrios was directed against both parts of the audience to which the primitive church addressed its proclamation. At times it stood particularly for the risen and glorified Christ, as in Acts ii, 36; but in passages that echoed the Old Testament it was sometimes the pre-existence that was being primarily emphasized (Matt. xxii, 44). Gradually "our Lord," like "Christ," became a common way of speaking about Jesus Christ, even when the speaker did not intend to stress His lordship over the world.

Incarnation and Humiliation

Conceived by the Holy Spirit, Born of the Virgin Mary.—Earlier forms of the creed seem to have read: "Born of the Holy Spirit and of the Virgin Mary." The primary affirmation of this article is that the Son of God. the Word, had become man or, as John's Gospel put it, "flesh" (John i, 14). Pre-existence and Incarnation presuppose each other in the Christian view of Jesus Christ. Hence the New Testament assumed His pre-existence when it talked about His becoming man; and when it spoke of Him as pre-existent, it was ascribing this pre-existence to Him whom it was describing in the flesh. It may be that the reference in the creed to the Virgin Mary was intended to stress primarily her function as the guarantee oi Christ's true humanity, but the creed also intended to teach the supernatural origin of that humanity. Although it is true that neither Paul nor John makes reference to it, the teaching about the virginal conception of Jesus, apparently based upon Isa. vii, 14, was sufficiently widespread in the 1st century to warrant inclusion in both Matthew and Luke, as well as in creeds that date back to the 1st century. As it stands, the creedal statement is a paraphrase of Luke i, 35. In the New Testament the Holy Spirit was also involved in the baptism and the Resurrection of Jesus.

Suffered Under Pontius **Pilate,** Was Crucified, Dead, and Buried.—To a reader of the Gospels, the most striking feature of the creed is probably its omission of that which occupied a major part of the Gospels, the story of Jesus' life and teachings. In this respect there is a direct parallel between the creed and the epistles of the New Testament, especially those of Paul. Judging by the amount of space they devoted to the Passion story, even the writers of the Gospels were apparently more interested in these few days of Jesus' life than they were in anything else He had said or done. The reason for this was the faith underlying both the New Testament and the creed, that the events of Jesus' Passion, death and Resurrection were the events by which God had accomplished the salvation of men. The Gospels found their climax in those events, and the other material in them led up to those events. The epistles applied those events to concrete situations in the early church. From the way Paul could speak of the Cross (Phil. ii, 6–11) and of "the night when he [Jesus] was betrayed" (I Cor. xi, 23) it seems that before our Gospels came into existence the church commemorated the happenings associated with what came to be called Holy Week. Some of the earliest Christian art was a portrayal of these happenings, another indication of their importance in the cultic and devotional life of early Christianity. How did the Cross effect the salvation of men? The answers of the New Testament and the early church to this question involved a variety of metaphors: Christ offered Himself as a sacrifice to God; His life was a ransom for many; His death made us alive; His suffering was an example to us when we must suffer; He was the Second Adam, creating a new humanity; His death shows us how much God loves us; and others. Every major atonement theory oi Christian theological history discussed below was anticipated by one or another of these metaphors. The New Testament employed them all to symbolize something that could be described only symbolically, that "God was in Christ reconciling the world to himself, not counting their trespasses against them" (II Cor. v, 19).

He Descended Into Hell.—This phrase was probably the last to be added to the creed. Its principal source in the New Testament was the description in I Pet. iii, 18–20, oi Christ's preaching to the spirits in prison. Originally the descent into hell may have been identified with the death of Christ, when He entered the abode of the dead in the underworld. But in the time before it entered the creed, the descent was frequently taken to mean that Christ had gone to rescue the souls of the Old Testament faithful from the underworld, from what western Catholic theology eventually called the limbo *patrum.* Among some of the church fathers the descent into hell had come to mean Christ's declaration of His triumph over the powers of hell. Despite its subsequent growth in importance, however, the doctrine of the descent into hell apparently did not form an integral part of the apostolic preaching about Christ.

Glorification

The Third Day He Rose Again From the Dead.—The writers of the New Testament nowhere made the Resurrection of Christ a matter for argument, but everywhere asserted it and assumed it. With it began that state in the history of Jesus Christ that was still continuing, His elevation to glory. They used it as a basis for three kinds of affirmations. The Resurrection of Christ was the way God bore witness to His Son, "designated Son of God in power according to the Spirit of holiness by his resurrection from the dead" (Rom. i, 4); this theme was prominent also in the Book of Acts. The Resurrection was also the basis for the Christian hope of life after death (I Thess. iv, 14), and without it that hope was said to be baseless (I Cor. xv, 12–20). The Resurrection of Christ was also the ground for admonitions to manifest a "newness of life" (Rom. vi, 4) and to "seek the things that are above" (Col. iii, 1). The writers of the New Testament themselves expressed no doubt that the Resurrection had really happened. But Paul's discussion in I Cor. xv shows that among those who heard the Christian message there was such doubt, as well as efforts

to rationalize the Resurrection. The differences among the Gospels, and between the Gospels and Paul, suggest that from the outset a variety of traditions existed regarding the details of the Resurrection *(see* above). But such differences only serve to emphasize how universal the faith in the Resurrection was amid this variety of traditions.

He Ascended Into Heaven, and Sitteth on the Right Hand of God the Father Almighty. — As indicated earlier, the narrative of the Ascension is peculiar to Luke-Acts, but other parts of the New Testament may refer to it. Eph, iv. 8–10, may be such a reference. but many interpreters hold that for Paul Resurrection was identical with Ascension. That. they maintain, is why he could speak of the appearance of the risen Christ to him in continuity with the appearances to others (I Cor. xv. 5–8) despite the fact that. in the chronology of the creed. the Ascension intervened between them. Session at the right hand of the Father was apparently a Christian interpretation of Ps. cx. 1. It implied the elevation — or. as the doctrine of pre-existence became clearer, the restoration — of Christ to a position of honour with God. Taken together. the Ascension and the session were a way of speaking about the presence of Christ with the Father during the interim between the Resurrection and the Second Advent. From Eph. iv. 8–16, it is evident that this way of speaking was by no means inconsistent with another Christian tenet, the belief that Christ was still present in and with His church. It was, in fact, the only way to state that tenet in harmony with the doctrine of the Resurrection.

From Thence He Shall Come to Judge the Quick and the Dead. — The creed concludes its Christological section with the doctrine of the Second Advent: the First Advent was a coming into the flesh. the Second Advent a coming in glory. Much controversy among modern scholars has been occasioned by the role of this doctrine in the early church. Those who maintain that Jesus erroneously expected the early end of the world have often interpreted Paul as the first of those who began the adjustment to a delay in the end. with John's Gospel as a more advanced stage of that adjustment. Those who hold that the imminence of the end was a continuing aspect of human history as Jesus saw it also maintain that this phrase of the creed was a statement of that imminence. without any timetable necessarily implied. From the New Testament it seems that both the hope of the Second Coming and a faith in the continuing presence of Christ belonged to the outlook of the apostolic church. and that seems to be what the creed meant. The phrase "the quick and the dead" is a summary of passages like I Cor. xv. 51–52, and I Thess. iv. 15–17.

In order to complete the confession of the creed regarding the glorification of Christ. the Nicene Creed added the phrase: "Of His kingdom there shall be no end." This was a declaration that Christ's return as Judge would usher in the full exercise of His reign over the world. Such was the expectation of the apostolic church. based upon what it knew and believed about Jesus Christ.

THE DOGMA OF CHRIST IN THE ANCIENT COUNCILS

The main lines of orthodox Christian teaching about the person of Christ were set by the New Testament and the ancient creeds. But what was present there in a germinal form became a clear statement of Christian doctrine when it was formulated as dogma. In one way or another, the first four ecumenical councils nere all concerned nith the formulation of the dogma regarding the person of Christ — His relation to the Father, and the relation of the divine and the human in Him *(See* COUNCIL)

Such a formulation became necessary because teachings arose within the Christian community that seemed to threaten what the church believed and confessed about Christ. Both the dogma and the heretical teachings against which the dogma was directed are therefore part of the history of Jesus Christ.

THE COUNCILS OF NICAEA AND CONSTANTINOPLE

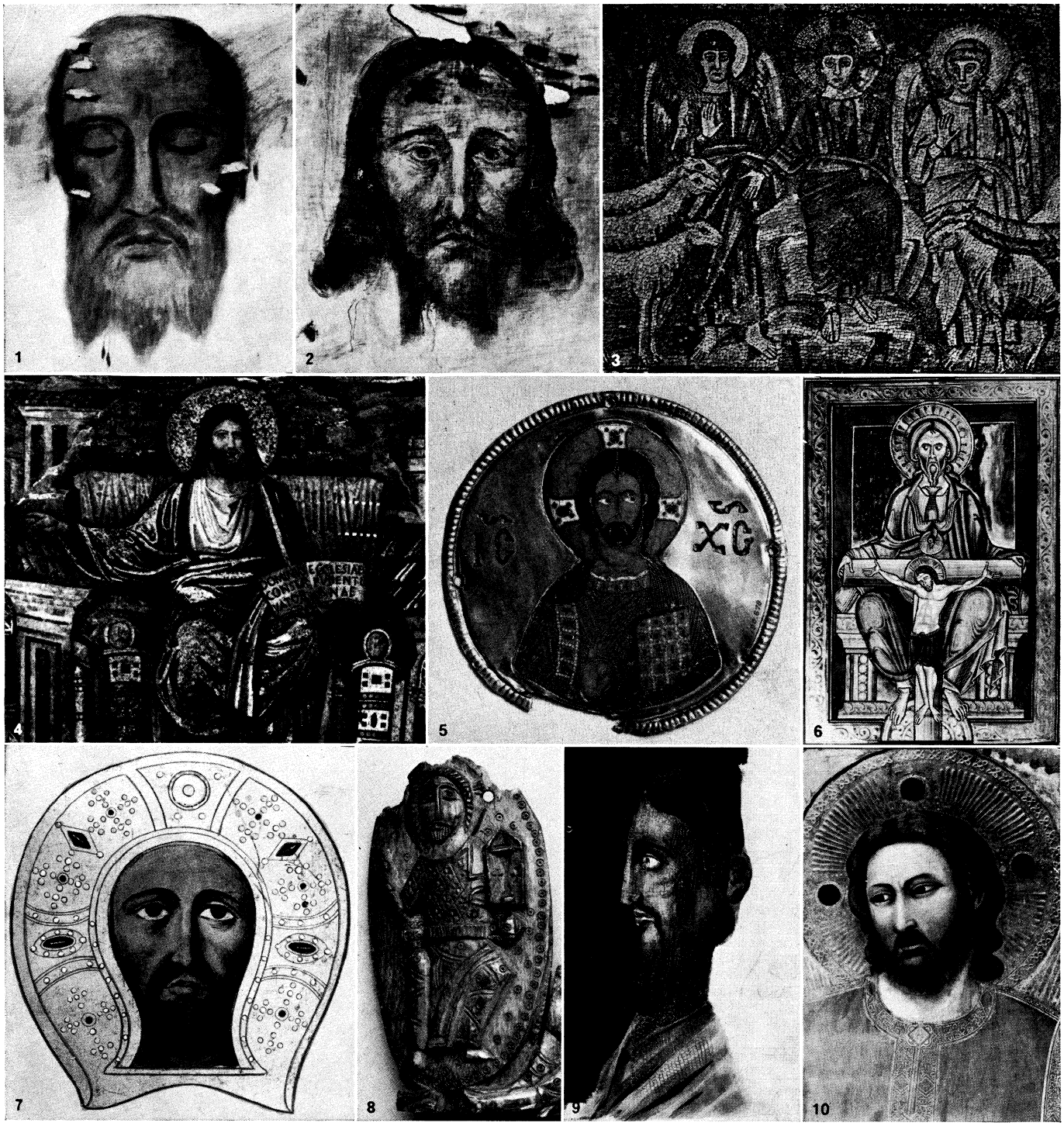
Early Heresies. — From the outset Christianity has had to contend with those who misinterpreted the person and mission of Jesus. Both the New Testament and the early confessions of the church referred and replied to such misinterpretations. As the Christian movement gained adherents from the non-Jewish world, it had to explain Christ in the face of new challenges.

These misinterpretations touched both the question of His humanity and the matter of His deity. A concern to safeguard the true humanity of Jesus led some early Christians to teach that Jesus of Nazareth, an ordinary man, was adopted as the Son of God in the moment of His baptism or after His Resurrection; this heresy mas called adoptionism (*q.v.*). Gnostics and others wanted to protect Him against involvement in the world of matter, which they regarded as essentially evil, and therefore taught that He had only an apparent. not a real body: they were called Docetae *(see* DOCETISM). Most of the struggle over the person of Christ, however. dealt with the question of His relation to the Father. Some early views were so intent upon asserting His identity with the Father that the distinction of His person was lost and He became merely a manifestation of the one God. Because of this idea of Christ as a "mode" of divine self-manifestation, proponents of this view were dubbed "modalists"; from an early supporter of the view it was called "Sabellianism" *(see* SABELLITS). Other interpretations of the person of Christ in relation to God went to the opposite extreme. They insisted so strenuously upon the distinctness of His person from that of the Father that they subordinated Him to the Father. Many early exponents of the doctrine of the Logos were also subordinationists, so that the Logos idea itself became suspect in some quarters. What was needed was a framework of concepts, with which to articulate the doctrine of Christ's oneness with the Father and yet distinctness from the Father, and thus to answer the question (Adolf von Harnack): "Is the Divinity which has appeared on earth and reunited men with God identical with that supreme Divinity which governs heaven and earth. or is it a demigod?"

Nicaea.—That question forced itself upon the church through the teachings of Arius (*q.v.*). He maintained that the Logos was the first of the creatures, called into being by God as the agent or instrument through which He was to make all things. Christ was thus less than God. but more than man; He was divine, but He was not God. To meet the challenge of Xrianism. which threatened to split the church. the newly converted emperor Constantine convoked in 32j the first ecumenical council of the Christian church at Nicaea *(see* NICAEA, COUNCIL OF). The private opinions of the attending bishops were anything but unanimous, but the opinion that carried the day was that espoused by the young presbyter Athanasius. who later became bishop of Alexandria. The Council of Nicaea determined that Christ was "begotten, not made." that He was therefore not creature but Creator. It also asserted that He was "of the same essence as the Father" (*homoousios to patri*). In this way it made clear its basic opposition to subordinationism, even though there could be, and were, quarrels about details. It was not equally clear how the position of Nicaea and of Athanasius differed from modalism. Athanasius asserted that it was not the Father nor the Holy Spirit, but only the Son that became incarnate as Jesus Christ. But in order to assert this, he needed a more adequate terminology concerning the persons in the Holy Trinity. So the settlement at Nicaea regarding the person of Christ made necessary a fuller clarification of the doctrine of the Trinity. and that clarification in turn made possible a fuller statement of the doctrine of the person of Christ.

Constantinople.—Nicaea did not put an end to the controversies, but only gave the parties a new rallying point. Doctrinal debate was complicated by the rivalry among bishops and theologians as well as by the intrusion of imperial politics that had begun at Nicaea. Out of the post-Nicene controversies came that fuller statement of the doctrine of the Trinity which was needed to protect the Nicene formula against the charge of failing to distinguish adequately between the Father and the Son. Ratified at the Council of Constantinople in 381. but since lost, that statement apparently made official the terminology developed by the supporters of Nicene orthodoxy in the middle of the 4th century: one divine essence. three divine persons *(mia ousia, treis hypostaseis)*. The three persons, Father, Son and Holy Spirit, were distinct from one another, but were equal in their eternity

JESUS CHRIST



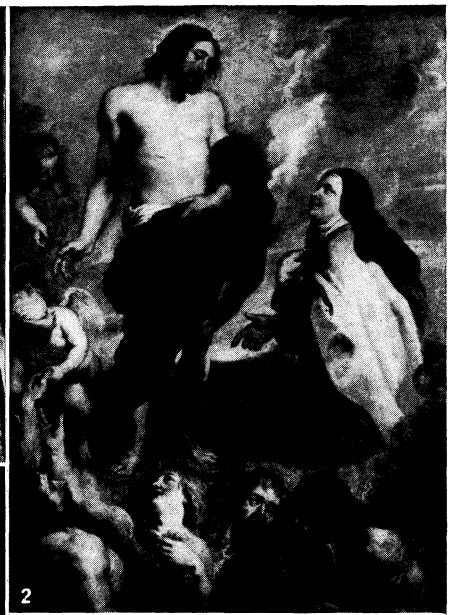
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REPRESENTATIONS OF JESUS CHRIST FROM THE 2ND TO 14TH CENTURIES

1. Painting on cloth in the Sacristy of St. Peter's, Rome; 2nd century
2. Painting on cloth of the head of Christ; 2nd century. Church of S. Bartolomeo, Genoa, Italy
3. "Division of the Sheep and Goats"; Byzantine mosaic of the 6th century. Church of S. Apollinare Nuovo, Ravenna, Italy
4. Mosaic, "Christ Enthroned"; 4th century. Church of Sta. Pudenziana, Rome
5. Byzantine cloisonné enamel of Christ; late 11th century
6. "The Trinity", from a German illuminated manuscript: 12th-13th century. Pierpont Morgan library, New York city
7. Head of Christ painted on cypress wood; by tradition attributed to St. Luke, but probably 3rd century. Vatican library, Rome
8. Palestine Coptic ivory carving, "The Ascension"; late 6th or early 7th century
9. Mosaic of the head of Christ, from the Roman catacombs
10. Detail, head of Christ from "The Last Judgment". Giotto di Bondone (1267?–1337), Italian, In the Arena chapel, Padua, Italy

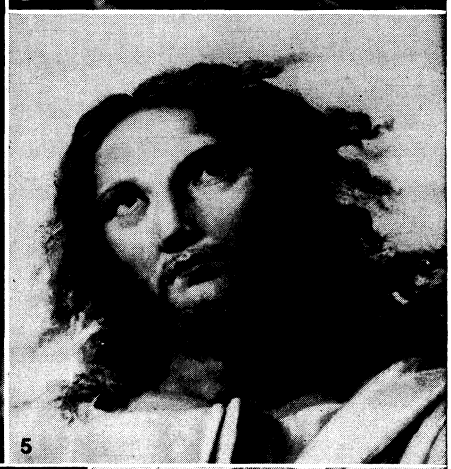
JESUS CHRIST

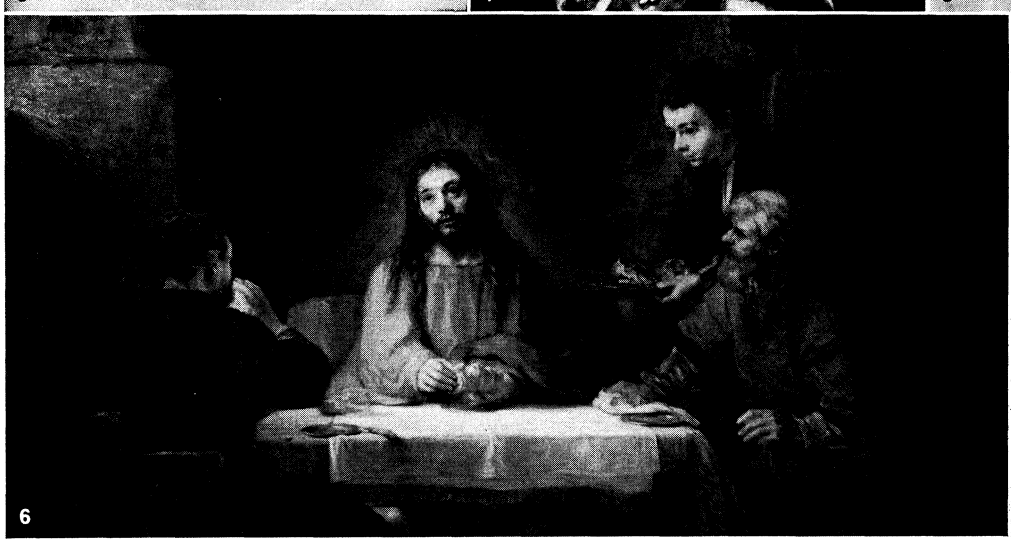














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PAINTINGS OF JESUS CHRIST FROM THE 15TH TO 20TH CENTURIES

1. Right-hand panel of altar-piece, "The Crucifixion", by Roger Van der Weyden (1400–64), Flemish. The Prado, Madrid
2. "St. Teresa Praying to Christ for the Souls in Purgatory," Peter Paul Rubens (1577–1640), Flemish. In Royal museum, Antwerp
3. "Ecce Homo", pastel by Guido Reni (1575–1642), Italian. In the National gallery, London
4. "Christ", by El Greco (Domenico Theotocopuli, c. 1542–1614) of the Spanish school. In the cathedral at Toledo, Spain
5. Head of Christ, from "The Transfiguration", Raphael (1483–1520), Italian. In Vatican gallery
6. "Christ at Emmaus", Rembrandt Van Rijn (1606–69), Dutch. In the Louvre, Paris
7. "Head of Christ", by Georges Rouault (1871–1958), French. Collection of Walter P. Chrysler, Jr., New York city

and power. Now it was possible to teach, as Nicaea had, that Christ was "of the same essence as the Father" without arousing the suspicion of modalism. Although this doctrine seemed to make problematical the unity of God, it did provide an answer to the first of the two issues confronted by the church in its doctrine of the person of Christ—the issue of Christ's relation to the Father. It now became necessary to clarify the second issue—the relation of the divine and the human within Christ.

The Councils of Ephesus and Chalcedon

By excluding several extreme positions from the circle of orthodoxy, the formulation of the doctrine of the Trinity in the 4th century determined the course of subsequent discussion about the person of Christ. It also provided the terminology for that discussion, since jth-century theologians were able to describe the relation between the divine and the human in Christ by analogy to the relation between the Father and the Son in the Trinity. The term that was found to express this relation in Christ was the term "nature," *physis.* There were three divine persons in one divine essence; such was the outcome of the controversies in the 4th century. But there were also two natures, one of them divine and the other human, in the one person Jesus Christ. Over the relation between these two natures the theologians of the 5th century carried on their controversy.

The abstract questions with which they sometimes dealt in that controversy, some of them almost unintelligible to a modern mind, must not be permitted to obscure the fact that a basic issue of the Christian faith was at stake: how can Jesus Christ be said to possess that identity with God which He must have to be our Saviour. and yet be called our Brother, as He truly must be to make His salvation available to us?

The Parties.—During the half century after the Council of Constantinople several major points of emphasis developed in the doctrine of the person of Christ; characteristically, these are usually defined by the episcopal see that espoused them. There was a way of talking about Christ that was characteristic of the see at Alexandria. It stressed the divine character of all that Jesus Christ had been and done, but its enemies accused it of absorbing the humanity of Christ in His divinity. The mode of thought and language employed at Antioch. on the other hand, emphasized the true humanity of Christ; but its opponents maintained that in so doing it had split Christ into two persons, each of whom maintained his individual selfhood while they acted in concert with each other. Western theology was not as abstract as either of these alternatives. Its central emphasis was a practical concern for human salvation and for as irenic a settlement of the conflict as was possible without sacrificing that concern. Even more than in the 4th century, considerations of imperial politics were always involved in conciliar actions, together with the fear in countries like Egypt that Constantinople might come to dominate them Thus a decision regarding the relation between the divine and the human in Christ could be simultaneously a decision regarding the political situation. Nevertheless, the settlements at which the councils of the 5th century arrived may be and are regarded as normative in the church long after their political setting has disappeared.

The conflict between Alexandria and Antioch came to a head when Nestorius (*q.v.*), taking exception to the use of the title "Mother of God" or, more literally. "God-Bearer" (*Theotokos*) for the Virgin Mary, insisted that she was only "Christ-Bearer." In this insistence the Antiochean emphasis upon the distinction bet een the two natures in Christ made itself heard throughout the church. The Alexandrian theologians responded by charging that Nestorius was dividing the person of Christ, which they represented as so completely united that, in the famous phrase of Cyril (*q.v.*), there was "one nature of the Logos which became incarnate." By this he meant that there was only one nature, the divine, before the Incarnation, but that after the Incarnation there were two natures indissolubly joined in one person; Christ's human nature had never had an independent existence. There were times when Cyril appeared to be saying that there was "one nature of the incarnate Logos" even after the Incarnation, but his most precise formulations avoided this language. The Council (*q.v.*) of Ephesus in 431 was one in a series of gatherings called to settle this conflict, some by one party and some by the other.

Chalcedon.—But the actual settlement was not accomplished until the calling of the Council (*q.v.*) of Chalcedon in 451. The basis of that settlement was the western understanding of the two natures in Christ, as formulated in the *Tome* of Pope Leo I of Rome. Chalcedon declared: "We all unanimously teach . . . one and the same Son, our Lord Jesus Christ, perfect in deity and perfect in humanity . . . in two natures, without being mixed, transmuted, divided, or separated. The distinction between the natures is by no means done away with through the union, but rather the identity of each nature is preserved and concurs into one person and being." In this formula the valid emphases of both Alexandria and Antioch came to expression; both the unity of the person and the distinctness of the natures were affirmed. Therefore the decision of the Council of Chalcedon has been the basic statement of the doctrine of the person of Christ for most of the church ever since. The western part of the church went on to give further attention to the doctrine of the work of Christ. In the eastern part of the church the Alexandrians and the Antiochians continued the controversies that had preceded Chalcedon, but they clashed now over the question of how to interpret Chalcedon. The controversy over the Monophysite and the Monothelite (*qq.v.*) heresies was an effort to clarify the interpretation of Chalcedon, with the result that the extremes of the Alexandrian position were condemned just as the Nestorian extreme of the Antiochian had been.

Emerging from all this theological discussion was an interpretation of the person of Christ that affirmed both His oneness with God and His oneness with humanity while still maintaining the oneness of His person. Interestingly, the liturgies of the church had maintained this interpretation at a time when the theologians of the church were still struggling for clarity; and the final solution was a scientifically precise restatement of what had been present germinally in the liturgical piety of the church. In the formula of Chalcedon that solution finally found the framework of concepts and of vocabulary that it needed to become intellectually consistent. In one sense, therefore, what Chalcedon formulated was what Christians had been believing from the beginning; but in another sense it represented a development from the earlier stages of Christian thought.

THE INTERPRETATION OF CHRIST IN WESTERN FAITH AND THOUGHT

With the determination of the orthodox teaching of the church regarding the person of Christ, it still remained necessary to clarify the doctrine of the work of Christ. While it had been principally in the east that the discussion of the former question was carried on—though with important additions from the west, as we have seen—it was the western church that provided the most detailed answers to the question: granted that this is what Jesus Christ was, how are we to describe what it is that He did?

Doctrines of the Person and Work of Christ

The Medieval Development.—The most representative spokesman of the western church on this question, as on most others, was St. Augustine (*q.v.*). His deep understanding of the meaning of human sin was matched by his detailed attention to the meaning of divine grace. Central to that attention was his emphasis upon the humanity of Jesus Christ as man's assurance of his salvation, an emphasis to which he gave voice in a variety of ways. The humanity of Christ showed us how God elevated the humble; it was the link between our physical nature and the spiritual nature of God; it was the sacrifice which the human race offered to God; it was the foundation of a new humanity, recreated in Christ as the old humanity had been created in Adam—in these and other ways Augustine sought to describe the importance of the Incarnation for the redemption of man. By combining this stress upon the humanity of Christ as our Saviour with a doctrine of the Trinity that was orthodox but nevertheless highly creative and original, St. Augustine put his mark indelibly upon western piety and theology, which, in Anselm and in the reformers, sought

further for adequate language in which to describe God's deed of reconciliation in Jesus Christ.

During the formative centuries of Christian dogma, there had been many ways of describing that reconciliation, most of them having some precedent in biblical speech. One of the most prominent pictures of the reconciliation was that connected with the biblical metaphor of ransom: Satan held the human race captive in its sin and corruptibility, and the death of Christ was the ransom paid to the devil as the price for setting men free. A related metaphor was that of the victory of Christ: Christ entered into mortal combat with Satan for the human race, and the winner was to be lord; although the crucifixion appeared to be Christ's capitulation to the enemy. His Resurrection broke the power of the devil and gave the victory to Christ, granting to men the gift of immortality. From the Old Testament and the Epistle to the Hebrews came the image of Christ as the sacrificial victim who was offered up to God as a means of stilling the divine anger. From the sacrament of penance came the idea, most fully developed by St. Anselm, that the death of Christ was a vicarious satisfaction rendered for men. Like the New Testament, the church fathers could admonish their hearers to learn from the death of Christ how to suffer patiently. They could also point to the suffering and death of Christ as the supreme illustration of how much God loves mankind. As in the New Testament, therefore, so in the tradition of the church there were many figures of speech to represent the miracle of the reunion between man and God effected in the God-man Christ Jesus.

Common to all these figures of speech was the desire to do two things simultaneously: to emphasize that the reunion was an act of God, and to safeguard the participation of man in that act. Some theories were so "objective" in their emphasis upon the divine initiative that man seemed to be almost a pawn in the transaction between God in Christ and the devil. Other theories so "subjectively" concentrated their attention upon man's involvement and man's response that the full scope of the redemption could vanish from sight. It was in Xnselm of Canterbury (see ANSELM, SAINT) that western Christendom found a theologian who could bring together elements from many theories into one doctrine of the Atonement, summarized in his book. *Cur* Deus *homo?* According to this doctrine, sin was a violation of the honour of God. God offered man life if he rendered satisfaction for that violation; but the longer man lived, the worse the situation became. Only a life that was truly human and yet had infinite worth would have been enough to give such a satisfaction to the violated honour of God on behalf of the entire human race. Such a life was that of Jesus Christ! whom the mercy of God sent as a means of satisfying the justice of God. Because He was true man, His life and death could be valid for men; because He was true God. His life and death could be valid for all men. By accepting the fruits of His life and death, men could receive the benefits of His satisfaction. With some relatively minor alterations, Xnselm's doctrine of Atonement passed over into the theology of the Latin church, forming the basis of both Roman Catholic and orthodox Protestant ideas of the work of Christ. It owed its acceptance to many factors, not the least of them being the way it squared with the liturgy and art of the west. The crucifix has become the traditional symbol of Christ in the western church, reinforcing and being reinforced by the satisfaction theory of the Atonement.

Scholastic theology, therefore, did not modify traditional ways of speaking about either the person or the work of Christ as sharply as it did, for example, some of the ways the church fathers had spoken about the presence of the body and blood of Christ in the Eucharist. The major contribution of the scholastic period to the Christian conception of Jesus Christ appears to lie in the way it managed to combine theological and mystical elements. Alongside the growth of Christological dogma and sometimes in apparent competition with it was the development of a view of Christ that sought personal union with Him rather than accurate concepts about Him. Such a view of Christ appeared occasionally in the writings of Augustine, but it was in men like Bernard of Clairvaux (see BERNARD? SAINT) that it attained both its fullest expression and its most adequate harmonization with the dogmatic view. The relation between the divine and the human natures in Christ, as formulated in ancient dogma, provided the mystic mith the ladder he needed to ascend through the man Jesus to the eternal Son of God, and through Him to a mystical union with the Holy Trinity; this had been anticipated in the mystical theology of some of the Greek fathers. At the same time the dogma saved mysticism from the pantheistic excesses to which it might otherwise have gone; for the doctrine of the tno natures meant that the humanity of our Lord was not an expendable element in Christian piety, mystical or not, but its indispensable presupposition and the continuing object of its adoration, in union with His deity. As a matter of fact. another contribution of the medieval development was the increased emphasis of St. Francis of Assisi *(q v.)* and his followers upon the human life of Jesus. These brotherhoods cultivated a more practical and ethical version of mystical devotion. to be distinguished from speculative and contemplative mysticism. Their theme became the imitation of Christ in a life of humility and obedience With it came a new appreciation of that true humanity of Christ which the dogma had indeed affirmed, but nhich theologians had been in danger of reducing to a mere dogmatic concept. As Henry Thode and others have suggested, this new appreciation is reflected in the way painters like Giotto began to portray Jesus, in contrast with their western predecessors and especially with the stylized picture of Christ in Byzantine icon painting.

The Reformation and Classical Protestantism. — The attitude of the reformers toward traditional conceptions of the person and work of Christ was conservative. Insisting for both religious and political reasons that they were orthodox, they altered very little in the Christological dogma. Martin Luther and John Calvin gave the dogma a new meaning when they related it to their doctrine of justification by grace through faith. Because of his interpretation of sin as the captivity of the will, Luther also revived the patristic metaphor of the Atonement as the victory of Christ; it is characteristic of him that he wrote hymns for both Christmas and Easter, but not for Lent. The new attention to the Bible that came with the Reformation created interest in the earthly life of Jesus, while the Reformation idea of "grace alone" and of the sovereignty of God even in His grace made the deity of Christ. a matter of continuing importance.

In the ideas about the Lord's Supper set forth by Huldreich Zwingli *(q.v.)*, Luther thought he saw a threat to the orthodox doctrine of Christ, and he denounced those doctrines vehemently. As this controversy progressed. Luther interpreted the ancient dogma of the two natures to mean that the omnipresence of the divine nature was communicated to the human nature of Christ, and that therefore Christ as both God and man was present everywhere. Although he repudiated both Luther's and Zwingli's theories, Calvin was persuaded that the ancient Christological dogma mas true to the biblical witness and he permitted no deviation from it. All this is evidence for the significance that "Jesus Christ, true God begotten of the Father from eternity, and also true man, born of the Virgin Mary," to use Luther's formula, had in the faith and theology of all the reformers.

At one point the theology of the reformers did serve to bring together several facets of the biblical and the patristic descriptions of Jesus Christ. That was the doctrine of the threefold office of Christ, systematized by Calvin and developed more fully in Protestant orthodoxy: Christ as prophet, priest and king. Each of these symbolized the fulfillment of the Old Testament and represented one aspect of the church's continuing life. Christ as prophet fulfilled and elevated the prophetic tradition of the Old Testament, while continuing to fulfill His prophetic office in the ministry of the Word. Christ as priest brought to an end the sacrificial system of the Old Testament by being both the priest and the victim, while He continues to function as intercessor with and for the church. Christ as king was the royal figure to whom the Old Testament had pointed, while exercising His rule among men now through those whom He has appointed. In each of the three, Protestants differed from one another according to their theological, ethical or liturgical positions. But the threefold office enabled

Protestant theology to take into account the complexity of the biblical and patristic pictures of Christ as no oversimplified theory was able to do, and it is probably the chief contribution of the reformers to the theological formulation of the doctrine of the person and work of Christ.

The Debate Over Christology in Modern Christian Thought

Few Protestant theologians in the middle of the 20th century were willing to endorse the ancient dogma of the two natures in Christ as unconditionally as the reformers had done, for between the Reformation and modern theology there intervened a debate over Christology that altered the perspective of most Protestant denominations and theologians. By the 20th century there was a wider gap between the theology of the reformers and that of many modern Protestants than there had been between the theology of the reformers and that of their Roman Catholic opponents.

Origins of the Debate. — The earliest criticism of orthodox dogma came in the age of the Reformation, not from the reformers but from the "left wing of the Reformation," from Michael Servetus (1511?–53) and the Socinians. This criticism was directed against the presence of nonbiblical concepts and terms in the dogma, and it was intent upon safeguarding the true humanity of Jesus as a moral example. There were many inconsistencies in this criticism, such as the willingness of Servetus to call Jesus "Son of God" and the Socinian custom of addressing prayer and worship to Him. But it illustrates the tendency, which became more evident in the Enlightenment, to use the Reformation protest against Catholicism as a basis for a protest against orthodox dogma as well. While that tendency did not gain much support in the 16th century because of the orthodoxy of the reformers, later criticism of orthodox Christology was able to wield the "Protestant principle" against the dogma of the two natures on the grounds that this was a consistent application of what the reformers had done. Among the ranks of the Protestant laity, the hymnody and the catechetical instruction of the Protestant churches assured continuing support for the orthodox dogma. Indeed, the doctrine of Atonement by the vicarious satisfaction of Christ's death has seldom been expressed as amply as it was in the hymns and catechisms of both the Lutheran and the Reformed churches. During the period of Pietism in the Protestant churches, this loyalty to orthodox teaching was combined with a growing emphasis upon the humanity of Jesus, also expressed in the hymnody of the time.

When theologians began to criticize orthodox ideas of the person and work of Christ. therefore, they met with opposition from the common people. Albert Schweitzer dates the development of a critical attitude from the work of H. S. Reimarus (1694–1768), but Reimarus was representative of the way the Enlightenment treated the traditional view of Jesus. The books of the Bible were to be studied just as other books are, and the life of Jesus was to be drawn from them by critically sifting and weighing the evidence of the Gospels. The Enlightenment thus initiated the modern interest in the life of Jesus, with its detailed attention to the problem of the relative credibility of the Gospel records. It has been suggested by some historians that the principal target of Enlightenment criticism was not the dogma of the two natures but the doctrine of the vicarious Atonement. The leaders of Enlightenment thought did not make a sudden break with traditional ideas, but gave up belief in miracles, the Virgin Birth, the Resurrection and the Second Advent only gradually. Their principal importance for the history of the doctrine of Christ consists in the fact that they made the historical study of the sources for the life of Jesus an indispensable element of any Christology.

The 19th Century. — Although the Enlightenment of the 18th century was the beginning of the break with orthodox teachings about Jesus Christ, it was only in the 19th century that this break attracted nide support among theologians and scholars in many parts of Christendom — even, for a uhile, among the Modernists of the Roman Catholic Church. Two works of the 19th century were especially influential in their rejection of orthodox Christology. One was the Life of Jesus first published in 1835 by David Friedrich Strauss; the other, bearing the same title, was first published by Ernest Renan (*q.v.*) in 1863. Strauss's work paid more attention to the growth of Christian ideas — he called them "myths" — about Jesus as the basis for the picture we have in the Gospels, while Renan attempted to account for Jesus' career by a study of His inner psychological life in relation to His environment. Both works achieved wide circulation and were translated into other languages, including English. They took up the Enlightenment contention that the sources for the life of Jesus were to be studied as other sources are, and what they constructed on the basis of the sources was a type of biography in the modern sense of the word. In addition to Strauss and Renan, the 19th century saw the publication of a plethora of books about the life and teachings of Jesus. Each new hypothesis regarding the problem of the synoptic Gospels implied a reconstruction of the life and message of Jesus.

The fundamental assumption for most of this work on the life and teachings of Jesus was a distinction between the "Jesus of history" and the "Christ of faith." Another favourite way of putting the distinction was to speak of the religion *of* Jesus in antithesis to the religion about Jesus. This implied that Jesus was a man like other men. but with a heightened awareness of the presence and power of God. Then the dogma of the church had mistaken this awareness for a metaphysical statement that Jesus was the Son of God and had thus distorted the original simplicity of His message. Some critics went so far as to question the very historicity of Jesus, but even those who did not go that far questioned the historicity of some of the sayings and deeds attributed to Jesus in the Gospels.

In part this effort grew out of the general concern of 19th-century scholarship with the problem of history, but it also reflected the religious and ethical assumptions of the theologians. Many of them were influenced by the moral theories of Kant in their estimate of what was permanent about the teachings of Jesus, and by the historical theories of Hegel in the way they related the original message of Jesus to the Christian interpretations of that message by later generations of Christians. The ideas of evolution and of natural causality associated with the science of the 19th century also played a part through the naturalistic explanations of the biblical miracles. And the historians of dogma, climaxing in Adolf von Harnack (1851–1930), used their demonstration of the dependence of ancient Christology upon non-Christian sources for its concepts and terminology to reinforce their claim that Christianity had to get back from the Christ of dogma to the "essence of Christianity" in the teachings of Jesus about the fatherhood of God and the brotherhood of man.

The 20th Century. — At the beginning of the 20th century the most influential authorities on the New Testament were engaged in this quest for the essence of Christianity and for the Jesus of history. But that quest led in the early decades of the 20th century to a revolutionary conclusion regarding the teachings of Jesus, namely, that He had expected the end of the age to come shortly after His death and that His teachings as laid down in the Gospels were an "interim ethic," intended for the messianic community in the brief span of time still remaining before the end. The effort to apply those teachings in modern life was criticized as a dangerous modernization. This thesis of the "consistent eschatology" in Jesus' message was espoused by Johannes von Weiss (1863–1914) and gained wide circulation through the writings of Albert Schweitzer.

The years surrounding World War I also saw the development of a new theory regarding the composition of the Gospels. Because of its origin, this theory is usually called form criticism (German Formgeschichte). It stressed the forms of the Gospel narratives — parables, sayings, miracle stories, Passion accounts, etc.—as an indication of the oral tradition in the Christian community out of which the narratives came. While the attention of earlier scholars had been concentrated on the authenticity of Jesus' teachings as transmitted in the Gospels, this new theory was less confident of being able to separate the authentic from the later elements in the Gospel records, though various proponents of it did suggest criteria by which such a separation might be guided. The studies of form criticism made a life of Jesus in

the old biographical sense impossible, just as consistent eschatology had declared impossible the codification of a universal ethic from the teachings of Jesus. Some adherents of form criticism espoused an extreme skepticism regarding any historical knowledge of Jesus' life at all, but the work of men like Martin Dibelius and even Rudolf Bultmann showed that such skepticism was not warranted by the conclusions of this study.

Influenced by these trends in New Testament study, Protestant theology by the middle of the 20th century was engaged in a reinterpretation of the Christology of the early church. Some Protestant churches continued to repeat the formulas of ancient dogma, but even there the critical study of the New Testament documents was beginning to call those formulas into question. The struggles of the evangelical churches in Germany under Adolf Hitler caused some theologians to realize anew the power of the ancient dogma of the person of Christ to sustain faith, and some of them were inclined to treat the dogma with less severity. But even they acknowledged that the formulation of that dogma in static categories of person, essence and nature was inadequate to the biblical emphasis upon actions and events rather than upon states of being. Karl Barth for the Reformed tradition, Lionel Thornton for the Anglican tradition and Karl Heim for the Lutheran tradition were instances of theologians trying to reinterpret classical Christology. While yielding nothing of their loyalty to the dogma of the church, Roman Catholic theologians like Karl Adam were also endeavouring to state that dogma in a form that was meaningful to modern men. The doctrine of the work of Christ was receiving less attention than the doctrine of Christ's person. In much of Protestantism, the concentration of the 19th century upon the teachings of Jesus had made it difficult to speak of more than the prophetic office. The priestly office received least attention of all; and therefore, despite the support accorded to efforts like that of Gustaf Aulén to reinterpret the metaphor of the Atonement as Christ's victory over His enemies, Protestant theology in the middle of the 20th century was still searching for a doctrine of the Atonement to match its newly won insights into the doctrine of the person of Christ.

In a curious way, therefore, the figure of Jesus Christ has become both a unitive and a divisive element in Christendom. All Christians are united in their loyalty to Him, even though they express their loyalty in a variety of doctrinal and liturgical ways. But doctrine and liturgy also divide Christian communions from one another. It has not been the official statements about Christ that have differed widely among most communions. What has become a sharp point of division is the amount of historical and critical inquiry that is permitted where the person of Christ is involved. Despite their official statements and confessions, most Protestant denominations had indicated by the second half of the 20th century that they would tolerate such inquiry, differ though they did in prescribing how far it would be permitted to go. On the other hand, the exclusion of Modernism by the Roman Catholic Church in 1907–10 drew definite limits beyond which the theological use of the methods of critical inquiry was heretical. Within those limits, however, Roman Catholic biblical scholars were engaging in considerable critical literary study, at the same time that critical Protestant theologians were becoming more sympathetic to traditional Christological formulas.

BIBLIOGRAPHY.—From the enormous amount of literature on Jesus Christ the following list selects books that survey the field or combine data that are otherwise accessible only in many other books.

It may seem gratuitous to suggest that the basic books for a study of the life and teachings of Jesus remain the Gospels of Matthew, Mark, Luke and John But many a modern student has become so preoccupied with conflicting theories about Jesus and the Gospels that he has neglected to study these basic sources by themselves For the scholar there are critical texts of the original Greek, that of Eberhard Nestle in its various editions being perhaps the most widely used and that of Westcott-Hort being one of the most influential. For the English reader there are modern translations into English by Protestant scholars (James Moffatt; E J. Goodspeed; the Revised Standard Version) as well as by Roman Catholics (Ronald Knox; F A. Spencer; the translation of the New Testament from the Vulgate in 1941; and the New Testament in the Westminster version by Cuthbert Lattey in 1948, from the original Greek).

The literature on the Gospels is a study in itself *(see* GOSPEL); in fact, a separate literature has grown up around each of them. B. H. Streeter, *The Four Gospels: a Study of Origins,* 4th ed. (New York, 1930), remains the standard introduction to the problem. Martin Dibelius, *From Tradition to Gospel,* Eng. trans. by Bertram L. Woolf, 2nd ed. (London, 1934; New York, 1935), and Frederick C. Grant (ed. and trans.), *Form Criticism* (Chicago, 1934), provide orientation in the modern trends of Gospel analysis. Roman Catholic evaluation of those trends has generally been in the context of studies on the life of Jesus. J. Lebreton, *The Life and Teaching of Jesus Chvist,* Eng. trans. by Francis Day, 2 vol. (London. Milwaukee, Wis., 1935), gives a good orientation to the Roman Catholic view.

Lives of Jesus have continued to appear. Albert Schweitzer, *The Quest of the Historical Jesus,* Eng. trans. by W. Montgomery (Sew York, 1948), is, as its German title indicates, "a history of research on the life of Jesus from Reimarus to Wrede." Chester C. McCown, *The Search for the Real Jesus* (New York, 1940), is another useful history of this research. Jean Guitton, *The Problem of Jesus,* Eng. trans. by A. Gordon Smith (New York, London, 1955), presents a Roman Catholic assessment of modern biblical criticism with detailed references. Among the most influential and useful lives of Jesus are: John Knox, *The Man Christ Jesus* (Chicago, 1941); Rudolf Bultmann, *Jesus and the Word,* Eng. trans. by Louise P. Smith and Erminie Huntress (New York, 1934; London, 1935); E. J. Goodspeed, *The Life of Jesus* (New York, 1950); S. J. Case, *Jesus: a New Biography* (Chicago, 1927); and Martin Dibelius, *Jesus,* Eng. trans. hy C. B. Hedrick and F. C. Grant (Philadelphia, 1949). F. M. William. *The Life of Jesus,* Eng. trans. by Newton Thompson (St. Louis, 1944); Karl Adam, *Christ Our Brother,* Eng. trans. by Justin McCann (New York, London, 1931); Ferdinand Prat, *Jesus Christ,* Eng. trans. by J. J. Heenan, 2 vol. (St. Paul. Minn., 1950): Romano Guardini, *The Lord,* Eng. trans. by Elinor Castendyk Briefs (Chicago, 1954): and the work of Lebreton mentioned above are discussions of the life of Jesus from the Roman Catholic standpoint. Henry Daniel-Rops, *Jesus and His Times,* Eng. trans. by Ruby Millar, 2nd ed. (New York, 1956), has received considerable circulation in Roman Catholic circles.

The history of Christology is summarized in works like Sydney Cave, *The Doctrine of thr Person of Chvist* (New York. London, 1925), and in the standard histories of doctrine. Roman Catholic Christology can be studied in R. Garrigou-Lagrange, *Christ the Savior,* Eng. trans. by Bede Rose (St. Louis, 1950); Aloys Grillmeier and Heinrich Bacht (eds.), *Das Konzil von Chalkedon: Geschichte und Gegenwart,* with an immense bibliography, 3 vol. (Würzburg, 1951–54); and in the works of Karl Adam mentioned above, in addition to *The Christ of Faith,* Eng. trans. by Joyce Crick (New York. London, 1957). Another important book is R. V. Sellers', *Two Ancient Christologies* (London, 1940), a very good study of the clash between Alexandria and Antioch by an Anglican scholar. H. R. Mackintosh, *The Doctrine of the Person of Christ* (New York, 1912), is an excellent introduction to the problem of Christology in modern Protestantism. Lionel S. Thornton. *The Incarnate Lord* (New York, London, 1928); Karl Heim, *Jesus drr Herr* (Berlin, 1935), *Jesus der Weltvollender* (Berlin, 1937); and the sections on Christology in the dogmatics of Karl Barth and Emil Brunner are efforts to meet and solve that problem. In his *Christ the Lord* (Chicago, 1945) and *On the Meaning of Christ* (New York, 1947), John Knox used insights of his earlier life of Jesus to construct a Christology. Gustaf Aulén, *Christus Victor* (New York. London. 1931), occasioned new discussions of the Atonement. (J. J. PN.)

JET, a dense. fine-grained, compact variety of subbituminous coal. or lignite (*q.v.*). It is coal-black in colour and has a hardness of 2+ and a specific gravity of 1.1 to 1.4. Unlike lignite, it is not laminated and so has little tendency to split, but breaks with a conchoidal fracture. It can be worked readily on a lathe and takes a high glossy polish.

Jet, used for ornaments and buttons, has been found in Bronze Age burial sites in Britain. It occurs near Whitby, Yorkshire, and was originally found as nodular or lenticular masses that had weathered out of the hard shales and were found in streams and along the Yorkshire coast. Later small mines in the shale were opened to enlarge the supply. Similar material has been found in other coal formations.

From prehistoric times until the 20th century, jet was a popular item in English jewelry. It enjoyed considerable vogue as jewelry suitable to wear during mourning. Because of its softness it scratches readily. It was supplanted by the harder chalcedony, which can be dyed a deep black colour. Although this is harder, it is much heavier, and longer necklaces are a burden to the wearer.

With the advent of coloured plastics which are easily cut in any form, jet is now seen only in antique jewelry and in museums. It still has considerable importance to archaeologists but is no longer worn as jewelry. (C. B. SN.)

JETHRO (or JETHER, Exod. iv, 18), the priest of Midian, in the Bible, whose daughter Zipporah became the wife of Moses.

He is known as Hobab, the son of Reuel the Kenite (Num. x, 29; Judg. iv. ii) and once as Reuel (Exod. ii, 18); if Zipporah is the wife of Moses referred to in Num. xii, 1, the family could be regarded as Cushite (see CUSH). Jethro was a priest of Yahweh and resided at the sacred mountain where the deity commissioned Moses to deliver the Israelites from Egypt. Subsequently Jethro came to Moses (probably at Kadesh), a great sacrificial feast was held, and the priest instructed Moses in legislative procedure; Exod. xviii, 27, (see EXODUS) and Num. x, 30, imply that the scene was not Sinai. Jethro was invited to accompany the people into the promised land, and later his clan is found settling in the south of Judah (Judg. i, 16) (see KENITES). The traditions agree in representing the kin of Moses as related to the mixed tribes of the south of Palestine (see EDOM) and in ascribing to the family an important share in the early development of the worship of Yahweh. It was suggested by T. K. Cheyne that the names of Hobab and Jonadab the father of the Rechabites (*q.v.*) were originally identical (Encyclopaedia *Biblica* col. 2101 [1914]).

JET **PROPULSION** denotes the propulsion of a vehicle in which the ejection rearward of a stream of matter causes a forward thrust. In rockets (*q.v.*) the matter, usually products of combustion, is given off from fuel and oxygen stored in the vehicle. This article covers a specific form of jet propulsion, in which a stream of the medium is caused to flow through the vehicle and by some internal agency (engine) is ejected at a velocity greater than that by which it entered. By Newton's second law of motion, the force required to cause this change of velocity is proportional to the change of momentum. Since by Newton's third law of motion, action is accompanied by an equal reaction, the vehicle in this manner receives a forward thrust. Strictly speaking, propulsion of all vehicles by liquid or gaseous mediums is accomplished in this fashion. The oar, paddle wheel, ship's propeller and air screw, for example, all provide a propulsion force by change of momentum in the medium.

Historical. — Jet propulsion was adopted by squids and cuttlefish as a natural means of propulsion in water. This was known to man long ago. and the several inventions for propelling ships in this manner probably originated from this knowledge. James Rumsey's steamboat, in which the water pump was driven by a steam engine. is one of these. It was run successfully on the Potomac river in 1787. Benjamin Franklin and Oliver Evans later suggested essentially the same mode of propulsion. The rocket, an ancient device invented by the Chinese, clearly embodied a similar mode of propulsion. Jet propulsion of aeroplanes was developed as a product of World War II, but its beginnings go back much earlier. When the aeroplane emerged as a practical device, the air screw or propeller, driven by an internal-combustion engine, became the natural means of propulsion. The piston type of aircraft engine soon reached a high degree of perfection. The propulsive force created by the engine exhaust was understood at an early date, but in the piston engine the flow of air is relatively small and at low flight speeds the work of the exhaust thrust is usually negligible.

The output of any heat engine is usually determined by the amount of oxygen which can be supplied through the air. The supercharger, a blower for compressing the inlet air and thus increasing the supply of oxygen, was invented in the early part of the 20th century. It was later applied to aircraft engines, facilitating flight at high altitudes. Eventually, the supercharger was driven by a turbine, actuated by the hot exhaust gases from the engine. This type of aircraft engine was built in the United States in large quantities during World War II and provided experience which anticipated many of the problems of modern jet propulsion. A later development of this type is the compound engine, in which the exhaust gas turbine also delivers power to the engine shaft.

Schemes for jet propulsion of aircraft had already appeared in the years following World War I. These inventions utilized blowers or compressors, driven by internal-combustion engines. burning fuel in the air stream after the compressor and ejecting it rearward through a jet nozzle. The system of Secundo Campini of the Caproni company in Italy is in this category. A successful flight was reported in Aug. 1940, publicized at the time as the first flight of a jet-propelled aircraft.

In England new ideas on aircraft propulsion were under study in the 1920s. A. A. Griffith and others of the Royal Aircraft Establishment (R.A.E.) considered the use of gas turbines to drive propellers and made important contributions to the axial-flow type of compressor. Flying Officer Frank (later Air Commodore Sir Frank) Whittle applied for a patent on jet propulsion in 1930, using a centrifugal compressor. Maxime Guillaume of France had patented a similar device in 1921, but no developments followed Guillaume's invention. These proposals involved taking in air from the atmosphere, compressing it in a compressor, burning fuel in the compressed air, expanding the air and the combustion products through a turbine which drove the compressor, and then ejecting the mixture rearward to the atmosphere. This development led to the first English air-borne jet engine in May 1941.

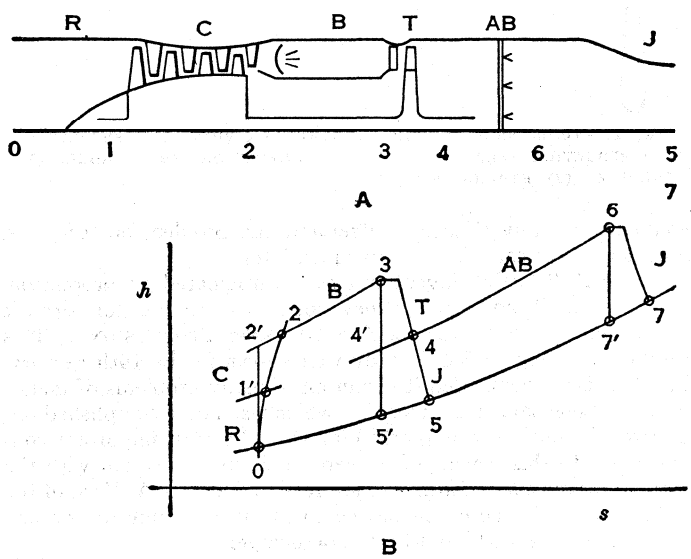


FIG. 1.—TURBOJET (TJ) ENGINE WITH AFTERBURNER: A. SCHEMATIC VIEW, B. THERMODYNAMIC PROCESS. (R) RAM (AIR INLET): (C) COMPRESSOR: (B) MAIN BURNER: (T) TURBINE: (AB) AFTERBURNER; (J) EXHAUST NOZZLE: (*h*) ENTHALPY; (*s*) ENTROPY

In Germany there had taken place important scientific developments in aeronautics, particularly under Ludwig Prandtl at Göttingen. These efforts were eventually merged on a larger scale under the Deutsche Versuchsanstalt für Luftfahrt (D.V.L.). The Reichluftfahrtministarium (R.L.M.) was formed in 1936, and under the initiative of these institutions serious efforts toward jet propulsion of aircraft were started in the middle 1930s. Two students at Gottingen, Hans von Ohain and Max Hahn, apparently unaware of Whittle's work, patented an engine for jet propulsion based on the same principles as the Whittle engine. These ideas were later taken up by the Ernst Heinkel aircraft company, and the second engine of this development made a flight on Aug. 27, 1939, which is now looked upon as the earliest date of modern jet propulsion. The Junker company and the Bavarian motor works later brought out engines which were far ahead of the contemporary British developments and which foreshadowed many of the features of the engines of the early 1950s. They were all based on axial-flow compressors, and, since there was a shortage of high-temperature alloys in Germany at the time, the important idea of blade cooling was conceived. 'Knowledge of the German developments did much to advance the art in England and the United States after the close of World War II, but the U.S.S.R. gained the most from these German efforts through the windfall of men, ideas and equipment, information on which was restricted by that country after the lowering of the "iron curtain."

In the United States developments were delayed by the formidable production task which occupied the U.S. aircraft and engine companies.

The first Whittle production unit was transplanted to the United States in 1941. The same year the National Advisory Committee

for Aeronautics (NACA) called W. F. Durand to initiate plans for research on the subject as chairman of the Committee on Jet Propulsion. The results later became the basis for some of the major U.S. achievements.

Significant inventions and developments were made in other

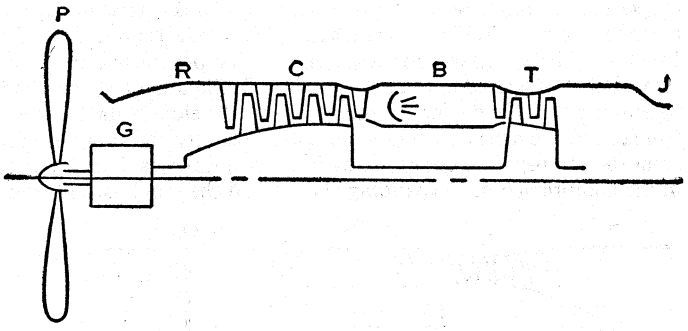


FIG. 2 — TURBOPROP (TP) ENGINE. SCHEMATIC VIEW. (P) PROPELLER: (G) REDUCTION GEAR: (R) RAM: (C) COMPRESSOR: (B) BURNER: (T) TURBINE: (J) EXHAUST NOZZLE

countries, notably France, Switzerland and Sweden, but they did not yield practical results until much later.

Although Whittle's invention clearly anticipated jet propulsion, the true significance of the new idea was the use for aircraft propulsion of the gas turbine (see AIRCRAFT PROPULSION). This type of heat engine was already well known in the 19th century, but its success demanded the solution of many problems of metallurgy and mechanical engineering, which was not accomplished until after the outbreak of World War II. The most important contributions to this development were made in connection with the turbine-driven superchargers of aircraft engines. S. A. Moss of the United States furthered the development of jet propulsion through his work on the turbine-driven supercharger.

In comparison with the piston type of internal-combustion engine, the gas turbine is characterized by high air flow and low engine weight, properties which have proved to be ideal for aircraft propulsion at high speed. even though the thermal efficiency may be inferior at low flight speeds.

These properties were further accentuated with the application of afterburning, in which the air is heated a second time by the combustion of fuel before it is ejected through the jet nozzle. This modification may be regarded as one of the most significant contributions to the achievement of supersonic flight.

It was natural to use the gas turbine as a replacement of the piston engine for driving the air screw. This idea emerged simultaneously with those on jet propulsion.

Major Devices.—In general, jet propulsion devices involve rotating compressors and turbines. The progenitors of this type of machinery were the steam turbine and the turbocompressor. This had led to the adoption of the word "turbo" to signify this type of aircraft engine. When compression is accomplished by scooping air from the atmosphere, the word "ram" is used. In the nomenclature of the United States air force, the following are the four recognized types of propulsion devices: turbojet (TJ), turboprop (TP), ramjet (RJ) and turbofan (TF). The pulsejet, which was used in the German V-I projectiles, also belongs to this series. While the turboprop is not strictly a jet-propulsion device, it is a logical member of the series and makes use of identical machine elements.

The four major devices mentioned above were developed in that order. In the order of ascending speed of application, they would be listed as TP, TF, TJ and RJ. with the rocket at still higher speeds following. Specific application may involve overlapping of the speed ranges, however.

Description.— In all the devices the air is taken in from the outside and compressed in ram or compressor or both, heated by combustion of fuel in a burner and then expanded in a turbine or exhaust jet or both.

In the turbojet (fig. 1) the turbine work just balances that required for the compressor. In the turboprop (fig. 2) the expansion in the turbine is carried further, so that the major part of the output is transmitted via a reduction gear to an air screw. In the turbofan (fig. 3) a separate portion of the compressor provides an air stream which by-passes the main burner. Both the turbojet and the turbofan may employ an afterburner for momentary boosting of the thrust. In the ramjet (fig. 4) the compressor and turbine are eliminated altogether, the compression being wholly by the ram, the expansion wholly by the exhaust jet.

Propulsion Efficiency.— The quantities involved are expressed in conventional English units, given in parentheses after each symbol, in which $g = 32.2$ ft./sec.^{2} is the acceleration caused by gravity at sea level and $J = 778$ ft.lb./B.T.U. is the mechanical equivalent of heat.

The schematic propulsion device illustrated by fig. 5 may be made to illustrate the essentials of the four propulsion devices enumerated above. It is assumed to move at the velocity V_o (ft./sec.) relative to still air. It scoops up the quantity W_a (lb./sec.) of this air, which passes through the device proper. A heat engine, E, to which is supplied fuel at the rate W_f (lb./sec.), receives this air and accelerates it to a velocity V_1 ft./sec. An air screw P is also driven by this engine and is assumed to generate the thrust F_p. Newton's second law gives for the total thrust on the vehicle

$$F = F_p + \frac{1}{g}\left[(W_a + W_f)\, V_1 - W_a V_o\right] \text{ lb.}$$

It is a characteristic of these heat engines that the fuel flow is a small fraction (2% to 5%) of the air flow. W_f may thus be neglected in comparison with W_a in this equation, giving

$$F = F_p + \frac{W_a}{g}(V_1 - V_o) \qquad (2)$$

The energy supplied by the fuel is $W_f.J.H$ (ft.lb./sec.), where H (B.T.U./lb.) is the heating value of the fuel.

The useful work, the work of propulsion, is FV_o (ft.lb./sec.). Hence, the total efficiency of the propulsion device is given by the expression

$$\eta = \frac{FV_o}{W_f.J.H} \qquad (3)$$

If the efficiency of the heat engine is η_E, the energy available for propulsion in $\eta_E W_f.J.H$. The air screw, having the efficiency η_p, requires the amount $\frac{1}{\eta_p} F_p.V_o$ (ft.lb./sec.); the rest goes to accelerate the air from the velocity V_o to V_1 relative to the vehicle. The balance of energy is thus expressed by the equation

$$\eta_E \,.\, W_f.J.H = \frac{1}{\eta_p} F_p V_o + \frac{W_a}{2g}(V_1^2 - V_o^2) \qquad (4)$$

The over-all efficiency may now be determined by using equations (2) and (4). It is most instructive to examine two idealized

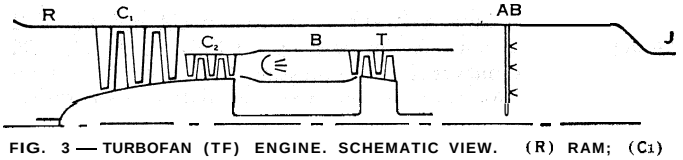


FIG. 3 — TURBOFAN (TF) ENGINE. SCHEMATIC VIEW. (R) RAM; (C_1) FAN: (C_2) COMPRESSOR: (B) MAIN BURNER: (T) TURBINE: (AB) CO-BURNER: (J) EXHAUST NOZZLE

cases. If jet action is wholly absent ($W_a = 0$), the idealized turboprop is found to give the efficiency.

$$\eta_{TP} = \eta_E.\eta_P \qquad (5)$$

For the case of idealized jet propulsion ($F_p = 0$), the efficiency is

$$\eta_{VTJ} = \eta_E \frac{2V_o}{V_o + V_1} \qquad (6)$$

In actual cases, the efficiency will be intermediate between these extremes.

Equations (5) and (6) show that if the flight velocity is low

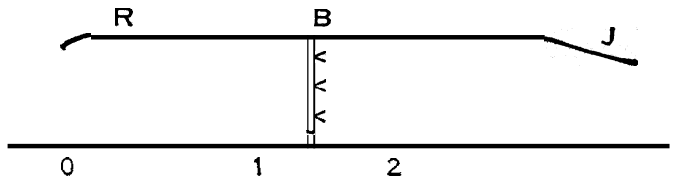


FIG. 4.—RAMJET (RJ) ENGINE: SCHEMATIC VIEW, (R) RAM; (B) BURNER; (J) EXHAUST NOZZLE

compared with the exhaust velocity, the jet is inefficient compared with the air screw. For example, to compete with an air screw efficiency of .85 requires that V_1/V_0 be 1.35 or less.

Performance Parameters.— It has become customary to characterize the jet-propulsion devices by relating the weight of the complete engine W_0(lb.), the air flow W_a(lb./sec.) and the fuel flow W_f(lb./sec.) to the net thrust F(lb.). This has given rise to the following traditional parameters:

$$\text{Specific dry weight: } w_0 = \frac{W_0}{F} \text{ (lb./lb.)} \qquad (7)$$

$$\text{Specific impulse: } i = \frac{F}{W_a} \text{ (lb./lb./sec.)} \qquad (8)$$

$$\text{Specific fuel consumption, thrust: } w_{fF} = \frac{3{,}600\, W_f}{F} \text{ (lb./lb./hr.)} \qquad (9)$$

$$\text{Specific fuel consumption, power: } w_{fP} = \frac{550}{V_0} w_{fF} \text{ (lb./h.p./hr.)} \qquad (10)$$

Note that the specific fuel consumption is directly related to the over-all efficiency as defined by equation (3).

The optimum propulsion device for aircraft is usually the one for which the weight of the engine plus the weight of the fuel consumed is a minimum for a certain mission. For short distances and high flight speeds this total weight may be much lower for the turbo-type than for the piston-type aircraft engines.

The projected area of the engine influences the drag of the aeroplane. For this reason the thrust per square foot of projected area is another parameter of significance, particularly for high-speed aircraft. This is one of the reasons for the gradual replacement of centrifugal with axial-flow compressors.

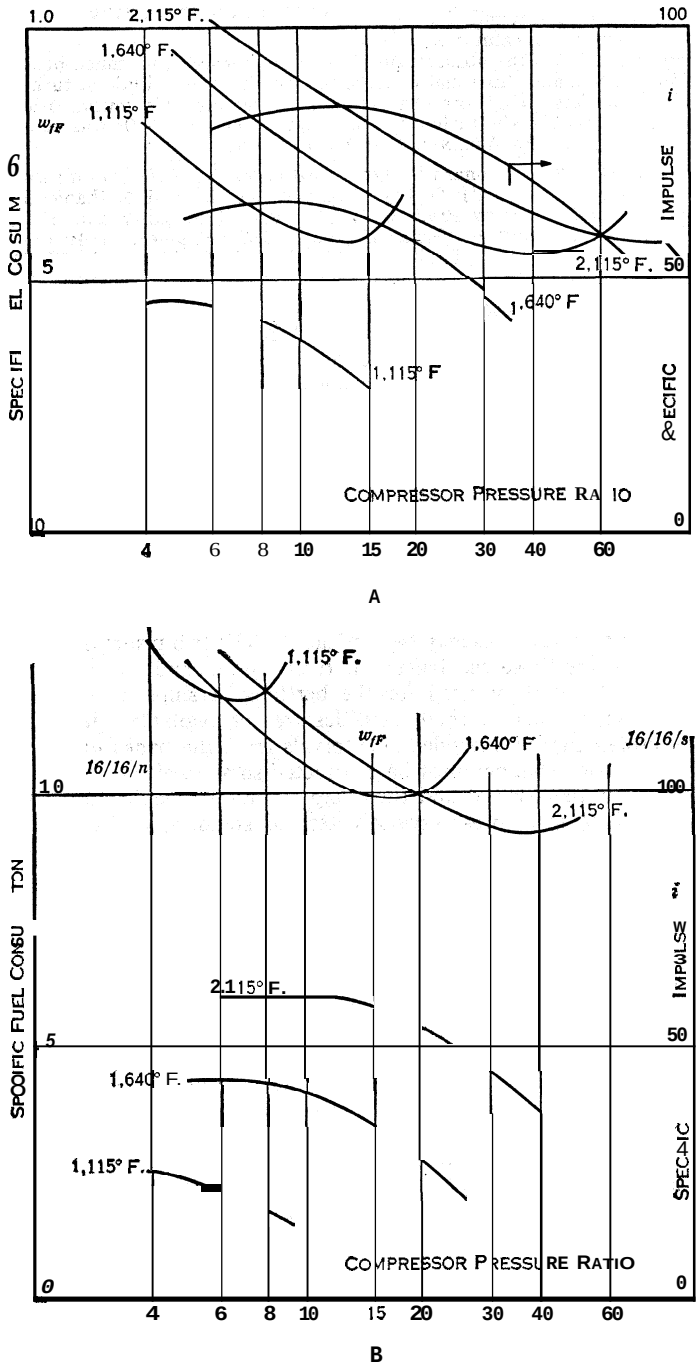
These parameters depend on a variety of circumstances, of which the details of the thermodynamic cycle are the most important. Fig. 1 shows a typical cycle for a turbojet as it appears in the enthalpy-entropy chart. The significant variables are: (1) inlet, ambient temperature, T_0, or corresponding sound velocity, a,; (2) pressure ratio of the compressor, p_2/p_0; (3) maximum temperature, T_3; (4) flight speed, V„ or flight Mach number, $M_0 = V_0/a_0$; (5) efficiencies of the component devices: ram, compressor, burner, turbine and jet nozzle. For preliminary designs the parameters w s and i are computed for different pressure ratios, maximum temperatures, etc., and plotted as shown in the examples of fig. 6. To obtain low fuel consumption, it is necessary to have high turbine temperatures as well as high pressure ratios. As a result of this, there was a steady advance of both of these variables, and turbine temperatures in excess of 1,600° F. and pressure ratios of about 10 were in successful use in the mid-1950s.

Varying Operating Conditions.— An engine optimized for a certain set of conditions will have operating characteristics which are highly dependent on external operating circumstances. The most important of these are flight speed and altitude. The actual conditions are complicated, because they depend upon many of the details of the engine, such as compressor characteristics, mode of control, etc. Some conclusions may be drawn from what is possible within the limitations of the thermodynamic cycle, however.

The maximum thrust is attained at sea level and low flight speeds, a characteristic which facilitates take-off. As the flight speed increases, the maximum thrust possible will fall. This occurs because the action of the ram raises the temperature of the air closer to the limit set by the turbine, so that less fuel can be burned. Eventually the thrust will fall to zero. This condition is clearly incompatible with the rising drag of the aeroplane. High fight speeds are, in fact, dependent upon high temperatures.

The process of thrust augmentation by afterburning proved to be essential to the solution of this dilemma. Because of the absence of moving parts and the possibility of cooling by air, much higher temperatures can be used in the afterburner than in the main burner. Complete combustion of the oxygen present in the air would involve temperatures of the order of 4,500° F. (not yet attainable in the mid-1950s, though temperatures of 3,000° F. were in use). Analysis of the cycle shown in fig. 1 shows that at standstill the thrust augmentation is of the order of $\sqrt{T_6/T_4}$, which for typical conditions represents a factor of about 1.4 to 1.5. High flight speeds increase this augmentation ratio still further. Fig. 7 shows a typical thrust characteristic of a turbojet at altitude with and without afterburner.

Additional thrust augmentation can be attained by the injection of



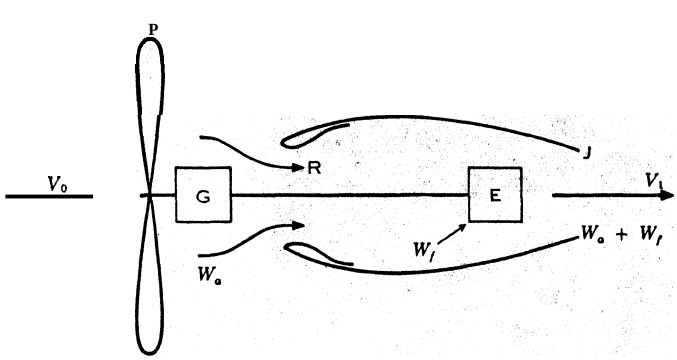


FIG. 5.— SCHEMATIC AIRCRAFT PROPULSION DEVICE. (P) PROPELLER; (G) REDUCTION GEAR: (R) RAM: (J) EXHAUST NOZZLE (*see* TEXT FOR FURTHER EXPLANATION)

FIG. 6.—CHARACTERISTICS OF TURBOJET CYCLE: A. SEA LEVEL. STATIC, B. SEA LEVEL. FLIGHT 612 M.P.H. ($M_0 = .8$) (*see* TEXT FOR EXPLANATION)

water in the compressor and in the main burner, but this had not received much practical application by the mid-1950s.

The engine thrust will vary with altitude for several reasons. As the air density decreases, the weight flow of air is diminished, and less fuel can be burned before the limit in temperature is reached. Changes in component efficiencies, and particularly limitations necessary to avoid stalling of the compressor, may cause further drop in thrust. Improvement of the thermodynamic efficiency as a result of lowering of the ambient temperature partly compensates for these effects. This lapse rate of thrust is one of the significant characteristics of the engine and depends to a considerable degree on intelligent design. Fortunately, the thrust requirements of the airplane are similarly reduced, so that the engine and airplane characteristics are not wholly incompatible. Combustion cannot be reliably maintained when the absolute pressure in the burner drops much below about ½ atm., and this usually marks the true limit in altitude of turbojets or ramjets. High-pressure ratio clearly favours this consideration to some extent in the turbojet. The limit in the mid-1950s was about 55,000 ft. *See* also AERONAUTICS; AIRCRAFT PROPULSION.

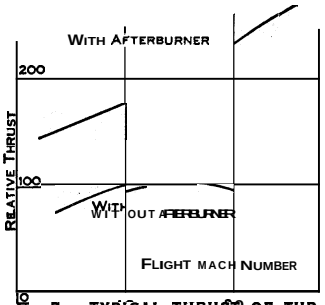


FIG. 7.—TYPICAL THRUST OF TURBOJET

BIBLIOGRAPHY.—Leonard Bridgman (ed.), *Jane's All the World's Aircraft, 1953–54* (annual) (1954); Leslie E. Neville and Nathaniel F. Silsbee, *Jet Propulsion Progress* (1948); Robert Schlaifer and S. D. Heron, *Development of Aircraft Engines* and *Development of Aviation Fuels* (1950); Paul H. Wilkinson (ed.), *Aircraft Engines of the World* (annual) (1954). (C. R. S.)

JETSAM: *see* FLOTSAM, JETSAM AND LAGAN.

JET STREAM, a high-speed westerly wind which is notable for being concentrated in a narrow current. It occurs in the middle latitudes, at altitudes ranging from 20,000 to 40,000 ft. Winds at the centre of the stream can exceed 200 m.p.h. *See* WIND.

JETTY. The term jetty, derived from the French *jetke*, thus designating something "thrown out," is applied to a variety of civil engineering structures connected with river, harbour and coastal works.

Although most jetties resemble either small breakwaters or piers, their forms and structural designs are varied and depend primarily on their uses and the availability of materials from which economical structures may be fabricated. The two principal kinds of jetties are those constructed at river mouths and other coastal entrances and those used for the berthing of ships in harbours and offshore where harbour facilities are not available. Jettylike structures may be extended at intervals from the banks of rivers where a wide channel must be contracted so as to effect a concentration of the current and thus help maintain a navigable channel. These structures, variously termed spurs, spur dikes, and groynes, may also be projected from the concave side of a river to retard erosion of the bank.

Jetties of open-pile or impervious-masonry construction may be built on each side of a navigation channel immediately outside the entrances to docks which must be entered through locks. These structures, sometimes called lead-in jetties, are positioned so as to form a funnel-shaped entrance to the lock. They serve to guide vessels' ingress and egress, to protect vessels from river or tidal currents and to provide temporary mooring facilities; if of solid construction, they may serve also as minor breakwaters. (*See* also BREAKWATER.)

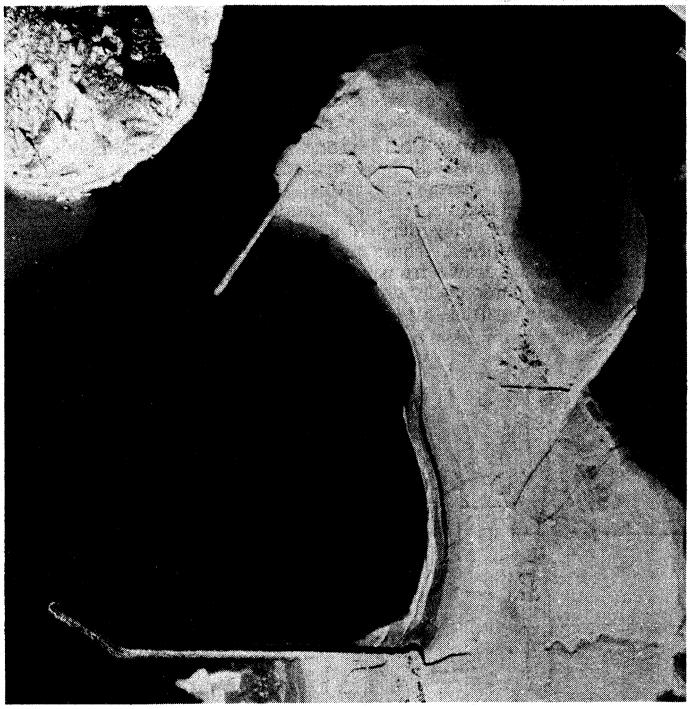
Entrance Jetties.— Entrance jetties are built at bay inlets, at entrances to harbours of the lagoon type, and at the mouths of rivers. Since the function of entrance jetties is the training of river and tidal flows to improve navigation, they are also referred to as training jetties. They confine and direct the currents so as to maintain a navigable channel by promoting scour; they extend farther into deep water, the reach of river where currents slacken and deposit transported material; and they protect the flow of water at such entrances from the disturbing effects of littoral currents, sand drift and wave action. Entrance jetties are usually constructed in pairs, either parallel or converging toward the seaward ends, and are of several structural types. They may be of rubble-mound construction, masonry or concrete walls, composite-type structures (concrete or masonry wall placed on an underwater rubble mound), concrete caissons, sheet piling, or timber cribs.

Approximately 24 mi. of primary and secondary parallel training jetties and about 7 mi. of groynes have been constructed at the South and Southwest passes of the Mississippi river. In 1856 work was started on a jetty one mile in length on the east side of Southwest pass. This jetty was a light-weight, sheet-pile structure, and was seriously damaged by a storm shortly after construction began. After considerable controversy as to the best method of securing a satisfactory navigation entrance and channel from the Gulf of Mexico to the Head of Passes, the U.S. congress in 1875 accepted the proposition of James B. Eads, who, by the construction of jetties and auxiliary works, contracted to secure and maintain for zo years a 26 × zoo ft. channel for the sum of $8,000,000. This jetty system, constructed during the period 1875–79, included a total of 3.6 mi. of primary, parallel jetties constructed of fascine mats topped with rubble stone; a similar set of inner, secondary jetties which reduced the channel width from 1,000 to 650 ft.; an extensive system of groynes averaging about zoo ft. in length, placed perpendicular to the inner jetties, and spaced from 400 to 1,300 ft. apart; submerged sills across the heads of Southwest pass and Pass a Loutre; and a closure of the outlet to Grand Bayou.

Detailed descriptions of these works, and an interesting account of the political, financial and engineering problems encountered by Eads and his associates during their construction, are contained in *History of the Jetties of the Mississippi River,* by E. *L.* Corthell (1880) and "The Passes of the Mississippi River" by W. C. Cobb, *Transactions* ASCE, vol. CT (1953). *See* also RIVER AND RIVER ENGINEERING.

Berthing Jetties.— In Great Britain a narrow projecting pier is commonly referred to as a berthing jetty. Other forms of berthing jetties are those with T-shaped berthing heads, and openwork island structures connected to shore by lightweight bridging or open-pile viaducts.

The conditions in some ports make it more economical to extend berthing jetties into deep water, to provide shore facilities to the ships, than to dredge the additional depths of water necessary to allow ships to berth near shore at conventional piers or quays.


BY COURTESY OF U S. ARMY ENGINEER DISTRICT, LOS ANGELES, CALIF.

AERIAL VIEW OF MORRO BAY HARBOUR, CALIFORNIA, SHOWING JETTY CONSTRUCTION

This practice became more common shortly after World War II, at nhich time the advantages of large. deep-draft tankers uere proven. A factor which gave impetus to the construction of larger tankers was the increased reliance on the middle east as a source of oil for Europe and the United States. It is significant that even 1 j years later no harbour in the United States could satisfactorily accommodate tankers nith drafts between 40 and 49 ft., although more than 80 such vessels nere in use, under construction or in the design stage and planned for service aithin a few years. Berthing jetties for the discharging of oil were constructed at a number of ports and harbours, including Mena Al Ahmadi, Kuwait; Heysham in Morecambe bay; Fawley on Southampton water; Thames Haven; Yonderberry Point, Devonport; Falconara (Ancona), Italy: Port of La Spezia, Italy; and the oil harbour at Loudden, Stockholm, Swed. *(See* also *TANKER.)*

An important contribution to the design and construction of berthing jetties and piers was the self-elevated spud-type barge developed by the DeLong Engineering and Construction company, New York city. This unusual structure, called the DeLong dock. combines a prefabricated bargelike hull and large steel spuds with pneumatic jacks by means of which the hull may be jacked out of the water to form a pier, wharf or jetty within a few days after it has been towed to the construction site in self-contained, prepackaged units. Notable examples of the application of the DeLong dock included a pier for the U.S. air force at Thule, Greenland, 1951; an ore dock at Puerto Ordaz, on the Orinoco river, Venezuela, 1953; and the "Texas tower" radar islands in the Atlantic ocean for the U.S. air force.

The docks have also been used as offshore well-drilling platforms in the Gulf of Mexico: and the U.S. army transportation corps has tested these structures as a principal component of a "packaged port" for possible use on beachheads. (R. Y. H.)

JEVONS, WILLIAM STANLEY (1835–1882), leading English economist and logician. was born at Liverpool on Sept. 1, 183 j, and educated at University College school and University college, London.

In 1854 he had to break off his studies of the natural sciences to take a post as assayer in the new mint at Sydney, Austr., where he stayed until 1859. It was in these lonely years in Australia that Jevons turned increasingly to political economy and social studies.

When Jevons returned to England he soon completed two of his most original and seminal papers, his "General Mathematical Theory of Political Economy" (read before the British association. 1862) and "A Serious Fall in the Value of Gold" (1863). In the first paper he outlined what subsequently came to be known as the marginal utility theory of value (though the adjective "marginal" was not used by Jevons). In the second (republished in the posthumous collection *Investigations in Currency and Finance,* 1884) he set out to measure the rise in prices in the period following the Californian and Australian gold discoveries and made one of the greatest contributions to the theory of index numbers ever published. But neither of these papers obtained for Jevons any public recognition; this mas first achieved with his book *The Coal Question* (1865), a powerful warning on the gradual exhaustion of Britain's coal supplies.

In 1866 Jevons was appointed to a chair at Owens college, Manchester, from which he moved to University college, London, in 1876.

Jevons' *Theory* of *Political Economy* (1871; new ed.. 1924) is his most famous work, and its exposition of the "final" utility theory of value, in the same year as Karl Menger's similar work in Vienna, and almost simultaneously with Léon Walras in Switzerland three years later, can now be seen to have marked the opening of a new period in the history of economic thought. But at the time Jevons' challenging new theory met with an unsympathetic reception from most English economists.

Of Jevons' various works on logic and scientific method, the most important are his *Principles* of *Science* (1874) and his construction of a logical machine exhibited before the Royal society in 1870.

Among his many other writings mention should be made of *The State in Relation to Labour* (1882), in which he eloquently advocated a cautious empirical approach to the problems of the role of the state in economic affairs, and of his essays on economic crises (see *Investigations in Currency and Finance,* 1884). Jevons mas drowned near Hastings on Xug. 13, 1882, at the age of 46. and it is only possible to guess at the magnitude of the loss to the wide range of subjects to which he had made such powerfully original contributions.

See *Letters and Journal of W. Stanley Jevons,* ed. by his wife (1886), nhich contains a bibliography of his writings.

(T. W. H.)

JEW, THE WANDERING, a legendary Jew *(see* JEWS) doomed to wander till the second coming of Christ because he taunted Jesus as He passed bearing the cross, saying, "Go quicker." Jesus replied, "I go, but thou shalt wait till I return." This legend first appeared in a pamphlet alleged to have been printed at Leyden in 1602. This pamphlet relates that Paulus von Eizen (d. 1598), bishop of Schleswig, had met at Hamburg in 1542 a Jew named Ahasuerus, who declared he was "eternal" and was the same who had been thus punished by Jesus. The pamphlet is supposed to have been written by Chrysostomus Dudulaeus of Westphalia and printed by one Christoff Crutzer, but as no such author or printer is known—the latter name indeed refers directly to the legend—it has been conjectured that the whole story is a Protestant myth.

The story met with ready acceptance. Eight editions of the pamphlet appeared in 1602, and the 40th edition before 1700. It was translated into Dutch and Flemish with immense success. The first French edition appeared in 1609, and the story was known in England before 1625, when a parody was produced. Denmark and Sweden followed suit, and the expression "eternal Jew" passed into Czech. Thus the story in its usual form spread wherever there was a tincture of Protestantism. In southern Europe little is heard of it in this version, though Rudolph Botoreus, parliamentary advocate of Paris (*Comm. histor.,* 1604), speaks contemptuously of the popular belief in the Wandering Jew in Germany, Spain and Italy.

The popularity of the pamphlet soon led to reports of the appearance of this mysterious being almost everywhere. Besides the original meeting of the bishop and Ahasuerus, the Wandering Jew was stated to have appeared at Prague (1602), at Liibeck (1603), in Bavaria (1604), Brussels (1640), Paris (1644, by the "Turkish Spy"), Stamford (1658), and Astrakhan (1672). In the next century he was seen at Munich (1721), Brussels (1774), Newcastle (1790, *see* Brand, *Pop. Antiquities, s.v.*), and in London between 1818 and 1830 (see *Athenaeum,* 1866, ii. 561). The latest report of his appearance was near Salt Lake City in 1868, when he is said to have made himself known to a Mormon named O'Grady. It is difficult to tell in any one of these cases how far the story is an entire fiction and how far an ingenious imposture.

In most Teutonic languages the stress is laid on the perpetual character of the punishment and the man is known as the "eternal" Jew (Ger. *ewige Jude).* In Romance lands the usual form has reference to the wanderings (Fr. *le Juif errant).* The English form follows the Romance, possibly because derived from France. The actual name given to the mysterious Jew varies in the different versions: the original pamphlet calls him Ahasver, a name most inappropriately borrowed from the Book of Esther. In one of his appearances at Brussels his name is given as Isaac Laquedem—bad Hebrew for "Isaac of old'—and Dumas made use of this title. In the *Turkish Spy* he is called Paul Marrane, from the Marranos or secret Jews of Spain. In the few references to the legend in Spanish writings the Wandering Jew is called Juan Espera en Dios, which gives a more hopeful turn to the legend. Eugène Sue calls him Ahasvérus.

Under other names, a story very similar to that of the pamphlet of 1602 occurs nearly 400 years earlier on English soil. According to Roger of Wendover in his *Flores historiarum* for 1228, an Armenian archbishop, then visiting England, was asked by the monks of St. Albans about Joseph of Arimathaea, who had spoken to Jesus and was said to be still alive. The archbishop claimed to have seen him in Armenia under the name of Carthaphilus, who

had confessed that he had taunted Jesus. This Carthaphilus had afterwards been baptized by the name of Joseph. Matthew Paris, in copying Wendover, reported that other Armenians had confirmed the story on visiting St. Albans in 1252. A similar account is given in the chronicles of Philippe Mouskks (d. 1243). A variant was known to Guido Bonati, an astronomer quoted by Dante *(Inferno,* xx. 118), who calls his hero Butta Deus because he struck Jesus. Under this name he is said to have appeared at Mugello in 1413 and at Bologna in 1415.

SOURCE OF THE LEGEND

The source of all these reports is probably Matthew xvi. 28. These words indeed are quoted in the pamphlet of 1602. Again, a legend was based on John xxi. 20; while another legend (current in the 16th century) condemned Malchus, whose ear Peter cut off (John xviii. 10), to wander perpetually till the second coming for scoffing at Jesus. These legends and the utterance of Matt. xvi. 28 were "contaminated" with the legend of Joseph of Arimathaea and the Holy Grail, and took the form given in Wendover and Matthew Paris. But there is nothing to show the spread of this story among the people before the pamphlet of 1602, and it is difficult to see how this Carthaphilus could have given rise to the legend of the Wandering Jew, since he is not a Jew nor does he wander. The author of 1602 was probably acquainted with the story as given by Matthew Paris, since he gives almost the same account. But he gives a new name to his hero and directly connects his fate with Matt. xvi. 28.

The combination of eternal punishment with restless wandering has attracted the imagination of writers in almost all European tongues. The German Romantic poets have been especially attracted by the legend, which has been made the subject of poems by Schubart, Schreiber, W. Miiller, Lenau, Chamisso, Schlegel, Mosen and Koehler. They were perhaps influenced by the example of Goethe, who in his *Autobiography* describes the plan of a poem he had designed on the Wandering Jew. More recently poems have been composed on the subject in German by Wilbrandt, Lienhard and others; in English by Robert Buchanan, and in Dutch by Heijermans. German novels also exist on the subject, by Franz Horn, Oeklers, Laun and Schucking, tragedies by Klinemann, Haushofer and Zedlitz. Sigismund Heller wrote three cantos on the wanderings of Ahasuerus, while Hans Andersen made of him an "Angel of Doubt." In France, E. Quinet published a prose epic on the subject in 1833, and Eugkne Sue, in his best-known work, *Le Juif errant* (1844), associates the Jew with the legend of Herodias. In modem times the subject has teen made still more popular by Gustave Doré's designs (1856), containing some of his most striking and imaginative work. This probably suggested Grenier's poem on the subject (1857).

In England, besides the ballads in Percy's *Reliques,* Godwin introduced the idea of an eternal witness of the course of civilization in his *St. Leon* (1799), and Shelley introduces Ahasuerus in *Queen* Mab. It is doubtful how far Swift derived his Struldbrugs from the notion of the Wandering Jew. George Croly's *Salathiel* (1828) gave a highly elaborate turn to the legend; this has been republished under the title *Tarry Thou Till I Come.*

BIBLIOGRAPHY.—J. G. Th. Graesse, *Die Sage vom ewigen Juden* (1844); *F.* Helbig, *Die Sage vom ewigen Juden* (1874); *G.* Paris, *Le Juif errant* (1881); *M.* D. Conway, *The Wandering Jew* (1881); S. Morpugo, *L' Ebreo errante in Italia* (1891); *L.* Neubaur, *Die Sage vom ewigen Juden* (2nd ed., 1893). The recent literary handling of the subject has been dealt with by J. Prost, *Die Sage vom ewigen Juden in der neueren deutschen Literatur* (1905); T. Kappstein, *Ahasver in der Weltpoesie* (1905). (J. JA.; E. E. K.)

JEWEL, JOHN (1522–1571), English divine, bishop of Salisbury, son of John Jewel of Buden, Devonshire, was born on May 24, 1522, and educated at Merton college, Oxford. He became a fellow (1542) of Corpus Christi, made some mark as a teacher, and was after 1547 one of the chief disciples of Peter Martyr. He became public orator of the university, in which capacity he composed a congratulatory epistle to Mary on her accession. In 1554 he acted as notary to Cranmer and Ridley at their disputation, but in the autumn he signed a series of Catholic articles. He was, nevertheless, suspected, fled to London, and thence to Frankfort, where he sided with Coxe against Knox. He soon joined Martyr at Strasbourg, accompanied him to Zurich, and then paid a visit to Padua.

Under Elizabeth's succession he returned to England, and tried to secure what would now be called a low-church settlement of religion. Indeed, his attitude was hardly distinguishable from that of the Elizabethan Puritans, but he gradually modified it under the stress of office and responsibility. He was one of the disputants selected to confute the Romanists at the conference of Westminster after Easter 1559; he was select preacher at St. Paul's Cross on June 15, and in the autumn was engaged as one of the royal visitors of the western counties. In 1560 he became bishop of Salisbury.

Jewel now constituted himself the literary apologist of the Elizabethan settlement. He had on Nov. 26, 1559, in a sermon at St. Paul's Cross, challenged all comers to prove the Roman case out of the Scriptures, or the councils or Fathers for the first six hundred years after Christ. He repeated his challenge in 1560, and Dr. Henry Cole took it up. The chief result was Jewel's *Apologia ecclesiae Anglicanae* (1562), which in Bishop Creighton's words is "the first methodical statement of the position of the Church of England against the Church of Rome, and forms the groundwork of all subsequent controversy." Thomas Harding, an Oxford contemporary whom Jewel had deprived of his prebend in Salisbury Cathedral for recusancy, published an elaborate and bitter *Answer* in 1564, to which Jewel issued a *Reply* in 1565. Harding followed with a *Confutation,* and Jewel with a *Defence,* of the *Apology* in 1566 and 1567; the combatants ranged over the whole field of the Anglo-Roman controversy, and Jewel's theology was officially enjoined upon the Church by Archbishop Bancroft in the reign of James I. He was consulted by the government on such questions as England's attitude towards the council of Trent, and political considerations made him more and more hostile to Puritan demands with which he had previously sympathized. He wrote an attack on Cartwright, which was published after his death by Whitgift. He died on Sept. 23, 1571, and was buried in Salisbury Cathedral.

Jewel's works were published in a folio in 1609 under the direction of Bancroft who ordered the *Apology* to be placed in churches, in some of which it may still be seen chained to the lectern; other editions appeared at Oxford (1848, 8 vols.) and Cambridge (Parker Soc., 4 vols.). *See* also Gough's *Index to Parker Soc. Publ.;* Strype's *Works* (General Index); *Acts of the Privy Council; Calendars of Domestic and Spanish State Papers;* Dixon's and Frere's *Church Histories;* and *Dict. of Nat. Biography.*

JEWELLERY, a collective term for jewels, and so for the art of making them. Jewels are personal ornaments made of precious metals and precious stones. alone or combined. One type of jewel, including clasps and brooches of all kinds, arises from the decorative elaboration of a practical object; another type, of which pendants are an example, is derived from the primitive practice of wearing objects hung round the neck with magical intent. Other jewels, such as earrings and bracelets, appear to be purely decorative in origin.

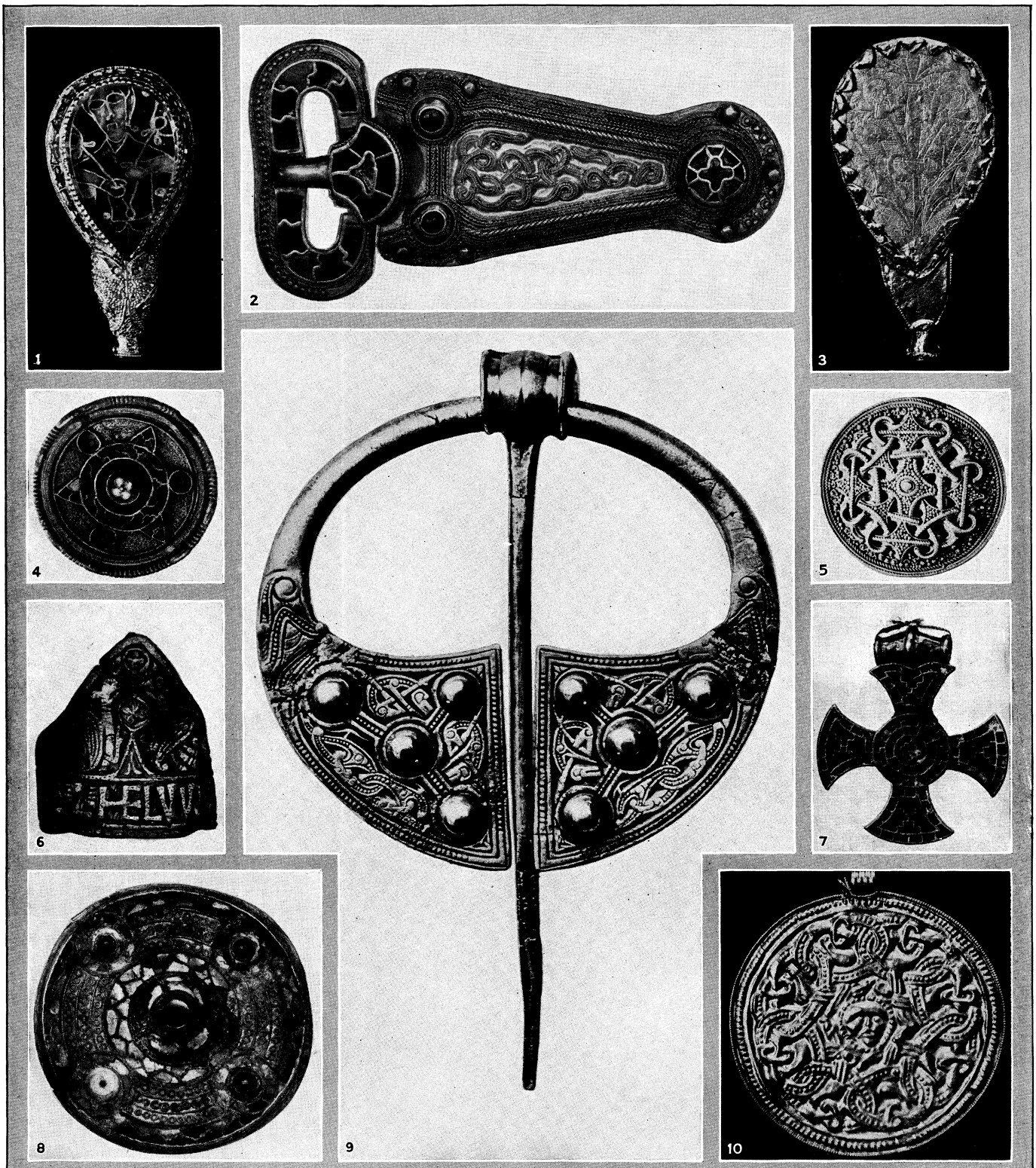
The origins of jewellery are lost in the mists of antiquity. In primitive times a strange stone, tooth or other object was often worn at the neck. doubtless with the intention of protecting the wearer by its magical qualities. Precious stones were still believed to have these qualities as late as the 17th century, and the belief is hardly yet extinct among the credulous. The belief that opals are unlucky seems to come only from Sir Walter Scott's *Anne* of *Geierstein;* in the middle ages they were supposed to be extremely fortunate.

The practice of wearing objects round the neck dates from the stone age, and gold was worked to make jewels before the use of bronze was known.

For an account of Egyptian jewellery, *see* EGYPT: *History: Ancient Civilization and Culture;* for Greek and Roman jewels, *see* SILVERSMITHS' AND GOLDSMITHS' WORK.

HISTORY OF EUROPEAN JEWELLERY

In regions that had been under the Roman empire the form, technique and decoration of jewels were influenced by Roman



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EARLY ANGLO–SAXON, CELTIC AND SCANDINAVIAN JEWELLERY

1 and 3. The Alfred Jewel, of gold, found in 1693 at Newton Park, three miles from the isle of Athelney. Fig. 1 shows the front set with a plaque of cloisonné enamel held in place by a gold fret of the letters AELFRED MEC HEHT GEWYRCAN (Alfred ordered me to be made). Fig. 3 shows the engraved back

2. Seventh century buckle from Faversham, set with garnets and decorated with gold filigree

4. Kentish brooch of the 7th century, set with garnets and pastes and decorated with gold filigree

5. Silver filigree brooch of the 9th century from the province of Scania, Sweden

6. Gold engraved and nielloed ring of Aethelwulf, King of Wessex; inscribed Etheivulfr: second quarter of the 9th century. This ring was found at Laverstock near Salisbury in A.D. 1780

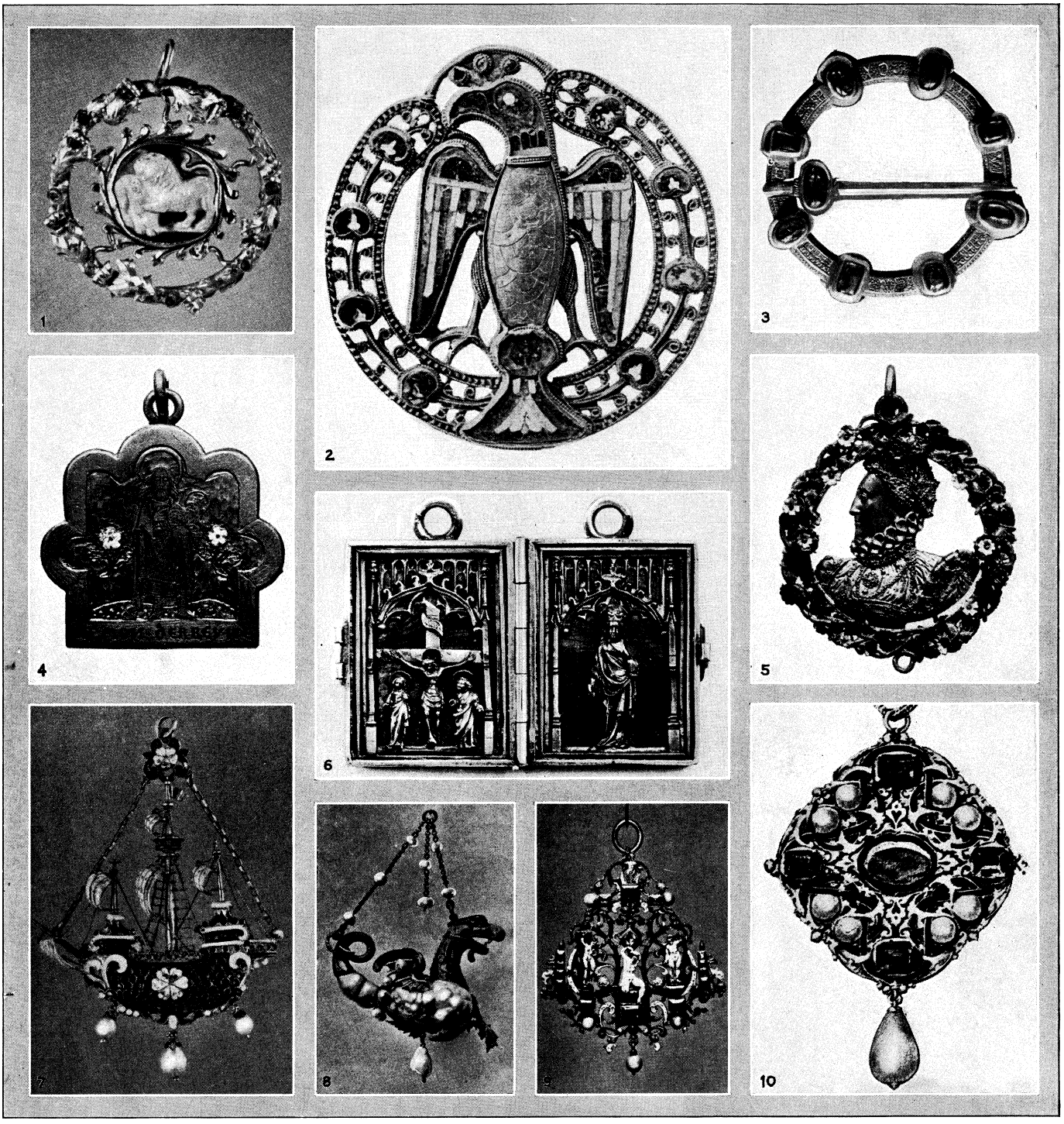
7. Saxon cross of the 7th century, mads of gold and set with garnets, found at Ixworth

8. Kentish brooch of the 6th century, set with garnets and meerschaum, and decorated with gold filigree

9. Celtic penannular brooch of silver of the early 10th century

10. Gold bracteate of the 7th century from Faversharn

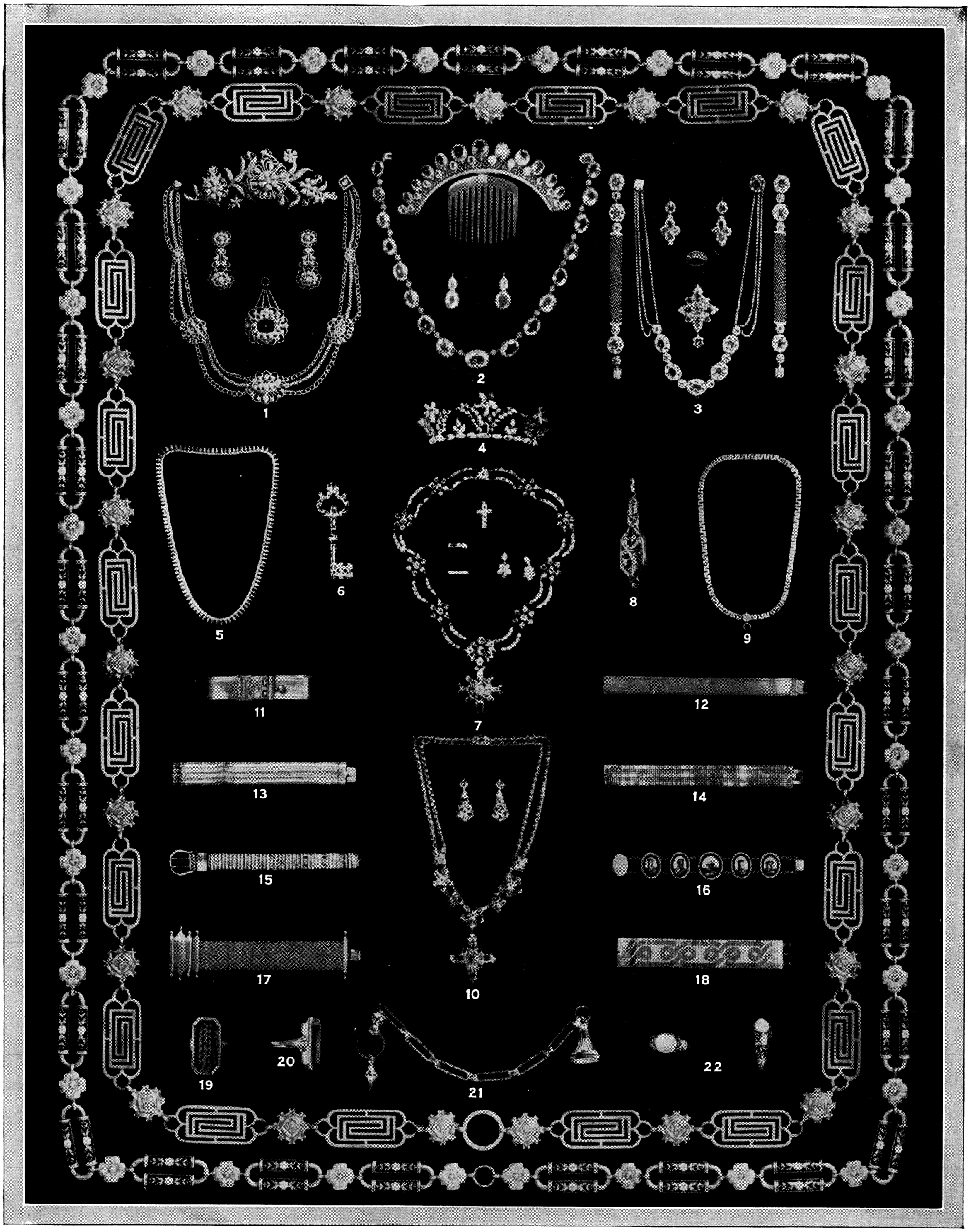
JEWELLERY



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BROOCHES AND PENDANTS OF THE MIDDLE AGES AND THE EARLY RENAISSANCE

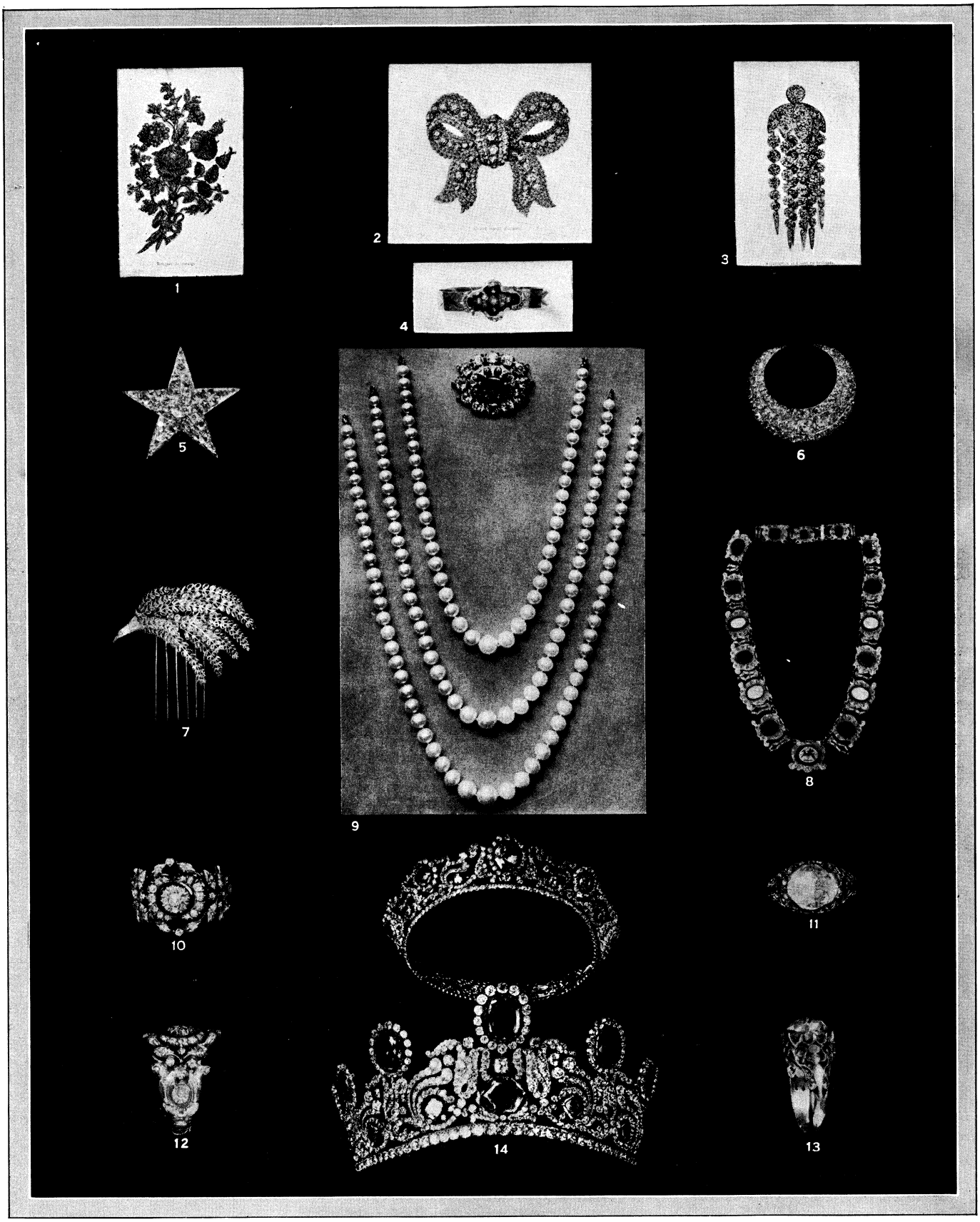
1. Brooch of gold set with a cameo. French, 14th century
2. "The Ea le Brooch," about 1120, of gold decorated with cloisonné enamel in translucent green and blue, turquoise, white and yellow
3. Ring brooch of gold, engraved and set with rubies and sapphires. French or English, late 13th century
4. Reliquary pendant of gold; the side shown is engraved with figure of St. John and the inscription A *mon derreyne*, the opposite side with the figure of a bishop. Both figures are between flowers of white enamel. English of about 1480
5. The "Phoenix" jewel; a bust of Queen Elizabeth cut from the Phoenix badge of 1574, mounted in a wreath of red and white roses of enamelled gold
6. "Tablet" of silver gilt, enamelled, with the scene of the crucifixion and the figure of the Virgin in relief. French or Rhenish, early 15th century
7. Enamelled pendant in the form of a ship. Italian, 16th century
8. Dragon-shaped pendant of gold, enamelled and set with baroaue pearls. German, about 1570
9. Pendant of gold, enamelled and set with jewels, representing Hercules upholding the world in the garden of the Hesperides. South German, end of the 16th century
10. Design for a pendant of enamelled and jewelled gold, by Hans Holbein. About 1540



EUROPEAN JEWELLERY OF THE 19TH CENTURY

Outside chain in gold with decoration in black enamel, French Restoration period. Inside chain of open gold work, the work of a French provincial goldsmith about 1840. 1, 2, 3, 7, 10. Parures, 1830–40: (1) seed pearls, (2) topazes set in gold, (3, 10) pink tourmalines, (7) garnets. 4. Garnet head ornament, 1830. 5, 9. Gold necklaces, French, 1830. 6. Gold key decorated in black enamel used with outside chain. 8. Gold lorgnette, French. 1850 11–18. Gold bracelets, c. 1814–50: (15) silver gilt, (16) mosaics in gold with borders of blue enamel, (17) gold end coral tissue. Russian, (18) two-coloured gold. 19, 20. Front and side views of gold ring set with plaited hair, 1840. 21. Waistcoat chain in gold and enamel with seal, 1830. 22. Gold ring decorated in black enamel, set with turquoise, French Restoration period

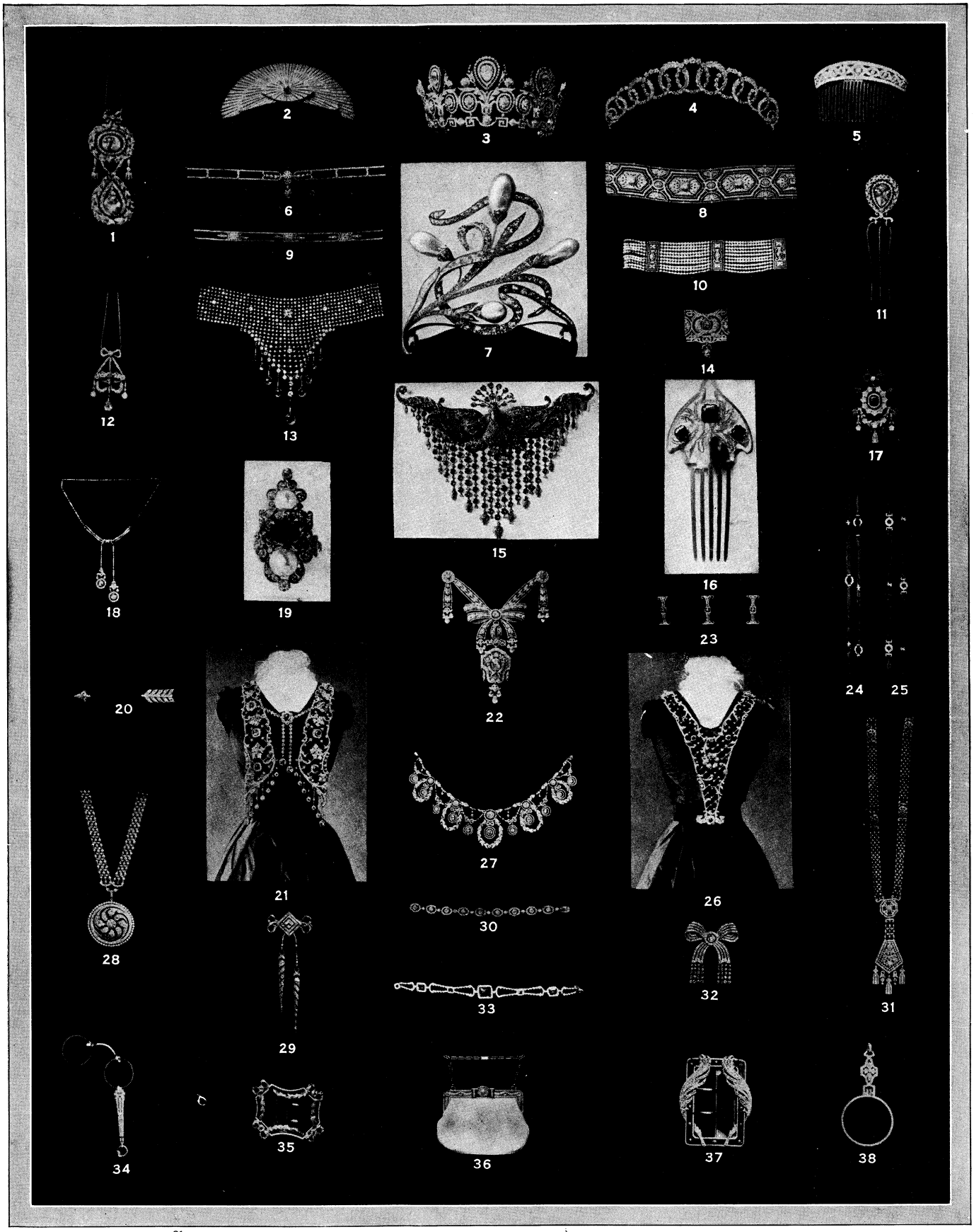
JEWELLERY



PHOTOGRAPHS, (1, 2, 3) COPR. H. BONNAIRE FROM "CATALOGUE OF THE CROWN JEWELS OF FRANCE 1887"

FRENCH JEWELLERY OF THE 19TH CENTURY

1. Diamond floral spray or bouquet, made in 1820. 2. Diamond bow knot as worn by the Empress Eugénie; made in 1863. 3. Diamond aiguillette pampille, made in 1868. 4. Bracelet, of gold and black enamel and rose diamonds; period of the Restoration. 5. Diamond star, made about 1860. 6. Diamond crescent brooch as worn by the Empress Eugénie; made in 1867. 7. Comb bird mounted in gold and topazes; period of the Restoration. 8. Necklace in gilt, copper and cameos; period 1835. 9. Necklace of three rows of pearls containing 145 pearls weighing 2136.94 grains with ruby and diamond cluster clasp, collected by Madame Thiers, who left it to the Louvre. They were bought at auction June 16th, 1924, and sold privately by Cartier. 10 and 12. Ring in rose diamonds mounted in gold; period 1850. 11 and 13. Ring in one large rose diamond mounted in gold; period 1850. 14. Diamond and sapphire coronet and tiara as worn by the Empress Eugénie

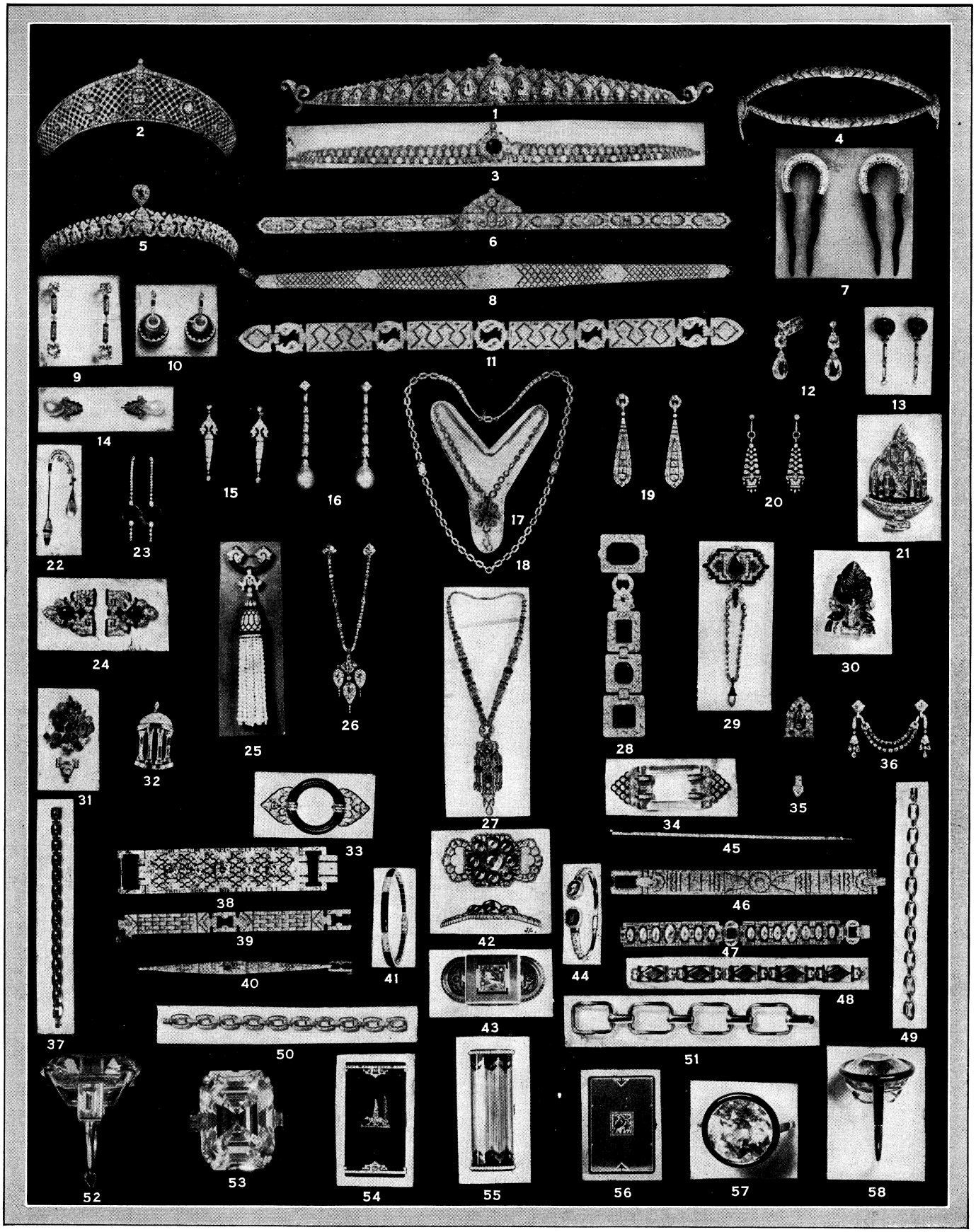


PHOTOGRAPHS, (7, 15, 16, 21, 26) COPR. H. BONNAIRE FROM REVUE DE LA BIJOUTERIE, JOAILLERIE, ORFÈVRERIE, 1901 TO 1902, MAISON DUJAERIE

MODERN **JEWELLERY,** FROM 1900–1914

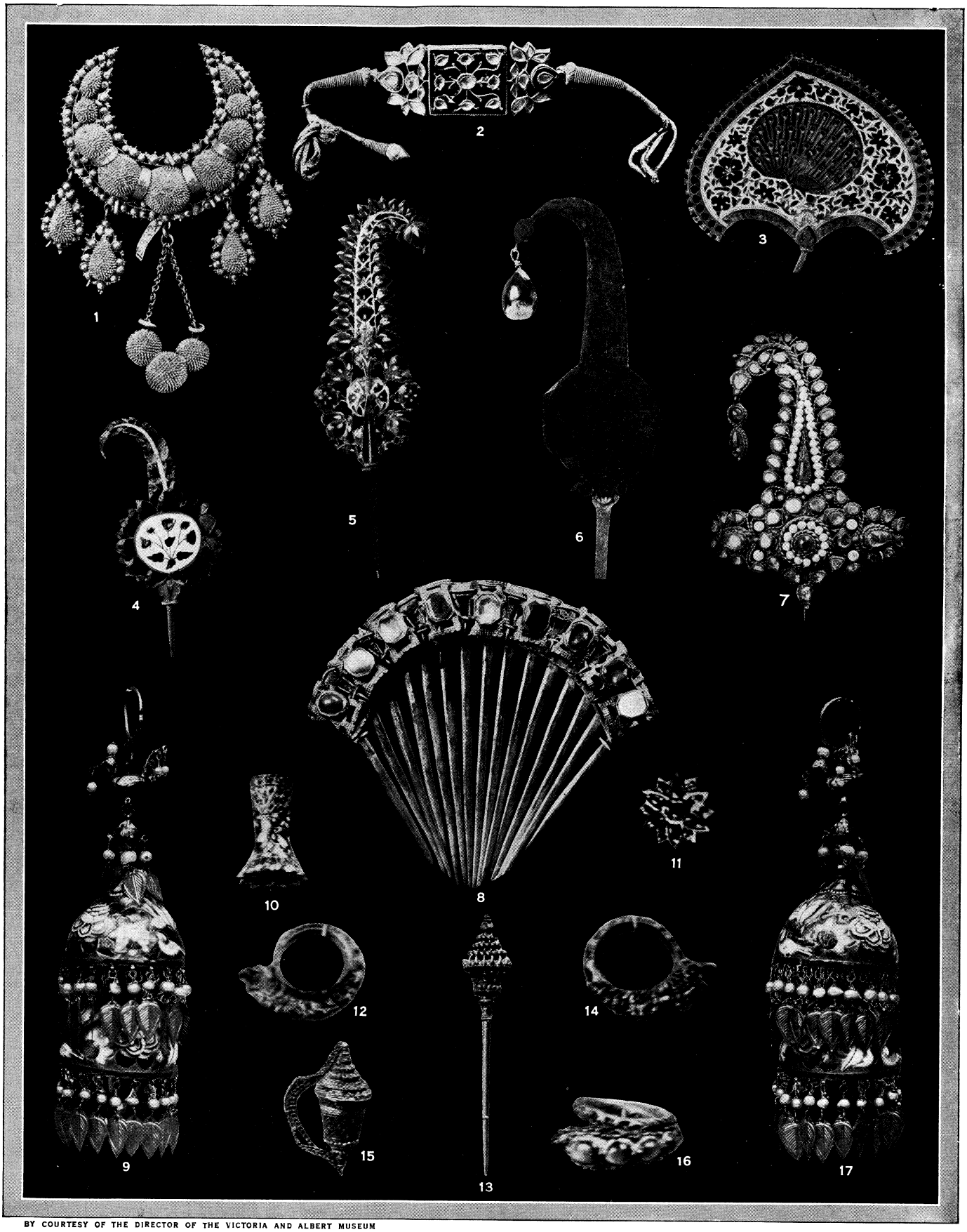
1, 12, 17. 18, **28,** 31. Diamond pendants, (17) with emeralds. **2,** 3, 4. Diamond tiaras. 5. Diamond comb. **6,** 9, 23, **24,** 25. Neckbands and sautoirs of diamonds on moiré ribbon. 7. Head ornament in diamonds and pearls. 8, 10, 13. Dog collars in diamonds, (10) with pearls. **11.** Diamond fourche. 14. Diamond plaque for dog collar. 16. Fourche in translucent enamels and amethysts. 15. **22.** Stomachers in diamonds, (15) with sapphires. 19. Pearl and diamond sapphire ring. 20, 29, 32. Diamond brooches. 21, 26. Back and front of bolero in diamonds and other precious stones. 27. Diamond necklace. 30, 33. Diamond bracelets. **34,** 38. Diamond lorgnettes. 35, 37. Diamond buckles. 36. Hand bag with gold and enamel frame

JEWELLERY



EXAMPLES OF MODERN JEWELLERY

1, 2, 5. Diamond tiaras. **3, 4, 6, 8, 11.** Flexible bandeaux of diamonds, **(3)** with emerald. **7.** Diamond Fourches. 9, **10, 12, 13, 15, 16, 19, 20, 23.** Earrings of diamonds, pearls, emeralds. onyx or crystal. **17, 18, 27.** Diamond necklaces, **(17, 27)** with emeralds. **14, 21, 22, 24, 25, 26, 28, 29, 30, 31, 32, 33, 34, 35, 36, 42.** Brooches in diamonds, and other precious stones, **37, 48,** 49, **50, 51.** Gold link bracelets, **(48)** with carnelians. **38, 39, 40, 45, 46 47.** Flexible bracelets in diamonds. **41, 44.** Diamond bangles, (41) with onyx, **(44)** with emeralds. **43, 54, 55, 56.** Vanity cases in gold and enamels. **52** and **53.** Two views of emerald cut diamond ring. 57, 58. Two views of round diamond ring

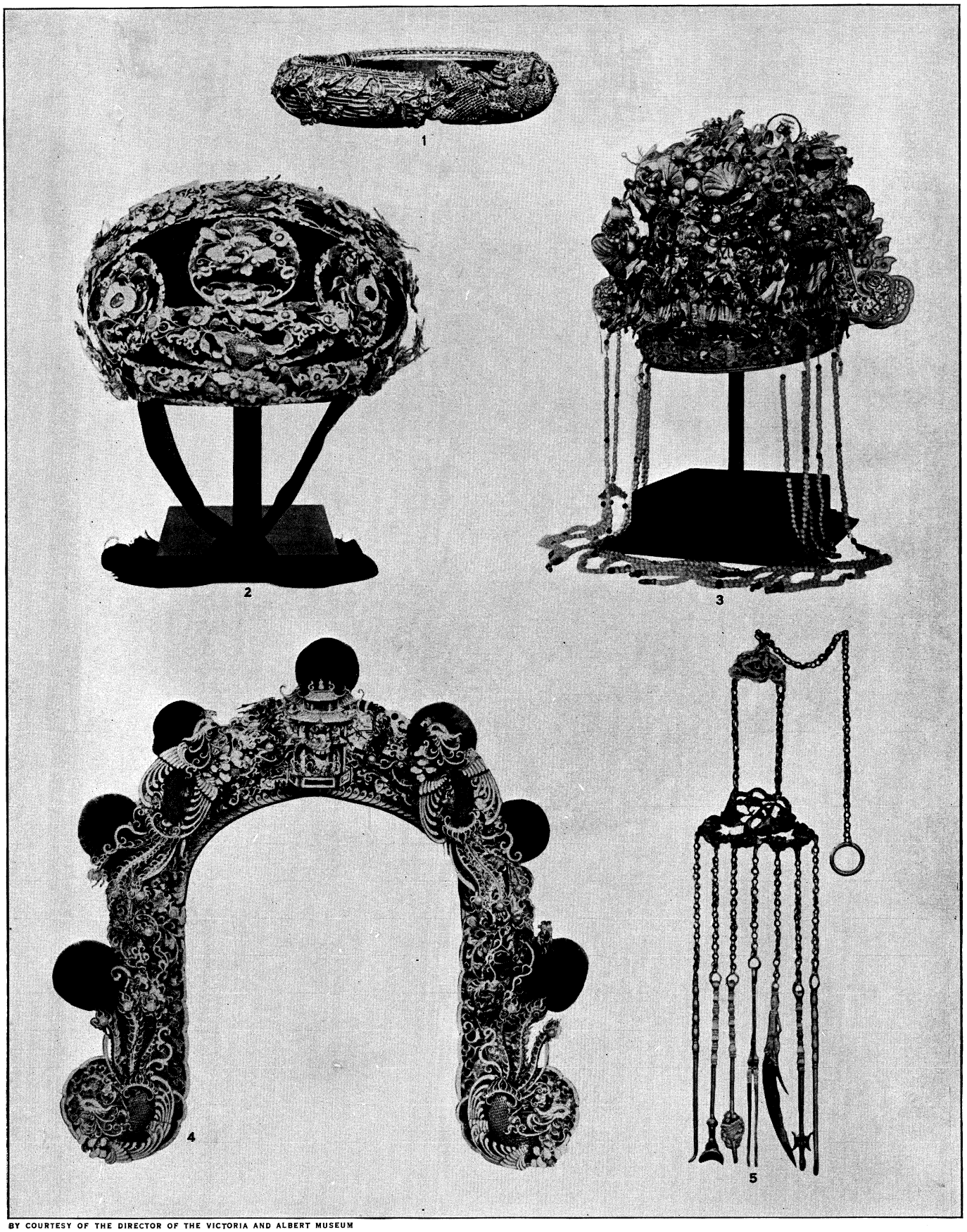


BY COURTESY OF THE DIRECTOR OF THE VICTORIA AND ALBERT MUSEUM

INDIAN, PERSIAN AND SIAMESE JEWELLERY

1. Crescent shaped brooch of granulated gold from Delhi. 2. Glass armlet inlaid with diamonds set in gold. India. 3–6. Turban ornaments of gold decorated with enamels. From Jaipur in Rajputana. 7. Pine-shaped turban ornament from Benares set with precious stones. 8. Nepalese silver comb with nine stones set in gold. 9 & 17. Pair of gold enamelled earrings fringed with rows of seed pearls and gold leaves. Persian. 10 & 11. Ear plugs of jewelled gold. Assam. 12, 14, 16. Jewelled gold rings in fnrms of dragons. Siamese. 13. Gold hair pin for knot on top of the head. Siamese. 15. Gold case for scented ointment. Siamese

JEWELLERY



BY COURTESY OF THE DIRECTOR OF THE VICTORIA AND ALBERT MUSEUM

CHINESE (MANCHU) HEAD–DRESSES AND JEWELLERY

1. Bracelet of gold filigree work in the form of two dragons
2. Head-dress of silk and silver-gilt worn by a Manchu lady of high rank
3. Silver-gilt filigree cap, probably a wedding head-dress, worked in a design of human figures and insects; ornamented with kingfisher plumes, pearls and coral
4. Bride's head-dress of silver-gilt filigree with applied ornament in form of a temple, dragons and phoenixes. Height, 12 in.
5. Chatelaine of gilt metal chains and pendants holding seven silver-gilt implements for the toilet. Length 15¼ in.

usage. The use of gold filigree remained general; and the varied Roman fibula forms became the basis of yet more complicated brooches. The most important development was in the use of thin slices of garnet set like enamel in metal cells, a technique ultimately derived from Egypt and probably transmitted through the Crimea. It is represented in the great 4th-century treasure found at Petrossa. 60 mi. from Bucharest. and appears to have been in use nearly all over Europe between the 3rd and 8th centuries A.D. At the same time under Byzantine influence cloisonné enamel (see ENAMEL) was used for exceptional pieces, such as the famous Alfred jewel This common tradition, however was modified by each of the great European tribes into a style characteristic both in design and technique.

In Italy classical influence was strong, but the Ostrogoths developed the type of the Roman radiated fibula into brooches of great magnificence. and combined the Byzantine interlaced style with the northern style of animal decoration. to produce a type of ornament that was to be yet more fully developed in Scandinavia. The Roman tradition of filigree and still more of niello (*q v*) continued to persist, and lent themselves well to the new style.

The Visigoths used cloisonné work set with garnets or pastes, combined with pearls and cabochon gems set in fretted gold. The most splendid surviving Visigothic jewels are the crowns dedicated by Kings Swintila (621–631) and Reccesninth (649–672). preserved in the Musée de Cluny, Paris, and the Real Armeria, Madrid. They show abundant use of cabochon gems, both set in gold and hung as pendants.

The Franks practised a more Germanic style, but with their settlement of Gaul they came under the influence of the Gaulish classical tradition. Their style is represented by the jewels found in the tomb of Childeric I, king of the Franks, who died in 481. When it was opened in 1653, it was found to contain a sword with jewelled gold mounts. and 300 golden bees. inlaid with garnet, that must have been senn upon his robe (They later inspired the Napoleonic use of bees as an emblem of empire.) Their characteristic forms are rosette or circular brooches, generally decorated with filigree. brooches shaped as birds. and buckles of heavy rectangular form. They also developed the Roman type of radiated fibula with oval foot and square or semicircular headplate (a type which was also used with a lozenge foot in the Rhineland), and occasionally used the classical fish and horse forms of brooch. Great treasures, probably of the late 4th century, have been found in Teutonic graves in Rumania, Transylvania and Wallachia. The goldsmiths of the Belgian provinces practised a "chip carving" style of design that was common over a wide area in the 5th century but was later characteristic of Scandinavia.

Scandinavia developed the common types along complex lines and produced fibulae of great size and elaboration. The Swedish "bracteates," circular pendants of thin gold, are at first imitated from Roman medallions of the time of Constantine, but in the jth century the local style of animal ornament supersedes this, and when coins are imitated they are Anglo-Saxon sceattas

In Norway, too, fibula types of the 4th, 5th and early 6th centuries are derived from Roman or Crimean Gothic originals but after about 550 the types become national. The Scandinavian "tortoise" and trefoil brooches are characteristic; the former date from the 7th to the early 11th century. while the latter are mostly of the 9th and 10th centuries. These and cognate circular brooches are generally decorated with symmetrical designs of considerable beauty. The relations between Scandinavia and Ireland in the 8th and 9th centuries brought in the type of penannular brooch which in its attenuated northern form is characteristic of the Viking age.

In England types from many of these areas were received and modified. The continental type of gold filigree and garnet work was introduced by the Jutish settlements of Kent, the Isle of Wight and part of Hampshire. Splendid examples were recovered in 1938–39 from the ship burial at Sutton Hoo, Suffolk (preserved in the British Museum, London), which seems to date from the third quarter of the 7th century. They shon immense technical ability both in the working of gold and in the extraordinarily complex and minute cloisonné work in garnets with which clasps, purse-mounts and other lesser objects are adorned. The goldsmith who made them was so skilful that he could adapt the flowing animal form patterns usually worked out in gold or gilt metal to be interpreted in the far more difficult cloisonné technique. In Sussex, Surrey; Berks and Oxon "saucer" fibulae of a type found in the Hanover district are fairly common! while north of the Thames complex Scandinavian types are general. With the introduction of Christianity such forms as pendant crosses came in, and Carolingian and Byzantine influence is evident.

Ireland. and in a lesser degree Scotland, had types of their own, of which the most characteristic is the penannular brooch. Generally of great size, and worn on the shoulder with the pin pointing upward! it was richly decorated; and the finest example, the "Tara" brooch, represents the climax of Celtic art, with an infinite variety of the delicate interlaced patterns that are characteristic of Irish work. This probably dates from the 8th century and is preserved in the National museum. Dublin. The type continued in use until the 10th century or later. The jewels of the Celtic period are of importance not only for themselves but also because of their relation with the nascent art of manuscript illumination.

Mediaeval **Jewellery.**—With the dawn of the middle ages jewellery takes its place as one of the many industrial arts. fostered first in the monastic workshops for the service of the church, and then by the jewellers of the towns. At the same time knowledge of it is drawn from different sources. After Carolingian times the custom of burying jewels with the dead fell into disuse; but with the development of graphic and plastic art, more and more jewels were represented in painting and sculpture, and with the development of a settled society more and more were accurately described in wills and inventories. In the late 15th century the manuscript illuminators of Bruges often painted jewels in the margins of their books.

The brooch continued to be the most characteristic ornament, but the Roman safety pin type fell into disuse. Classical cameos and intaglios continued to be used all through the middle ages, and by the 14th century were being imitated with considerable skill. The mediaeval brooch is nearly always a ring brooch. of which the pin is held in position by the pull of the stuff through which it passes. The ring form was modified in endless ways: it might be partly filled in, as on the great Eagle brooch at Mainz, or its rim might be formed as a wreath or a heart or in more fantastic shape. The other characteristic mediaeval jewel is the reliquary or devotional pendant chased or enamelled with religious subjects, often set in an architectural frame. In the 14th and 1 jth centuries jewellery became increasingly a part of dress (*q.v.*) and was fashioned into belts and chaplets, hair nets and necklaces, and sewn upon garments. Some splendid crowns of this time survive, notably that which Blanche of England, daughter of Henry IV, more on her marriage to Louis, elector palatine of the Rhine. in 1402 (Wittelsbach treasure. Munich). Badges were worn in the hat to indicate the wearer's party, to commemorate a pilgrimage he had undertaken or to portray his patron saint. The personal motto of the wearer, or an amatory sentiment. was often inscribed upon jenels.

Renaissance **Jewellery.**—With the Renaissance the link between jewellery and costume became still closer. On occasions of ceremony the nhole dress was sewn with jewels, as many portraits of the 16th century show. A new class of artificers in metal came into being, whose only concern was with such small objects as jewels. No ancient Roman jewels were used as models. but classical subjects were often represented and engraved gems of classical type employed. Many ornaments mere designed rather as little pictures in enamel than as jewels in the ordinary sense. However, after 1600 a gradual loss of plastic quality is noticeable, compensated by increasing skill in the cutting and display of gems At the same time the publication of engravings of designs for jenels helped to standardize their patterns throughout Europe Both these developments honever, were gradual; and the design of Renaissance jenels shows no lack of individual fancy, and is often condstioned by the shape of an oddly-formed gem or baroque pearl. The Reformation and the classical revival combined to bring the

religious symbolism of mediaeval jewel design to an end; only in Italy and Spain did the mediaeval reliquary classical types survive. A new class of portrait jewels came into being and many jewelled cases of great beauty were made to contain portrait miniatures,

Jewels of the 17th Century. — With the 17th century a certain change is evident. Jewels cease to be works of art with some idea or fancy to express, and become mere personal ornaments beautiful in line and in material but without any deeper significance. Many improvements were made in technique; the art of gem cutting was developed *(see* GEM: *Gems in Art;* LAPIDARY AND *GEM* CUTTING). By the middle of the 17th century rose and brilliant cutting had almost superseded the older table cut diamond, and the enamellers produced painted flower enamels of great beauty as well as enamels in such delicate technique as *émail en resille sur verre,* of which the ground is not metal but glass; and the jewellers learned to mass their gems and to set them with great lightness and elegance in leafy settings of gold and silver *(see* SILVERSMITH'S AND GOLDSMITH'S WORK). With the development of this style the forms of jewels tended to become stereotyped. The characteristic jewel of about 1 joo is the parure: earrings and brooch. necklace or clasp, and ring and sometimes shoulder brooches or buckles, all to match, set with diamonds alone or in combination with rubies. topazes, sapphires or emeralds.

Jewels of the 18th Century. — The courtly splendours of the 18th century mere reflected in diamond jewellery of the utmost magnificence that looked its best at candlelit fetes. Louis XIV and Louis XV both had parures of great splendour, including their orders and sword hilts. shoe buckles and sets of immense "Brandenburgs" to fasten their coats. Parures were created of less precious stones, notably garnets and pearls, for daytime wear, and much "sentimental" jewellery was worn that contained the hair of dead friends and relations or living sweethearts, often set with delicate sepia miniatures within pearl borders.

Jewels of the 19th and 20th Centuries.—The French Revolution impoverished Europe. and the abolition of the French guilds of goldsmiths struck a blow at the continuity of craft tradition. For state occasions the Napoleonic court imitated the parures of the *ancien régime,* with the addition of a jewelled coronet of classic form, while for everyday wear they, and poorer folk, contented themselves with parures set with semiprecious stones or shell cameos in mounts of delicate filigree of gold enamelled with patterns in black or blue. Many bracelets were worn; and long earrings were matched by extremely long chains and *santovis* reaching below the waist. With the Restoration in France such semiprecious jewellery became increasingly important, and quantities of topaz, amethysts and aquamarines were imported from Brazil and Mexico. A considerable amount of jewellery was made in imitation gold like pinchbeck, and some in finely cast iron. Diamonds and precious stones were set in light flower, leaf and wheat-ear patterns that could be executed in stones of lesser size. With the reign of Louis Philippe the influence of mediaeval and Renaissance decoration was shown in the use of Gothic arcadings and Baroque scrolls on jewels, but at the same time jewellery became steadily more stereotyped in its form and more industrial and mechanical in its production.

With the creation of the Second Empire many jewels were designed on simple lines — frets crescents, stars and so on — simply to display the diamonds with which they were set, while others attempted to imitate flowers with inartistic verisimilitude. A few jewellers such as Lucien Falize in Paris and Giuliano in London, revived the Renaissance style alike in design and technique and produced beautiful work in enamelled and jewelled gold At the same time others — notably Castellani of Rome and Fontenay of Paris — drew inspiration from such classical jewellery as that of the Campana collection and produced delicate "Etruscan" nork in gold adorned nith filigree. In England a widowed queen did much to encourage the nearing of mourning jewels in black enamel set with diamonds and pearls.

The redistribution of nealth provided a market for a vast quantity of middle-class jewellery; stars, crescents, lockets. small brooches, chain bracelets and the like, for nhich for the first time the production of jewellery reached a purely commercial level. The tendency was greatly accelerated when South African diamonds began to come on the market after 1868. By the end of the 19th century machine-made mille-grains settings were being used for diamonds, and after 1920 an increasing number of settings of all kinds were machine-produced. As a reaction against this tendency, jewellers such as R. Lalique and C. L. Tiffany produced art *nouveau* jewellery of elegant and fantastic design with relatively few precious stones. It, however, was ill adapted to changing fashion.

Queen Alexandra introduced high pearl and diamond dog collars, the wearing of which encouraged the use of stud rather than pendant earrings. The courts of England. Germany and Italy were at this time splendidly jewelled, but World War I greatly reduced their splendour. Some fine emeralds and pearls came on the market from Russian and Turkish sources and were used by the great French jewellers, one of the chief of whom was C. Fabergé, whose work can be seen at Luton Hoo. Beds. Many brooches and necklaces were sold to India and the United States. After that war wrist watches were universally worn and were included in the repertory of the designers of diamond jewellery.

The years between the wars saw a great fashion for diamond bracelets, many of which were worn at once, and for clips, which to a great extent took the place of brooches. They were often designed in pairs, and so made that they could be joined together to form a single brooch. At the same time the market was flooded with strings of Japanese culture pearls. The introduction of a heavy purchase tax on jewellery in 1940 did much to create a fashion for antique jewels, which was encouraged by the vogue of wearing a single large lapel brooch. The years after 1940 will, however, go down in the history of jewellery for their development of "costume" jewellery, designed for effect in materials of little or no intrinsic value.

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THE UNITED STATES AND LATIN AMERICA

After World War I the influence of the United States, as in so many other spheres of the decorative arts. became dominant in that of jewellery. Furthermore, during the period between World Wars I and II, the ranks of the jewellers in the United States were swelled by a number of emigrant European craftsmen. The result has been that to "place" a piece of 20th-century North American jewellery with reference either to its exact date or its fabricator became almost impossible. One thing which all modern United States jewellery has in common is an efficient, smooth. streamlined quality. Platinum and. in later years, palladium have taken the place of gold in gem-set work. Palladium, because of its extreme lightness, has been particularly in evidence in large clips and brooches. These two metals have also been widely used for such mass-produced articles as wedding rings, a contrast with the traditional conservatism of Europe which in this respect still

prefers gold. A particularly revealing departure from European taste has been the widespread adoption of jewellery by men. Gem-set signet rings, tie and scarf pins, *minuterie* or small-nork in the shape of cigarette cases, lighters and holders have all been produced in the United States with a lavishness of decoration which almost recalls masculine jewellery of the Renaissance.

In the United States, engagement rings and nedding rings are made as matching pairs, often set with diamonds. A certain ostentation in gem-set jewellery—evidenced in very large "cocktail" rings—lends an opulence and a flamboyance to this modern nork which would not have seemed out of place in 16th-century Europe.

The most outstanding aspect of the U.S. scene proved to be the mass production of "costume" or "fashion" jenellery, much of which is tastefully designed and finely executed. The range of techniques and materials used is considerable. Plastics, anodized aluminum and silver often oxydized to give an antique effect have all been employed. In the better-quality articles fine hand-set marcasites or pastes are common. Artificial pearls, the manufacture of nhich originated in Czechoslovakia. also play a large part in U S jewellery. A mixture of nitrocellulose and guanine (a fish silver obtained from the scales of certain fish) is coated over a bead of glass or plastic. These are then used in decorative necklaces and earrings. (The modern cultured pearl which evolved from experiments by K. Mikimoto in Japan must not be confused with this purely artificial and inexpensive article.)

Composite suites of precious jewellery were a U.S. innovation that has been uidely adopted. Necklaces were designed so that they could be dismantled to form brooches, clips and a bracelet; or gem-set clips that converted into two matching clips, or a single clip and a hair ornament. Gold. which had been used less for gem-set pieces, came into its own in heavy link bracelets and necklets. These rely solely upon the metal's colour and the link design for their decorative quality.

In South America modern jewellery remained more traditional in styling. although influenced by the United States. Although platinum and palladium gradually became commonly used. there was a wide preference for gold. The richness of this metal has always appealed more to Latin taste, and it is used with that extravagant display of coloured stones which has always been a feature of Spanish work. Enamelling continued to be popular, and fan-shaped brooches set with rubles, emeralds and diamonds follow the style familiar to the first conquistadors. Emeralds, mined in Brazil, play a large part. Again, as in the United States, jewellery is commonly worn by men in the shape of elaborate signet rings, gold and platinum watch straps, and gem-set cigarette cases.

Gem-set cocktail rings, mainly executed in gold, are made to go in company with colourful bracelets and matching earrings. Pendant earrings, usually diamond-set, are larger and more lavish than their United States or European counterparts. An exchange of influence between North and South America is apparent and, nhereas the south tended to streamline its conventional idiom, the north adopted a wider colour range in its gem-set pieces. The combination of precious stones such as the diamond and ruby with semiprecious ones like the tourmaline or peridot in brooches became common to both. The influence of the international fashion houses became noticeable not only in costume jewellery, but even in precious gem-set pieces. Thus, the delicate feminine stylings which were termed the "new look" in the years immediately following upon World War II gave rise to pendant earrings. light and elegant chain bracelets, and necklaces that mere often Victorian in detail. By the 1950s it became difficult to designate whether a piece had been made in New York or in Buenos Aires. This mould not have been the case 50 years earlier. But, in any case, it appeared that the dating of a piece of precious jewellery would, in the future, depend largely upon recourse to contemporary fashion plates.

See E. D. S Bradford, *Contenzporary Jewellery and Silver Design* (London, 1950; New York, 1951) and *Four Centuries of European Jewellery* (London, New York, 1953). (E. D. S. B.)

ORIENTAL JEWELLERY

Nature and Use.—Few branches of craftsmanship more clearly express the characteristics of a people than jewellery. Not only is the refinement born of centuries of civilization to be set against the untutored love of mere glitter, but many other factors have to be considered. Some of these become obvious at once when a comparison of the jewellery of the far east with that oi western Europe or America is attempted. Even the circumstance that in such a comparison Japan would have to be left almost entirely out of the question is relevant. Living in a mountainous country with scanty natural resources, and parted from their neighbours by the ocean. the Japanese hardly know the meaning of jewellery.

The character of the personal ornaments depends to a large extent upon the minerals and metals which a country provides, upon its climate. and upon the amount and nature of the clothing worn. Consideration must also be given to religious beliefs and national customs. giving to this or that article of jewellery a special significance, and limiting its use to persons of a particular age, condition or station. Personal ornaments may serve a5 indispensable articles of dress, rather than as mere embellishments, and their nature is thus to a large extent determined by the purpose they serve. The influence of religion and ritual observance is too obvious to need emphasizing. In the east, the custom of accumulating savings in the form of jewellery is a factor not to be overlooked. A young bride's dowry may consist entirely of personal ornaments in gold or silver, or of a headdress strung with coins or precious stones. But others too find in jewellery a convenient means of holding their wealth, enabling them to have it continually with them, both for safeguarding and for use when occasion requires. (X.)

China.—Chinese taste in jewellery is characteristic. Gold was seldom used in massive form, but chiefly to gild silver or bronze. Stones, apart from jade, were prized ior their colour rather than their luminosity or rarity. 'They were never cut into facets, and were set nearly always *en cabochon,* sometimes even retaining the irregularities of the pebble. They are invariably semiprecious or even commonplace: amethyst, agate. chalcedony, pink and other quartzes were commonly used in girdle fastenings. Jade has always been prized most, above gold. and less for its costliness—never a dominant motive—than for its traditional august associations. Girdle fastenings. head ornaments and plaque spacers for beads are some of the forms it takes. For all of these white jade is favoured. (X.)

India and Ceylon.—It has been the custom in India, since the beginning of its history, to wear few garments of cool cotton. This has given the Indian, especially the Indian woman. the opportunity for a lavish display of jewellery, worn not as "costume" jewellery but to enhance the charms of the person. 'The hair was adorned with pins, ornaments at the parting and elaborate nets and diadems, the body with earrings. necklaces, arm and wrist bands, girdles and anklets. Few actual examples of early Indian jewellery have survived and the history of the craft from the 1st to the 16th centuries A.D. .can only be followed on contemporary sculptures and paintings. Here, especially in the paintings of Ajanta (2nd to 7th centuries A.D.), the fcrms and, to a lesser extent, the techniques, inay be seen. It is clear that at this period the Indian rivalled the great Renaissance and Baroque jewellers in invention and technical virtuosity.

A little is known of the jewellery of the Harappa culture (c. 2500–1500 B.C.). Many necklaces of beads made of gold. silver, steatite and faience have been discovered on the Indus valley sites. The famous bronze figure of a girl found at Mohenjo-Daro is wearing the nuinerous heavy arm bands of historical fashion. Of the material culture of the period which intervened between the Harappa culture and the Buddhist period there is little or no evidence. The only large hoard (some 180 pieces) of early jewellery is that discovered by Sir John Marshall at Sirkap (Taxila). It may be dated to the 1st century A.D. Many of the pieces show "western" influences in the design. The technical processes, too, are those familiar in the Graeco-Roman world—the use of moulds and dyes, granulation and filigree. There is, however, no reason to believe that any of these techniques. with the possible exception of granulation, was derived irom the west. The encrustation with gems, paste, shell and amber, either close-set (cold cloisonné) or studded, was perhaps due to the taste of the "Scythian" invaders

of northwest India. In a fine gold necklace from Sirkap, preserved in the Central Asian Antiquities museum, New Delhi, the pendants are of two patterns—an oval crystal en *cabochon* enclosed by dolphins in repousse' and a quatrefoil device of seven cloisons inlaid with nhite feldspar. The ox-head terminals are inlaid with feldspar and black agate. Granulation is generously employed. An innovation mas the use of opaque (white) and transparent (red and green) enamels on gold, the technique used being champlevé.

The encrusting with gems, cabochon-cut, is also common, especially in south India and Ceylon, and gold and silver filigree was used on both court and folk jewellery. Gold and silver were also worked up into *repoussé* and finely chased designs. Some of the best of this work was done in south India. Sinhalese jewellery, especially of the Kandy period (16th to 18th century), is of great variety and fine quality. (D. E. B.; X.)

Persia and the Islamic Near East.—From the Neolithic period of Persia, excavations have revealed necklaces, pins and awls of shell and bone. After the discovery of metal in about 4000 B.C. these objects were increasingly made of copper, sometimes with insets of stones. The most significant adornments which have been discovered from the period before Persia became a world poner belong to a group of bronzes found in Luristan, the upland district of western Persia. These probably extend from the end of the 2nd millennium to the 7th century B.C. They include awls and pin heads cast in bronze as well as belt plaques, bracelets and anklets. Many of these are decorated with animals, such as the ibex nith curving horns.

Achaemenid jewellery is fairly well represented in museums. Notable examples are in the Oxus treasure, preserved in the British Museum, London Judging from their splendour and technical perfection, these were evidently the adornments of an aristocratic society. Most are of gold with decoration executed in *repoussé,* granulation and cold inlay of stones and coloured glass. Adornments include bracelets and armlets, torques and plaques. The animal style—perhaps a legacy of the Luristan metalworkers—is seen in the terminals of bracelets and torques; these are in the form of lions', ibexes' and rams' heads and fabulous animals. Other pieces reveal quite another animal style, that of the Scythians and the nomads of the steppes. A striking feature of Achaemenid jewellery is the effective use of polychrome.

This tradition seems to have been interrupted during the Parthian period nhen Persia entered the sphere of Hellenistic art. With rare exceptions ornaments were no longer solid but were composed of gold or silver wire, braided or tnisted Cnder the Sassanids Persia reverted to the tradition of Achaemenid polychrome jewellery. The only sure example of Sassanian jewellery is the so-called "Cup of Khusrau." a circular gold base inset with roundels of red and white glass. and with green glass in the interspaces. The central roundel is of crystal and carved with the seated figure of Khusrau (Chosroes) I (A D. 531–579) The figural arts of the period represent men and women nearing necklaces and earrings No doubt the finest achievements must have been the elaborate crowns made for the kings of this dynasty. None has survived but a later Arab historian describes the crown of Khusrau (Chosroes) II as of "pure gold encrusted with pearls that looked like sparrows eggs. with grenadine rubies that lit up the shadows and were used as lights on dark nights, and with emeralds the very sight of which melted the sight of vipers. A gold chain 70 cubits long was hung from the ceiling of the palace and the crown was attached to that chain so that it touched the king's head without bothering him or weighing on him."

The Arab conquest of Persia brought Persia into the Islamic community of peoples. Rings, pendants, earrings and necklaces of gold continued to be worn. The Iranian tradition of animal art persisted modified to some extent in order to conform to the canons of Islam. A 12th-century gold pendant in the form of a lion is a highly schematic rendering of this animal; it is decorated nith granulation. Besides the latter, other techniques were filigree and encrustation with precious and semiprecious stones and niello. From the 14th century onward, manuscript illustrations give some idea of the kind of jewellery worn by Persians. In Mongol and Timurid times jewelled coiffures for women and diademed headdresses for men seem to have been fashionable in court circles. Under the Safavid rulers jewellery became more sumptuous and elaborate. In the 19th century native traditions were corrupted by European influence. Traditional designs. however. have persisted in Zinjan and among the Kurdish mountaineers of northwest Persia. Silver decorated mith twisted wire arranged in scrolls is a feature of the former. The Kurdish goldsmiths also work in silver which they decorate with chased or *repoussé* designs.

Jewellery aorn by men and women in Turkey during the Ottoman period was probably influenced by the fashions current in Persia. Objects of adornment mere jewelled turban aigrettes. rings, earrings, necklaces and armlets. A technique popular in Turkey from the 16th century onward was the encrusting of jade and other hard stones with jewels attached to the surface by delicate floral scrolls in gold.

In North Africa an independent tradition has been maintained by the Berber and Arab tribes. The jewellery of southern Morocco shows curious analogies in design to Byzantine jewellery—heavy silver plaques decorated with niello or cabochons. serving as diadems or head bands. In other parts of Morocco, in Algeria and Tunisia, popular forms are head bands. breast ornaments, brooches, pendants and a characteristic triangular-shaped shawl pin.

See A. U. Pope and P. Ackerman (eds), *A* Survey of *Persian* Art . . . , 6 vol (1938–39); M. S. Dimand, Handbook of *Muhammedan* Art, 2nd ed (1947). (R. P.-W.; X.)

JEWELWEED: see IMPATIENS.

JEWETT, SARAH QRNE (1849–1909). U.S. writer of regional fiction nhose finest prose. modeled on Flaubert's style, is distinguished by naturalness, clarity and compactness. was born in South Berwick. Me . Sept. 3, 1849. She attended Berwick academy but obtained her most effective education from long rides with her father, Theodore H. Jewett, a doctor. on his rounds of farms and fishing villages. She absorbed his comments on classic and modern authors and observed acutely the indigenous characters. customs and details of background. Early in her teens she determined to perpetuate in writing the rapidly disdppearing traditions of provincial life about her. In 1869 the *Atlantic Monthly* published one of her first stories. Her attitude is sympathetic without being sentimental. The most worthy of her 20 volumes are collections of realistic sketches and short stories about aging natives of Maine, whose manners. idioms and pithiness she recorded with pungency and humour. She provided narrative framework for Deephaven (1877) and The Country *of* the *Pointed Firs* (1896), considered her greatest single achievement, but exciting incident was not among her strong points. Her three extended novels—A *Country* Doctor (1884). which portrayed her father. *A* Marsh Island (1885) and The Tory Lover (1901), a historical romance—are notably lacking in dramatic invention An edition of collected *Verses* (1916) was published posthumously. In 1901 she became the first woman to receive an honorary degree from Bowdoin college, Brunswick, Me. In 1902 a disabling accident virtually ended her writing career. She died at South Berwick on June 24. 1909.

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JEWFISH, the name applied to several tropical American grouper fishes of the family Serranidae, especially the guasa (*Promicrops* itaiara) of the Caribbean sea, pale olive-bronn mith darker spots, and reaching a weight of 500 lb. or more; the black sea bass (Stereolepis *gigas)* of southern California, reaching a length of 7 ft. and a weight of 500 lb.. brown in colour, blotched with greenish-black and highly esteemed for eating; and the black jewfish (*Garrupa nigrita),* also reaching a weight of 500 lb., chocolate brown in colour and a favourite with anglers. It ranges from South Carolina south to Brazil.

JEWISH HOLIDAYS. The leading holidays of Judaism, distinguished by rejoicing and festivity, are Pesach (Passover), Shabuoth (Feast of Weeks, or Pentecost) and Sukkoth (Feast of Tabernacles, or Booths). The other major holidays are Rosh

Hashana (New Year) and Yom Kippur (Day of Atonement), the holiest day in the calendar. The semiholidays are Rosh Hodesh (the first day of the month), Hanukkah (Feast of Dedication) and Purim (Feast of Lots).

One trait all the Jewish holidays have in common is cessation of work. In fact, in the Bible (Lev. xxiii, 24, 39) the festivals bear in addition to their particular names also the title Shabaton (*i.e.,* a day of rest), and the prohibition of work on these days is explicitly stated. There is, however, a diiference between the holidays and the Sabbath (*q.v.*). While all types of work are prohibited on the Sabbath, on the holidays, with the exception of the Day of Atonement (Yom Kippur), activities related to the preparation of food, provided they could not be performed earlier, are permitted. Similarly, carrying burdens in the street. which is prohibited on the Sabbath, is permitted on the holidays, even when not necessary for the preparation of food.

Passover. Shabuoth and Sukkoth are celebrated over periods of several days, the number of which differs as between the Jews of Palestine and those of the Diaspora, the latter giving each holiday an additional day. The difference arises because of certain peculiarities of the Jewish calendar. Passover, Shabuoth and Sukkoth were and still are celebrated in Palestine for the number of days prescribed in the Bible, namely seven for Passover, one for Shabuoth and eight for Sukkoth. The Jews in the Diaspora (except for the Reform wing, which follows the biblical dating) for at least two millennia have celebrated Passover for eight days, Shabuoth for two and Sukkoth for nine.

The Jewish calendar year consists of 12 lunar months determined by the time of the revolution of the moon around the earth. That revolution is accomplished in 29 days, 12 hours and 793 parts of an hour divided by 1,080. Up to the year 363 C.E., as long as the patriarch (Nasi) and his court functioned in Palestine, the first day of a new month was determined by that body according to the birth of the new moon. Witnesses who noted its first appearance in the sky testified to the court on the same day, and that day was declared to be Rosh Hodesh, *i.e.,* the first day of the month. But if the witnesses could not report on that day, they did so on the next, and the day following the appearance of the moon was declared Rosh Hodesh. Accordingly there were months of 29 days and months of 30 days. The declaration of Rosh Hodesh was broadcast by lighting bonfires on high places and mountaintops so that the people in Palestine might know when the month began, in order to prepare for the holidays or for general reckoning. Nearby Jewish communities were informed by messengers on the same day. Distant communities in the Diaspora added an extra day to the holidays because of the doubt as to whether Rosh Hodesh was declared to be on the 30th day of the preceding month or on the following day.

The celebration of the extra day in the Diaspora continued even after the year 363, when the calendar was firmly established by Hillel II, according to reckoning and calculation, making the testimony of witnesses unnecessary. The talmudic sages of Babylonia urged all Diaspora communities to continue the old way of celebrating the holidays, and thus it remained. In Palestine, however, where there was no such tradition, the celebration according to the biblical dating remained, with one exception. Rosh Hashana (New Tear), occurring on the first day of the month, was celebrated for two days even in the days of the Temple, if the witnesses arrived after noon. Hence, it is celebrated in Palestine even now for two days. The Reform wing, however, celebrates all these holidays according to the biblical prescription. (See also CALENDAR.)

Pesach.—Pesach (Passover) celebrates the most momentous event in Jewish history, the Exodus. It extends, according to the Bible, for seven days, beginning with the 15th and ending with the 21st (or, in the Diaspora, the 22nd) of the month of Nisan. On these seven (or eight) days, all leaven, whether in bread or other mixture, is prohibited; only unleavened bread, specially prepared, called matzoth, is eaten.

In early times, a special sacrifice was brought to the Temple; this was the Paschal lamb, the flesh of which was eaten by the family. Even after the destruction of the Temple, Passover was and continues to be celebrated with great pomp and ceremony, especially on the first night, when the festal meal, the Seder (an ordered banquet), is held. At this meal four cups of wine are drunk at certain intervals. The first is the cup of sanctification, Kiddush (*see* KIDDUSH AND HABDALAH), on which a lengthy benediction is pronounced, stressing the holiness of the holiday. This is followed by a special ceremony consisting of washing the hands and eating as an appetizer vegetables dipped in vinegar and salt water. Both the washing of the hands and the eating of the appetizer were customary in early times at festal meals and have been retained in later times, in order to maintain the full formality of the feast.

After this ceremony, the Haggadah ("Tale") containing the history of the Exodus and interpretations of the ceremonies is recited by the whole family. In order that the observance of the Seder should leave an indelible impression even on very young children, the sages ordained that the recitation of the Haggadah be preceded by four questions asked by the youngest child for explanation of the laws and ceremonies. Specifically, the child inquires why only matzoth is eaten and leavened bread is prohibited; why bitter herbs are eaten before the meal; why food is dipped tnice (see below); and why the father and other leading members of the family sit in special comfort, leaning on cushions (a relic of oriental custom). The Haggadah, which purports to be a detailed answer to these questions, is then recited, and at the end of the recitation the second cup of wine is blessed and tasted.

After the breaking of the matzoth and the pronouncement of a benediction, another ceremony is performed before beginning the meal proper. This consists in dipping bitter herbs, called *maror* in Hebrew, in a mixture of crushed fruits and wine. The bitter and the sweet are mingled together in order to indicate that freedom and spiritual progress are achieved only by means of suffering and sacrifice. The third cup of wine celebrates thanksgiving and is associated with the chanting of grace after meals. Another part of the Haggadah and several religious poems are then chanted. stressing the theme that God is the Lord of history; the fourth cup of wine is a grateful acknowledgment of His beneficent Providence.

In the course of time, the observance of the Seder came to reflect the pathos of Jewish history. The "cup of Elijah" was added as a toast to the messianic future, when all exploitation of man by man will be ended, for, according to the Talmud, the future redemption of which Elijah is supposed to be the harbinger will take place during the week of Passover, which commemorates the redemption from Egypt. Saluted as a vision of the future. not a reality, this cup remains untouched by the celebrants (see also Hol *ha-Moed*, below).

Shabuoth.—Shabuoth, celebrated on the 6th (or 6th and 7th) of the month of Sivan (corresponding to parts of the months of May and June), is called in the Bible by three names: Hag ha-Kazir (Feast of Harvest; Ex. xxiii. 16), Yom ha-Bikkurim (Day of the First Fruits; Num. xxviii. 26) and Hag ha-Shabuoth (Feast of Weeks; Ex. xxxiv, 22). The last name refers to the end of the seven-week period, between the beginning of the harvest in the fields (primarily barley) and its close (with the harvest of wheat). These seven weeks begin on the first day of Passover when as a sign of thankfulness to God the *omer,* a measure of barley, was taken to the Temple as an offering. From that day on. the days were counted for seven weeks, or 49 days, and the 50th day was the festival of weeks, Shabuoth. The custom of counting the days between the two festivals was continued, even after the destruction of the Temple, up to the present day, though no omer is offered. The counting is done at the evening service, arid the six weeks between Pesach and Shabuoth are called *Sefirah* days. In Jewish custom, this period is observed as a time of mourning, when, except for certain days, no weddings or celebrations are to be held.

In Temple times, Shabuoth was marked by the ceremony of *bikkurim; i.e.,* bringing of the first fruits to the Temple. Throughout the larger part of Jewish history, however, this festival has been observed as the anniversary of the giving of the Law (*Matan* Torah) on Mt. Sinai, and it is this event that dominates the holi-

day both in prayer and in custom.

Sukkoth.— According to the Bible, Sukkoth extends for eight days, beginning with the 15th and ending nith the 22nd (or. in the Diaspora. the 23rd) of the month of Tishri (corresponding to dates in September and October). It is called in the Bible by two names, Hag ha-Asif (Feast of Ingathering; Ex xxiii. 16). marking the ingathering of all grains and fruits at the end of the year, and Hag ha-Sukkoth (Feast of Tabernacles, or of Booths; Lev. xxiii, 34), as a reminder of the dnelling in huts by the Jeas during their march through the desert. Essentially a festival of thanksgiving. it is marked by two commandments, to dwell in the *sukkah* ("hut") in memory of the historical event, and to take four plants—the *ethrog* (a species of citrus fruit), the *lulab* (a branch of the palm tree). the myrtle and the willow branch—and recite thanks to God for the fruitfulness of the land. Both ceremonies are performed for seven days only.

Shemini Azereth and *Simhath* Torah —The eighth day of Sukkoth is theoretically a separate holiday. dedicated to the love of God. and is called in the Bible Shemini Azereth (the Eighth Day of the Solemn Assembly. Num. xxix, 35). In the Diaspora, however, the eighth and ninth days are celebrated under two different titles, the eighth bearing its biblical name. Shemini Azereth, and the ninth being called Simhath Torah (joy of the Torah), for on that day the annual cycle of the reading of the Law is completed. It is celebrated with great rejoicing, manifested by a special ceremony called *ha-Kofot* ("encircling"). During the evening and morning services, a number of worshipers with scrolls of the Law in their arms encircle the Ark of the Law and, led by the cantor, sing religious songs.

Hol ha-Moed.—Though Passover and Sukkoth consist of eight (seven) and nine (eight) days respectively, only the first two and the last two days (or in Palestine the first and the last) are really Yom Tob, or complete holy days. The intervening four for Passover and five for Sukkoth partake of the character of semiholidays and are known as Hol ha-Moed (*i.e.*, both holiday and weekdays). The principal ceremonies (as the eating of matzoth, dwelling in the *sukkah* and the benediction over the four plants) are observed, but no cessation of work is enjoined. The fifth intervening day of Hol ha-Moed of Sukkoth, however, bears a special name. Hoshanah Kabba, because of a special ceremony connected with it in which the worshipers carry willow branches and chant *hosha-na* ("please help"). Through the influence of cabala this semiholiday came to be regarded as a Day of Judgment.

Rosh **Hashana.**—It is not definitely known when Rosh Hashana, which falls on the first day of the month of Tishri, became the first day of the New Year. The Bible (Lev. xxiii, 24; Num. xxix. 1) merely refers to it as a festival which is to take place on the first day of the seventh month. taking Nisan, in the spring, as the first month, as stated in Ex. xii, 1. Nor is it indicated in the eighth chapter of Nehemiah, where a description of the celebration of the holiday is given, that it marks the beginning of the year.

Without entering into the complicated discussion as to whether the ancient Jewish calendar followed the solar or lunar year, it can be asserted that even in early times Tishri practically began the year. Several references in the Pentateuch itself confirm the notion that the month of Tishri initiated the practical year. Ex. xxxiv, 22 speaks of the Feast of Ingathering, or Sukkoth, as the turn of the year. Deut. xxxi, 10–11 speaks of Sukkoth as taking place at the end of the year. Since Sukkoth falls on the 15th of the month of Tishri, it could not begin the year, for such beginning must take place on the first of a month and not in the middle. Both passages are therefore to be understood as meaning that the holiday occurs in the month which begins the year. In fact, the very commandment that the shophar (ram's horn; trumpet) shall be sounded on the first of Tishri points to its special solemnity, for in biblical times the shophar was sounded on important public occasions. However, be that as it may, an old mishnaic statement hailing from earlv Soferic times (*c.* 350–330 B.C.E.) speaks of the 1st of Tishri, in a very matter-of-fact manner, as the beginning of the civil year. It is evident that it had acquired that status at least several centuries earlier.

Rosh Hashana is the first of the ten days of penitence. In the Agada (Haggadah), it marks the anniversary of the creation of the first human couple, their sin and their repentance. The same idea is expressed in the Rosh Hashana *Musaf* prayers, where it is stated. "This day marks the beginning of Thy work. a memorial of the first day of creation." The principal ceremony is the blowing of the shophar, which is a call for spiritual anakening The ram's horn recalls Abraham's willingness to sacrifice Isaac, and God's acceptance of a ram in place of a human being. Many and complex penitential ideas are associated with the various notes of the shophar.

Yorn **Kippur.**—The Day of Atonement, or Yorn Kippur (Yom ha-Kippurim), is the holiest day in the Jenish calendar and is entirely devoted to faiting. prayer and meditation The Bible calls it by a double title, Shabbat Shabaton (i e., a Sabbath of solemn resting), for on this day solemnity and rest from work are most complete. Yorn Kippur celebrates the theme of repentance—man's weakness. man's capacity to envision the ideal. God's help to the penitent and God's forgiveness. According to the Haggadah. the Day of Atonement marks the day when the Israelites received the second Tablets of the Law; they then knew that they mere forgiven for the sin of the golden calf. The forgiveness of God is conditioned upon man's obtaining the forgiveness of his fellow men; thus the day before Yorn Kippur is usually devoted to the mutual asking of forgiveness.

The evening service with nhich Yom Kippur opens is preceded by the recitation of Kol Nidre. a declaration annulling all vows and oaths of the coming year that are in conti'adiction to the Jewish faith or that were made under improper conditions (*e.g.*, duress). The practice of annulling vows by confesiing them to a court was developed in the mishnaic period. Symbolically, Kol Nidre dramatizes the ideal of holding every spoken word as a hallowed pledge. In addition, the uords and the melody of Kol Nidre are associated with the suffering and martyrdom of the Spanish marranos (*q.v.*). Yorn Kippur also is distinguished by the number of services held, an additional service, Neila, being chanted just before sunset. In Orthodox and Conservative congregations, the entire day is devoted to prayer and meditation; in Reform temples, two services usually are held, in the morning and in the late afternoon

Semiholidays.—*Rosh Hodesh.*—The first of the semiholidays is Rosh Hodesh. the first day of the month. The Bible commands no cessation of nork on that day. only special sacrifices. However. during the First Commonwealth it was given special distinction and was observed by family feasts Saul held a family feast on that day and invited David to participate in it (I Sam. xx). The prophets couple it frequently with the holidays (Isa, i, 14). From a passage in Amos viii, 5 it may be inferred that people even abstained from nork and from carrying on business on that day. Later however, Rosh Hodesh declined in importance. It is observed today only by special prayers, recited on the Sabbath before Rosh Hodesh and by certain prayers on Rosh Hodesh.

Hanukkah.—Hanukkah (Feast of Dedication) commemorates the victory of the Hasmonaeans (Maccabees) over the Greco-Syrian king Antiochus IV Epiphanes, who at one time attempted to extirpate the Jewish faith. The Maccabean victory (165 B.C.) was a triumphant vindication of the principle of freedom of religion. Hanukkah extends for eight days, from the 25th of Kislev to the 2nd or 3rd of the month of Tebet (depending on whether Kislev has 29 or 30 days), corresponding to the latter part of December. Its distinguishing ceremony is the lighting of candles each evening, commemorating the rededication of the Temple to the worship of the One God by Judas Maccabeus. One candle is lighted on the first evening, two on the second. and so on for each evening of the festival. Symbolically, it asserts that the light of faith is certain to grow, even if only a small remnant of the faithful remains. The Talmud dramatizes this interpretation with a tale concerning the desecration of the oil in the Temple, leaving only "a small cruse of oil bearing the seal of the high priest." It appeared that the oil would last only one evening, but it lasted miraculously for eight full days. The lighted Menorah,

or seven-branched candelabrum, became a Jewish symbol of God's words to Zechariah, "Not by might, nor by power, but by my Spirit, says the Lord of hosts" (Zech. iv. 6).

Hanukkah is observed as a joyous family semiholiday, with the giving of gifts to children and the playing of games. In the state of Israel, national overtones prevail in the evocation of the Maccabean triumph.

Purim.—The origin of Purim (Feast of Lots) is told in the Book of Esther. Its name is said to be derived from the Persian word pur, which means casting of lots (Esth. iii, 7). Purim is celebrated on the 14th of Adar, corresponding to the latter part of February and early March, commemorating the occasion when the Jews of the Persian empire were saved. from destruction, planned by their enemy, Haman, through the influence of Queen Esther and her uncle Mordecai. Its principal ceremony consists in the reading of the scroll of Esther in the evening service of the 13th and in the morning service of the 14th of Adar. Another ceremony prescribed in the scroll itself is the exchange of gifts and distribution of charity. Since the scroll calls it a day of joy. it subsequently became a day of public festivity. (M. WA.)

JEWISH LITERATURE: see HEBREW LITERATURE.

JEWISH PHILOSOPHY. The term "Jewish philosophy" denotes the attempts made by Jews. at various periods in their history, to harmonize the tenets of their religious faith with prevailing trends in the philosophy of their environment. Attempts of this kind arose, in the first place, from apologetical motives. Soon, however, the philosophical quest as such became predominant, and the reconciliation of religion and reason was sought on a high level of methodical and disciplined thinking. Inevitably, as a result, the interpretation of Judaism underwent certain developments. This explains the sometimes violent opposition to philosophy offered by the more traditionally minded. Philosophy too changed through its liaison with religious faith: the thought of the ancient world developed its Jewish as well as its Christian and Islamic versions. In the modern period, the philosophy of German idealism exercised a profound influence on Jewish religious thinkers.

Jewish mysticism and the Kabbalah are historically linked with the philosophical trend in Jewry. On the whole, however, theosophical speculation falls outside the scope of Jewish philosophy proper: it does not follow the rational standards applied in philosophy and belongs to a tradition of its own.

ORIGINS

Jewish philosophy takes its rise among the Greek-speaking Jews of the Diaspora in the Egypt of the Ptolemies. The four fragments of Aristobulus (fl. *c.* 160 B.C.), dealing with the interpretation of the Mosaic law, show some Pythagorean influence and use allegory to explain the anthropomorphic descriptions of God in the Bible; and allegory is also used to interpret Jewish ritual and dietary laws in the Letter of *Aristeas* (c. 100 B.C.), an obviously missionary work that purports to be an eyewitness account of the events leading up to the translation of the Bible into Greek (Septuagint). This use of allegory follows the example of Greek philosophers who employed it in order to "save" the Homeric descriptions of the gods; and the excessive application of it by certain Jewish extremists is condemned by Philo.

The *Wisdom* of Solomon (written at some time between 200 B.C. and AD. 100) follows in the tradition of the Palestinian Hebrew "Wisdom literature," but reflects a decidedly Hellenistic outlook and seems to have some affinities uith the thoughts of the Essenes, who themselves were influenced by Hellenistic syncretism, notably by Pythagoreanism (the author's knowledge of Greek philosophy may have been drawn from Poseidonius' *Protrepticus*). Its aim is both apologetic and missionary: the wisdom of the Greeks is already contained in Solomon's. The enumeration of the attributes of the cosmic Wisdom as "a clear effulgence of the glory of the Almighty" suggests a cosmological theory of emanation and foreshadows Philo's Logos doctrine; it combines Platonic and Stoic elements. The cosmopolitan ethics of Stoicism also pervades the Fourth Book of Maccabees, which discourses on the rule of reason over the passions and is notable for its use of the expression "pious reason" to denote "reasoning which follows the rules of piety" and also "reasoning for the sake of piety."

Hellenistic-Jewish philosophy culminates in Philo (*q.v.*) of Alexandria. Philo is strongly influenced by Poseidonius (1st century B.C.), who revived Platonism in the later Stoa: God is both transcendent and immanent, "fills all things; contains but is not contained," "is everywhere and nowhere," "is at the same time close to us and far from us." God is "better than the Good. purer than the One and more primordial than the monad." His essence is unknowable, and the only valid statement about Him is "that He is, not *what* He is." Philo's negative theology probably goes back to a passage in Plato's Parmenides (142 A) which the Neopythagoreans and Neoplatonists understood to refer to the supreme God. The most celebrated of Philo's notions is that of the Logos, uhich combines the features of the Stoic all-pervading reason and of the Platonic ideas. "The intelligible world (*sc.* the ideas) is the divine mind in the act of creation." The concept of the Logos also re-echoes such biblical notions as those of "angel," "wisdom" and the "Word of God" by which the world was made. In Philo, the Platonic eros, the "winged and heavenly yearning" for the "form of the good," is blended with the biblical "love of God": we have to learn to live in the soul alone, to migrate from body, sense and even speech in order to find God in the peace of our mind.

Philonic influence is clearly attested in Christian patristic literature, and the preservation of his writings is due to the Fathers of the Church. Yet it would be wrong to assume that no traces of Philo are left in the Jewish tradition. A number of Philonic motifs occur in Talmudic and Midrashic sources. The Karaites (Qaraites) of the 9th century in Jerusalem had access to the books of the Maghariya ("People of the Cave"), amongst which were the writings of "the Alexandrian" (namely Philo); and Benjamin Kahawandi's doctrine that the world was created through the intermediacy of an angel may be said to re-echo Philo's concept of the Logos. It may have been through the Karaites that Philonic teachings reached the medieval Jewish Neoplatonists, but it is safer to suppose that it was by way of patristic influence on the Islamic kalam (see below): thus the writings of St. John of Damascus embody a great deal of Philonic teaching.

THE MEDIEVAL PERIOD

For nine centuries, from Philo to Saadia, Jewish philosophic activity ceased. Alexandrian Jewry had lost its creative impulse, and the rabbinic academies of Palestine and Babylonia, absorbed as they were in the study and expansion of Jewish sacred literature, felt little or no inclination toward philosophy. What there existed of speculative endeavour in the religious field was attracted to Gnostic thought, the influence of which is noticeable in the apocalyptic writings, in scattered Talmudic and Midrashic references and in the ecstatic hymnology of Hekhaloth mysticism and kindred tracts. The only systematic treatise of a quasi-philosophical character is the Sefer *Yesirah* ("Book of Creation"), written probably between the 3rd and 6th centuries AD., which may represent a Jewish version of Proclus' Elements of Theology.

The Kalam Tradition. — The rise of medieval Jewish philosophy followed the revival of Greek philosophy under the 'Abbasid caliphs in the 9th century AD., when the principal philosophical works of Greek antiquity were translated into Arabic. This "hellenization of Islam," however, had been prepared by Syriac versions of Greek texts made by Nestorian and Jacobite theologians in the 6th–8th centuries; and meanwhile the influence of Christian theologians, notably John of Damascus. on the formation of the Islamic kalam (speculative theology) had also been considerable. We find the Islamic *mutakallimun* ("dialecticians"; in Hebrew, *medabberim;* in Latin, loquentes) discussing the divine attributes, the eternity of the Koran (corresponding to that of the Logos), free will, etc. Jewish theologians in Egypt and in Iraq were attracted by the writings of the rational Mu'tazilite theologians who, from c. AD 723, were emphasizing the unity and justice of God. The Mu'tazilites adopted a great deal of Stoic teaching and were familiar with Aristotle's Categories; but their metaphysical notions were chiefly based on Democritean or Epicurean atomism and were expressed in a theology of continuous creation. This

latter view is not shared by the Jewish theologians.

The Jewish variant of *kalam* represents the earliest phase in medieval Jewish philosophy (preceded only by the solitary figure of Isaac Israeli, the 10th-century Neoplatonist). David ben Marwan al-Mokammes (10th century), the author of the *Ishrun Makalat* ("Twenty Chapters"), discusses the attributes of God in the manner of the Arabic *kalam* but reaches in the end a Neoplatonic outlook. His younger contemporary, Saadia (882–942), a native of the Egyptian Fayyum who became gaon (head) of the rabbinic academy of Sura in Iraq, was brilliant in many fields of scholarship. As a grammarian and lexicographer, as a translator of the Bible into Arabic and as a commentator. he helped to break fresh ground and has been hailed as "the first spokesman in all matters" (*sc.* of the faith). His most important work. *Kitab al-'Amanat w'al-I'tikadat* ("Book of Doctrines and Beliefs"), is modeled on the Mu'tazilite *kalam* but far surpasses it in the sovereign manner in which the author replaces its atomism by Aristotelian notions and in the originality with which he deals with the problem of faith and reason. In contrast to patristic teaching, for which philosophy is the mere "handmaid of theology." Saadia assigns to divine revelation a merely pedagogical, preparatory function and regards it as a religious duty to verify its truths by way of rational inquiry. In discussing the rational basis of Jewish law and ritual he draws both on the *kalam* concept of natural religion (*fitra*), which derives from the Stoics, and on Plato's ethics. In his *Commentary on Sefer Yesirah* (ed. and trans. by ill. Lambert. Paris, 1891) he introduces the notion of the creative Word of God. which he describes as a vital breath or "second air," serving also as the medium of revelation.

The influence of *kalam* also pervades the theology of Samuel ben Hofni (d. 1034), another gaon of Sura, who offers a rationalistic interpretation of the Bible and combats the belief in magic and astrology. Other followers of *kalam* among rabbinic circles were Nissim ben Jacob of Kairwan (10th–11th century) and Hai Gaon (d. 1038), head of the academy of Pumbeditha (Iraq). Among the Karaite (scripturalist, anti-rabbinic) theologians, *kalam* doctrines are even more pronounced: 'Joseph ben Abraham al-Basir and his disciple Joshua ben Judah (11th century), for their doctrine of the divine attributes, use the concept of *hal* ("mode"; *i.e.,* an attribute not distinguishable from the essence), which goes back to Abu Hashim, the Mu'tazilite teacher at Basra. The doctrines of *kalam,* moreover. remained in vogue among the Karaites long after they had been replaced in rabbinic Judaism by Neoplatonic and Aristotelian trends: according to Aaron ben Elijah of Nicomedia, whose *'Es Hayyim* ("Tree of Life") was written in Hebrew in 1346, the teachings of *kalam* are essentially of Jewish origin, whilst Aristotelianism represents a pagan philosophy.

The Jewish **Neoplatonists.**—In marked contrast to the dry rationalism of *kalam,* the h'eoplatonic phase of medieval Jewish philosophy is characterized by the strong mystical bent and by the ascetic frame of mind prevalent in earlier Neoplatonism. Compilations from Plotinus' *Enneads* were current in 10th-century Baghdad, and excerpts from the last three books of that work were known from the so-called *Theology of Aristotle* (extant in two Arabic recensions). Other classical works of Neoplatonism known to the Arabs were Proclus' *Elements of Theology,* of which there was a translation by Abu 'Uthman Sa'id al-Dimashki and from which excerpts had been taken to form the famous *Liber de causis* (extant also in Arabic); Porphyry's *Sententiae;* and above all, the Alexandrian commentaries on Aristotle or compilations of them. Furthermore the works of al-Kindi and the "writings" of the Brethren of Purity (*q.v.*) contain a great deal of Neoplatonic philosophy; and variants of Neoplatonic doctrine are also found in pseudo-Empedoclean writings such as the *Book of the Fiae Substances.* The influence of Neoplatonic pseudepigrapha on medieval Jewish Keoplatonism is pronounced.

Isaac ben Solomon Israeli (*q.v.; c.* 850–950), court physician at Kairwan and famous chiefly as a medical writer, initiates the era of Jewish Neoplatonism. His philosophical works are based on al-Kindi and on a pseudo-Aristotelian work describing the series of emanations from the supernal Wisdom down to the composite beings of the sublunary world. Israeli was the first to link the tenets of Neoplatonisrn. especially its notion of the ascent of the soul to the upper world. with biblical theology. His concepts of purification. illumination and union with the supernal Wisdom derive in the main from Proclus. Some of his notions especially those concerning the nature of prophecy, reappear in the *Commentary on Sefer Yesirah* by his pupil Dunash ibn Tamim; and his influence is also noticeable in other Jewish Neoplatonists, for example Joseph ibn Saddik (d. 1149), whose *'Olam Katan* ("Microcosm") blends *kalam* with Neoplatonism, and Moses ibn Ezra (c. 1060–1139).

The greatest figure among the Jewish Neoplatonists of Spain is Solomon ibn Gabirol (q a), the 11th-century poet and philosopher knonn to the Latin schoolmen as Avencebrol His chief nork, *Fons vitae* ("The Fountain of Life"), is designed to teach man how to achieve freedom from death and the attainment of union with God Its metaphysical scheme is in many ways similar to Isaac Israeli's but differs in its emphasis on the role of the will of God as the source of all form (a concept which seems to derive from pseudo-Empedoclean sources) Ibn Gabirol's philosophy is cast in poetical form in his magnificent hymn, *Keter Malkhut* ("The Royal Crown")

Another 11th-century philosopher, Bahya ibn Paquda, wrote his *Kitab al-Hidaya ila Fara'id al-Qulub* ("Book of the Introduction to the Duties of the Heart"; in Hebrew *Sefer Hobot ha-Lebabot)* as a manual of the inner life The "duties of the heart." in the terminology of the Mu'tazilites, are moral and spiritual commandments as distinct from mere outward observance. Bahya's doctrine is steeped in the ethos of Neoplatonic and Sufi asceticism but also reflects the more homely type of traditional Jewish piety, and his book has become a classic of Jewish moralist literature. The treatise *Kitab ma'ani al-Nafs* ("On the Soul"). falsely attributed to Bahya, is a popular version of h'eoplatonic metaphysics and psychology, presented as identical with the Jeuish doctrine

Abraham bar Hiyya of Barcelona (fl. *c.* 1130), a mathematician and an astronomer, is the first medieval Jewish philosopher to write in Hebrew. His *Hegyon ha-Nefesh* ("Meditation of the Soul"), though adopting the Keoplatonic doctrine of the soul's ascent, introduces a more Aristotelian metaphysic by stressing the dualism of matter and form. In his *Megillat ha-Megalleh* ("The Scroll of the Revealer") he outlines a metaphysical doctrine in which the Neoplatonic triad of intellect. soul and nature is enlarged by the superimposition of two more stages, namely the worlds of "light" and of "dominion." The principal aim of this treatise is, however, the "revelation" of the date and the events of the messianic future. His interest in history, something alien to the spirit of Neoplatonism, is inspired by Christian eschatological speculation and in particular by the work of Isidore of Seville. His philosophy of history proceeds from the idea that the periods of the world correspond to the six days of creation—a concept which was later to be developed, again under Christian influence (Joachim of Floris), in the 13th-century Kabbalistic *Sefer ha-Temunah* ("Book of the Image").

Abraham ibn Ezra (Abenezra; *c.* 1092–1167) introduces a pantheistic Neoplatonism into his commentaries on the Bible: "God is the One; He is the Former of All, and He is All."

Medieval Jewish Neoplatonism had a considerable share in the rise of the Kabbalah. 'Azriel of Gerona. a prominent member of the circle of Jewish mystics in Spain. quotes the pseudo-Aristotelian treatise which furnished Isaac Israeli with his metaphysical scheme and finds only a difference in terminology between it and the doctrines of Kabbalah. Abraham bar Hiyya's teachings were also largely employed by the Kabbalists. Though closely akin to Keoplatonism, the doctrine of Judah ben Samuel Halevi (*q.v.; c.* 108j–c. 1140), poet and philosopher of Toledo. must be regarded as *sui generis.* His *Book of Argument and Proof in Defense of the Maligned Religion* (in Hebrew commonly known as *Sefer ha-Kuzari*), written as a dialogue between a Jewish theologian and the king of the Khazars, offers an incisive criticism of current Aristotelian doctrines and was no doubt inspired by the work of the great Islamic theologian and mystic al-Ghazali.

The Aristotelian Revival: **Maimonides.**—From about the middle of the 12th century, Jewish philosophy took a turn toward

a stricter form of Aristotelianism, following the lead given by the Islamic philosophers al-Farabi, Avicenna and Averroes. The new trend found its first literary expression in the treatise Ha-Emunah he-Ramah ("The Sublime Faith"), written by Abraham ibn Daud (Rabed I) in 1161. It contains a spirited attack on Ibn Gabirol's Neoplatonic doctrine of universal matter and form. Ibn Daud's treatise. however. was soon eclipsed by the famous Guide for the Perplexed (Dalalat al-Ha'irin; in Hebrew, *Moreh* Nebukhim) of Moses Maimonides (*q.v.;* 1135–1204). This, the most important work of medieval Jewish philosophy, exercised a profound influence on all subsequent Jewish thought and. through Latin translations, on Christian scholasticism as well. It shares neither the arid rationalism of kalam, whose principles it closely analyzes and refutes, nor the mystical faith of the earlier Neoplatonists, although it retains, in a modified way, some of their metaphysical notions (emanation and the doctrine of negative theology) and their contemplative ethos. Instead it defines the separate provinces of demonstrable and revelational truths. It breaks new ground in theology by its treatment of the divine attributes; in cosmology by joining issue with Aristotle's theory of the eternity of the world; and in the interpretation of Jewish law and ritual by evolving the viewpoint of comparative religion.

The **Averroists.**—Maimonides was a younger contemporary of Averroes but was unacquainted with the works of this most radical of the Islamic Aristotelians at the time when he wrote the Guide. During the subsequent phase of medieval Jewish philosophy, however, Averroes comes increasingly to the fore. His numerous writings were almost all translated into Hebrew, and many commentaries were written on them by Jews. Samuel ibn Tibbon, whose Hebrew rendering of the Guide had been approved by Maimonides, translated also some of Averroes' works and made use of them in his biblical exegesis. His son-in-law Jacob Anatoli, author of the homiletical *Malmad* ha-Talmidim ("Instruction of the Disciples"). translated Averroes' "middle commentary" on several of Aristotle's logical works. Shemtob ibn Falaquera (d. c. 1295), a prolific writer with strong Neoplatonic tendencies, follows Averroes in an encyclopaedic work and quotes his views constantly in his Moreh ha-Moreh ("The Guide of the Guide"), a commentary on Maimonides' work. Joseph ben Jacob Kaspi (1279–*c.* 1340), another commentator of Maimonides, also betrays the influence of Averroes. In Italy. Hillel ben Samuel (d. *c.* 1291) seeks to refute Averroes' denial of the survival of the individual soul in his *Tagmule ha-Nefesh* ("Reward of the Soul").

The most extreme form of Averroism in medieval Jewish philosophy is represented by Isaac Albalag's notes appended to his translation of al-Ghazali's Aims of the Philosophers, where the doctrine of "double truth" is propounded: the truth of the Scriptures may contradict the truth of philosophy, and it is futile to attempt to reconcile the two. In spite of his radical rationalism, Albalag believes in an intuitive knowledge superior to discursive thinking and contained in prophecy yet impenetrable to exegetical speculation; hence the revealed law (Torah) cannot serve as a guide to solving the problems of metaphysics. An interesting parallel to Albalag's attitude is presented by the philosophizing Kabbalists of the 14th century, who were faced with the more complicated problem of reconciling not only philosophy and the Scriptures but also philosophy and Kabbalah (and astrology as well). This task was attempted by Joseph ben Abraham ibn Wakar of Toledo and by Judah ben Nissim ibn Malka of Fez. Ibn Wakar assigns to each domain a validity of its own but, while he insists on the superiority of Kabbalah, he does so at the price of adjusting it to the truths of philosophy. A similar position is taken up by Ibn Malka. Moses ha-Kohen ibn Crispin provides an extreme example to the tendency to distinguish revealed truth from metaphysics and astrology.

The outstanding Jewish Averroist of the period is Gersonides (*q.v.;* 1288–*c.* 1344), philosopher, astronomer, mathematician and commentator on the Bible In his *Milhamot* Adonai ("The Wars of the Lord") he discusses the immortality of the soul, dreams, magic and prophecy, the attributes of God, divine providence. the celestial bodies and the prime mover, creation and miracles. In contrast to Maimonides, he affirms the positive attributes of God and the existence of prime matter as the substratum of creation. God, he teaches, has no knowledge of the individual as such but only knowledge of the universal order of things. Gersonides evolves his position in scholastic fashion by subjecting all opinions held on the matters under discussion to a searching scrutiny. Himself a commentator of several of Averroes' writings, he adopts in most cases the latter's strict Aristotelianism and thus arrives at a philosophy which does little justice to the intrinsic character of Judaism.

Crescas.—The work of Gersonides was made the target of attack by Hasdai Crescas (*q.v.;* 1340–1410), whose Or Adonai ("The Light of the Lord"), one of the profoundest books in medieval Jewish philosophy, contends that Gersonides had only increased the problems that he had set out to solve. Crescas' critique of Gersonides resembles, in a way, Judah Halevi's and al-Ghazali's refutations of Aristotelianism but is less radical in its attitude to philosophy as such. It opposes the Aristotelian notion of God as pure self-thinking and stresses the love of God as the supreme divine attribute: the highest aim of man is communion with God through love, not through the exercise of the intellect; and this can be achieved only by following the way of the revealed law Crescas combines his theology with a concept of providence that implies a strict determinism: God has a foreknowledge of events by knowing the possible not only as possible but as the inevitable result of human choice, which is itself determined by the law of causality. Crescas' devastating criticism of the "26 Propositions" (Guide, ii, introduction) in which Maimonides had expressed the traditional system of Aristotelian physics anticipates the new cosmology of the Renaissance.

The End **of** the Middle Ages.—In Crescas, medieval Jewish philosophy reaches its climax and turning point. His successors in the field more or less continue the Aristotelian tradition. Simon ben Semah Duran (1361–1444), in his *Magen* Abot ('The Shield of the Fathers"), reverts essentially to the position of Maimonides His importance lies in the fact that, continuing Maimonides' discussion of the principles of the Jewish faith, he lays down three essential dogmas: God's existence, revelation and retribution. Joseph Albo (d. 1444), a pupil of Crescas, tried to harmonize Crescas with Maimonides; his *Ikkarim* ("Principles") is a classic of Jewish dogmatics. Abraham ben Shemtob Bibago (15th century) wrote not only commentaries on Aristotle but also the Derekh Emunah ("Path of Faith"), which deals with theology, psychology and dogmatics from the viewpoint of Maimonides without showing any trace of Crescas' influence. Isaac Abrabanel (1437–1508), statesman, philosopher and biblical commentator, the last Jewish thinker on Spanish soil (whence he was expelled with his co-religionists in 1492), likewise clings to the teachings of Maimonides, on whose *Guide* he wrote an elaborate commentary.

In Italy, where some of the Spanish exiles had found refuge and where interest in philosophy had been alive among the Jews since the 13th century, Jewish philosophy was temporarily renovated. Judah Messer Leon, though still within the Aristotelian orbit and largely dependent on Christian scholasticism (notably on Walter Burleigh), is already drawn toward the new humanism, in the spirit of which he wrote on rhetoric. Elijah Delmedigo (1460–97) taught Pico della Mirandola and lectured at the university of Padua, the centre of Christian Averroism. His *Behinat* ha-Dat ("Examination of Religion") reflects the influence of the doctrine of the "double truth" but is careful not to deny the possibility of the philosophical interpretation of religion. In Isaac Abrabanel's son Judah, called Leone Ebreo or Leo Hebraeus (*c.* 1460–1521), contact with the Florentine academy produced the only Jewish Renaissance philosophy worthy of the name: his *Dialoghi d'amore* was the most successful work of the period. Its grandiose conception of the universe as an organism animated by love and exhibiting both truth and beauty provides the epilogue to more than 600 years of medieval Jewish philosophy.

Aristotelianism in Medieval Jewish Philosophy

All medieval Jewish philosophy reflects the influence of Aristotle; and the study of Aristotle's works eventually dominated

the philosophical pursuits of medieval Jewry in Spain, in northern France and in Italy. Aristotle is as a rule referred to as "the philosopher" par excellence. Maimonides calls him "the chief philosopher" and states that "he reached the highest degree of intellectual perfection open to man, being short only of the still higher degree of the divine gift of prophecy." Gersonides speaks in similar terms. The works of Aristotle were included in the school curriculum; and in certain families it became a tradition to specialize in his works and in those of his commentator Averroes. Some knew as much of Aristotle as of the Bible or of the Talmud.

Logic.—Aristotle's logical writings, collectively known as the *Organon,* were studied in the Arabic version as early as the 10th century. Saadia was familiar with the Categories and used them for his treatment of the divine attributes. Isaac Israeli's Book of Definitions shows that he knew Aristotle's four types of inquiry (whether, what, how and why) through al-Kindi. Ibn Gabirol applies these four questions severally to the various levels of being and asserts that, in the case of God, only the question "whether" He exists is admissible. Maimonides' Treatise on Logic represents the first attempt in Jewish philosophy to abridge the entire *Organon* within a unified conspectus (together with the Rhetoric and the Poetics). Maimonides here adopts Porphyry's notion of the five predicables, which, moreover, in his Guide (i, 51–52) he combines with the ten categories in order to present a comprehensive list of possible "attributes": he makes the point that in the case of God only attributes denoting "action" are admissible. Another attempt to present the *Organon* in a concise form was made by Elijah ben Eliezer of Crete (15th century) in his Book'of Logic in *Questions* and Answers. Gersonides. in his Book of Correct *Syllogisms,* sought to improve Aristotle's and Averroes' methods in certain respects.

Theory of Knowledge.— The *Organon* introduced into Judaism the concept of scientific knowledge (*episteme*): to "know" was to know scientifically. The biblical "knowledge of God" (da'at Elohim) thus came to be interpreted as rational theology capable of furnishing demonstrative proofs for the tenets of faith; and faith itself tended to become identified with scientific knowledge. Aristotle had spoken of faith accompanying, in varying degree, the act of knowledge (scientific knowledge being faith in its strongest sense), so that knowledge was "a particular kind of faith" Hence the Islamic schools of kalam could feel in accord with Aristotle when they defined knowledge as faith (*'i'tiqad*). Saadia's definition of faith reflects the same outlook, which is found next in Neoplatonists such as Bahya ibn Pakudah and eventually in philosophers of the Aristotelian revival. When Bahya and Maimonides speak disparagingly of faith in the sense of mere reliance on tradition, they imply an interpretation of faith at variance with the biblical concept of faith as trust and surrender to God. Only with the onset of radical Averroism did the identification of faith and scientific knowledge lose its hold on the Jewish philosophical mind.

Natural **Philosophy.**—Aristotle's natural philosophy exercised considerable influence already on the Islamic kalam, especially through the Commentary on the Physics by John Philoponus. Saadia's four proofs for creation are borroned from kalam and follow the Aristotelian line as interpreted by John Philoponus. Maimonides' emphatic rejection of the kalam propositions (Guide, i, 73) cleared the way for a more thorough adoption of Aristotelian principles; and the propositions on which Maimonides bases his arguments for the existence of God (Guide, ii. introduction) follow Aristotle's example. Averroes' treatment of Aristotle's *Physics* was made the subject of commentaries by a number of Jewish writers. This applies in particular to his "middle commentary" on the Physics, on which in turn Gersonides, Moses of Narbonne, Isaac ben Shemtob and Shemtob ben Joseph wrote commentaries and which was twice translated into Hebrew. Moses of Narbonne and Abraham Bibago also wrote commentaries of their own on the Physics.

Aristotle had defined nature as "the principle and cause by which a thing rests and moves essentially, not accidentally" (Physics, ii, 1); in other words, nature is the formative principle of organic growth. As an immanent principle, inherent in living beings. it seems to render superfluous any transcendent divine principle; Aristotle, indeed. actually identified God and nature (De *Caelo,* i, 4). The operations of nature could thus be equated with divine providence. As this view appeared to run counter to the religious faith in a personal God exercising individual providence and capable of producing miracles, it is not surprising that both orthodox Islamic kalam and Jenish traditionalists opposed the notion of a "nise nature" seemingly independent of God.

The Jewish Aristotelians, however. folloning in the footsteps of the later Arabic philosophers. accepted the Aristotelian concept of nature They saw in the regularity of natural happenings evidence of the unchanging nature of things and regarded the universals as subsisting in the mind of God. Nature meant to them the expression of the will and/or wisdom of God. Maimonides speaks of nature as the totality of generic forces which govern the universe and provide for the protection of life and adds: "It may be that by nature the divine will is meant" (*Guide*, ii, 10). There is, obviously, an unresolved tension in Maimonides' view of nature, which he conceives as denoting both the force of the universe and God's will; and this dual aspect is characteristic of the whole of medieval Jenish philosophy.

Maimonides identifies the biblical concept of "angels" with the "natural forces" by means of which God rules the world (Guide, ii. 6). Nature is held to be obedient to God, and miracles are therefore considered possible, though the tendency is to explain them in a natural nay. Individual providence. which Aristotle was understood to deny (cf the pseudo-Aristotelian *De Mundo*), was affirmed by Maimonides and interpreted on an astrological basis by Gersonides.

Psychology.—Aristotle's psychology, again, was widely studied in medieval Jewish philosophy. The De Anima uas extant in an Arabic translation from which, c. 1284, Zerahyah ben Isaac made a Hebrew rendering. The famous Aristotelian definition of the soul as "the entelechy of a natural organic body" (De Anima, ii, 1) is quoted already by Saadia and by Isaac Israeli. Temporarily eclipsed by Plotiriian influences in Neoplatonic writers such as Ibn Gabirol, Aristotle's psychology makes its full impact for the first time in Abraham ibn Daud's discussion of the soul. Following Avicenna's Kitab *al-Najat,* Ibn Daud adopts the distinction between the vegetative, animal and rational soul and also distinguishes between the internal and external senses. He moreover assigns to the rational soul a practical and a theoretical faculty and explains the processes by which it acquires knowledge, thus merging psychology into epistemology. The division of the soul according to its functions remains the standard doctrine in both Islamic and Jewish medieval philosophy. It also furnishes the basis for the elaboration of theories on the nature of prophecy.

A more controversial aspect of psychology concerns the relationship between body and soul and the allied question of the soul's immortality. The medieval controversy on this topic reflects an earlier difference between Greek commentators of Aristotle. Alexander of Aphrodisias (*q.v.*) had described the soul as being a mere form of the organic body and as perishing with the body. He meant this to apply to all parts of the soul, including the rational soul, to which substantiality was denied; the "active intellect," nhich Aristotle had described as immortal, represented in Alexander's view the divine intellect. Themistius, on the other hand, had radically separated the rational soul from the vegetative and animal souls and held it to be an immortal, pre-existent and immaterial substance. The Jewish medieval discussion was focused on this difference between Alexander and Themistius, but was also largely concerned nith the novel interpretation of Aristotle's doctrine that Averroes had advanced in a number of writings (all of nhich came to be translated into Hebrew). Averroes adopts Alexander's concept of the active intellect as a cosmic, divine intellect but regards the passive intellect not as belonging to the individual soul but as being an aspect of the active intellect; viz., as the active intellect "in conjunction with" the human soul Even so. the corollary of this doctrine is the denial of individual immortality Maimonides, as has been said, nas unacquainted with Averroes' theory. As Avicenna had done. he adopted Alexander of Aphrodisias' distinction between the active and the passive intellect to-

gether with al-Farabi's concept of "acquired intellect" as the final stage of intellectual development at which the rational soul becomes substantial and immortal. Shemtob ibn Falaquera ignores Averroes' doctrine in his treatise *On the Soul,* but bases himself on Averroes in another work. Hillel ben Samuel of Verona's *Tagmule ha-Nefesh* combats Averroes' view, following the lead of Thomas Aquinas. Moses of Narbonne reviews the problem in connection with his discussion of Maimonides' doctrine of the unity of the knower, the knowing and the known *(Guide,* i, 68). Gersonides offers the most incisive analysis of the conflicting views and finally reverts to the theory of Alexander of Aphrodisias with the modifications introduced by al-Farabi and by Avicenna.

Metaphysics.—Of all Aristotelian writings the *Metaphysics* claimed pride of place in the estimation of medieval Jewish philosophers. It was commonly held to represent the "ripe fruit" of Aristotle's philosophy; and book xii in particular was regarded as embodying the essence of his thought. Yet no Hebrew version of the *Metaphysics* existed until *c.* 1485, when Barukh ibn Ya'ish produced one from a Latin translation. The work was, however, accessible in Arabic, as also were Alexander of Aphrodisias' *Commentary* (covering the first two chapters of book xii) and Themistius' *Paraphrase* (covering the whole work). Maimonides knew Alexander's *Commentary* and seems also to have read Themistius' *Paraphrase.* Other Hebrew translations from the Arabic include one of al-Farabi's *Treatise on the Tendencies* of *Aristotle's Metaphysics;* one of Averroes' *Epitome of the Metaphysics* (by Moses Tibbon) ; and two of Averroes' "middle commentary" on the *Metaphysics* (the first by Isaac She'altiel Hen of Barcelona in 1284, the second by Kalonymus ben Kalonymus of Arles in 1313–17). Both Gersonides and Abraham Bibago based their own commentaries on Aristotle's *Metaphysics* on Averroes' "middle commentary."

Aristotle's concept of matter and form plays a dominant part both in the Neoplatonic and in the more strictly Aristotelian phase of Jewish philosophy. Following Plotinus, the Jewish Neoplatonists consider matter and form to be the constitutive elements not only of corporeal but also of noncorporeal beings: Ibn Gabirol assumes that a universal matter and universal form underlie all beings (including the intelligences or angels) except God; and this view is shared by Bahya ibn Paquda, by Abraham ibn Ezra and also by Judah Halevi. The Jewish Aristotelians, however, oppose this view. For a survey of the controversy *see* Isaac Abrabanel's commentary on I Kings, 2. Maimonides employs the concept of matter and form in a strictly Aristotelian fashion.

In Aristotle, the concept of matter and form served the purpose of explaining the fact of becoming: all change presupposes a substratum that remains identical. This ontological view entails the assumption of an eternal matter *(prima materia)* that becomes endowed with form. God, for Aristotle, is not the creator of prime matter, since pure actuality and form (God) cannot be regarded as the origin of pure potentiality (matter). The medieval Jewish Aristotelians were faced here with s serious difficulty: the ontological framework of matter and form seemed to imply a cosmology incompatible with the notion of God as the creator of the world "out of nothing." Maimonides. like Abraham ibn Daud before him, did not pursue the Aristotelian ontology to its cosmological conclusions but assumed God to be the creator of matter as well; he drew a line between the act of creation and the ontological character of the created world. Gersonides. however, reverted to the strictly Aristotelian position: he argues that God could have created the world only from a material substratum capable of receiving form; that, since God is the form of forms, creation cannot be "out of nothing"; that the world is created out of a matter devoid of all form; but that this prime matter is no rival to God, since its eternity constitutes no pre-eminence, whereas God is God not because He is eternal but because He is the highest principle, the giver of all form. The problem of creation continued to attract a great deal of discussion in medieval Jewish philosophy until its very end. Abraham Bibago mentions a treatise of his own called *Es Hayyim* in which he sought to uphold the concept of creation "out of nothing" against Aristotle and Averroes. Isaac Abrabanel's *Mif'alot Elohim* ("Works of God") is devoted to the same purpose.

The Jewish concept of creation was likewise opposed to the doctrine of the eternity of the world. Aristotle saw in the order of things something existing of necessity and from eternity, and this view clashed with the biblical idea of the norld's having been created by the free will of God "in time." Maimonides therefore made a strenuous effort to uphold the concept of creation against Aristotle, al-Farabi and Avicenna: the world, he argues, exhibits not only rational necessity but also traces of a free. creative will, particularly in the motions of the stars. which present phenomena inexplicable by reference to causal necessity. The postulation of a divine will responsible for creation in time raised, however, a perplexing problem. What moved God to create after an eternity of inactivity? Does creation in time not imply a transition in God from potentiality to actuality, which is inadmissible in the case of God who is pure actuality? Whereas the Islamic philosophers yielded to the force of this argument (discussed first in John Philoponus' De *Aeternitate mundi*), Jewish thinkers, with the exception of Hasdai Crescas, maintain the concept of creation in time and advance three counterarguments: (1) no change is implied in God's will to create, as it has its determinant cause in itself and is not motivated by anything external to it, so that to act at one time and not to act at another does not affect God's unchanging actuality (only beings composed of matter and form can pass from potentiality to actuality); (2) the problem is devoid of meaning, as there is no "before" or "after" in the eternity of God's existence, to which time does not apply; and (3) God willed eternally to create but not to create eternally. The question, however, continued to trouble medieval Jewish philosophers (cf. Gersonides, *Milhamot,* vi, 1, 18) and was pondered also in Jewish mystical writings.

Of great importance for medieval Jewish philosophy was the interpretation which al-Farabi and Avicenna had given to the Aristotelian concepts of essence and existence. According to Aristotle essence as such "is" and is "one." Al-Farabi and Avicenna affirmed that existence was an accident of essence. Avicenna's view was understood to be that essences, being universals, "are" in the mind of God and come to exist by having existence conferred upon them, so that essence and existence must be distinguished in all beings except God ("the necessary existent." in whom essence and existence are one). Averroes severely criticized this non-Aristotelian separation of essence and existence. Avicenna's doctrine gained some currency amongst Jewish Neoplatonists and was also echoed by Maimonides, but later philosophers mostly shared Averroes' view.

The question whether Aristotle's prime mover is identical with God (the first cause) had been raised by the Greek commentators of Aristotle and was widely debated in Islamic philosophy: al-Farabi and Avicenna followed Alexander of Aphrodisias in holding God to be above the mover of the first sphere; Averroes followed Themistius in identifying the prime mover with the first cause. Maimonides *(Guide,* ii, 4) rejected the identification of the necessary existent with the prime mover. but his view was attacked by Moses of Narbonne and by Shemtob ben Joseph. Gersonides, however, reverted to Avicenna's and Maimonides' position (*Milhamot,* v, 3, 11). Moses ben Joseph ha-Lawi devoted a whole treatise to the problem and re-affirmed Avicenna's view. Hasdai Crescas *(Or Adonai,* iv, 12) added a note of his own to the discussion, which nas reproduced by Albo (*Ikkarim,* iii, 3). The whole matter is finally reviewed by Isaac Abrabanel in *'Ateret Zekenim* and in *Shamayim Hadashim.*

The Opposition to **Aristotelianism.**—Judah Halevi had already rejected Aristotelianism in the 12th century, stressing the difference betneen "the God of Abraham" and "the God of Aristotle." After the death of Mairnonides, however, opposition became more articulate. and the conflict between philosophers and traditionalists fills the history of the Jews in Spain and in France during the 13th century Within the Christian Church of the period, moreover, anti-Aristotelian sentiment was also very strong. Among the Jews, one of the fiercest antagonists of Aristotelianism was Solomon Petit, a Kabbalist of northern France. toward the end of the 13th century. Other Jewish thinkers, such as Abba

Mari ben Moses of Montpellier, readily acknowledged Aristotle's merit as "the father of philosophy" who had demonstrated the existence, unity and incorporeality of God and who could not be expected to believe in creation or in miracles as he had received no divine revelation; but they maintained that a Jewish philosopher who made him his guide in matters of religion deserved to be proscribed. Aristotle's teachings were "like a jar of honey about which a dragon is wrapped." Abba Mari was instrumental in drafting the ban pronounced in 1305 in Barcelona by Solomon ben Abraham Adret, prohibiting the study of Greek natural science and metaphysics before the age of 25.

In the course of the ensuing battle of ban and counterban, opposition to philosophy on the part of the traditionalists stiffened. Attacks on philosophy and on Aristotle in particular became more frequent as the Kabbalah gained in influence; and Aristotelianism did not achieve within Judaism the status that Roman Catholicism eventually accorded to it. Yet in many ways some of the key notions of Aristotelianism, such as matter and form, active and passive intellect, potentiality and actuality, retained their currency in Jewish thought. Above all, Aristotle remained an object of study among Jews by virtue of the fact that the classical works of medieval Jewish philosophy, notably Maimonides' *Guide,* never ceased to attract students interested in a rational approach to Judaism.

MODERN JEWISH PHILOSOPHY

Modern Jewish philosophy reflects the fundamental changes in outlook characteristic of the period from Descartes onward. It no longer seeks to harmonize revelation and reason as two distinct bodies of truth, but tries to delineate the significance of religion within the general framework of human reason or, later, as a basic attitude toward the situation in which man finds himself.

Moses **Mendelssohn.**—In Moses Mendelssohn (1729–86), the new philosophical approach is inspired by the intellectual climate of the German *Aufklärung,* of which he was a distinguished representative: he bases his Jewish philosophy on Leibniz's distinction between truths of fact and truths of reason. For him the source of religious truth is not historical revelation, but the "natural light" of human reason: the basic affirmations of religion—the existence of a personal God and the immortality of the human soul—are universal truths on account of their "reasonableness"; manifest at all times, they do not depend on historical revelation. Following a suggestion made by Spinoza, he restricts the significance of historical revelation to the realms of practical morality and of religious law: Judaism is not a revealed religion but a revealed law. Judaism thus shrinks to a body of divinely ordained legislation but at the same time expands into a universal religion of reason.

Kantianism and the 19th-Century Idealists.— The rise of Kantianism accentuated the division between the theoretical and practical spheres which Mendelssohn had accepted. The destruction of rational theology, cosmology and psychology which Kant accomplished made religion wholly dependent on moral philosophy and turned it into an expression of practical reason. Kant's moral and religious philosophy proved exceedingly attractive to Jewish thinkers of the period. Moritz Lazarus (1824–1903), the founder of comparative psychology in its anthropological aspect, interpreted Judaism as a system of autonomous ethics in the light of Kant's categorical imperative. Hermann Cohen (1842–1918), the originator of the Marburg school of neo-Kantianism, evolved a Jewish religious philosophy from the premisses of his own system. Against Hegel, who had made ethics a part of his panlogistic metaphysics, Cohen emphasizes the essential difference between the moral and the ontological. He hailed Kant's division of the two spheres of nature and morality and upheld it with particular emphasis against Spinoza's assertion that the will and the understanding were the same. Cohen's spirited rejection of the monistic principle reflects the biblical consciousness of a holy God who transcends nature: God and nature must not be identified; and the Jewish concept of God's unity expresses the uniqueness and incomparability of God. The idea of God, however, is related to nature as well insofar as it both invests the moral sphere with the aspect of eternal value and guarantees the maintenance of the physical world as a realm for moral realization. Cohen thus gives the Messianic ideal of Judaism a philosophic expression: the idea of God creates the concept of human history as a field for the working-out of God's purpose which is the unification of all mankind under the law of morality. In *Die Religion der Vernunft aus den Quellen des Judentums* (Leipzig, 1919), recognizing that the concepts of humanity and universal history are insufficient to give meaning to the individual existence of man, Cohen breaks the magic circle of his idealistic philosophy in founding the meaning of religion, not on the universal idea of morality, but on the personal "correlation" between God and the individual soul.

The idealist movements of the 19th century inspired Solomon Formstecher (1808–89) and Samuel Hirsch (1815–89) to recast the systems of Schelling and of Hegel respectively, in order to assess the true significance of Judaism within the dialectical process of history. Schelling, claiming that spirit and nature were expressive of each other and represented two equal aspects of the absolute, had arrived at a philosophy of pantheism; and Hegel, recognizing in nature a lower form of the self-realization of mind, had concluded all that is real is essentially reasonable and good. Formstecher and Hirsch reject these total or partial identifications and subordinate nature to mind. The spirit, they maintain, is. first and foremost, the self-consciousness of nature and is therefore capable of understanding nature and of artistic creation. But mind is also consciousness of itself, of free will and of the ethical ideal. Freedom is the essence of the spirit. Whereas pagan religion, embracing the aesthetic ideal, deifies nature and sees the destiny of man as apotheosis, Judaism, being the religion of the spirit, places God above nature and considers it the duty of man to become free like God but does not deify man. Judaism is superior to paganism inasmuch as the spirit is superior to nature. Revelation becomes, in terms of Hegelian dialectic. the awakening of the consciousness of the ideal: at the first stage—that of historical revelation—the ideal appears to be given from without, as something external (this is prophetic revelation and, as such, is an illusion); at the next stage prophetic teaching is embodied in Scripture and becomes part of a religious tradition; at the third and final stage the mind recognizes itself as the source of the ideal and embraces it as its own child. The old conflict between reason and revelation is thus dissolved not by logical harmonization but by the concept of historical development.

In radical opposition to this view, Solomon Steinheim (1789–1866) affirms that religious truth belongs to revelation only: the teachings of revelation are incompatible with and irreducible to reason; and the latter must sacrifice itself to give way to the former. His position recalls the impassioned stand made by Sören Kierkegaard against Hegel.

Existentialism.— Jewish philosophy from Mendelssohn to Cohen can be seen, on the whole, as a sustained effort to interpret Judaism as the religion of reason par excellence. In the 20th century Jewish philosophers abandon this position and turn toward an existentialist interpretation of religion, in protest no less against the idealistic identification of revelation and reason than against the medieval harmonization of religious and philosophic truths.

Franz Rosenzweig (1886–1929) in *Der Stern der Erlosung* (Frankfurt-am-Main, 1921) and Martin Buber (1878–) in I and *Thou* (Eng. trans. by R. G. Smith, Edinburgh, 1937) evolve a philosophy that seems to revert to the fundamental attitude implied in the prophetic consciousness. Not the formal truths of logic in their timeless, abstract essence, but the truths brought out in the relationships of human beings with God and with one another are the really vital and relevant ones. They are truths which spring from the presentness of time. Traditional philosophy with its stress on contemplation had made God into an object, an "it" to be known. The "new thinking" which Rosenzweig and Buber advocate is centred in the I-thou relationship, with its emphasis on response and on action rather than on contemplation. This existentialism is not an attempt to make man's existence the measure of all things (which might be a renewal of idealism in disguise): on the contrary, it assumes the task of interpreting the relations existing between God, man and the world. These rela-

tions are brought out in full by the terms creation, revelation and redemption God is as much alive as the gods of mythology; the world is complete in itself, as are the works of plastic art; and man, thrown back upon himself, is as stubbornly and willfully closed against God as the hero of the Greek tragedy. The importance of classical antiquity lies in the fact that it faithfully portrays the elementary situation of God. world and man. Here Rosenzweig sees the relative truth of paganism: it is truth in an elementary, unrevealing form, but it must not pretend to be the whole and complete truth. Only when God, the world and man enter into relationship with one another do they fully reveal themselves: as this revelation happens in time, it is inaccessible to the pure reason. Truth itself depends on time; and only the future will show whether it is verified by the three factors of history.

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JEWISH SECTS DURING THE SECOND COMMONWEALTH. A series of different sects. indicating considerable controversy and divereency, emerged in Judaism during the period of the Second Temple (516 B C.–A.D. 70) and especially during the second commonwealth in Palestine. Modern Judaism and, to a lesser extent. Christianity are the outcomes of this series of internal religious controversies. The sects represented philosophies ranging from conservatism to extremism, from asceticism to activism and from rigid orthodoxy to religious liberalism, and their differences reflected not only religious but also social, political, economic and religious issues.

The second commonwealth may be considered to have lasted from the successful Maccabaean revolt for independence in the 2nd century B.C., through the Roman period, to the fall of Jerusalem and the destruction of the Temple in A.D. 70. For the history of the period. see JEWS: Greek and Roman Conquests; PALESTINE: History. Another sect, not comparable with those discussed below, is described in the article SAMARITANS.

PHARISEES

The Pharisees (Heb. Perushim) emerged as a distinct group shortly after the Maccabaean revolt, about 165–160 B.C., probably deriving from the Assideans (or Hasideans; Greek form of Heb. *Hasidim,* "pious ones").

Assideam. — The Assideans were probably organized as a sect during the 4th or 3rd century B.C. to revive and promote the observance of Jewish rites, to study the Law and to uproot paganism from the land. The group is first mentioned by this name during the persecutions of Antiochus IV Epiphanes in the 2nd century B.C., when its members joined and became the nucleus of the Maccabaean revolt against the Syrians. They refused to compromise in any way nith the Hellenizing policy of the Syrians and willingly suffered torture and martyrdom rather than desecrate the sabbath or violate other Jewish observances. Explicit references to the Assideans are found in the Apocrypha (Books of Maccabees) and in the Talmud. In I Macc. ii, 42 it is recorded that they were 'mighty warriors of Israel, every one who offered himself willingly for the Law." In I Macc. vii they are described as welcoming peace with the Syrians when the latter offered them assurance of religious liberty. They ceased to co-operate with the Hasmonaean dynasty in the fight for political independence. References to Hasidim (rendered in the English Bible as "saints" or "the godly") are found in Psalms (xii. 1; xxx, 4; xxxvii, 28), where their efforts to observe the Law. their persecutions by their adversaries and their struggles against their enemies are referred to; it is doubtful whether these accounts refer to the Assideans as such. The *Hasidim* mentioned in the Mishnah and the Talmud (Berachot vi; *Hagigah* ii, 7; *Sotah* iii, 4; Aboth v, 10; and *Niddah* 17a) may be the Assideans or merely pious persons of a later period. The Talmud refers to the strict observance of the commandments by the Hasidim, to their ardent prayers (which they would not renounce even at the risk of their lives) and to their observance of the sabbath. Because of this meticulous legal observance. the Assideans have been linked uith the Essenes, but the consensus is that they were the spiritual forerunners of the Pharisees.

Origins of the Pharisees. — For two centuries following the Babylonian Exile (586–516 B.C.) the high priesthood provided the sole leadership of the Jewish people. Gradually, however, learned men and scribes (*q.v.*) of nonpriestly descent began to play a role in the conduct of the religious and, to a lesser extent, the secular affairs of the people, and by the beginning of the 2nd century B.C. the Sanhedrin (*q.v.;* the supreme Jewish council and tribunal of the Second Temple period) was composed of both priests and lay leaders. One of the chief problems of the Sanhedrin was to find in the ancient Torah of Moses answers to questions and bases for decisions about contemporary matters arising under circumstances far different from those of the time of Moses. A conflict developed between priests and laymen over the approach to this problem. Two parties emerged, and in the course of time their theological differences became entangled with politics, Under John Hyrcanus (135–106) the nonpriestly teachers were excluded from membershio in the assembly of the Sanhedrin and branded by the priestly party as Dissenters or Separatists (Heb. Perushim, "Pharisees"). The name was meant as a taunt, but the group accepted it and took it up. interpreting it as a title of honour (Perushim can also mean the interpreters or the exponents of the Torah). A long-drawn-out struggle ensued as the Pharisees tried to democratize the Jewish religion and remove it from the rigid control of the Temple priests.

The Pharisees, though they exercised great political power, were not primarily a political party but a society of scholars and pietists. They enjoyed a large popular following—in Josephus and in the New Testament they appear as spokesmen for the majority of the population. Religious values towered so high above all their other concerns that the Pharisees would rather submit to foreign domination, so long as it did not interfere with their inner way of life, than to an impious Jewish government. On one occasion, three successive Pharisaic delegations appeared, at great personal peril, before Mark Antony, pleading for the removal of Herod. Again, during the great war with the Romans, two Pharisaic leaders, Johanan ben Zakkai and Josephus, made peace with Vespasian.

Attitude to Torah. — The basic differencethat led to the split between the Pharisees and Sadducees, the priestly party, lay in their respective attitudes toward the Torah and its interpretation in the solution of contemporary problems. The Sadducees, on the one hand, refused to accept any precept as binding unless it was based directly on the Torah, (the Pentateuch), the Written Law. The Pharisees, on the other hand, believed that the Law God gave to Moses was twofold, consisting of the Written Law and the Oral Law. For the Pharisees, the Torah was divine revelation to man, contained in the five books of Moses, but it had been supplemented and explained by the teaching of the prophets and by unwritten traditions of the fathers. They admitted the principle of evolution in the Law. hfen must use God-given reason m interpreting the Torah; the Law could never mean anything else than what the teachers understood it to mean. Since they did not follow blindly the letter of the Law, if it conflicted with reason or conscience, the Pharisees found no great difficulty in harmonizing the teachings of the Torah nith their ideas or in finding such ideas

suggested or implied in it. To discover such scriptural support they developed a ramified system of hermeneutics.

The Pharisees, in contrast to the Sadducees, interpreted the Law according to its spirit. When in the course of time a law had been outgrown, they gave it a new and more acceptable meaning. For example, they interpreted the Mosaic law of an eye for an eye (Ex. xxi, 24) as referring to monetary compensation and not retaliation. It was due to this progressive tendency of the Pharisees that their interpretation of the Torah continued to develop and has remained an everliving force in Judaism. (For a discussion of the evolution of the Oral Law and its relation to the Torah, see TALMUD.)

Theological Doctrines. — Conception of God. — From the prophets the Pharisees learned to think of God as a spiritual being, omnipotent, omnipresent and just, all-wise and all-knowing, all-merciful and like a father loving all his creatures. He must not be represented in any image and cannot be likened to any other being. None of the expressions in the Torah that speak of him in anthropomorphic terms is to be taken literally. God was conceived of as the One whom no human being could fully comprehend, for he is transcendent. Even the use of his name is to be avoided, except in prayer and in reading of the Scriptures, since no name can describe his essence or the totality of his being. The Pharisees spoke of him in such terms as the "Creator of the World," the "Merciful One," the "Divine Presence" and the "Spirit of Holiness."

Divine Providence and Free Will. — Another point of difference between Pharisees and Sadducees lay in their respective positions regarding free mill. The Sadducees believed that God does not concern himself with human affairs. The individual is left to his own resources. To the people as a group God gives his protection if they fulfill his commands, just as he punishes them for violating laws stipulated in his Covenant. The Pharisees believed that God takes cognizance of all human doings, but with the belief in divine providence and prescience they combined belief in the freedom of will; there is no virtue in doing good if man does not have the power to choose between good and evil. In talmudic reports the followers of the Pharisees declare, "Everything is in the hands of God but the fear of God" (Berachot 33b), and although "everything is foreseen, yet freedom of choice is given" (Aboth iii, 15). As the Talmud puts it, "If a man chooses to do good the heavenly powers help him. If he chooses to do evil, they leave the way open to him" (Shabbath 104a).

Divine Retribution. — Belief in man's responsibility for his conduct leads to belief in divine retribution. According to Josephus, the Pharisees believed that souls have an immortal vigour and "that under the earth there will be reward and punishment according as they have lived virtuously or viciously in this life."

Immortality and Resurrection. — According to the Talmud and the New Testament, the Pharisees believed in the resurrection of the dead. This belief in another world makes possible the belief in divine justice in the face of apparent injustices on earth: a practical solution to a nagging problem that threatened to tempt man from virtue and cause him to abandon the pursuit of righteousness. Ideas of immortality and resurrection are generally attributed to Greek or Persian origins, yet to the Pharisees it was a genuine Jewish belief based on passages in the Torah.

Humanity. — The Pharisees were also concerned with the salvation of their people and of humanity, and with the future of this world when all mankind will accept the Law and believe in One God. According to the Pharisees, all men are born equal. Israel's position among the other nations is that of an older brother, since it was the first to recognize God as the Father, and it is Israel's duty and function to help other peoples to do so. It was for this reason that God gave the Torah to Israel in the wilderness and not in Palestine. Probably with this in mind, the Pharisees engaged in active prcselytism. In the words of the New Testament, they did "traverse sea and land to make a single proselyte" (Matt. xxiii. 15).

Divine Worship. — The Pharisees believed that from the rising of the sun until its setting the Lord's name must be praised (Ps. cxiii, 3) and that there was no place where God could not be found and reached in prayer. He could and should be worshiped even away from the Temple and outside Jerusalem. Worship consisted not in bloody sacrifices — the practice of the Temple priests — but in prayer and study of God's Law. Hence the Pharisees fostered the synagogue as an institution of religious worship, outside and separate from the Temple. The synagogue may be considered a Pharisaic institution, since, though it was not they who founded it, the Pharisees developed it, raised it to high eminence and gave it a central place in religious life.

New Testament References. — While the Pharisees, as a body, set for themselves a high ethical standard, not all Pharisees lived up to it. The Talmud itself lists seven hypocritical types of Pharisees. The derogatory references in the New Testament (Matt. xxiii, 2 ff.; Luke xviii, 10 ff.; etc.) to the Pharisees as "hypocrites" and "offspring of vipers" were probably directed not at the entire Pharisaic group but at the minority who were condemned by leaders of the Pharisees themselves as "sore spots" or "plagues of the Pharisaic party" (Sotah iii, 4 and 22b). Many Pharisaic doctrines indeed have a great deal in common with those of Christianity. Paul boasted of being a Pharisee and the son of Pharisees (Acts xxiii, 6); he was educated "according to the strict manner of the law of our fathers" by Gamaliel (Acts xxii, 3), a "teacher of the law" (Acts v, 34), probably grandson of the great Pharisee Hillel.

Evaluation. — The active period of Pharisaism, the most influential movement in the development of orthodox Judaism, extended well into the 2nd and 3rd centuries A.D. The Pharisees preserved and transmitted Judaism. The deepest and most stable elements among the forces that built Judaism and the Jewish people ,were contained in Pharisaism. Unlike the Zealots, the Pharisees rejected the appeal to force and violence, believing that God was in control of history, that Israel and the nations would be redeemed in God's good time and that in the meanwhile every true Jew should live in accordance with the Torah. It is not surprising, therefore, that the Pharisees devoted much effort to education. After the destruction of the Temple and the fall of Jerusalem, it was the synagogue and the schools of the Pharisees that continued to function and promote Judaism.

SADDUCEES

The Sadducees (Heb. Tsedukim) were formed about 200 B.C. as the party of high priests, aristocratic families and merchants — the wealthier elements of the population. While the Pharisees claimed the authority of piety and learning, the Sadducees claimed that of blood and position. During the long period of the two parties' struggle — which lasted until the destruction of Jerusalem and from which the perspective of history shows the Pharisees to have emerged triumphant — the Sadducees dominated the Temple and Sanhedrin.

Origins. — The name Sadducees may be derived from that of Zadok, the high priest in the days of David (II Sam. viii, 17 and xv, 24) and Solomon (cf I Kings i, 34 ff.). Ezekiel (xl, 46; xliii, 19; and xliv, 10–15) selected this family as worthy of being entrusted with the control of the Temple, and in fact Zadokites formed the Temple hierarchy down to the 2nd century B.C. Not all priests were Sadducees, however; the name may best be taken to mean anyone who is a sympathizer with the priestly descendants of Zadok. In the talmudic literature the designations Boethusians and Sadducees are used interchangeably, though some scholars believe that the Boethusians were merely a branch of the Sadducees, deriving their name from their leader, Boethus. The Sadducees came under the influence of Hellenism and later were in good standing with the Roman rulers, though unpopular with the common people.

The rivalry between the priestly and nonpriestly parties was. in a sense, the renewal of a conflict between the prophets and priests of pre-exilic times. Following the restoration of the Temple (516 B.C.) and its sacrificial cult, the priests were also restored to their former position as religious leaders. The rise of learned laymen and scribes who possessed a knowledge of the Law, however, caused the authority of the priests to be questioned. Greek rule also probably helped to weaken priestly authority, for among

the Greeks priests were the servants, not the leaders, of the community.

Sadducean Beliefs.—Throughout the second commonwealth period the Sadducees represented the conservative view. Their main difference with the Pharisees was concerned with their attitude toward the Torah (see above, Pharisees: Attitude to Torah). The theological struggle, as J. Z. Lauterbach puts it, was actually a struggle between two concepts of God. The Sadducees sought to bring God down to man. Their God was anthropomorphic and the worship they offered him was like the homage paid a human king or ruler. The Pharisees, on the other hand, sought to raise man to divine heights and to bring him nearer to a spiritual and transcendent God. The Sadducees denied the doctrine of the resurrection of the body (Mark xii, 18; Matt. xxii, 23: Luke xx, 27; Acts xxiii, 8), they denied (according to Josephus) the immortality of the soul and they rejected the Pharisaic doctrine regarding the existence of angels (Acts xxiii, 8). The Sadducees, because of their strict adherence to the letter of the Law, acted severely in cases involving the death penalty; the Mosaic principle of lex talionis, for instance, they interpreted literally. Further, the Sadducees, holding to the older doctrines and cherishing the highest regard for the sacrificial cult, were strongly opposed to any reform in the Temple. The two parties also differed over numerous legal and ritualistic details.

The Sadducean hierarchy had its stronghold in the Temple, and it was not until the last two decades of the Temple's existence that the Pharisees finally gained control. Since the whole power and raison *d'être* of the Sadducees were bound up with the Temple cult, the group ceased to exist after its destruction.

New Testament References.—In the New Testament, John the Baptist condemned both the Pharisees and the Sadducees, calling them a "brood of vipers" and challenging them to "bear fruit that befits repentance" (Matt. iii, 7 ff.). In his denunciation of their doctrines, Jesus, too, grouped Sadducees and Pharisees together (Matt. xvi, 6 ff.), and both parties were said to have posed captious questions designed to perplex Jesus. According to Acts (iv, 1 ff.; v, 17), Peter and John were imprisoned by the Sadducees.

ASCETIC SECTS

Essenes

The Essenes were a religious communalistic sect or brotherhood found in Palestine from about the 2nd century B.C. to the end of the 1st century A.D. The name is of uncertain origin but probably derives ultimately from Heb. *'syym*, "healers." Chief sources of information about them are the Jewish philosopher Philo of Alexandria, the Jewish historian Josephus and the Roman Pliny the elder.

The brotherhood's members clustered in monastic communities from which, with few exceptions, women were excluded. In the course of time the communities developed into more closely linked units, and by the end of the 1st century B.C. the main group was located in the northwestern Dead sea region, organized as a monastic order. The Essenes, according to Philo, were never numerous; there were 4,000 in his day. Historically they have a great deal in common with the Pharisees, both sects stressing the need for meticulous observance of the Law and for avoidance of the impurities of daily life. But the Pharisees took an active part in public life and continued to participate in Temple worship even when that worship was controlled by the Sadducees, while the Essenes, except for a few individuals, withdrew from the larger community. It appears that they deemed themselves the only true Israel and regarded the religious observances in the cities and the Temple as corrupt. They may be regarded as the extremist wing of the Pharisees, probably deriving also from the Assideans.

Practices and Rites.—It is probable that the Essenes first lived as small communities or brotherhoods of men intent on strict observance of the Torah. This led naturally to a strong emphasis on ritual precision, the sabbath and the levitical laws of purity being observed with particular strictness. The brothers met at dawn for prayers, worked till about 11 A.M., then gathered and, clad in white linen garments, bathed in cold water. They had their midday meal together, in silence, with a priest reciting grace before and after the meal. Then they worked until evening and again ate together, again in silence. They spent the entire sabbath in prayer, meditation and study of Torah.

The younger brothers ministered to the elder; seniority and learning were the basis of position in the Essenic society. All activities were regulated by designated officials; only in deeds of mercy and charity toward the aged or the sick was individual initiative exerted.

In principle, the Essenes objected to oaths, but an oath once taken could not be rescinded. Since they observed strict purity in their food and refrained from eating anything prepared by outsiders, excommunicated persons could soon be starved into obedience. However, expulsion seems to have been almost unknown and disobedience rare. The Essenes supported themselves by manual labour, avoiding commercial and military pursuits and dispensing with the labour of slaves. They opposed private ownership of property and were celibate. Despising luxury and pleasure, they did not anoint their bodies with oil. The Essenes declined to take part in Temple rites involving animal sacrifice and brought to the altar offerings of flour and oil only. They studied the books of their ancestors and had some knowledge of medicine. Blasphemy against God was punishable by death.

Doctrines.—According to Josephus, the Essenes attributed all things to fate. They believed in the immortality of the soul but not of the body, from which, in their view, the soul will be gladly delivered. They also believed in reward and punishment and in resurrection after death. Josephus stresses the belief of the Essenes in the resurrection and states that their doctrines were borro ed by the Pythagoreans and Stoics. He observes that the Essenes are the oldest of ascetics and that it was from Egypt that their doctrines spread abroad. Certain scholars believe that they were under foreign influence, pointing to the fact that they worshiped facing the sun, not the Temple, and suggesting that Essenic belief in immortality is derived from Greek or Iranian influences. Such beliefs, however, are thoroughly Jewish and are found among the Pharisees and the Qumran sect.

Initiation.—The Essenes recruited members by adopting proselytes, who had to undergo an arduous probationary period. A candidate had to wait a year before he was given the emblems—hatchet, belt and white garment. Then he was allowed to follow the routine and receive purifying washings, but he was not yet permitted to take part in the common meals. If he proved himself worthy for two more years he was then admitted to the society, but not until he had taken an oath to observe the rules. Josephus, who states that he himself underwent the probationary period but then resigned, says that the oath exacted from the initiate, before he was allowed to share the common meal, was as follows: To be pious to God, to practise justice toward men; never to injure anyone, either of his own accord or under compulsion; always to hate the wicked and side with the just; ever to show faithfulness to all mankind and to be true to those in authority, for all power comes from God; never when in offices to force his personal views or authority or to assume a special dress or luxury; to love truth and hate falsehood; to keep his hands pure of theft and his soul from unrighteous gain; not to have any secret from his brethren and never to betray one of theirs, even at the cost of his life; to pass on the traditions he himself had received; never to be a brigand; to safeguard the sacred books and to preserve, with care, the names of the angels that had been taught him.

The Essenes and the New Testament.—There is no reference to the Essenes in the New Testament. It is possible that John the Baptist, who lived, preached and baptized in the Jordan river only a few miles from a community of Essenes, was influenced by them. Some New Testament scholars also believe that the apostolic church incorporated Essenic elements in its structure.

Varieties of Essenism.—A study of the Essenes is complicated by the term "Essene" itself, which was used to describe individuals and brotherhoods differing widely in significant tenets. Josephus, for instance, speaks of an Essenic order whose members approved of restricted conjugal intercourse until children had been born; Pliny, on the other hand, asserts that the Essenes abstained from

marriage altogether. Other bodies of pre-Christian Jews who lived a monastic life were the 'Therapeutae and the Qumran (Dead sea scrolls) sect. The Hemerobaptists, or Tobele-Shaharith, comprised another monastic group whose daily ablutions were a matter of ritual; Epiphanius, 4th-century bishop of Salamis, refers to them as the fourth heresy among the Jew and classes them doctrinally with the Pharisees, noting, however, that, like the Sadducees, they denied the resurrection of the dead.

Common to all the varieties of Essenes were the circumstances that each lived a monastic life and formed a homogeneous body, ruled by officers acting in accordance with traditional laws, and possessing initiatory oaths and ceremonies incumbent on the neophyte. Greek sources make it clear that they are speaking of sects. Rabbinic writings, on the other hand, speak of individuals or informal groups, lacking the cohesion and permanence implied by the Greek sources. Probably both are correct; allowance must be made for the fact that the Greek accounts are connected descriptions, possibly even coloured by the desire to heighten parallels to other bodies, while rabbinic sources contain only incidental references.

Qumran Community

Shortly after the discovery of the Dead sea scrolls, scholars began to note resemblances between the community described in the scrolls and the Essenes as described by Josephus, Philo and Pliny. Both the Qumran sect and the Essenes had separated themselves from the normative Judaism of their day, including Temple services. The Qumran community, too, had rules of discipline; a superintendent or overseer was responsible for the lives of members; possessions were held in common; newcomers had to undergo a period of probation, and the uninitiated were excluded from the community meal; ritual lustration was practised.

On the other hand, there are differences between Essenic and Qumran practices, The Essenes, although they repudiated animal sacrifice, sent gifts of flour and oil to the Temple; Qumran was completely separated from the Jerusalem priesthood. Priests apparently were not prominent among the Essenes; the Qumran writings indicate that in that community they were. Moreover, there is no reference to an Essenic leader comparable with the "Teacher of Righteousness" of the Qumran sect.

The majority of scholars classify the Qumran community as Essene or as an Essenelike sect. Others, with not much success, have pointed to parallels with Pharisees, Zealots, Ebionites and other groups (see also Dead Sea Scrolls).

Therapeutae

The Therapeutae (Gr. "healers" or "attendants"), a sect of ascetics closely resembling the Essenes, are believed to have settled on the shores of Lake Mareotis in the vicinity of Alexandria, Egy., during the 1st century of the Christian era. The only original account of this community is given in De Vita Contemplativa ("Concerning the Contemplative Life"), attributed to Philo. Their origin and fate alike are unknown. The sect was characterized as being unusually severe in discipline and mode of life. According to Philo, the members, both men and women, devoted their time to prayer and study. They prayed twice every day, at dawn and at eventide, the interval between being spent entirely on spiritual exercise. They read the Holy Scriptures, from which they sought wisdom by treating them as allegorical, believing that the words of the literal text were symbols of something hidden. Attendance to bodily needs, such as food, was entirely relegated to the hours of darkness. Some ate every other day, while others ate on only one single weekday; all abstained from wine and meat. Upon joining the sect a man no longer belonged to the world and voluntarily assigned his property to his heirs.

Members of the community lived in separate and scattered houses, close enough together to afford mutual protection yet not too close to deprive members of solitude. Each house contained a chamber or sanctuary, consecrated to study and prayer (cf. Matt. vi, 6). The Therapeutae had. in addition to the Old Testament, books composed by the founders of their sect on the allegorical method of interpreting Scripture. Philo's account refers to the composition of "new psalms" to God in various metres and melodies.

For six days a week members lived apart, seeking wisdom in solitude. On the sabbath they met in the common sanctuary, where they listened to a discourse by the member most skilled in their doctrines and then ate a common meal: coarse bread, flavoured with salt and sometimes hyssop, and a drink of spring water. The sect. according to Philo, revered the number seven and its square, but the most sacred of numbers was 50. Thus on the eve of the 50th day they observed an all-night festival, with a discourse, hymn singing and a meal, followed by a sacred vigil.

The main distinction between Therapeutae and Essenes, as S. W. Baron observes, is that the latter were anti-intellectual, while "wisdom," Philo says, was the main objective of the Therapeutae. Further, the Alexandrian group is described as upper-class, while most Essenes apparently were of the lower classes. The Therapeutae shared with the Essenes a dualistic view of body and soul and an affection for the secret doctrine that underlies the literal word of the Scriptures.

Ascetic Sects and Christian Monasticism

Neither the Essenes nor the Therapeutae nor the Qumran sect left a permanent trace on Jewish life; on the other hand, their semimonastic communities were probably the prototype of a great development in the Christian church. To the modern reader, the importance of all the pre-Christian Jewish ascetic sects lies in the evidence they afford of the existence of a monastic system long before the Christian era. The Greeks who followed Alexander to India make reference to the Indian ascetic philosophers (gymnosophists), but the first-known form of organized monasticism in the Mediterranean world was Essenism. Eusebius (A.D. 260–339) was so struck by the similarities between the Therapeutae and the Christian monks of his own day as to claim that the Therapeutae were Christians converted by the preaching of St. Mark. N. Bentwich observed in this connection that the emphasis on individual salvation and the breaking away from the national life and the national Law cut these sects off from the Jewish people and led to their absorption into the Christian body.

ZEALOTS AND SICARII

The Zealots (Heb. Qanna'eem; Gr. Zelotes), a sect of activists — indeed, sometimes terrorists — whose members relentlessly opposed the attempt to bring Judaea under the dominion of idolatrous Rome, regarded themselves as defenders of the Law and the national life of the Jewish people. They were first influential in Galilee and later in Jerusalem, especially from the time of Herod (37 B.C.–A.D. 4) until the fall of the city. They were members of one of the parties that loosely formed what Josephus called the "Fourth Philosophy," and by this definition were distinguished from Pharisees, Sadducees and Essenes. The main characteristic of the Fourth Philosophy was strong opposition to foreign rule. Sicarii, or Assassins, is a term applied in the two decades immediately preceding the destruction of Jerusalem to the extreme Jewish Zealots. Members of this group concealed under their cloaks small daggers or sicae (Gr. sikarioi, "daggermen," "assassins'), with which, at public places and assemblies, they stabbed their opponents who were friendly to the Romans.

Under the leadership of Hezekiah (a Zealot martyr who was beheaded by Herod without trial) and his sons, the Zealots becdme an aggressive political party that would accept no compromise and make no peace with Rome. Josephus says it was the introduction of Roman institutions antagonistic to the spirit of Judaism (such as the gymnasium and the arena) that provoked the indignation of the people. The Zealots were active in Galilee in A.D. 6 at the time of the revolt of Judas of Gamala against the taking of the census (assessing property for taxation) on the grounds that compliance with the Roman demand would constitute an act of enslavement. Some scholars, therefore, believe that the Zealot party was formed during this revolt, though there is little evidence to support the view.

The Zealots are mentioned but not described in the Gospels, the term being applied as a designation of Simon, a disciple of

Jesus, in Luke vi, 15 and Acts i, 13; the same disciple is called the Cananaean (from a Hebrew and Aramaic stem *qanna'*, "to be zealous") in Matt. x. 4 and Mark iii, 18.

The Zealots considered it an act of disloyalty to God to acknowledge Roman domination over Judaea and considered it their right to assassinate any Roman who dared enter the consecrated area of the Temple. In addition to refusing to pay taxes, they harassed the Roman administration with every means at their disposal. During the period immediately preceding the great rebellion against Rome in A.D. 66 they won followers from all social classes. The Roman successes in Galilee in that year weakened the Jewish government in Jerusalem and strengthened the position of the Zealots, who fled to Jerusalem and played an important role in the defense of the city. They terrorized their political opponents who accepted foreign rule, deposed the high priest and elected a successor by lot. However, because of their excesses, the population rose against them and drove them. under Eleazar ben Simon, into the inner court of the Temple. With the support of the Idumeans, the Zealots regained control of Jerusalem, under the leadership of John of Gischala, and resumed their acts of terror.

One of the chief leaders of the revolt in A.D. 66, Menahem ben Jair. a Sicarius, appears to have claimed messianic status; surrounded with royal pomp, he went up to the Temple to be crowned hut was slain by rivals within his own party. His supporters, including his relative Eleazar ben Jair, fled to Masada, on the shores of the Dead sea, and eventually committed suicide when the fortress was taken by the Romans in A.D. 73.

The Zealots were not, as Josephus pictured them, purely selfish and secularly motivated, but rather, like the early Maccabees, deeply patriotic and motivated by zeal for the Torah. Traditional Jewish history has declared itself in favour of the quietistic Pharisees, who regarded the house of study as more important to the Jews than the state and the Temple. Some modern historians, however, believe that the Zealots deserve recognition for their example of steadfastness.

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(ME. M.)

JEWISH WELFARE BOARD, NATIONAL, was founded by U.S. Jews in 1917, at the request of the war and navy departments, to meet religious, cultural, recreational and welfare needs of Jews in the armed forces. It provides these services through local volunteer committees assisted by a trained field staff. Its chaplaincy division procures and supervises full- and part-time chaplains for military establishments and the Veterans administration. The Jewish Welfare board is the only governmentally recognized Jewish organization to carry out this type of work, and it represents the Jewish community in the nonsectarian United Service organizations. In 1921 the board became also the service agency of the Jewish Community centres throughout the country. Representing Orthodox, Conservative and Reform agencies, the organization serves about 350 centres, with a membership of about 600,000, providing cultural and recreational opportunities for persons of all ages. (I. M. F.)

JEWS. The word Jew is derived through the Latin *Judaeus* and the Greek *Ioudaios* from the Hebrew *Yehūdhī,* a gentilic adjective. occurring only in the later parts of the Old Testament and signifying a descendant of Yehūdhāh (Judah, Judas), the fourth son of Jacob, whose tribe, together with that of his half-brother Benjamin. constituted the kingdom of Judah, as opposed to that of the remaining tribes (Israel). The name came to mean the followers of Judaism, the racial signification diminishing as the religious increased. ***See*** also separate articles, JUDAISM, JEWISH PHILOSOPHY, ZIONISM. ANTI-SEMITISM. etc. (H. M. J. L.)

The racial composition of the Jews has given rise to considerable controversy. Most observers profess to see in the Jewish type one of the most persistent varieties of the human race; others, including Ripley and F. Boas, believe that the Jews take on the physical traits of the people among whom they live. Certain observations — which, however, by no means include Jews from all over the world — seem to show that in the majority of cases the Jews tend to have rather round heads and show to an unusual degree the same amount of variation. They also tend to preserve other characters, the most noticeable being the form of the nose. There is a resemblance between Jews and Armenians. and though the Armenoid type predominates there are other features in their composition. S. A. Weissenberg suggests that there was within historic times a mixture, not in Palestine but in the Caucasus, between the Armenoid and a blond type, and that there are two types of Jews — the Semitic, dark with a fine nose, and Armenoid. with a coarser nose and an appearance of blondness.

This article is divided into the following main sections:

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I. EARLIEST TIMES TO A.D. 135

A. EARLY HISTORY TO THE EXILE

For the first two periods the history of the Jews is mainly that of Palestine. It begins among those peoples occupying the area between the Nile on the one side and the Tigris and the Euphrates on the other. Surrounded by ancient seats of culture in Egypt and Babylonia, by the deserts of Arabia and by the highlands of Asia Minor, Palestine, with Syria on the north, was the high road of

civilization: trade and warlike enterprise, and the meeting place of religions. Its small principalities were frequently dominated by the great powers, whose weakness or acquiescence alone enabled those principalities to rise above dependence or vassalage. The land was traversed by old-established trade routes and possessed important harbours on the Gulf of Aqaba and on the Mediterranean coast, the latter exposing it to the influence of the Levant. It was "the physical centre of those movements of history from which the world has grown." The portion of this district abutting upon the Mediterranean may be divided into two main parts: Syria (from the Taurus to Hermon) and Palestine (southward to the desert bordering upon Egypt). The latter is about 150 mi. from north to south (the proverbial "Dan to Beersheba"), with a breadth varying from 25 to 80 mi.; *i.e.*, about 6,040 sq.mi. This excludes the land east of the Jordan. (See also PALESTINE.)

By the 15th century B.C. Palestine was inhabited by a settled people. Petty princes ruled as vassals of Egypt, which, after expelling the Hyksos from its borders, had entered upon a series of conquests as far as the Euphrates. Some centuries previously, however. Babylonian influence had held sway to the west, and the Akkadian script and language were now used, not merely in the diplomatic correspondence between Egypt and Asia, but also among the Palestinian princes themselves. Canaan (Palestine and the south Phoenician coast land) and Amor (Lebanon district and beyond) were under the constant supervision of Egypt, and Egyptian officials journeyed round to collect tribute. to attend to complaints and to assure themselves of the allegiance of the vassals. The Amarna tablets and those found at Taannek (biblical Taanach) and at Boghaz Keui (see HITTITES. THE) combine with other archaeological evidence (Lachish. Gezer, Megiddo, Beth-shan, etc.) to reflect advanced conditions of life and culture. This, the "Amarna age." with regular maritime intercourse among the Aegean settlements. Phoenicia and the Delta, and with lines of caravans connecting Babylonia, north Syria. Arabia and Egypt, presents a vivid picture of life and activity. in the centre of which lies Palestine. with here and there Egyptian colonies and traces of Egyptian cults.

The Amarna age affords a tangible starting point for any estimate of Palestine and the history of Israel. The records reveal a state of anarchy in Palestine for which the weakness of Egypt and the downward pressure of north Syrian peoples were responsible. Subdivided into a number of small local principalities, Palestine was suffering both from internal intrigues and from the designs of the northern powers. A restless group, called the Habiru. now makes its appearance on the arena of Palestinian history. Many scholars identify the name Habiru with that of the Hebrews. but this statement requires qualification. The name Habiru is found in very early Mesopotamian tablets, where the application is not gentilic, but seems to refer to intruding foreigners. It is probably in this sense that it was used in the Amarna tablets (which were written by the vassal princes or governors of Palestine to the Egyptian king, Ikhnaton) and is descriptive of the hordes who came into the country over the eastern frontier. If the philological identification of Habiru with Hebrew is correct, then we may conclude that the term was and remained the designation (in the modified Hebrew form *'ibrim*) of that group of tribes that invaded, conquered and dominated Canaan; *i.e.*, the Hebrews (see IKHNATON.) In this Amarna age, the time had come when the fate of Palestine was no longer controlled by the great powers, and the curtain rises upon the historical traditions of the Old Testament.

1. Traditions of Origin.— The traditions about the Israelites' origins and of the formative years of their early history are found in the records of the Pentateuch. Though scholarly research has established the general conclusion that these narratives, in the literary form in which they have been preserved, are composite and bear the stamp of late (*i.e.*, monarchal and exilic) editing. it is nevertheless recognized that the basic materials in them are ancient. The strands in these composite accounts are regarded by many scholars not as independent late traditions but as recensions of original parent traditions. Confirmation of the detailed biographical accounts in the patriarchal sagas cannot, by their very nature, be expected from external sources. Yet the background in which these sagas are set conforms to the general pattern of social practice and historical situations in the contemporary near east.

The migration of Abraham from Ur Kasdim may be associated with the unsettled conditions in that area during the 18th century B.C., while movement between Mesopotamia and the Mediterranean coast is attested by cuneiform tablets. The mural painting of Beni Hasan in Egypt. dated in the early 19th century B.C. and depicting the arrival in Egypt of a Semitic group, brings to mind Abraham's arrival in that country. The "descent" into Egypt by the Jacob clan is endowed with historical reality in the light of the Hyksos (Asiatic) domination of Egypt. while the later enslavement of the numerically increased Jacob group fits in with the overthrow of the Hyksos by Amasis I about 1550 B.C. In the biographical accounts of the patriarchs, the expectation of the childless Abraham that his chief slave, Eliezer, would become his heir, and his taking of Sarah's handmaid, Hagar, as a secondary wife. are examples of current near eastern social custom. Likewise are the incidents in the Jacob-Laban disputes as. for example, Rachel's theft of Laban's teraphim (or household gods) to make Jacob heir to Laban.

The traditions that prevailed among the Israelites concerning their origin seem to have matured at a time not when Judah and Israel were "brother" or rival kingdoms, but when they formed one body and Judah was among the "sons" of Israel (or Jacob), the son of Isaac and grandson of Abraham. The names of the "sons," or rather tribes, vary in origin and probably also in age; and where they represent fixed territorial limits. the districts so described were in some cases certainly peopled by groups of non-Israelite ancestry. But as tribal names they invited explanation, and of the many characteristic traditions that were doubtless current, a number have been preserved, though not in any very early dress. Close relationship was recognized with the Aramaeans. with Edom, Moab and Ammon. Esau (Edom) is the "brother" of Jacob, Moab and Ammon are sons of Lot, Abraham's nephew. Abraham himself, it was traditionally narrated. came from Harran (Carrhae), primarily from Ur, of the Chaldees, and Jacob re-enters from Gilead in the northeast, with his Aramaean wives and concubines and their families (Benjamin excepted). It is on this occasion that Jacob's name is changed to Israel.

The story of the settlement of the tribal ancestors in Palestine is interrupted by an account of the southward movement of Jacob (or Israel) and his sons into a district under the immediate influence of the kings of Egypt. After an interval of uncertain duration there appears in the book of Exodus (*q.v.*) a numerous people subjected to rigorous oppression. No longer "sons" of Jacob or Israel, whose tribes were led out by Moses and Aaron; and, after a series of incidents extending over 40 years, the "children of Israel" invaded the land in which their ancestors had lived. For the details of their conflict see EXODUS, THE. The story of the "exodus" is that of the religious birth of "Israel," joined by covenant with the national god, Yahweh (see JEHOVAH; TETRAGRAMMATON), whose aid in times of peril and need proved his supremacy. In bloses (*q.v.*) was seen the founder of Israel's religion and laws, in Aaron (*q.v.*) the prototype of the Israelite priesthood. Modern scholarship gives due recognition to the personality of Moses and to his molding influence during the formative years following the Exodus; he is no longer regarded as a shadowy and unreal figure, whose historicity was doubted. Yahweh had admittedly been the God of Israel's ancestors, but his name was only now made known (Ex. iii, 13 et seq.; vi, 2 *et seq.*), and this conception of a new era in Yahweh's relations with the people is associated with the family of Moses and with small groups from the south of Palestine who reappear in religious movements in later history (see KENITES; RECHABITES).

Amid a great variety of motives the prominence of Kadesh in south Palestine is to be recognized; but it is uncertain what clans or tribes were at Kadesh, and it is possible that traditions, originally confined to those with whom the new conception of Yahweh is connected, were subsequently adopted by others who came to regard themselves as the worshipers of the only true Yahweh. Two quite distinct views can be distinguished. The one associates itself

with the settlement of the ancestors of the Hebrews and has an ethnic character. The other, part of the religious history of "Israel," is essentially bound up with the religious genius of the people and is partly connected with clans from the south of Palestine whose influence reappears later.

2. The Conquest of Canaan. — The book of Joshua continues the fortunes of the "children of Israel" and describes a successful occupation of Palestine by the united tribes. in striking contrast to other records of the partial successes of individual groups, whose association appears to have been rather loose (Judges i). The book of Joshua. however, is based upon the account of victories by the Ephraimite Joshua over confederations of petty kings to the south and north of central Palestine, apparently the traditions of Ephraim describing from its own standpoint the conquest of Palestine. The book of Judges represents a period of unrest after the settlement of the people. External oppressions (Moab, Ammon. Philistines. etc.) and internal rivalries rent the Israelites; and the religious philosophy of a later (Deuteronomic) age represents the period as one of alternate apostasy from and of penitent return to the Yahweh of the "exodus," and the Israelites' deliverance by "judges." The best narratives relate to Israel and Gilead; Judah scarcely appears, and in an old poetical account of a great fight of the united tribes against a northern adversary the tribe of Judah lies outside the writer's horizon of interest and is not mentioned (Judges v; see DEBORAH).

Stories of successful warfare and of temporary leaders (see ABIMELECH; EHUD: GIDEON; JEPHTHAH) form an introduction to the institution of the Israelite monarchy. The background picture of the period of the Judges, as depicted in the book of that name, fits into the general pattern of contemporary political conditions in the near east. The country and the adjacent petty states were free from the domination of the great powers, and the whole area became the scene of local contending interests in the absence of external imperial pressures. The report of the Egyptian Wenamon (in the 11th century B.c.) suggests a background of low Egyptian prestige and the re-emergence of petty local princes. The consolidation of the territorial gains made by the Hebrew tribes and the prospects of further expansion were menaced by the emergence of a new local power, the Philistines. Expelled from Egypt after their attempt to obtain a foothold there, they settled in the coastal plain of Palestine. They were a highly civilized people and far in advance of the Hebrews in the arts of warfare and in effective weapons, and the contest between them and the Hebrews for supremacy was inevitable. To meet this challenge a united front by the Hebrew tribes was essential, and the loosely associated tribes federated into a national unit. This federation was cemented by the establishment of a monarchy and a new epoch was ushered in, the importance of which was supreme for the future history of Israel.

3. The Monarchy of Israel. — The heroic figure who stands at the head is Saul ("asked"), and there are conflicting accounts of his rise. (See SAMUEL, BOOKS OF.) The Philistines (*q.v.*), newly settled in the land, held the people in subjection, and their defeat is ascribed by the later account to the godly prophet-judge, Samuel, and by the earlier to Saul. The first of a series of annals of the kings of Israel ascribes to Saul conquests over the surrounding peoples to an extent implying that the district of Judah formed part of his kingdom (I Sam. xiv, 47 et seq.). His might is also attested by the fine elegy (II Sam. i, 17 et seq.) over the death of two great Israelite heroes, Saul and Jonathan, knit together by mutual love, inseparable in life and death, whose overthrow by the Philistines on the plain of Jezreel was a national misfortune. The court was removed across the Jordan to Mahanaim, where Saul's son, Ishbaal (Ish-bosheth), thanks to his general, Abner, recovered some of the lost prestige and reigned two years over Israel and Gilead (II Sam. ii, 8–10; contrast the figure in v, 11). But at this point the scanty annals are suspended and the history of the age is given in more popular sources. Israelite national history has come down through Judean hands, with the result that much of it has been coloured by late Judean feeling, and the Judean account of the beginning of the monarchy.

4. David and Solomon. — Certain traditions of Judah and Jerusalem appear to have looked back upon a movement from the south, traces of which underlie the present account of the "exodus." The land was full of "sons of Anak," giants who had terrified the scouts sent from Kadesh. Caleb alone had distinguished himself by his fearlessness, and the (semi-Edomite) clan Caleb drove the Anakites out from Hebron in south Judah (Josh. xv, et *seq.;* cf. also xi, 21 et seq.). David and his followers are found in the south of Hebron. and as they advanced northward into a hostile district they encountered wondrous heroes between Gath and Jerusalem (II Sam. xxi, 15 et *seq.;* xxiii, 8 et seq.). (See PHILISTINES.) After strenuous fighting the district was cleared, and Jerusalem, taken by the sword, became the capital. Tradition saw in David the head of a lengthy line of kings, the founder of the Judean monarchy, the psalmist and the priest-king who inaugurated religious institutions. The rise of Jerusalem, the centre of postexilic Judaism, demanded explanation. Israelite tradition had ascribed the conquest of Jerusalem, Hebron and other cities of Judah to the Ephraimite Joshua; Judean tradition, on the other hand. relates the capture of the sacred city from a hostile people (II Sam. v).

The famous city, within easy reach of the southern desert and central Palestine (to Hebron and to Samaria the distances are about 18 and 35 mi. respectively), had entered into Palestinian history in the Amarna age and had an old religious history. But Judean tradition dated the sanctity of Jerusalem from the installation of the Ark (*q.v.*), a sacred movable object, the symbol of the presence of Yahweh. It is associated with the half-nomad clans in the south of Palestine, or with the wanderings of David and his own priest, Abiathar (I Kings ii, 26). It is ultimately placed within the newly captured city. But canonical tradition associates it with the invasion of all the tribes of Israel from beyond the Jordan.

Other narratives describe the life of the young David at the court of the first king of the northern kingdom. The scenes cover the district which he took with the sword, and the brave Saul is represented in an unfavourable light. It is necessary to allow for the popular tendency to idealize great figures, and for the Judean colouring of the compilation. To David is ascribed the sovereignty over a united people. After being the popular favourite of Israel in the little district of Benjamin, he was driven away by the jealousy and animosity of Saul. Gradually strengthening his position by alliance with Judean clans, he became king at Hebron at the time when Israel suffered defeat in the north. His subsequent advance to the kingship over Judah and Israel at Jerusalem is represented as due to the weak condition of Israel and to the compliance of Saul's general, Abner; partly, also, to the long-expressed wish of the Israelites that their old hero should reign over them. Saul had been chosen by Yahweh to free his people from the Philistines; he had been rejected for his sins, and had suffered continuously from this enemy; Israel at his death was left in the unhappy state in which he had found it; it was the Judean David, the faithful servant of Yahweh, who was now chosen to deliver Israel, and to the last the people gratefully remembered their debt. The rift between Samuel and Saul marks the initial phase in the struggle between ecclesiastical and temporal power, a phenomenon prominent in later monarchal times. The rugged warrior-king Saul would not submit to the authority of Samuel and thus brought upon himself the implacable hostility of the prophet. David, on the other hand, recognized the important role which the contemporary prophet could play in the consolidation of his regime and appears to have given him a constitutional status in his court. David accomplished the conquests of Saul, but on a grander scale; "Saul hath slain his thousands and David his tens of thousands" is the popular couplet comparing the relative merits of the rival dynasts. A series of campaigns against Edom, Moab, Ammon and the Aramaean states, friendly relations with Hiram of Tyre, and the recognition of his sovereignty by the king of Hamath on the Orontes, combine to portray a monarchy that was the ideal. (See also DAVID; SAMUEL; SAUL.)

David, the warrior, was followed by his son Solomon, as "peaceful" as his name signifies, famous for his wealth, wisdom and piety and above all for the magnificent Temple he built at Jerusalem. Phoenician artificers were enlisted for the purpose, and with

Phoenician sailors successful trading journeys were regularly undertaken. Commercial intercourse with Asia Minor. Arabia, Tarshish (in Spain) and Ophir (q v.) filled Solomon's coffers, and his realm extended from the Euphrates to the border of Egypt. Solomon's enterprises included a foundry for the smelting of copper ore at Ezion-Geber, at the northern tip of the inlet of the Red sea, Gulf of Aqaba. Tradition depicts him as a worthy successor to his father, and represents a state of luxury and riches impressive to all who were familiar with the great oriental courts. (See SOLOMON.) Another side of the picture, however, shows the domestic intrigues that darkened the last days of David. The accession of Solomon had not been without bloodshed, and David's old general, Joab, and his faithful priest, Abiathar, were opposed to the son of a woman who had been the wife of a Hittite warrior. The era of the Temple of Jerusalem starts with a new regime, another captain of the army and another priest—Zadok of Jerusalem. Moreover, the employment of Judeans and Israelites for Solomon's palatial buildings. and the heavy taxation for the upkeep of a court that was the wonder of the world, caused grave discontent. External relations, too, were unsatisfactory. The Edomites, who had been almost extirpated by David in the valley of Salt, south of the Dead sea, were now strong enough to seek revenge; and the powerful kingdom of Damascus. whose foundation is dated to this period, began to threaten Israel on the north and northeast. These troubles affected all Solomon's reign, and even Hiram the Phoenician appears to have acquired a portion of Galilee. In the approaching disruption writers saw the punishment for the king's apostasy, and they condemn the sanctuaries in Jerusalem which he erected to the gods of his heathen wives. Nevertheless, these places of cult remained some 300 years until almost the close of the monarchy, when their destruction is attributed to Josiah (sec. 10).

At Solomon's death the opportunity was seized to request from his son. Rehoboam, a more generous treatment. The reply is memorable: "My little finger is thicker than my father's loins; my father chastised you with whips, but I will chastise you with scorpions" These words were calculated to inflame a people nhom history proves to have been haughty and high-spirited, and the great Israel renounced its union with the small district of Judah.

The secession of northern Israel from the united monarchy seems to have been the inevitable result of the rivalry that persisted between the north and the south, in spite of their political union. Though the pressure of the Philistine menace had forced them into a united monarchy in an earlier age, the two groups did not merge into one homogeneous national unit and lose their separate identity Once the Philistine threat was removed, the trend in Israel toward secession was heightened by Solomon's impositions and brought to a head by Rehoboam's autocratic attitude. His haughty rejection of the popular demand for a more liberal regime reflects the despotism of an oriental king who, unlike his grandfather David, was cradled in the arrogant splendour of the court and was far removed from the subjects he was to rule. Jeroboam (*q.v.*), once one of Solomon's officers, became king over the north, and the history of the divided monarchy begins (about 937 B.C.[1]) with the Israelite power on both sides of the Jordan and with Judah extending southward from a point a few miles north of Jerusalem.

5. **The** Rival Kingdoms. — The history of the two kingdoms is contained in the books of Kings and the later and relatively less trustworthy Chronicles, which are mainly concerned with the fortunes of Judah. In the former a separate history of the northern kingdom has been curiously combined with Judean history by means of synchronisms (see BIBLE: Old Testament; **KINGS,** FIRST AND SECOND BOOKS OF). Moreover, the Judean compiler finds in Israel's troubles the punishment for its schismatic idolatry, nor does he spare Judah. He looks back upon the time when each kingdom laid the foundation of its subsequent fortunes. Judah enjoys an unbroken dynasty, which survived the most serious crises, a temple that grew in splendour and wealth under royal patronage, and a legitimate priesthood that owed its origin to Zadok, the successful rival of David's priest, Abiathar. Israel, on the other hand. signed its death warrant by the institution of calf cult. a cult which, however. was scarcely recognized as contrary to the worship of Yahweh before the denunciations of Hosea. Judah had natural connections with Edom and southern Palestine; Israel was more closely associated with Gilead and the Aramaeans of the north. That Israel was the stronger may be suggested by the acquiescence of Judah in the new situation. Shishak's invasion caused a diversion (c. 930 B.C.[2]), but of this reappearance of Egypt after nearly three centuries of inactivity little is preserved in biblical history Only the Temple records recall the spoliation of the sanctuary of Jerusalem. However, Shishak left an inscription with a long list of cities which he claims to have conquered in Israel, as well as in Judah. Archaeological evidence supports the view that the invasion was of a much wider extent than that suggested by the biblical account. Although both kingdoms suffered, common misfortune did not throw them together. On the contrary, the statement that there was continual warfare is supplemented in Chronicles by the story of a victory over Israel by Abijah, the son of Rehoboam.

Jeroboam's son, Nadab, perished in a conspiracy while besieging the Philistine city of Gibbethon, and Baasha of (north) Israel seized the throne. Incessant warfare prevailed between him and Abijah's successor, Asa. The newly arisen state of Baasha nas in league with Damascus, which had once been hostile to Solomon (I Kings xi, 24 et seq). Upon whom Asa could rely is not stated. Baasha seized Ramah, about 5 mi. N. of Jerusalem, and the existence of Judah was threatened Asa utilized the treasure of the Temple and palace to induce the Syrians to break off their relations with Baasha. These sent troops to harry north Israel, and Baasha was compelled to retire. Asa. it would seem, was too weak to achieve the remarkable victory ascribed to him in II Chron. xiv. Baasha's short-lived dynasty resembles that of his predecessors. His son. Elah. after a reign of two years (like Ishbaal and Nadab), was slain in a drunken carousal by his captain. Zimri. Meanwhile, the Israelite army was again besieging the Philistines at Gibbethon, and the recurrence of these conflicts points to a critical situation in a district in which Judah itself (although ignored by the writers) must have been vitally concerned. The army preferred its general, Omri, and. marching upon Zimri at Tirzah, burned the Palace over his head. A fresh rival immediately appeared, the otherwise unknown Tibni. Israel was divided into two camps, until, on the death of Tibni, Omri became sole king (c. 884 B.C.[3]). The scanty details of these important events stand in contrast to the full accounts of earlier Philistine wars and internal conflicts.

6. **The** Dynasty of **Omri.**—Omri (q v), the founder of one of the greatest dynasties of Israel, was contemporary with the revival of Tyre under the priest-king Ethbaal, whose daughter was married to Omri's son Ahab. Omri's most notable recorded achievement was the subjugation of Moab (q *v.*). Moreover. Judah (now under Jehoshaphat) was bound intimately to Israel; and traditions of intermarriage and of co-operation in commerce and war imply what was practically a united Palestine. Alliance with Phoenicia gave the impulse to extended intercourse; trading expeditions were undertaken from the Gulf of Aqaba, and Ahab built himself a palace decorated with ivory. Government administration at Samaria is attested by some 60 ostraca (*i.e.*, potsherds bearing inscriptions) discovered at that site. which, from their contents, are identified as office dockets relating to the collection of taxes in kind. The cult of the Baal of Tyre followed Jezebel to the royal city, Samaria, and even found its way into Jerusalem. This, the natural result of matrimonial and political alliance, already met with under Solomon, receives the usual denunciation. The conflict between Yahweh and Baal and the defeat of the latter are the characteristic notes of the religious history of the period, the records of which are now more abundant.

Although little is preserved of Omri's history, the fact that the northern kingdom long continued to be called by the Assyrians after his name is a significant indication of his reputation Assyria was now making itself strongly felt in the nest. Assur-nasir-pal II had exacted tribute from north Syria (*c.* 876 B.C), and his suc-

[1] Some scholars date the schism as late as gaa B.C.

[2] Those who accept the later dating place the invasion some years later than 922 B.C.

[3] Some scholars date Omri's accession as 876 B.C.

cessor, Shalmaneser III, in the course of a series of expeditions, succeeded in gaining the greater part of that land. Irhuleni of Hamath and Adad-idri of Damascus formed a coalition with the kings of Cilicia, Phoenicia, Ammon, the Arabs of the Syrian desert and "Ahabbu Sirlai." In the last may be recognized the Israelite Ahab, whose contribution of 10.000 men and 2.000 chariots perhaps included levies from Judah and Moab (*cf.* for the number I Kings x, 26).

In 853 the allies at least maintained themselves at the'battle of Karkar. Other indecisive battles were fought later, but the precise constitution of the coalition is not recorded.

In 842–841 Shalmaneser records a campaign against Hazael, the new king of Damascus; no coalition is mentioned, although a battle was fought at Sanir (Hermon; Deut. iii, 9), and the cities of Hauran south of Damascus were spoiled. Tribute was received from Tyre and Sidon; and Jehu, the new king of Israel, sent gifts of gold, silver. etc. The "Black Obelisk" (now in the British museum), which records the submission of the petty kings, gives an interesting representation of the humble Israelite emissaries, with their long, fringed robes and strongly marked physiognomy. Yet another expedition in 837 would seem to show that Damascus was neither crushed nor helpless, but thenceforth, for a number of years, Assyria was fully occupied elsewhere and the west was left to itself.

Biblical tradition associates the changes in the thrones of Israel and Damascus with the work of the prophets Elijah and Elisha, but without a reference to Assyria. Ahab, it seems, had aroused popular resentment by encroaching upon the rights of the people to their landed possessions; had it not been for Jezebel, the tragedy of Naboth would not have occurred. The worship of the Tyrian Baal roused a small circle of zealots, and again the Phdenician marriage was the cause of the evil. Elijah of Gilead inspired the revolt which culminated in the accession of Jehu, the son of one Jehoshaphat (or! otherwise, of Nimshi). The work begun by Elijah was completed by Elisha, who supported Jehu and the new dynasty. The royal families of Israel and Judah perished in a massacre. While the extirpation of the cult of Baal was furthered in Israel by Jonadab the Rechabite, it was the "people of the land" who undertook a similar reform in Judah. Jehu (*q.v.*) became king, as the champion of the purer worship of Yahweh. The descendants of the detested Phoenician marriage were rooted out, and unless the close intercourse between Israel and Judah had been suddenly broken, it would be supposed that the new king at least laid claim to the south. Here: however, Athaliah, daughter of Jezebel, destroyed the Judean court. Only the child Jehoash was preserved, and six years later the priests slew the queen, overthrew the cult of Baal and crowned the young child.

7. Damascus, Israel and Judah.—Hazael of Damascus, Jehu of Israel and Elisha the prophet are the three men of the new age linked together: as though commissioned for like ends (see I Kings xix, 15–17). Elisha had sent to anoint Jehu as king, and, while on intimate terms with Bar-hadad (Ben-hadad) of Damascus, recognized Hazael as its future ruler. But after the accession of Jehu the situation changed. "In those days Yahweh began to cut short" (or, amending the text, "to be angry with") "Israel." This brief notice heralds Hazael's attack upon Israelite territory east of the Jordan (II Kings x, 32). The cause of the attack is obscure. Certain traditions, it is true, indicate that Israel had been at war with the Aramaeans from before 853 to 841, and that Hazael was attacking Gilead at the time when Jehu revolted; but in the midst of these are other traditions of the close and friendly relations between Israel and Damascus. (On the problems of the Elijah-Elisha period. see *Cambridge* Ancient History, vol. iii, p. 364 et seq.)

The southern kingdom suffered little in the disastrous wars between Damascus and Israel. Hazael indeed advanced upon Gath, and Jerusalem was saved only by a timely bribe. There were internal troubles, and Jehoash perished in a conspiracy. His son, Amaziah. had some difficulty in gaining the kingdom, and showed conspicuous leniency in sparing the children of his father's murderers. Israel, on the other hand, was almost annihilated by the Syrians. These seized Gilead, crossed over into Palestine and occupied the land. Jehu's son, Jehoahaz, saw his army made "like the dust in threshing," and the desperate condition of the country recalls the straits in the time of Saul (I Sam. xiii. 6, 7, 19–22). and the days before the great overthrow of the northern enemy as described in the Song of Deborah (Judg. v, 6–8). The atrocities committed by Damascus and its Ammonite allies upon Gilead were not forgotten (Amos i, 3, 13), and they illustrate a remarkable interview between Elisha and Hazael (II Kings viii, 12). Several of the situations can be more vividly realized from the stories of Syrian wars ascribed to the time of Omri's dynasty but more probably relating to the dynasty of Jehu.

Under Joash, son of Jehoahaz. the tide turned. Elisha was apparently the champion, and posterity told of his exploits when Samaria was visited with the sword. Thrice Joash smote the Syrians—in accordance with the last words of the dying prophet—and Aphek in the Sharon plain, famous in history for Israel's disasters, now witnessed three victories. The enemy under Hazael's son, Ben-hadad, was driven out and Joash regained the territory which his father had lost (II Kings xiii, 25); it may reasonably be supposed that a treaty was concluded (cf the anonymous I Kings xx. 34). But the peace does not seem to have been popular. The story of the last scene in Elisha's life ascribes to Joash an easily contented disposition that hindered him from completing his successes. Syria had not been crushed and the failure to utilize the opportunity was an act of impolitic leniency for which Israel mas bound to suffer (II Kings xiii, 19). Elisha's indignation can be illustrated by the denunciation passed upon an anonymous king by the prophetic party on a similar occasion (I Kings xx. 35–43).

At this stage it is necessary to notice the fresh invasion of Syria by Hadad (Adad)-nirari, who besieged Mari, king of Damascus, and exacted a heavy tribute (c. 802 B.C.). A diversion of this kind would explain the Israelite victories; the subsequent withdrawal of Assyria would afford the occasion for Damascus to retaliate. Men in Israel who remembered the wars between Assyria and Damascus, and the recuperative power of the Aramaeans. would perceive the danger of the lenient policy of Joash. Hadad-nirari claims tribute from Tyre, Sidon and Beth-Omri (Israel), also from Edom and Palastu (Philistia). There are no signs of an extensive coalition as in the days of Shalmaneser; Ammon is probably included under Damascus; the position of Moab—which had freed itself from Jehoram of Israel—can hardly be calculated. But the absence of Judah is surprising. Both Jehoash (of Judah) and his son, Amaziah, left a great name; and the latter was comparable only to David (II Kings xiv, 3). He defeated Edom in the valley of Salt, and it is conceivable that Amaziah's kingdom extended over both Edom and Philistia. A vaunting challenge to Joash (of Israel) gave rise to one of the two fables that are preserved in the Old Testament (for the other see Judg. ix, 8 et seq). It was followed by a battle at Beth-shemesh; the scene would suggest that Philistia also was involved. The result was the rout of Judah, the capture of Amaziah, the destruction of the northern wall of Jerusalem. the sacking of the temple and palace and the removal of hostages to Samaria (II Kings xiv, 12 et seq.). This disaster was scarcely the outcome of a challenge to a trial of strength; it was rather the sequel to a period of smoldering jealousy and hostility, and. according to one chronological scheme, 27 years passed before Judah had another king (Uzziah).

8. Jeroboam and Uzziah.—The defeat of Syria by Joash (of Israel) was not final. The decisive victories were gained by Jeroboam II. He saved Israel from being blotted out, and "the children of Israel dwelt in their tents as of old" (II Kings xiii. 5, xiv, 26 et seq.). Syria must have resumed warfare with redoubled energy, and a state of affairs is presupposed that can be pictured with the help of narratives dealing with similar historical situations. In particular. the overthrow of Israel as foreshadowed in I Kings xxii implies an Aramaean invasion after a treaty, although this can scarcely be justified by the events that followed the death of Ahab. in whose time they are now placed. Under Jeroboam II (c. 785) the borders of Israel were restored and the disastrous Aramaean wars avenged.

For a time the kingdom of Van (Urartu, Ararat) was the most important factor in the north, and the Hebrews may well have

come into close touch with peoples who were the descendants of the Hittite, Mitannian and other non-Semitic stock of old. Moab was probably tributary; the position of Judah and Edom is involved with the chronological problems. According to the Judean annals the "people of Judah" set Azariah (Uzziah) upon his father's throne; and to his long reign of 52 years are ascribed conquests over Philistia and Edom, the fortification of Jerusalem and the reorganization of the army. The two great kings Uzziah and Jeroboam were contemporary, but upon the relations between them we have no information; yet had Amaziah suffered at the hands of Israel, and when, at the death of Jeroboam. Israel hastened to its end amid anarchy and dissension, it is unlikely that the southern kingdom nas unmoved. All that can be recognized from the biblical records, however, is the period of internal prosperity enjoyed by Israel and Judah under Jeroboam and Uzziah (*qq.v.*) respectively.

The events inaugurating the dynasty of Jehu, the terrible Aramaean wars, Yahweh's "arrow of victory," and at length the rise of Jeroboam, make the century (*c.* 850–750 B.C.) one of the most conspicuous epochs in Hebrew history. This dynasty culminates in the rise of the great Hebrew prophets (Amos, Hosea, Isaiah, Micah, etc.). That these had predecessors in the stirring days before them is to be expected—for there is much in prophecy that makes it far from unique or necessarily elevated. But they strike so distinctive a note, their teaching is so fundamental, and its effects so evident, that the question arises whether the religious conditions they condemn are those as set forth in the literature referring to earlier periods. In fact, the modern historical and religious study of the Old Testament turns upon the interpretation of the great prophets and the relation between them, on the one hand, and the Pentateuch and historical recensions on the other. (See also JUDAISM; PROPHET; and the articles on the several prophets.)

9. The Fall of the Israelite Monarchy.—Israel's prosperity under Jeroboam II proved its undoing. The disorders that hastened the end find analogy in the events of the more obscure period after the death of the earlier Jeroboam. Only the briefest details are given. Zechariah was slain after six months by Shallum ben Jabesh in Ibleam; but the usurper fell a month later to Menahem (*q.v.*), who only after much bloodshed established his position. Assyria again appeared upon the scene, under Tiglath-Pileser (Assyrian, Tukulti-apal-Esharra) III; on his approach a coalition was soon formed that was overthrown in 738. Among those who paid tribute were Rasun (the biblical Rezin) of Damascus, Menahem of Samaria, the kings of Tyre, Byblos and Hamath and the queen of Aribi (the Syrian desert).

Israel was once more in league with Damascus and Phoenicia, and the biblical records must be read in the light of political history. Judah was probably holding aloof. Its king, Uzziah. was a leper in his latter days, and his son and regent, Jotham, claims notice for a circumstantial reference to his subjugation of Ammon—the natural allies of Damascus—for three years (II Chron. xxvii, cf. xxvi, 8). Scarcely had Assyria withdrawn before Menahem lost his life in a conspiracy, and Pekah, with the help of Gilead, made himself king. The new movement was evidently anti-Assyrian, and strenuous endeavours were made to present a united front. Judah was the centre of attack. Rasun and Pekah directed their blows from the north, Philistia threatened the west flank, and the Edomites, who drove out the Judeans from Elath (on the Gulf of Aqaba), were no doubt only taking their part in the concerted action. A more critical situation could scarcely be imagined. The throne of David was then occupied by a youth—Ahaz, the son of Jotham. In this crisis arose Isaiah (*q.v.*), perhaps the grandest of Hebrew prophets. The disorganized state of Egypt and the uncertain allegiance of the desert tribes left Judah without direct aid; on the other hand, opposition to Assyria among the conflicting interests of Palestine and Syria was rarely unanimous. Either in the natural course of events—to preserve the unity of his empire—or influenced by the rich presents of gold and silver with ahich Ahaz accompanied his appeal for help, Tiglath-Pileser intervened with campaigns against Philistia (734 B.C.) and Damascus (733–732). Israel was punished by the ravaging of the northern districts, and the king claims to have carried away the people of "the house of Omri." Pekah was slain, and one Hoshea (q v.) was recognized as his successor. Assyrian officers were placed in the land and Judah thus gained its deliverance at the expense of Israel. But the proud Israelites did not remain submissive for long; Damascus had indeed fallen, but neither Philistia nor Edom had yet been crushed.

When Israel began to regain confidence, its policy halted between obedience to Assyria and reliance upon Egypt—though whether Mizraim (g v) refers to Egypt proper or includes some more easterly area is open to dispute. The situation is illustrated in the writings of Hosea (*q.v.*). Tiglath-Pileser died in 727 and the slumbering revolt became general. Israel refused the usual tribute to its overlord, and definitely threw in its lot with "Egypt." In due course Samaria was besieged for three years by Shalmaneser V This statement seems perfectly credible, when one views the architectural remains of the Israelite city of Samaria. The thick walls of heavy masonry, laid in rock-cut foundations, must have been impregnable, while the storage pits and channels for collecting rain water suggest arrangements for holding out in a protracted siege.

The alliance with So (Seveh, Sibi) of "Egypt," upon whom hopes had been placed, proved futile, and the forebodings of keen-sighted prophets were justified. Although no evidence is at hand, it is probable that Ahaz of Judah rendered service to Assyria by keeping the allies in check; it is possible, also. that the former enemies of Jerusalem had now been induced to turn against Samaria. The actual capture of the Israelite capital is claimed by Sargon (722), who removed 27,200 of its inhabitants and 50 chariots. Other peoples were introduced. officers were placed in charge, and tribute mas reimposed Another revolt was planned in 720 in ahich the province of Samaria joined nith Hamath and Damascus, with the Phoenician Arpad and Simura, and with Gaza and "Egypt." Two battles, one at Rarkar in the north, another at Rapih (Raphia) on the border of Egypt, sufficed to quell the disturbance The desert peoples who paid tribute on this occasion still continued restless, and in 71 j Sargon removed men of Tamud, Ibadid, Marsiman, Hayapa (cf. the Midianite Ephah. Gen. xxv, 4), "the remote Arabs of the desert," and placed them in the land of Beth-Omri. Sargon's statement is significant for the later history of Samaria; but the biblical historians take no further interest in the fortunes of the northern kingdom and see in Judah the sole survivor of the Israelite tribes (see II Kings xvii, 7–23). Yet the situation in this neglected district must continue to provoke inquiry.

10. Judah and **Assyria.**—Amid these changes the history of Judah was intimately connected with the south Palestinian peoples. Ahaz had recognized the sovereignty of Assyria and visited Tiglath-Pileser at Damascus. The Temple records describe the innovations he introduced on his return Under his son, Hezekiah, there were fresh disturbances in the southern states, and anti-Assyrian intrigues began to take a more definite shape among the Philistine cities. Ashdod openly revolted and found support in Moab, Edom, Judah and "Egypt." This step may possibly be connected with the attempt of Merodach-baladan (Marduk-apal-iddina) in south Babylonia to form a league against Assyria (cf. II Kings xx, 12); at all events Ashdod fell after a three years' siege (710) and for a time there mas peace. But with the death of Sargon in 705 there was another great outburst; practically the whole of Palestine and Syria was in arms, and Sennacherib's empire in the west was threatened.

In both Judah and Philistia the anti-Assyrian party was not without opposition, and those who adhered or favoured adherence to the great power were justified by the result. At Sennacherib's approach, Ashdod Ammon. Moab and Edom submitted; Ekron (which sent its king in fetters to Hezekiah), Ascalon, Lachish and Jerusalem held out strenuously. The southern allies (with "Egypt") were defeated at Eltekeh Hezekiah was besieged and compelled to submit (700). The small kings who had remained faithful mere rewarded by an extension of their territories, and Ashdod. Ekron (whose king was now restored) and Gaza were enriched at Judah's expense These events are related in Sen-

nacherib's inscription; the biblical records preserve their own traditions (see also HEZEKIAH).

In the long reign of Hezekiah's son, Manasseh (c. 692–638; *q.v.*), later writers sa the deathblow to the Judean kingdom. Much is said of his wickedness, but few details have come down. The land was practically under the control of Assyria. Both Esarhaddon (680–668) and Assurbanipal (668–c. 626) number among their tributaries Tyre. Ammon, Moab, Edom. Ascalon, Gaza and Manasseh himself, and cuneiform dockets unearthed at Gezer suggest the presence of Assyrian garrisons there. and no doubt also elsewhere. The situation favoured the spread of foreign customs, and the condemnation passed upon Manasseh thus, perhaps, becomes more significant. It is possible that Manasseh merely assimilated the older Yahweh worship to Assyrian form; politics and religion were inseparable, and the supremacy of Assyria weakened that of Yahweh.

If Judah was compelled to take part in the Assyrian campaigns against Egypt, Arabia (the Syrian desert) and Tyre, this would only be in accordance with a vassal's duty. But since tradition preserves some recollection of an offense for which Manasseh was taken to Babylon to explain his conduct (II Chron. xxxiii), also of the settling of foreign colonists in Samaria by Esarhaddon (Ezra iv, 2), it is possible that Judah attempted to regain its liberty. According to Assurbanipal all the western lands were inflamed by the revolt of his brother, Shamash-shum-ukin. What part Judah took in the Transjordanic disturbances, in which Moab fought invading Arabian tribes on behalf of Assyria, is unknown.

Manasseh's son, Amon, fell in a court intrigue, and "the people of the land," after avenging the murder, set up in his place the infant Josiah (039). The circumstances imply a regency, but upon this the records are silent The decay of Assyria doubtless awoke the national feeling of independence, and an account is given of Josiah's religious reforms. In an age when the oppression and corruption of the ruling classes had been such that those who cherished the old worship of Yahweh dared not confide in their most intimate companions (cf. Mic. vii, 5), no reforms were possible; but now the young Josiah, the popular choice, was upon the throne.

A roll, it was said, had been found in the Temple; its contents terrified the priests and king, and it led to a solemn covenant before Yahweh to observe the provisions of the lawbook that had been so opportunely recovered. The writer, as has been recognized since the days of Jerome, is describing the discovery of Deuteronomy (*q.v.*). It is, however, very doubtful whether it was the book in its present form, although the biblical writer believed that Josiah successfully put down the "high places" (*q.v.*) and centralized the religion. In any case Josiah's reforms were of no lasting effect, to judge from Jeremiah (xxv, 3–7, xxxvi, et seq.) and Ezekiel (xvi, xxiii). On the other hand Deuteronomy has a characteristic social-religious side; its humanity, philanthropy and charity are the distinctive features of its laws, and Josiah's reputation (Jer, xxii. 15 et seq.) and the circumstances in which he was chosen king may suggest that he, like Jehoash (II Kings xi, 17; *cf.* xxiii, 3), had entered into a reciprocal covenant with a people who, as Micah's writings would indicate, had suffered grievously.

11. The Fall of the Judean Monarchy. — A new era was beginning in the history of the world (see PALESTINE: History). Assyria was rapidly decaying and Egypt, under Psammetichus (Psamtek) I, had recovered from the blows of Assurbanipal, to which the Hebrew prophet Nahum refers (iii, 8–10). A Chaldean prince, Nabopolassar, set himself up in Babylonia. Nineveh fell in 612, and Harran, where the court had been removed, was taken in 610. Thus fell an empire that had dominated Palestine for two centuries, whose history in the west went back for a millennium. On the exultation caused by the events (see NAHUM), Necho, son of Psammetichus, marched through Palestine to aid Assyria. Josiah interposed; possibly he had hopes of extending his kingdom (II Chron. xxxv, 20 et seq. is more reliable than II Kings xxiii, 29 et seq.). That he had authority over a much larger area than Judah alone is suggested by II Kings xxiii, 19, and by the references to the border at Riblah, 45 mi. S. of Hamath (Ezek. vi, 14, xi, 10 et seq.). Josiah was slain at Megiddo, and Egypt, as in the long distant past, again held Palestine and Syria. The Judeans made Jehoahaz (or Shallum) their king. but the Pharaoh banished him to Egypt three months later and appointed his brother. Jehoiakim

Meanwhile, Nabopolassar recognized in Necho a dangerous rival, and sent his son Nebuchadrezzar (Nebuchadnezzar), who overthrew the Egyptian forces at Carchemish (605). The battle was the turning point of the age. The succession of the new Chaldean or Babylonian kingdom was assured, though the relations between Egypt and Judah were not broken off. Jehoiakim was inclined to rely upon Egypt. He died just as Nebuchadrezzar, after seeing his warnings disregarded. was preparing to lay siege to Jerusalem. His young son, Jehoiachin, surrendered after a three months' reign. with his mother and the court; they were taken away to Babylonia, together with a number of artisans (597). Jehoiakim's brother, Mattaniah. or Zedekiah, was set in his place under an oath of allegiance, which he broke, preferring Hophra, the new king of Egypt. A few years later the second siege took place. It began on the tenth day of the tenth month. Jan. 587. The looked-for intervention of Egypt was unavailing, although a temporary raising of the siege inspired wild hopes. The confusion and panic in the last phases of the Babylonian campaign is reflected in the Lachish ostraca. These are military dispatches sent by an officer in charge of a scouting party outside Lachish to his commander inside the city. His reports not only deal with the Babylonian advance but also reflect the atmosphere of suspicion and of low morale that beset the people in this shattering catastrophe. Desertion, pestilence and famine added to the usual horrors of a siege, and at length on the ninth day of the fourth month, 586, a breach was made in the walls.

Zedekiah fled toward the Jordan valley but was seized and taken to Xebuchadrezzar at Riblah. His sons were slain before his eyes, and he himself was blinded and carried off to Babylon after a reign of 11 years. The Babylonian Nebu-zaradan was sent to take vengeance upon the rebellious city, and on the seventh day of the fifth month 586 B.C. Jerusalem was destroyed. The Temple, palace and city buildings were burned, the walls broken down. the chief priest, Seraiah, and other leaders were put to death, and many people were again carried off. The disaster became the great epoch-making event in Jewish history and literature.

Throughout these stormy years the prophet Jeremiah (*q.v.*) had realized that Judah's only hope lay in submission to Babylonia. Stigmatized as a traitor, scorned and imprisoned, he had not ceased to warn deaf ears, although Zedekiah himself mas. perhaps, open to persuasion. Now the penalty had been paid. and the Babylonians, whose policy was less destructive than that of Assyria, contented themselves with appointing as governor a certain Gedaliah. The new centre was Mizpah, a commanding eminence and sanctuary, about 5 mi. N.W. of Jerusalem; there Gedaliah issued an appeal to the people to be loyal to Babylonia and to resume their former peaceful occupations. The land had not been devastated, and many gladly returned from their hiding places in Moab, Edom and Ammon. But discontented survivors of the royal family under Ishmael intrigued with Baalis, king of Ammon. The plot resulted in the murder of Gedaliah and an unsuccessful attempt to carry off various princesses and officials who had been left in the governor's care. This new confusion and a natural fear of Babylonia's vengeance led many to feel that their only safety lay in flight to Egypt, and, although warned by Jeremiah that even there the sword would find them, they fled south and took refuge in Tahpanhes (Daphnae, *q.v.*), afterward forming small settlements in other parts of Egypt. But the thread of the history is broken, and apart from an allusion to the favour shown to the captive Jehoiachin (with which the books of Jeremiah and Kings conclude), there is a gap in the records, and subsequent events are viewed from a new standpoint.

B. EXILE AND RESTORATION

1. Internal Conditions of the Exile. — Many of the exiles accepted their lot and settled down in Babylonia (cf. Jer. xxix, 4–7); Jewish colonies, too, were being founded in Egypt. The agriculturists and herdsmen who had been left in Palestine formed, as always, the stable population, and it is impossible to imagine either

Judah or Israel as denuded of its inhabitants. The peasants were left in peace to divide the land among them, and new conditions arose as they took over the ownerless estates. Here, as already in Israel, the fall of the monarchy involved a reversion to a pre-monarchical state, and it is impossible to sever too rigorously two sections of Hebrews who had so much in common. Indeed, kings of Judah might well have been tempted to restore the kingdom of their traditional founder, or Assyria might have been complaisant toward a faithful Judean vassal. But Israel, after the fall of Samaria, is ignored by the Judean writers, and lies as a foreign land; although Judah itself had suffered from the intrusion of foreigners in the preceding centuries of war and turmoil, and strangers had settled in its midst, had formed part of the royal guard or had served as janissaries.

Samaria had experienced several changes in its original population. Settlement upon new soil involved dependence upon its god, and a priest was sent to instruct the colonists in the fear of Yahweh. Thenceforth they continued the worship of the Israelite Yahweh along with their own native cults (II Kings xvii. 24–28, 33). Their descendants claimed participation in the privileges of the Judeans (cf. Jer. xli, j), and must have identified themselves with the old stock (Ezra iv, 2). Whatever recollection they preserved of their origin and of the circumstances of their entry would be retold from a new standpoint. To the prophets the religious position was lower in Judah than in the "sister" Samaria (Jer. iii, 11 et *seq.*, xxiii. 11 et seq.; Ezek. xvi. 51). The prevalence of heathen elements in Jerusalem, as detailed in the reforms of Josiah or in the writings of the prophets (*cf.* Ezek. viii), would at least suggest that the destruction of the state was not entirely a disaster. The political disasters not only meant a shifting of population, they also brought into prominence the old popular and nonofficial religion, the character of which is not to be condemned offhand. When there were sects like the Rechabites (Jer. xxxv). when the Judean fields could produce a Micah (*q.v.*), and when Israel had men who inherited the spirit of a Hosea, the nature of the underlying conditions can be more justly appreciated.

The writings of the prophets were cherished. not only in the unfavourable atmosphere of courts but also in the circles of their followers. In the smaller sanctuaries the old-time beliefs were maintained, and the priests, often perhaps of the older native stock, were the recognized guardians of the religious cults. The stories of earlier days encircle places that are not regarded as illegitimate, and in the form in which the dim traditions of the past are now preserved they reveal an attempt to purify popular belief and thought.

2. Restoration of **Judah.**—The course of events from the middle of the 6th century B.C. to the close of the Persian period is extremely obscure, although much indirect evidence indicates that this age holds the key to the growth of written biblical history. It was an age of literary activity, which manifested itself not in contemporary historical records—only a few of which have survived—but rather in the special treatment of previously existing sources (see EZRA and NEHEMIAH). In 561 B.C. the captive Judean king, Jehoiachin, received special marks of favour from Nebuchadrezzar's son, Amel-Marduk (Evil Merodach) (II Kings xxv. 27 et seq.; Jer. lii, 31–34). 4 little later Tyre received as its king Merbaal (jjj–j52), who had been fetched from Babylonia. If Babylon was assured of the allegiance of its vassals further acts of clemency may well have followed. But the later ,recension of Judean history—the only source—entirely ignores the elevation of Jehoiachin, and: passing over the exile, proceeds at once to the first years of Cyrus. who proclaims as his divine mission the rebuilding of the Temple (538) (II Chron. xxxvi). The Judean Sheshbazzar (a corruption of some Babylonian name) brought back the Temple vessels that Nebuchadrezzar had carried away and prepared to undertake the work at the expense of the royal purse. A large body of exiles is said to have returned to Jerusalem under Zerubbabel. who was of Davidic descent, and the priest Jeshua or Joshua! the grandson of the murdered Seraiah (Ezra i–iii; v. 13–vi, 5). When these refused the proffered help of the people of Samaria, men who claimed to be of the same faith as themselves, their troubles began, and the Samaritans retaliated by preventing the rebuilding.

The next historical notice is dated in the second year of Darius (520), when two prophets, Haggai and Zechariah (qq v.), kindled the Judeans to new efforts. Despite opposition. the work went steadily onward, thanks to the favour of Darius, and the Temple was completed four years later. 516 B.C. (Ezra v, 2. vi. 13 et seq). On the other hand. from the independent writings ascribed to these prophets, it appears that no considerable body of exiles could have returned—it is still an event of the future (Zech. ii, 7, vi, 15); little if anything, had been done to the Temple (Hag ii, 15); and Zerubbabel is the one to take in hand and complete the great undertaking (Zech iv, 9). The prophets address themselves to men living in comfortable abodes with olive fields and vineyards, suffering from bad seasons and agricultural depression, and. though the country is unsettled. there is no reference to any active opposition on the part of Samaritans So far from drawing any lesson from the brilliant event in the reign of Cyrus, the prophets imply that Yahweh's wrath was still upon the unfortunate city and that Persia was still the oppressor. Consequently, although small bodies of individuals no doubt came back to Judah from time to time, and some special mark of favour may have been shown by Cyrus, the opinion has gained ground since the early arguments of E. Schrader (Studien *und Kritiken,* pp. 460–504 [1867]) that the compiler's representation of the history is less trustworthy than the independent evidence of the prophetic writings His main object is to make the new Israel. the postexilic community at Jerusalem, continuous, as a society, with the old Israel.

Unfortunately. the internal conditions in the 6th century B C. can be estimated only indirectly, and the political position must remain for the present quite uncertain In Zerubbabel the people beheld once more a ruler of the Davidic race. The new temple heralded a new future; the mournful fasts commemorative of Jerusalem's disasters would become feasts; Yahweh had left the Temple at the fall of Jerusalem, but had now returned to sanctify it with his presence; the city had purged its iniquity and was fit once more to become the central sanctuary. So Haggai sees in Zerubbabel the representative of the ideal kingdom, the trusted and highly favoured minister who was the signet ring upon Yahweh's hand (contrast Hag. ii, 23 with Jer xxii. 24). Zechariah, in his turn, proclaims the overthrow of all difficulties in the path of the new king, who shall rule in glory supported by the priest (Zech. vi). What political aspirations were revived, what other writers were inspired by these momentous events are questions of inference. Again there is a gap in the history. (For the view that there was an important movement of semi-Edomite clans to north Judah after the fall of Jerusalem, see Cambridge Ancient History, vol. vi, ch. vii; see also KINGS, FIRST AND SECOND BOOKS OF.)

3. Nehemiah. — The history passes abruptly from the time of Zerubbabel to the reign of Artaxerxes I (but Artaxerxes II according to C. C. Torrey). The enthusiastic hopes have melted away, the Davidic scion has disappeared and Jerusalem has been—as it would seem—the victim of another disaster. The country is under Persian officials, the nobles and priests form the local government, and the ground is being prepared for the erection of a hierocracy. It is the uork of rebuilding and reorganization, of social and of religious reforms, that is encountered in the last pages of biblical history, and in the records of Ezra and Nehemiah Jerusalem is in the very centre of epoch-making events.

Nehemiah. the cupbearer of Artaxerxes at Susa, distressed at the news of the desolation of Jerusalem. obtained permission from the king to rebuild the ruins. Provided with an escort and with the right to obtain supplies of wood for the buildings, he returned to the city of his fathers' sepulchres (the allusion may suggest his royal ancestry). He aroused the people to the necessity of fortifying and repopulating the city. Sanballat of Horon, Tobiah the Ammonite. and Gashmu the Arabian (?Edomite) unceasingly opposed him. Tobiah and his son, Johanan, were related by marriage to Judean secular and priestly families, and active intrigues resulted, in which nobles and prophets took their part. It was insinuated that Nehemiah had his prophets to proclaim that Judah had again its own king, and that he nas intending to rebel against Persia! Nehemiah naturally gives his version; the earlier enthusi-

asm of Haggai and Zechariah for Zerubbabel would illustrate the feelings of Nehemiah's partisans. But Tobiah and Johanan themselves were worshippers of Yahweh (as their names show). and consequently, with prophets taking different sides and with the Samaritan claims summarily repudiated (Keh. ii, 20; *cf.* Ezra iv, 3), it is difficult to gather all the facts.

Nevertheless the undaunted Judean pressed on unmoved by the threatening letters that were sent around, and succeeded in completing the walls within 52 days. Nehemiah also appears as governor of the small district of Judah and Benjamin. Famine, the avarice of the rich and the necessity of providing tribute had brought the humbler classes to the lowest straits. Faced with old social abuses, Nehemiah vehemently contrasted the harshness of the nobles with the generosity of the exiles, who would redeem their poor countrymen from slavery. He himself had always refrained from exacting the usual provision that other governors had claimed; indeed, he had readily entertained over 150 officials and dependents at his table, apart from casual refugees (Neh. v). We hear something of a 12 years' governorship and of a second visit; but the evidence does not enable us to determine the sequence. Chapter v of the book of Nehemiah is placed in the middle of the building of the walls in 52 days; the other reforms during the second visit are closely connected with the dedication of the walls and with the events that immediately follow his first arrival, uhen he had come to rebuild the city. Xehemiah also remedies religious abuses. He found the busy agriculturists and traders (some from Tyre) pursuing their usual labours on the Sabbath, now more strictly observed, and he pointed to the disasters that had resulted in the past from such profanation (Neh. xiii. 18; cf. Jer. xvii, 20 et seq ; Ezek. xx, 13–24; Isa. lvi, 2, 6. lviii. 13).

Moreover, the maintenance of the Temple servants called for supervision; the customary allowances had not been paid to the Levites, who had come to Jerusalem after the smaller shrines had been put down, and they had forsaken the city. Nehemiah's last acts were the most significant. Jews had married women of Ashdod. Ammon and Moab, and the impetuous governor indignantly adjured them to desist from the historic cause of national sin. Even members of the priestly families had intermarried with Tobiah and Sanballat; the former had a chamber in the Temple, the daughter of the latter was the wife of a son of Joiada, the son of the high priest, Eliashib. Tobiah was cast out, the offending priest was expelled and a general purging followed, in which the foreign elements aere removed. With this Nehemiah brings the account of his reforms to a conclusion, and the words "Remember me, O my God, for good" (xiii, 31) have a meaning. According to Josephus (*Antiquities,* xi, 7, 2), a certain Manasseh, the brother of Jaddua and grandson of Joiada, refused to divorce his wife, the daughter of Sanballat. For this he was driven out, and, taking refuge with the Samaritans, founded a rival temple and priesthood upon Mt. Gerizim, to which repaired other priests and Levites who had been guilty of mixed marriages. There is little doubt that the events described by Josephus are those referred to also in the 13th chapter of Nehemiah, but Josephus places the schism and the foundation of the new Temple in the time of Alexander the Great. At all events. there is non a complete rupture with Samaria, and thus. in the concluding chapter of the last of the historical books of the Old Testament, Judah maintains its claim to the heritage of Israel and rejects the right of the Samaritans to the title.

4. Ezra. — In this separation of the Judeans from religious and social intercourse with their neighbours, the work of Ezra (*q.v.*) requires notice. The story of this scribe (now combined with the memoirs of Xehemiah) crystallizes the new movement inaugurated after a return of exiles from Babylonia. The age can also be illustrated from Isa. lvi–lxvi and Malachi (*q.v.*). There was a poor and weak Jerusalem, its Temple stood in need of renovation, its temple service was mean, its priests unworthy of their office. On the one side was the poverty of the poor; on the other the pride of the governors. There were two religious parties, one exclusive, the other more cosmopolitan and syncretizing, extending a freer welcome to strangers and tolerating the popular and superstitious cults of the day (Isa. lxv et seq.). But the former won and, realizing that the only hope of maintaining a pure worship of Yahweh lay in a forcible isolation from foreign influence, it took measures to insure the religious independence of their assembly.

It is related that Ezra, the scribe and priest, returned to Jerusalem with priests and Levites, lay exiles and a store of vessels for the Temple. He was commissioned to inquire into the religious condition of the land and to disseminate the teaching of the Law to which he had devoted himself (Ezra vii). On his arrival the people were gathered together, and he read "the book of the Law of Moses" daily for seven days (Neh. viii). They entered into an agreement to obey its teaching, undertaking in particular to avoid marriages with foreigners. An account is given of this reform (Ezra ix et seq.), and Ezra's horror at the intermarriages, which threatened to destroy the distinctive character of the community, sufficiently indicates the attitude of the stricter party. The true seed of Israel separated themselves from all foreigners (not, however, without some opposition) and formed an exclusively religious body or "congregation." Dreams of political freedom gave place to hopes of religious independence, and "Israel" became a church, the foundation of which it sought in the desert of Sinai a thousand years before. (See SAMARITANS; EZRA AND NEHEMIAH, BOOKS OF; NEHEMIAH.)

5. Postexilic Judaism. — With Nehemiah and Ezra arrives the era of normative Judaism. Judah was a religious community whose representative was the high priest of Jerusalem. Instead of sacerdotal kings, there were royal priests, anointed with oil, arrayed with kingly insignia. claiming the usual royal dues in addition to the customary rights of the priests. With his priests and Levites, and with the chiefs and nobles of the Jewish families, the high priest directs this small state, and his death marks an epoch as truly as did that of the monarchs in the past. This hierarchical government. which can find no foundation in the Hebrew monarchy, is the forerunner of the Sanhedrin (see SYNEDRIUM). Laws were recast in accordance with the requirements of the time, with the result that by the side of usages evidently of great antiquity, details now appear that were previously unknown or wholly unsuitable.

The postexilic priestly spirit represents a tendency that is not to be found in the "Deuteronomic" book of Kings but is conspicuous in the later, and to some extent parallel. book of Chronicles (*q.v.*). There is also an unmistakable development in the laws; and the priestly legislation, though ahead of both Ezekiel and Deuteronomy, not to mention still earlier usage, not only continues to undergo continual internal modification, but finds a further distinct development in the way of definition and interpretation, outside the Old Testament — in the Talmud (*q.v.*). Though postexilic priestly literature is marked by a lack of spontaneity and a ritualism, it must be recognized that monotheism was thereby placed upon a firm basis. "It was a necessity that Judaism should incrust itself in this manner; without those hard and ossified forms the preservation of its essential elements would have proved impossible. At a time when all nationalities, and at the same time all bonds of religion and national customs, were beginning to be broken up in the seeming cosmos and real chaos of the Graeco-Roman empire, the Jews stood out like a rock in the midst of the ocean. When the natural conditions of independent nationality all failed them. they nevertheless artificially maintained it with an energy truly marvellous, and thereby preserved for themselves, and at the same time for the whole world, an eternal good" (J. Wellhausen).

Yet the whole experience of subsequent history, through the heroic age of the Maccabees (*q.v.*) and onward, proves that the minuteness of ritual procedure could not cramp the heart. The work represented in Nehemiah and Ezra, and effected by the supporters of an exclusive Judaism, certainly won the day. and it left its impress upon the historical traditions. But Yahwism, like Islam. had its sects and tendencies, and the opponents to the stricter ritualism always had followers. Whatever the predominant party might think of foreign marriages, the tradition of the half-Moabite origin of David serves, in the beautiful idyll of Ruth (*q.v.*), to emphasize the debt which Judah and Jerusalem owed to one of their neighbours. Again, although some desired a self-contained community opposed to the heathen neighbours of Jerusalem, the story of Jonah (*q.v.*) implicitly contends against the

attempt of Judaism to close its doors. The conflicting tendencies were incompatible, but Judaism retained the incompatibilities within its limits, and the two tendencies, prophetical and priestly, continue. to find their further development in postbiblical Judaism as reflected in the later records of the Mishnah (*see* TALMUD).

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(S. A. C.; JB. W.)

***6.* The** Consolidation of Judaism. — From the time of Nehemiah, for a period of several generations, information regarding the history of the Jewish people is sparse in the extreme. No more than one or two isolated episodes are recorded. Josephus tells (*Antiquities,* xi. 297–301) of a dispute for the high priesthood that resulted in a murder in the Temple and the intervention of the Persian authorities. The story of the deliverance of the Jews throughout the Persian empire recounted in the Book of Esther (q v.), if it has a historical basis. presumably relates to this period. The 5th-century Elephantine papyri. from which it is possible to reconstruct the details of life in a Jewish military colony in Upper Egypt, and the government's paternal solicitude for even its religious observances, illustrate factually the organization and status of Jewish groups outside Palestine. Incidental evidence in these suggests that at this time the province of Judea was subordinated to that of Samaria, having lost the relative autonomy it had enjoyed under Nehemiah. The revolt of the Phoenician cities against Persia in 362–333 must necessarily have affected Palestine, but no details are known. There have been identified Persian coins struck presumably for the use of the military garrisons in Palestine and bearing the name of the province Yehud, which belong approximately to this period.

This is virtually all the information available regarding the lot of the Jewish people between the time of Nehemiah and the invasion of Alexander the Great. On the other hand. it is certain that this was a period of intense religious consolidation and, as it seems. of remarkable intellectual activity. It was then that the forms of postbiblical Judaism evolved and acquired their profound hold on Jewish life in its every aspect. It was in that period that what aas to be rabbinic Judaism struck its roots, that the synagogue (*q.v.*) emerged as an established institution, that the liturgy began to assume its definitive shape and that the works comprising the Old Testament assumed, as it seems, their present form and were assembled in an authoritative fashion. It was thus one of the great formative ages in Judaism, and therefore in the history of the Jewish people. nhich emerges from this period equipped with the literature. the outlook and the institutions thereafter to be so characteristic of it and the main secret of its endurance

Later semilegendary rabbinic accounts associate almost all the epochal developments in Jewish religious life at this period — including for example the formulation of the essential parts of the liturgy — with the *Anshe Kennesseth* Ha-Gedoleh, or "Men of the Great Assembly" (usually translated "of the Great Synagogue"), who were considered as the link between the biblical and talmudic ages, between the prophets and the rabbis. It is probable that the reference is to the assembly recorded in Nehemiah (ch x), which solemnly confirmed the allegiance of the Jewish people to the Laa of Moses, the Torah.

The Dead sea scrolls and other documents found in the same area from 1947 onward were expected to show this obscure period in a new perspective, when their investigation — still in progress in the late 1950s—was completed Although there was some dispute as to the scrolls' date. however. it was believed with considerable certainty that this literature was produced by a group of Jews whose separate existence ended in the 1st century, at the time of the destruction of Jerusalem by the Romans; the documents are therefore all anterior and in some cases considerably anterior to that event. Before the investigation of the documents was completed it was possible to state confidently that they demonstrate a great religious ferment in the last centuries of the pre-Christian era. which expressed itself in vast eschatalogical speculation, in an intense study of the biblical books and endeavour to ascertain the precise application of the prophesies in the organization of semimonastic bodies remote from human habitation. and in the composition of psalms of praise in which the biblical tradition was directly continued. The interpretation of the discovered documents came to suggest that in the period here being considered there was a far greater, but at the same time far less homogeneous. intellectual and spiritual activity than had formerly been imagined, and that the insistence on the Law that was to be characteristic of the later rabbis was paralleled by a no less intense study and even further development of the spirit of the prophets.

C. Greek and Roman Conquests

1. The Greek Conguest. — In 332, after the overthrow of the Persian empire at the battle of Issus, Alexander the Great occupied Palestine. Jewish legend, preserved both by Josephus and in rabbinic sources, tells how while preparing to march on Jerusalem he was met by and showed especial favour to the high priest of the Jews. The kernel of truth in this legend is presumably that the high priest hastened to perform homage to the conqueror and was accordingly recognized as the head of the Jewish nucleus in south Palestine (the north of the country had even now not been fully colonized by the returned exiles) and the representative there of the new ruler, to whom he was directly responsible — no longer to an intermediate official or satrap as previously. In modern parlance, one might perhaps say that Judea was now granted limited autonomy under its high priest, whose office was not strictly hereditary but confined by tradition to the members of a single family. This was more or less to remain the constitutional position of the country under different rulers for the next century and a half. reasserting itself at intervals as long as the Temple stood and the high priesthood existed. Jewish legend seems to have personified the ideal priest-ruler of this period under the name of Simon the Just — a title that may however apply to more than one high priest of the name — who administered the country in the pre-Maccabean period.

The peace imposed by Alexander did not last for very long. In the succeeding period. after his empire broke up, Palestine — the land-bridge between Africa and Asia — reverted to the role it has played repeatedly throughout history, both before and after, as the passive object of dispute between those in control of the countries to the north and south. between the rulers of Egypt and the rulers of Syria. In 320 B.C. Ptolemy I, aho had made himself master of the former country, took possession of Jerusalem, without resistance, on the Sabbath day, when the Jeas would not defend themselves. During the next few years there nas more than one change of master, until the battle of the Rings in 301 established the Ptolemies definitely in Palestine for a considerable period. Their rule seems to have been mild and benevolent. their main interest being the maintenance of order and the punctual payment of taxation. Some light is thrown on local political and economic conditions by some of the Zenon papyri found in Egypt, which comprise the archive of an Egyptian official family with Palestinian interests. The close political and economic connection with Egypt in this period resulted in the rapid development of the Jewish settlement there, particularly in Alexandria. This was to result in due course in the evolution of Hellenistic Judaism, culminating in the work and life of Philo (*q* v.) and having later a profound influence on the development of Christianity. It was under Ptolemy Philadelphus (285–247) that the beginnings at least were made, apparently under the royal auspices, of uhat was to be termed the Septuagint (*q.v.*) version of the Bible. The first positive archaeological evidences for the existence of the Synagogue are from Egypt at this period (c 240 B C).

The recurrent conflict between Seleucids and Ptolemies for the control of Palestine inevitably strengthened the authority of the high priesthood and other local Jewish representatives On the other hand, the prevailing practice of farming out the revenues

of the province resulted in the emergence of a class of wealthy tax farmers whose influence rapidly extended. Outstanding among them was the family of a certain Tobias, prominent in Ammon since the period of Nehemiah. who enjoyed great favour in Egyptian court circles and disputed with the high priest for the predominant position in Palestinian affairs. From time to time there were even outbreaks of violence between the two factions. A late member of the house. Joseph, who was chief tax collector in Palestine under Ptolemy III Euergetes (246–221), was also nephew of the high priest Onias II, and at one time seemed likely to establish his personal rule in the country.

2. The Hasmonaean Revolt.—The contest ior control of Palestine meanwhile continued between the Ptolemies of Egypt and their former allies the Seleucids oi hntioch, who were now masters of Syria. The latter temporarily occupied the country in 295, 219–217, and finally after their great victory at Paneas (near the sources of the Jordan) in 202. The constitutional position of Palestine remained unaffected except in one respect. Whereas the heterogeneous nature of the empire of the Ptolemies had reconciled them to a cultural pluralism, that of the Seleucids was somewhat more thoroughly Hellenized, in a crude sort of way, and any ostentatious deviation from superficial Greek standards appeared to them an intolerable relic of barbarism. Moreover, it seemed to them that owing to the special position of Palestine as a border province it was supremely necessary for it to become a homogeneous portion of their dominions. This was especially the case under Antiochus IV Epiphanes (*q.v.*), whose devotion to Greek culture and life (for he had been born in Athens) verged on a mania. Hence the superficial Hellenization of Judea, already well advanced among the upper classes, began to make very considerable progress under Seleucid rule. There was inevitably much opposition from the conservative elements—it was perhaps indeed at this period that the "sect" that produced the Dead sea scrolls withdrew into isolation, so not to be contaminated by or forced to conform to the new currents. It is however necessary to emphasize the fact that the Hellenic culture in question supplied the superficialities rather than the essentials. It was a question not of Athenian philosophy and literary achievement so much as the costume, a smattering of the language, shoddy provincial architecture, the games of the gymnasium and the licentious theatrical productions.

Two factions now emerged in the state; of those who supported and those who opposed the new tendencies. The high priest, Onias III, who was opposed to change, found himself superseded by his brother Jason, who not only was more amenable but also promised a higher tribute. (The Greek or Grecized names that now become so common themselves demonstrate how far Hellenic influences had already permeated the country.) The former's son, another Onias, fled to Egypt, where he was permitted by the Ptolemies to set up at Leontopolis a second temple, lasting for nearly 250 years, in which the old forms were scrupulously observed. The example set by Jason however proved fatal ultimately, for in due course he was in turn ejected irom office in favour of one Menelaus, who did not in fact belong to the family of high priests but was prepared to go even further in the direction of Hellenization and to raise an even larger tribute. To bolster up his authority, a Greek garrison, practising its obnoxious heathen ceremonial and ostentatiously contemptuous oi Jewish life and values. was installed in the citadel at Jerusalem. On his return from his first Egyptian campaign in 169 hntiochus made a detour to pass through Jerusalem and demanded admittance into the Temple, which he despoiled of its treasures. During his second campaign in the following year the iormer high priest Jason profited by the general feeling of discontent and raided Jerusalem, where he was greeted with enthusiasm.

Xntiochus, on his ignominious retreat from Egypt after the Roman intervention. decided to apply a drastic solution to the problem. He occupied Jerusalem, butchered or sold into slavery those who opposed the regime of his nominee. razed the city walls, installed a large garrison in a new fortress (known as the bcra) which he had constructed on the site of the citadel of David, placed a Phrygian governor named Philip in control and systematically set about destroying the last relics of Jewish separatism. For this purpose, an Athenian philosopher was set in authority to supervise a policy aimed at the eradication of the Jewish relipion, now considered both an evidence and a cause of the recalcitrance of the Jewish people. It was a question perhaps not so much of installing a new religion as of attempting to merge the local religion into the universally prevalent syncretistic pagan cult, as had happened without opposition in other parts oi the neo-Hellenic world. With this in mind, the God of the Jews was identified with the Olympian Jove, whose image (perhaps in the likeness of Antiochus himself) was set up for adoration over the altar in the Temple. This was the culmination of shame for the Jews, in whose eyes it was considered the Abomination of Desolation (cf. Dan. xi, 31). Before it, pagan rites abhorrent to the Jews were performed, while similar shrines were set up in the provincial centres. As a logical corollary. an attempt was made at the same time to suppress the observance of the traditional Jewish rites.

Discontent was now brought to a head, and in 167 an open revolt began in Modein, between Jerusalem and the sea, headed by a priest named Mattathias, of the house of Hasmon. with his five sons led by Judas (Judah) known as the Maccabee (hence the name Hasmonaeans given properly to the family; Maccabees is to some extent a misnomer. The significance of this name was still in dispute in the 1950s and no thoroughly satisfactory explanation had been suggested). More than once in recent years Jerusalem had been occupied by foreign forces on the Sabbath, when the Jews would not defend themselves. The observance of this prece-'dent now would obviously have resulted in speedy disaster, and accordingly it was-determined that in case of attack arms should be taken up in self-defense even on the day of rest. It may be said that, following the establishment in postexilic Judaism of the hold of the minutiae of Jewish observance, this marked the beginning oi the rabbinic tradition of their mitigation—in the spirit of the Torah—in cases of extreme necessity. Thus the new Judaism was saved from being (as was the case within dissident sects) a cast-iron set of precepts that could not be varied in any circumstances.

3. The Campaigns of Judas **Maccabaeus.**—Antiochus' generals, Seron from Syria and Apollonius from Samaria, failed to overcome Judas, who defeated them by sudden night attacks, in particular in a spirited engagement at Beth Horon. At this time the Parthians were revolting against the Seleucids, Mithridates I (c. 171–138) was making himseli independent, and Antiochus was seriously embarrassed. He determined to deal with the Parthians in person. but he ordered Lysias. his viceroy in Syria, to suppress the Jews. Lysias sent a strong force of infantry and cavalry, under Nicanor. Gorgias and Ptolemy. Judas checked Nicanor at Emmaus and Gorgias' army withdrew. Fresh Syrian forces were dispatched from the south. Either Judas routed them at Beth Zur, by Hebron, or else they retired in consequence of political conditions in Syria. In any case, Judas gained his end. The road to Jerusalem lay open to him, though the Greek garrison in the citadel could not be dislodged. But the Temple was free. It was cleansed and rededicated on 25 Kislev, 165 B.C., three years from the time when it had been defiled.

After reoccupying Jerusalem, Judas proceeded to consolidate his position. The revolt, at first purely religious in motive and scope, became national. After the death of Antiochus Epiphanes in 164 B.C., Judas made a number of punitive raids in all directions, steadily extending the area he controlled or withdrawing the Jewish population where he could not establish effective rule. Finally he made preparations for assaulting the Greek garrison that still maintained itself in the Jerusalem citadel. This made it imperative for Lysias, now regent of Syria, to intervene. The latter inflicted a heavy defeat on the Jewish forces at Beth Zechariah, south of Jerusalem, where one of Judas' brothers died gallantly. Providentially, at this point a pretender made a bid for the Syrian throne, and Lysias had to hurry home to cope with the situation. Accordingly, an agreement was hastily entered into with the Jewish malcontents so as to satisfy some of their more serious complaints. In particular, the usurping Hellenizing high priest Menelaus. who had hitherto continued in office, was deposed! and a certain Alcimus (Hebrew, Eliakim) appointed in his place. The new incumbent was

not directly tainted like his predecessor by implication in the recent sacrilege, but he nevertheless proved unacceptable to the mass of the people because of his political associations. After a while therefore he retired to Antioch and appealed for help to Demetrius Soter. who had now seized the Syrian throne. The latter sent his general Bacchides to restore order. This was effected without great difficulty, but the revolt flared up again immediately he had withdrawn, and Nicanor, the commander of the elephant corps. was routed and killed at a long-commemorated encounter in the historic pass of Beth Horon. Bacchides thereupon returned in overwhelming strength and crushed Judas' forces at Elasa (I Macc. ix, 18). the Jewish leader being among the slain.

Syrian rule was now once again effectively reasserted, without however a renewal of the former blunder of attempting to interfere with Jewish religious observances and institutions. The patriot bands, now headed by Jonathan, the youngest of the Hasmonaean brothers, refused all compromise. nevertheless, and withdrew to Transjordan, from which they made perpetual raids. In the end it seemed simplest to enter into negotiations with Jonathan and recognize his representative position. He and his followers were permitted to re-establish themselves in Judea provided they kept the peace. When however Demetrius found his throne threatened by Alexander Balas, claiming to be Antiochus IV's son, Jonathan was courted by both sides for the support of his veterans. He threw in his lot with Alexander Balas, but at a price. When Alcimus died, he was appointed high priest in his place, and in the autumn of 152 B.C. officiated for the first time in the Temple of Jerusalem. He mas thus recognized as the de facto ruler of the country, like former high priests. Meanwhile he firmly extended the area that acknowledged his authority. profiting from the general anarchy to capture Jaffa and other coastal cities. Thus, temporarily, Judea became to some extent—as seldom happened throughout history—a maritime state, the naval ambitions of the ruling house at this period being symbolized also on their public monuments.

In 143 B.c., however, after further victorious campaigns and steady extension of his territory, Jonathan was lured into a trap at Ptolemais by Trypho, the general of Alexander Balas' young son. Antiochus VI. Jonathan was now succeeded by Simon, the solitary survivor of the five heroic Hasmonaean brothers, who transferred his support to Demetrius of Syria in return for an amnesty and immunity from tribute. The Acra dominating Jerusalem was now evacuated by the Syrian troops (141), and in the autumn of the following year Simon's authority was approved by an assembly in the Temple court which confirmed him in the offices of high priest, prince and military commander. which were henceforth to be hereditary in his house. At about the same time he began to strike his own coins, the first ever issued by a Jewish ruler. then considered a token of independence. Thus, what had begun 17 years earlier as a revolt to secure religious freedom ended as a political movement that re-established the naticnal independence. in abeyance since the capture of Jerusalem by the Babylonians in 586 B.C. Simon was murdered at Dok, near Jericho, in 135 by Ptolemy. his son-in-law, the governor of Jericho. During his rule prosperity had increased, and his death was a great disaster. With him perished two of his sons, Mattathias and Judas; he was succeeded by his surviving son, John Hyrcanus (135–105).

The death of Simon marked the end of the generation of Hasmonaean liberators; all five brothers had died by violence. but they had been successful. When they rose in revolt their religion had been proscribed; Judaism, apparently, was doomed, and Judea was secure in the grip of a despotic foreign power. In the short period of 26 years (168–142) the Maccabees, beginning as a band of desperate guerrillas, had secured tolerance for their religion; they had fought to a successful conclusion what is believed to be the first war for the freedom of conscience, and they had won their political independence against an overwhelming might. The success of these five brothers was due to three factors: the brilliant military and diplomatic skill and courage of the family; the civil wars and anarchy in Syria; and the intrigues and moral support of the encroaching Roman state. (See also MACCABEES.)

4. John **Hyrcanus.**—Meanwhile Antiochus VII Sidetes of Syria (138–129), brother of Demetrius and the last effective representative of the Seleucids, had been endeavouring to reassert the Syrian authority in Judea without success. He now again invaded the country and captured Jerusalem after a lengthy siege. Thanks to the Roman intervention, however. he imposed mild peace terms, permitting John Hyrcanus to remain in power and even to retain recent conquests. subject to the recognition of Syrian suzerainty. Hence when in 129 Xntiochus was killed in battle and the Seleucid empire disintegrated. the Judean ruler was able to reassert his complete independence and resume the policy of national expansion that was the keynote of Jewish history of the period.

Hyrcanus forced the Idumeans to accept Judaism, and he destroyed the Samaritan temple on Mt. Gerizim. During Hyrcanus' rule Judea prospered, and in the Diaspora (*e.g.*, in Egypt. Cyrene and Cyprus) the importance of the Jews increased. Hyrcanus quarreled with the Pharisees. who objected to the combination of the high priesthood with temporal power, and joined their opponents. the Sadducees. He died in 105 and was succeeded by his eldest son, Judas Aristobulus, who conquered Ituraea and planted Judaism there by force. He moreover adopted the title of king. He was succeeded by another son of Hyrcanus. Alexander Jannaeus (103–78), whose continued support of the Sadducees made him disliked. Alexander intrigued with Cleopatra of Egypt and with Ptolemy. His reign was full of warfare, rebellion and bloodshed. On his deathbed he directed his wife Alexandra (76–69). whom he had destined for the succession, to reverse his policy and make peace with the Pharisees. As a result, her elder son. Hyrcanus, became high priest. The Pharisees. whom Alexander's massacres had driven to flight, returned. The queen was supported by Simon ben Shatah and Judah ben Tabbai. who are among the earliest rabbis known to us by name. Their rules of conduct, inculcating care and impartiality in the judicial office, are preserved (see S. Singer, *Authorized* Daily Prayer Book, London, p. 135, all eds.). When Alexandra died in 69 B.C., Aristobulus disputed the succession with Hyrcanus, his brother. War ensued, in which Hyrcanus besieged Aristobulus in Jerusalem. having. on the advice of his Idumean councilor. Antipater. enlisted the help of Aretas (Harith), the king of the Nabataean Arabs.

5. Intervention **of** Rome.—In 66 B.C. Pompey had defeated Mithridates VI of Pontus and his son-in-law Tigranes. Learning of the war in Judea, in 65 B.C. he sent M. Aemilius Scaurus, Sulla's stepson, to intervene, and to Scaurus both Hyrcanus and Aristobulus appealed. The latter won by bribery. Aretas retired and Aristobulus appeared to have triumphed. But Scaurus' superior was at hand. Pompey reached Damascus and immediately deputations followed him there. Aristobulus and Hyrcanus, the latter exploited by Antipater, sent their delegations and one more came from the Jewish nation, begging for the abolition of the kingship and the restoration of the sacerdotal theocracy. Pompey abolished the title of king but recognized Hyrcanus as high priest to rule the country as a Roman feudatory; in effect, however, Antipater secured power. Warfare broke out between the adherents of the two brothers, and the Roman legions participated. Pompey captured Jerusalem and a terrible massacre ensued, the priests being slain at the altar.

6. Roman Rule.—Rome now became the ruler. Aristobulus, his daughters and his sons, Alexander and Antigonus, were taken by Pompey to grace his triumph, but on the journey Alexander escaped and raised a revolt in Judea. Aulus Gabinius, the proconsul, crushed the revolt. Hyrcanus was appointed guardian of the Temple and the country was split up into five districts governed by synods. Alexander and Aristobulus continued their raids. Antipater supported Gabinius and in return could do as he liked. In 54 B.C. M. Crassus, who succeeded Gabinius, plundered the Temple. He was defeated and slain by the Parthians in the next year. Cassius opposed the Parthian invasion of Syria. and Antipater, whose policy was to stand well with Rome whatever happened. aided him. In 51 B.C. Taricheae was captured and 30,000 Jews. who had espoused the Parthian cause. were sold as slaves. When Julius Caesar made himself master of Rome, he released Aristobulus and sent him, with two legions, to Judea, in 49. But Pompey's emissaries contrived to poison him on the journey and Pompey be-

headed his son Alexander at Antioch. In 48 Pompey himself was defeated and slain. whereupon Antipater joined Caesar's party. Hyrcanus was confirmed as high priest and Xntipater made procurator of Judea. Caesar conferred privileges on the Jews, and Suetonius (Caesar 84) mentions how bitterly his death was lamented by those of Rome.

7. Herod the Great.—At this point one of the most remarkable figures in the history of Judea becomes prominent. This was Herod. one of Antipater's sons. who, at the early age of 25, was appointed prefect of Galilee, his brother Phasael being prefect of Jerusalem. After Caesar's departure. one Hezekiah attacked the Syrians; he is described as a brigand, but more probably was fighting for patriotic motives. Herod seized and executed him and a number of his followers. For this he earned the gratitude of Sextus Caesar, the governor of Syria, and the detestation of the Jews. He was summoned to appear before the Sanhedrin but he came to his trial with an armed bodyguard, overawing his judges. Sextus promoted Herod, who raised an army to attack Hyrcanus, but at Xntipater's request he desisted. In 43 Antipater was poisoned. Confusion arose in Judea. Herod repulsed a raid by Antigonus (in Hebrew Mattathias). the son of Aristobulus, who tried to take advantage of the situation.

After the defeat of Cassius at Philippi (42 B.C.) Antony became master of Asia. Deputations approached him in Bithynia, one from the Jews accusing Herod and Phasael of usurping the power of Hyrcanus. But the last-named was aware of the power of Antipater! Antony's friend. and of his sons. These became virtually kings of the Jews. Step by step the Hasmonaean dynasty was giving place to the Idumean Antipater. In 40 B.C. the Parthians. with Xntigonus. invaded Syria. They captured Hyrcanus and Phasael, but Herod escaped to Rome. Hyrcanus was carried away to Parthia and mutilated so as to make him unfit for the high priesthood. Antigonus took his uncle's place and ruled for a few years (40–37 B.C.) as a Parthian tributary with the title of king. Meanwhile, in Rome, Herod was recognized as ruler by the senate. Before long. he returned and captured Jerusalem with Roman aid, Xntigonus being beheaded. Herod strove to conciliate the Jews. He married the grandniece of Hyrcanus, not only because he loved her passionately. but because he hoped to gain favour by allying himself with the Hasmonaeans. When. in a fit of insane jealousy, he had her put to death, he was plunged into uncontrollable remorse. Her image haunted him all his life. By careful if harsh rule, efficient administration and trading activities. Herod amassed great wealth. He was known at home and abroad as a magnificent builder and patron. He filled Judea with public buildings in the Roman style. He rebuilt the Temple with great magnificence and at enormous cost. He encouraged the Pharisees and he conformed to Judaism at least at home, though he temporized religiously abroad. Religion was free so long as politics were eschewed. During this period the Diaspora increased and converts multiplied. Saints such as Hillel (*q.v.*) were among the notable teachers of the people. For the influence of these men, A. Büchler's *Types of Jewish-Palestinian Piety, from 70 B.C.E. to 70* C.E. (1922), may be consulted. Herod preserved peace in his dominions until his death in 4 B.C. (*See* also HEROD.)

8. Herod's Successors.—Herod divided his kingdom by will into tetrarchies, to which he appointed his sons, Archelaus, the elder son of his Samaritan wife Malthace, being named king, and Antipas, her second son, tetrarch of Galilee and Peraea. Philip. a son by another wife. was given the northeast. Archelaus was about to set off to Rome. that he might be confirmed in his title by Xugustus. But a revolt broke out in consequence of the execution. by Herod, shortly before his death, of Judah and Mattathias, two rabbis who endeavoured to remove from above the Temple gate the Roman eagle which they regarded as an emblem of idolatry. Archelaus was asked to punish their murderers. On his refusal riots broke out. Fighting between the Jews and the Romans and massacre took place. Deputations reached Augustus putting forward rival claims and also the desire of the nation to get rid of the Herodians. In the end Augustus reaffirmed Herod's will, counseling Archelaus to deal gently with his people. He did not follow this advice, however. He removed the high priest and violated the Pentateuchal marriage laws. His treatment of his subjects was so tyrannical that a joint deputation of Jews and Samaritans accused him to Xugustus, who summoned him to Rome and then banished him to Gaul.

9. The Procurators.—With this removal of their king at their own request the Jews obtained their desire but forfeited the last vestige of political independence: now the last trace of national liberty was gone and the power passed to the Roman procurators. The error of the Maccabees in invoking Roman aid had reached its logical consequence. No longer—save for a brief interval—was Judea governed by a Jew. If the procurators had been capable and honest, no great harm would have occurred, but Roman provincial government mas uneven. Very seldom were the two requisites combined in one administrator, and the harm done by the bad holders of the office was far greater than good predecessors or followers could counteract. At the outset trouble arose when the first procurator. Coponius, who was accompanied by P. Sulpicius Quirinius, the legate of Syria. endeavoured to take a census (A.D. 6–7) according to Roman methods; which conflicted with those of the Jews. If this is the census to which Luke (ii, 1) refers; the birth of Jesus would have to be dated in that year. but this is too late. The people submitted to the census, but this and similar incidents led to the formation of the Zealots. This body of malcontents, which was formed by Judas of Galilee and a Pharisee called Saduq, remained active down to the disaster of A.D. 70. As a whole the Pharisees were ready to wait and bear with patience attacks on their religion that were not too outrageous, but the Zealots were ever eager for warfare. They made headway especially in Galilee, then ruled by Herod Antipas. It is noteworthy that this province, Judaized so recently, was now the centre of Jewish nationalism. Herod Antipas, like others of his house, endeavoured to conciliate the Jews by observing Judaism, and to stand well with Tiberius, in whose honour he founded the city of Tiberias. Herod, who had married the daughter of Xretas (Harith), the Arabian king. divorced her in order to marry Herodias, the wife of his half-brother. The first consequence was trouble with the Arabs. In A.D. 36 disaster overtook his forces and Tiberius, his patron, died before help could be sent. The second consequence was his denunciation by John the Baptist (Mark vi, 14–29), whom he executed at the request of Herodias. But Xntipas himself suffered through following the counsel of Herodias. He petitioned Caligula for the title of king but his presumption was resented. He was banished and (apparently) slain in A.D. 39.

Pontius Pilate, under whom Jesus was crucified, was procurator from A.D. 26 to 36. He outraged Jewish feelings in all ways, and the picture of him in the Gospels hardly bears out his character, in view of his acts. Not only Josephus but also Philo record the way in which he goaded the people to revolt. As soon as he arrived he broke the existing compromise under which only standards that did not bear the imperial image were brought to Jerusalem, since the images were held to be idols, as the emperors were deified. The Jews petitioned Pilate to remove the standards. He refused and when they importuned him for six days he threatened them with death. yielding only when he found them ready to accept martyrdom. He next created indignation by using Temple money for an aqueduct and proceeded to other forms of oppressive annoyance.

Caligula's succession as emperor in A.D. 37 was welcomed by the Jews. One of his friends was Xgrippa. the grandson of Herod I, and the Jews hoped to win Caligula's favour through Agrippa's presence at court. But trouble arose when Caligula laid claim to divinity and the Jews, alone of his subjects. were unwilling, out of religious motives. to acknowledge his godhead. Thereupon the Alexandrians attacked the Jews, set up the images of the emperor in the synagogues. sacked the Jewish quarter, insulted Jewish women and scourged the Jewish elders. Through Agrippa's influence, the governor was degraded. but ill feeling between the Jews and their fellow citizens continued. In A.D. 40 each side sent embassies to plead their cause. Philo acting as the Jewish spokesman. Philo's account of the embassy sheds an extremely vivid light on the restless, irresponsible character of the emperor. While

the embassy was still awaiting Caligula's decision, the emperor commanded his statue to be erected in the Temple, but at Agrippa's intercession he canceled the order. In A.D. 41 Caligula was assassinated.

Claudius, who succeeded Caligula, made Agrippa king over all the districts that his grandfather had ruled. Once more the Jews had their own king, a popular monarch, who followed the Pharisees and was a strict Jew. He died in A.D. 44 and the rule of the procurators was restored. Under Cuspius Fadus, the patriot bandits were put down for the time. Theudas, who claimed to be a prophet, was followed by a number of people who looked for him to cleave the Jordan. He was captured and beheaded. After Fadus came Tiberius Alexander, an apostate Jew from Egypt, a nephew of Philo. During his administration Helena, queen-mother of Adiabene, embraced Judaism with others of her family and purchased corn to relieve a famine in Judea. The next procurator. Ventidius Cumanus (48–52). provoked the Jews to riot. A massacre took place in the Temple and there was a clash between Samaritans and Galileans.

Cumanus was ultimately banished by the emperor and replaced by Felix (52–60), under whom the revolutionary movement grew to greater dimensions.

The country was once more full of armed malcontents. considered "brigands" by the Romans. They attacked Roman sympathizers, and on one occasion even the high priest was murdered in the Temple. False prophets appeared. Felix tried in vain to restore order. He was recalled by Nero. The succeeding procurators (Porcius Festus. 60–62; Albinus, 62–64; Gessius Florus. 64–66) did no better. Sacrilege and exaction, misunderstanding and ill will grew worse and more frequent. The Jews: roused to fury, at last rose in revolt, expelled the Romans from Jerusalem and utterly overwhelmed in the pass of Beth Horon a Roman punitive force under Gallus, the imperial legate in Syria (autumn, 66). A revolutionary government was now set up, which extended its influence to the whole country. Finally Vespasian was sent by Nero to crush the rebellion. He advanced from his winter quarters in Antioch early in 67. He was joined by Titus, and the Roman armies entered Galilee. The historian Josephus was at the head of Jewish forces there. His army was confronted by that of Vespasian and fled. After the fall of the fortress of Jotapata, Josephus gave himself up. The Roman forces swept the country.

While Jerusalem was invested, Rabbi Johanan ben Zakkai (*q.v.*) is said to have had himself conveyed out of the city and, coming to the Roman general, to have craved a boon. He asked to be allowed to establish a school at Jamnia (Jabneh). His request was granted, and this seemingly trivial concession saved Judaism. Johanan saw that Judaism could survive the Temple, that its future lay in the school and that the Bible was the Jews' portable fatherland. On the 10th of Ab in the year 70, amid circumstances of unparalleled horror, Jerusalem fell. The Temple was burned and the Jewish state was no more.

10. Judaea Capta.—From 70 to 135, the only hope lay in the "vineyard" of Jabneh. The Sicarii and Zealots held out until, one by one, their fortresses were reduced. In Egypt and Cyrene they continued their fruitless but heroic efforts. The Egyptian temple of Onias, which had existed for 243 years, was first closed and then destroyed. Nevertheless, under Vespasian and Titus the Jews continued to enjoy freedom of conscience. Domitian inaugurated a persecution which Nerva ended. In Trajan's reign the Jews of Cyrene revolted but were subdued. Finally, in 132, Hadrian's intention to found a Roman colony on the site of Jerusalem and his proscription of some Jewish rites roused the last remnants of Palestinian Jewry to revolt. A bitter struggle ensued. Barcocheba was recognized as Messiah by the great Rabbi Aqiba, though some of Aqiba's colleagues repudiated Barcocheba's pretensions. For three years the hopeless conflict raged, the Jews fought with the energy of despair, but in 13j the end came. Jerusalem and then Bethar fell. The holy city was thenceforth prohibited to the Jews, though the Christians, who had taken no share in the war. were allowed to come and go there freely. Many scholars date the breach between Judaism and Christianity (see JUDAISM) to this event.

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(H. M. J. L.; C. R.)

II. A.D. 135 TO 1791

A. Learning and Communities in the Diaspora

1.— Rabbinical Learning in the East.—The ruthless suppression of the rising of Barcocheba had decimated the population of Judea. The centre of Jewish life in Palestine moved in consequence northward, to Galilee. Serious political aspirations were now at an end. Henceforth, the dominant position in the national life came to be occupied more and more by spiritual and intellectual leaders, the rabbis of this period being known as *Tannaim.* Pharisaism, in its finest sense: became an increasingly strong force in daily life. Political leadership was taken over by the presidents of the Sanhedrin, or patriarchs, who ultimately obtained formal recognition from the Roman authorities, and enjoyed additional consideration among the people in virtue of their descent from Hillel (*q.v.*), and hence by tradition from David. The office, which had become firmly established by Gamaliel II of Jamnia after the destruction of Jerusalem, reached its zenith in his grandson, Judah I (135–217), known as "Rabbi" par excellence. He is remembered for having codified the oral law by the redaction of the Mishnah, the basis of all the vast rabbinical literature of later times.

The intellectual activity of the latter half of the 2nd century seems to have been somewhat forced. Owing to the ravages caused by constant wars and revolts, as well as by adverse economic conditions, the importance of Palestine was declining. The establishment of Christianity as the religion of the Roman empire. and the consequent increase of moral and physical pressure on the Jews, hastened the process, and at the beginning of the 5th century the patriarchate, already in decline, was finally abolished by the Roman authorities. But the great centre of Jewish population lay already outside the country, particularly in Mesopotamia, where the "exile" had continued throughout the days of the second Temple. Babylonian students had been accustomed to come to Palestine and sit at the feet of its renowned teachers. By the time of the death of Judah I the younger settlement had become iritellectually self-supporting.

Abba Arika, commonly known as Rab or "Master," who had been a pupil of the great Palestinian patriarch, established at Sura a famous school of rabbinical learning that retained its prominence until the 11th century. His younger contemporary. Samuel (famous for his momentous maxim that "the law of the state is Law"), presided at Nehardea over an academy that long rivaled the other. During its temporary suspension owing to the sack of the city by Odaenathus (Zenobia's husband) in 261, there arose in the neighbourhood the school of Pumpeditha. These three academies co-operated with the dwindling schools in Palestine in maintaining the traditions of Jewish learning, the teachers now being called *Amoraim.* The discussions that went on in them, centred in the text of the Mishnah (especially at the semiannual *Kallah* assemblage). were ultimately redacted as the *Gemara,* the whole body together forming the Talmud. The foundations of the less important compilation made in the decaying academies of

Palestine were laid by Rabbi Johanan (died c. 279) in Tiberias; but it survives in a fragmentary state, and probably was never finished. Palestinian, too, was the Midrash—a vast compilation of homiletics, ethics, legend and folklore in the form of a commentary on the Bible. The fuller Talmud of Babylon, which exercised a preponderating influence upon Jewish life in later times. reached its final form at the close of the 5th century. It was far from being merely a code of religious practice. It was a whole literature, comprising law and theology, science, folklore and every other conceivable branch of intellectual activity, somewhat amorphously grouped about the text of the Mishnah. It was this that remained, after the Bible, the Jews' principal guide to life and object of study, and that gave Judaism unity, cohesion and resilience in the difficult period that lay before it. (See also TALMUD)

2. The Moslem Conquest.—The rise of the Moslems under Mohammed was an improvement over the anarchy of the declining neo-Persian state in which the talmudic literature and environment had formerly flourished. Mohammed set out originally to win the support of the Jews in Arabia for his syncretistic faith through his teachings of ethical monotheism. his borrowings from Jewish traditional lore. his introduction of dietary laws. his requirement of turning toward Jerusalem in prayer (kiblah) and his adoption of formal prayers and of special fasts similar to Jewish models. When the Jews rejected him he proceeded to destroy them or drive them out of Arabia. His successors, however, finally formulated a series of provisions that determined the status of all tolerated infidels, including the Jews. This was the "pact of Omar" (7th to 9th centuries), which established all infidels throughout the expanding Moslem world in a position of second-class citizenship. Its provisions, however, were frequently honoured more in the breach than in the observance.

The caliphs, once their original missionary zeal abated, showed themselves willing to accord an almost boundless toleration in return for a slender poll tax. In Mesopotamia intellectual activity continued with renewed vigour after the downfall of Zoroastrian intolerance. The secular dignity of "prince of the captivity," or exilarch (*q.v.*), which had existed from remote antiquity, was maintained with renewed magnificence. Intellectual leadership, however, resided in the gaon (*q.v.*), the head of the academy, who continued to expound and develop the principles of the Talmud with an authority that was extended by the conquests of the Crescent. The widening of intellectual horizons which the Moslem influence ultimately brought about was typified in the gaon Saadiah (Seadiah, *q.v.*; 882–942), who first exemplified the fruitful combination of Helleno-Arabic and Jewish culture. Jewish philology and philosophy both start with him, being necessitated by the threatening Karaite schism (see QARAITES), for the check of which his labours were principally responsible. This double organization, under gaon and exilarch. continued until the 11th century, by which time the Jewries of the occident were strong enough to stand by themselves.

3. The Diaspora in the West.—Already, before the destruction of Jerusalem, the Diaspora had been a familiar phenomenon in Europe. The prisoners captured in innumerable wars and distributed through the empire as slaves had been followed (if not preceded) by merchants and traders. Latin writers from the period of Augustus onward show the extent to which Jewish practices were spread throughout the civilized world of their day. Paul found them in Greece and Italy, and the infant church consistently advanced where the synagogue had blazed the way.

By the beginning of the 4th century, settlements were to be found as far afield as Spain and the Rhineland. Indeed. it is probable that before the Roman empire had begun to decay Jews were present in all its greater cities. By the constitution of Caracalla (212) they had been admitted to the privileges as well as the burdens of Roman citizenship, and thereafter they occupied a position that was privileged by comparison with that of members of other dissenting religions.

With the Christianization of the empire, the Jews' condition was altered. It is true that they were comprised in the toleration accorded by the edict of Milan. but their status was immediately and radically changed. The differentiatory policy of the church was adopted almost in its entirety by the state. From an *insignissima religio*, certe licita ("a most noted religion, undoubtedly lawful"), Judaism became the *secta* nefaria ("nefarious sect") or *sacrilegi* coetus ("sacrilegious gatherings") which figures in the edicts of the first Christian emperors. The policy of the church was far from being merely persecutory. Its intention was rather to prevent the inroads of Judaism by keeping its adherents from positions of authority and restricting social intercourse with them. At the same time, it regarded their preservation (if in ignominy) as evidence for the truth of Christianity, and frowned upon the use of force to bring them into the path of conformity The papacy, true to the tradition set by Gregory the Great, figured down to modern times alternately as the protector of the Jews from violence and the repressor of their "insolence," departing from this standard sometimes on the side of leniency; and Rome was almost the only city of Europe to preserve its Jewish community undisturbed from remote antiquity down to the present day. The secular rulers, however, did not show the same discrimination, and in the Byzantine empire in particular (especially from Justinian, who was the first emperor to interfere with religious institutions), discrimination degenerated rapidly into oppression. The embodiment of the new principles in the Codex *Theodosianus* ultimately permeated the whole of western law with the idea of Jewish inferiority.

B. MIDDLE AGES AND RENAISSANCE

1. Renascence of Jewish Culture.—With the barbarian invasions a momentary improvement had come about in the position of the Jews. The new rulers displayed at first that tolerance that arises from indifference, while those who adopted the Arian form of Christianity were sympathetically inclined toward the adherents of a stricter monotheism. Later, a reaction followed. In the 7th century there was a simultaneous wave of forced conversion throughout Europe from Constantinople to Toledo, reaching its height under the Visigoths in Spain, where the practice of Judaism was for a time utterly proscribed.

It was the Arab invasion that brought salvation. The ancient communities in northern Africa, which had waned under Byzantine intolerance, awakened to a new life, especially at Cairo and Kairouan. In Spain there came about a remarkable revival. The Jews knew no restriction upon their activities. Their linguistic and financial abilities won them high place in the administration. Under the aegis of Hasdai ibn Shaprut (c. 915–970) and Samuel haNagid (c. 993–1056) there was a remarkable renascence, in which the old traditions of the schools of Palestine and Mesopotamia, the manifold interests of the Moors, and the rediscovered sciences of ancient Greece were remarkably blended. Jewish poetry came to a new life, based on Arabic models, with Judah Halevi (c. 1085–*c.* 1140) and Solomon ibn Gabirol (c. 1021–*c.* 1058). Moses Maimonides (1135–1204) represents in his many-sided activities, as physician, Talmudist, codifier and philosopher, the Spanish school at its best. This tradition was proof against the intolerance introduced by the fanatical Almohades in the 12th century; for. partly from reasons of policy and partly imitatively, the earlier Moorish toleration was adopted by the growing Christian kingdoms.

Meanwhile, under the favourable rule of the Carolingians, important Jewish settlements had come into being in northern France and the Rhineland. Cultural life inevitably followed. But the tendencies of northern Jewry were sterner than those of Spain and centred in the interpretation and development of talmudic law rather than in humanism or philosophy. The first great name is that of Gershom, "the light of the exile," who published about the year 1000 the famous ordinance that forbade among western Jews the polygamy long since abandoned in practice. Solomon ben Isaac (Rashi) of Troyes (1040–1105) summed up the tendency, his writings preserving for after-generations the old traditions of rabbinic scholarship. An extensive body of Tosaphists, or "supplementers." whose activities extended to almost every township of northeastern France, carried on his work. But these were only varying facets of an intellectual activity that knew no boundary of country. A remarkably comprehensive educational system,

insisted upon as a religious duty, resulted in a general distribution of culture unequaled in any other section of the population The speculative tendency everyuhere found its outlet in a vast mystical literature, afterward grouped about the Zohar. The 13th-century renascence was forwarded in no small measure by the translations from the Arabic made by, or with the help of, Jewish scholars—sometimes under the sedulous patronage of monarchs like Alfonso the Wise of Castile and Robert of Anjou. In Immanuel of Rome (c. 1261–1330), Dante's earliest imitator, Hebrew poetry became infused with something of the careless spirit of Italian verse, in which Immanuel was equally proficient. The Jewish physician or astronomer, living under the highest patronage, was fully as characteristic a figure as the merchant or financier.

The Jems of Europe of the 11th century onward were economically far removed from their ancestors in Palestine and Mesopotamia. The original settlers had included tillers of the soil, and the calling lingered on in many places, particularly in the south, to a late date. But the peaceful immigrant into a country already inhabited cannot easily settle on the land, and the growth of the feudal system, from which the Jews as strangers were naturally excluded, tended to accentuate their divorce from the soil. Accordingly, there was an inevitable tendency for them to specialize in commerce, for which their acumen and ubiquity gave them especial qualifications. In the dark ages the commerce of western Europe was largely in Jewish hands, not excluding the slave trade, and in the Carolingian cartularies Jew and merchant are used as almost interchangeable terms.

With the growth of a mercantile class the Jews became excluded from commerce, particularly in northern Europe. Hence they were forced to employ their capital in the only way left open to them, by lending it at interest. The attitude of the church in endeavouring to suppress "usury" naturally tended to concentrate the profession more and more in the hands of those to whom the canonical prohibitions did not so fully apply, and against whom they could not readily be reinforced (the idea that the church approved the practice of usury by non-Christians is incorrect). Ultimately, other professions were closed to Jews by law in the greater part of Europe, though in Spain and Sicily they remained to some extent addicted to handicrafts and agriculture. The high probabilities of violence or expropriation naturally resulted in forcing up the rates of interest, though in point of fact the Jems charged no more than other usurers. Yet the advantage accrued rather to the crown, which did not scruple to avail itself to the utmost limit of its rights of taxation. The floating wealth of the country was soaked up by the Jews, who were periodically made to disgorge into the exchequer. The Holy Roman emperors in particular, as heirs to Vespasian, claimed exclusive proprietary rights, and their claims were imitated by other rulers. As *servi camerae regis* ("slaves of the king's chamber") the Jews of any particular place or country could be pledged, alienated or even expelled without compunction.

2. The Christian Reaction.— The third and fourth Lateran councils (1179 and 1215), roused to suspicion through the Albigensian movement, stimulated the reaction against the Jews. Besides renewing the old restrictions forbidding Gentiles to enter into Jewish service or to be otherwise subordinated, they ordered the infidels to be distinguished by a special badge and forbade the faithful so much as to lodge among them, thus laying the foundation of the later ghetto (*q.v.*) system. These regulations were not everywhere immediately or consistently enforced, but they remained a part of the ecclesiastical panoply, to come again into prominence in the 15th century. in the wake of the Hussite wars and the preaching of John of Capistrano, and in the 16th, as a consequence of the Reformation.

The counteroffensive against heresy found its expression also in conversionist sermons at which attendance was enforced; in the censorship or confiscation of Hebrew books; and in compulsory religious disputations, the most important of which were those of Paris in 1240, of Barcelona in 1263, before King James I, and of Tortosa under the patronage of the antipope Benedict XIII in 1413–14. The inevitable result of all this was to make the popular prejudice still stronger.

The last country of western Europe to be settled by the Jews had been England, whither they penetrated in the wake of the Norman Conquest (in the Scandinavian countries they never figured to any appreciable extent). This marked the culmination of the western sweep that had been going on since the beginning of the Christian era and had made the Jews into an essentially European people. The backward swing of the pendulum began almost immediately. With the first crusade (1096), there took place in the Rhineland the first of the long series of massacres that made the middle ages one long martyrdom for the Jews and ultimately had the effect of driving them back again toward the east. These were henceforth renewed on every conceivable pretext in almost every country of Europe. To reinforce racial and religious prejudice, the preposterous ritual murder (*q.v.*) accusation became common from the 12th century, and the even more fantastic charge of the desecration of the Host was formulated at the beginning of the 13th century after the recognition of the doctrine of transubstantiation. Meanwhile, the growth of the financial activities of the Lombards and Cahorsins rendered the Jews less necessary in the field they had previously tended to monopolize and drove them into the meaner calling of pawnbroking.

The logical outcome of the changed condition of affairs was, in current opinion, to drive the infidel away altogether. This had previously happened in isolated cities or regions, but the first country to rid itself of the Jews entirely was England, whence they were expelled by Edward I in 1290. This was followed a few years later by the more deadly expulsion of the far more important communities of France (1306), which two partial recalls (1315 ff. and 1350–94) utterly failed to make good. From Germany, by reason of its special political conditions, there was no general expulsion. It figures instead as the classical land of Jewish martyrdom, where banishment was employed only locally and sporadically to complete the work of the long series of massacres. These reached their climax, though not their close, at the period of the Black Death in 1348–49, when the absurd charge of poisoning the wells became current. Some of the refugees crossed the Alps into Italy, where, owing to the tolerant example of the Holy See, conditions were better. But the vast majority turned their steps toward Poland. where their settlement was especially encouraged by Casimir the Great (1310–70). This was the origin of the vast nuclei of Jews in the old Russian empire who retained for centuries the German dialect (see YIDDISH LANGUAGE AND LITERATCRE) which their ancestors brought with them from the west and imposed upon the indigenous communities which they found on their arrival.

In Spain the condition of the Jews, even under the Christian rulers, long compared favourably with that of their brethren in northern Europe. Nevertheless, with the passage of time and the growth of national and religious feeling, their situation deteriorated. In 1391, and again in 1411, a wild wave of massacre swept through the peninsula. Following the example of their fathers in Gothic times, many Jews (less stouthearted than their brethren elsewhere) sought refuge in baptism. To cope with the problem of these so-called marranos, who remained true at heart to their old faith, the Inquisition was introduced (1478). But the presence in the country of Jews true to their religion seemed a constant encouragement for their converted brethren to relapse. Accordingly, four months after the capture of Granada (which did away with all need for further conciliating this religious minority), Ferdinand and Isabella issued the edict of expulsion (March 31, 1492) which put an end to the settlement of the Jews in Spain after so many centuries. This extended to the more distant possessions of the crown of Aragon—Sicily and Sardinia—in spite of the fact that the problem of the crypto-Jew was unknown in them. It was in vain that Isaac Abrabanel (1437–1508), the last of the long line of Jewish scholar-statesmen in the peninsula, begged for reconsideration. The edict was imitated in Portugal (1496) and in Navarre (1498) after a very brief interval. Almost simultaneously, the last remnant of the ancient French communities was banished from Provence. An expulsion from the kingdom of Naples (1510 and, more completely, 1541) and from the duchy of Milan (1591) followed the Spanish occupation.

The whole of western Europe was now closed to the Jews, except parts of northern Italy and a few regions of Germany, together with the exiguous papal possessions in France. The marranos. indeed, continued a surreptitious existence in the peninsula. handing on their traditions in secret from generation to generation at the risk of their lives. It was their descendants, fleeing from the fires of the Inquisition, who. in the 17th century, founded the modern communities in France. Holland. England, and even America. Of the earlier refugees the vast majority made their way, sometimes with indescribable difficulty. to the Moslem countries of the Mediterranean littoral. With them they brought their native Spanish tongue. which is spoken by their descendants to the present day. The greatest haven of refuge was Turkey, where the newcomers were sedulously encouraged by the sultans and treated with a favour that reached its climax in the meteoric career of Joseph Nasi, duke of Naxos (d. 1 j79) (*q.v.*). The greatest masses of the Jewish people were thus to be found once more in the east, in the Polish and Turkish empires. The second westerly movement, which has continued to our own days, may be said to begin mith the deadly Chmielnicki massacres of 1648–49 in the former country. The few communities suffered to remain in western Europe—*i.e.*, in Italy. Germany and the papal possessions in southern France—were meanwhile subjected at last to all the restrictions which earlier ages had usually allowed to remain an ideal; so that, in a sense, the Jewish dark ages may be said to begin with the Renaissance.

3. Culture and Community in the Medieval Jewish World.--Medieval Jewry as an alien minority was not in a position to make any notable contribution to the culture of its environment except in science, medicine and philosophy. Yet it did much, if only by its mere existence, to encourage unitarian religious movements, to stimulate independent thought and to set an example of spiritual courage. In the Arab world in the 9th–12th centuries. it furthered translations of Greek classics, encouraged the rise of the *Mutazila* philosophy, transmitted oriental folk tales and helped to introduce numerals. In Christian Europe after the 11th century it rendered aid in the translation from the Arabic (usually via Hebrew) of philosophic and scientific works of Greek origin. the original texts of which mere now inaccessible in the western world; and made significant contributions in the fields of mathematics and medicine, astronomy and cartography. Through the philosophic writings of Ibn Gabirol and Maimonides it had some influence on medieval scholastic thought.

The waning of the Moslem threat in Spain in the 13th century, the growing Christianization of Europe, and the simultaneous rise of a powerful papacy furthered a Christian reaction that drove the Jews into a spiritual if not yet a physical ghetto. The Jews of Spain and Italy. to be sure, never divorced themselves from medieval secular culture; but the Jews of the orient and of central and eastern Europe were shut off from its influence.

In Christendom. the Catholic church, made nervous by the Reformation. wrongly suspected Jewish influences as partly the cause. In 15jj Pope Paul IV established the ghetto (*q.v.*), enforced perpetual wearing of the Jewish badge and drastic separation of Jews from Christians, and excluded Jews from all honourable positions and occupations. The ghetto also led to conversionist sermons with compulsory Jewish attendance, censorship of Hebrew books. and constant dread of kidnaping of Jewish children for baptism. But the popes never countenanced (save in one or two ex post facto instances) charges of ritual murder and desecration of the host. Moreover. when other rulers expelled the Jews, the popes always permitted them to live in those areas subject to them. The ghetto survived into the late 19th century.

In the troubled centuries of bigotry and misunderstanding the Jews found shelter in Judaism. In the ghetto Jewish separate communal life was legally recognized by the corporate medieval state. The Jewish community attempted to function as an elective representative democracy; in practice it tended to be plutocratic. The governing body was a small council, but its decisions were frequently subject to review by the rabbi who was the local communal judge. The council took the lead in assessing and collecting taxes and in administering the charities, the schools and the synagogues. The usual complement of paid officials included the rabbi, the cantor, the beadles and the ritual slaughterer. In Germany and eastern Europe, later on, large communities or groups of communities appointed or employed a liaison officer (*shtadlan*) to work with the non-Jewish authorities. Communal life concerned itself, in the main, with internal problems of organization, and raising of taxes for the gentile state and for the Jewish community, the preservation of its institutions of social welfare, and the administration of the Jen-ish courts which always exercised civil jurisdiction. Criminal jurisdiction was rarely tolerated by the state.

All these activities necessitated a great. deal of legislation, and in this the autonomous Jewish community was granted the widest latitude. Ordinances were enacted by the Jews governing every phase of life: business, synagogue attendance, social morals, policing of the ghetto, and sumptuary laws. to suppress extravagance or forestall gentile jealousy, which regulated dress, amusements. card playing, feasting and other aspects of ghetto life.

The schools and philanthropies were highly important aspects of medieval Jewish life. Elementary education was compulsory, but was limited to religious instruction; this however included reading and writing at least. Secular disciplines were acquired sometimes privately at the hands of tutors. There was little incentive to pursue the sciences—with the exception of medicine—because of the exclusion of the Jews from the world about them. Gifted students were encouraged to continue their religious studies at rabbinical academies, where the career of rabbi often led to fame, if not to fortune. Because rabbinic law was statute in the ghetto, a very impressive corpus of Hebrew legal literature grew up in the course of centuries, embracing codes, commentaries and legal *responsa*. In addition, Hebrew literature was rich in works of science, folk tales, mysticism, travel and history.

The education of women was of a perfunctory type, but many did learn to read, and with the development of printing there appeared in Judeo-German, Judeo-Spanish, etc., a vernacular literature primarily intended for them, but increasingly read by men ignorant of Hebrew-. This literature included works of an ethical-religious and also of a secular nature.

The philanthropic or social welfare work of the community included the school system, the synagogues, the hospice, help for impoverished members of the middle class, and a ticket system of relief for migrants. Many of the charities were administered by semiautonomous hebrot or confraternities working under communal supervision. There were societies for dowering brides, burying the dead, redeeming captives, supporting schools, clothing the poor and sending aid to Palestine.

The characteristics common to the medieval Jewish community were: self-imposed discipline. the consideration of all religious, philanthropic, educational and self-defense problems as common concerns and a strong sense of solidarity fortified by a uniform way of life.

4. Messianic Pretenders, **Hasidism** and Emancipation.—The compensations offered by a completely integrated communal life in the ghetto were not sufficient to maintain the morale of a Jewry that found itself almost completely expelled from western and central Europe by the 16th century: and ravaged during the revolts in Poland in the 17th century. Reacting in a fashion typical of Jewry for over 1,600 years. the Jews looked for relief to messianic pretenders. In 1665, Sabbatai Sebi, a Smyrna Jew, proclaimed himself the long-awaited Messiah and was enthusiastically acclaimed by Jews everywhere until unmasked as an impostor the following year. A century later, under the leadership of Israel Baal Shem Tov. the Master of the Good Name (1700–60), very large numbers of Jews in eastern Europe flocked to the new mystical and ethical sect of Pietists or Hasidim (see JUDAISM).

The forces that produced a false Messiah such as Sabbatai Sebi and a great spiritual and ethical movement such as Hasidism have a great deal in common. In both instances. the submerged Jewish masses were seeking "escape." In a political sense they yearned for physical leadership and security; spiritually they had a craving for an inner freedom which expressed itself in a protest against the

intellectualism of the rabbis. The great contribution of the Hasidim was their stress on the ethical aspects of Judaism! on religious consecration and on the joy of living. They opposed formalism in religion, decried asceticism and manifested a keen interest in man himself, particularly the common man. Messianic redemption and ethico-religious rebirth were thus for many Jews a form of emancipation from suffering. The Jews of central and western Europe, more directly influenced by the secular and liberalistic society in which they lived, sought emancipation, not at the hands of God, but at the hands of man. That emancipation, after slowly developing in the new lands of settlement in western Europe from the close of the 17th century, and in Germany after the intellectual achievement of Moses Mendelssohn (*q.v.*), received formal expression at the time of the American and French revolutions.

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III. MODERN PERIOD

A. THE AGE OF LIBERALISM, 1791–1919

1. Period of Emancipation.—A new world dawned for European Jewry with the French Revolution. The fall of the Bastille marked the beginning of the end of the Jewish "dark ages," which may be said to have extended from 311 to 1789. During the medieval period many Jewish disabilities had piled up in the Christian and Moslem lands. The Jew could not become a citizen or hold any government office, could not practise many of the professions or join a craft or merchant guild. He was frequently compelled to live in a ghetto and to wear a special badge and was subject to onerous taxation. Not infrequently he was compelled to pay a humiliating travel toll for himself (*Leibzoll*) as well as for his cattle. A rounded education and a decent standard of living were beyond the reach of most Jews. These disabilities—with considerable variation—were current in practically all Christian lands; similar legal incapacities affected the Jew in Moslem lands and were incorporated in the rather fluid body of law known as the pact of Omar. The first outright emancipation of a large body of European Jews occurred on Sept. 28, 1791, when the national assembly enfranchised French Jewry. This was the beginning of the liberal era, which reached its climax in the treaty of Versailles in 1919.

Emancipation of the Jews in France was itself the result of a spirit of liberalism and rationalism that had its roots deep in the Renaissance and the middle ages. Ever since the 16th century there had been a growth of tolerance among the thinkers and rulers of Europe. The Wars of Religion which ended with the Treaty of Westphalia (1648) established the right of tolerance for Catholics and Protestants within the Holy Roman empire. The growing national states, looking back to Roman and classical ideals, emphasized their own sovereignty, including the right to control the destiny of their Jewish subjects independent of church traditions. The mercantilist and capitalist state was willing to tolerate Jews if they could create wealth and if they could become "useful" citizens. These utilitarian motivations were supported by philosophic, rational and humariitarian considerations. The teaching of natural rights and natural religion made a place for the Jews, who were now looked upon as fellow human beings. The 16th-century Dutch welcomed them in their struggle against the Spanish empire; Oliver Cromwell wanted them to further English trade in the Spanish Main and to clip the wings of the rising Dutch state; Roger Williams and John Locke sincerely believed in religious liberty and encouraged the settlement of Jews in the British American colonies, and early in the 18th century John Toland, the Irish philosopher, in his *Reasons for Naturalizing the Jews* (1714) pleaded for a wide toleration of the oppressed Jews.

The 18th century saw the marshalling of the forces of liberalism. The French encyclopaedists led the way. Voltaire disliked the Jews, but his teachings made for freedom, Montesquieu and Rousseau pointed out abuses to which the Jews were subject, and Mirabeau and Abbé Grégoire asked for freedom for the Jews. The work of the French liberals found a sympathetic echo in G. E. Lessing's *Nathan der Weise* (1779). The model of this great plea for tolerance, Moses Mendelssohn (*q.v.;* 1729–86), greatly influenced the Prussian bureaucrat Christian Wilhelm von Dohm, who in 1781–83 published his essay *Über die bürgerliche Verbesserung der Juden* ("On the Civil Improvement of the Jews"). The first real effect of this new teaching was felt in the distant English colonies in America, where by the Declaration of Independence (1776) and the constitution (1789) all rights and privileges were given to Jewish inhabitants. The Bill of Rights of the American constitution influenced the French to emancipate their Jews in 1791.

Napoleon—whether it was his will ,or not—became the testamentary legatee of the French Revolution. Wherever he went: he spread the teachings of French liberalism. Jewish equality was imposed in practically every land he conquered. There was a breath of freedom, at least for a few years, for the Jewries of Holland, Switzerland, western Germany and Italy. But Napoleon himself entertained little sympathy for Jews. He called an Assembly of Notables in 1806 and a confirmatory Sanhedrin in 1807 in order to compel the Jews within his empire to assimilate themselves as speedily as possible into the new French civilization. He imposed a centralized consistorial type of church government upon the Jews, through which he completely subordinated the Jewish synagogue to himself in much the same way as he had done with the Catholics and the Protestants. Through the "Infamous Decree" of 1808, he "froze" the Jewish settlements in the German *départements* and exercised a dictatorial supervision over every important financial transaction into which the German Jews entered.

The fall of the First Empire ushered in a period of reaction broken only by the liberal revolutions of 1830 and 1848. Most of the Napoleonic gains were lost. except in Holland. But the spirit of liberalism mas on the march, and gradually throughout the century the Jews of central and western Europe were given equality. The new Belgium gave the Jews all rights in 1830; Austria-Hungary gave them political freedom in 1867 and had granted legal recognition to the Jewish religion by 1896; the Italian states, in spite of papal opposition, completed their legislation in favour of Jewry in 1870; and even Germany, where many Jews had been partially emancipated through the Prussian decree of March 11, 1812, completed the task, as an empire. in 1871. Three years later, in 1874, the Swiss, after diplomatic encounters with the French and the United States. gave up their opposition to Jewish political equality. In the Scandinavian lands. Denmark granted equality in 1849 and Norway admitted Jews in 1851 and allowed them to hold public office in 1891. In Sweden, no Jew can sit on the council of state because it is the governing body of the state Lutheran Church, but in every other way the Jews have enjoyed full equality since 1870. The Spanish state. which had expelled its Jews in 1492, never laid down a clear-cut policy toward readmission or emancipation. Jews have been tolerated in the country since 1876, and by the middle of the 20th century as far as they were Spanish citizens the Jews enjoyed apparently full civil rights. Greece emancipated its Jews in the middle of the 19th century, and the Turkish revolution of 1908 brought a semblance of political freedom to the Jewish masses in Turkish lands.

The attainment of political equality in England, for Jews as for dissenters, was a slow process. As early as 1; j3 a bill was introduced to bring about the naturalization and emancipation of foreign-born English Jews, many of whom were cultured and wealthy. But public opinion was not prepared for this assault on traditional prejudice, and on Dec. 20 of that same year the "Jew

bill" had to be repealed. It was not until 1830. after the repeal of the Test act and the emancipation of the Catholics, that the Jews again tackled the problem of equality. Even with the aid of the historian Thomas Macaulay, Robert. Grant and a host of other liberals, they still made progress only slowly. Francis Goldsmid, a Jew, was called to the bar in 1833, and by 185j all municipal offices were open to Jews. Finally, after a hard struggle. Baron Lionel de Rothschild took his seat in the house of commons in 1858, omitting from the oath the words "on the true faith of a Christian." In 1871 the University Tests act admitted men of all creeds on equal terms to all lay posts at the universities. in 1885 Lord Nathaniel de Rothschild took his seat in the house of lords, and by 1890 all offices were open to Jews except that of sovereign.

The central and western European lands had therefore practically all granted equality of rights to their Jewish inhabitants by about 1870, but Jews in these lands formed only a minority of world Jewry. The masses of Jews lived in eastern Europe. in Russia. Poland and Rumania, amidst veritable medieval conditions. Russia, bitterly anti-Jewish, inherited the largest Jewry in the world when, in the years 1772–95, it shared in the partition of the old Polish republic. These Jews were "frozen" in the eastern provinces of the empire into a Pale of Settlement (1791), and there they remained until World War I.

The attitude of the Russian rulers toward the Jews in this huge ghetto from the time of Catherine the Great (1762–96) to Nicholas II (1894–1918) was marked by curious inconsistencies; by occasional periods of sympathy alternating with the grossest brutality. In their moments of liberalism, various Russian rulers attempted to put the economic life of the Russian Jew on a sound basis by settling him on the soil and by establishing elementary schools to "civilize" him and to encourage his entrance into Slavic cultural life. Various commissions were appointed throughout the 19th century to study and to make recommendations to solve the problem of these millions of declassed people. but the recommendations of the liberal commissions were never accepted. Occasionally the same rulers who made gestures of liberalism to the Jews with one hand brutally repulsed them with the other. They were driven out of the villages in the borderlands: herded into the ghettos created within the larger ghetto of the Pale. deprived frequently of the chance of higher education, and conscripted into the army though denied the privileges of advancement and the rights of citizenship. Ritual murder charges abounded, and the horror of outright pogroms or state tolerated and organized killings and massacres began to terrify the Jewish masses in the 1870s and 1880s. There was a short interlude of liberalism under the emancipator tsar Alexander II (1855–81). In the period from 1855 to 1865 Jewish craftsmen, college graduates and wealthy merchants were permitted to settle in Russia proper.

The assassination of Alexander II in 1881, however, ushered in a period of reaction that continued with only slight alleviation until 1917. The Romanoffs, beginning with Alexander III (1881–94), cultivated an older Russian policy that was to have fateful consequences for all European Jewry: the policy of the scapegoat. The Russian landed magnates and bureaucrats ever since the early 19th century had refused to solve the social problems of the underprivileged peasant masses in a constructive fashion. The emancipation of the serfs only gave them the right to starve. To avoid a repetition of the Jacqueries which were not unknown in that land. the very magnates who had brutalized and exploited the serfs and peasants encouraged the belief that the Jews were the cause of all Russia's troubles. If the Jews could only be kept away from the peasants whom they "exploited," if the peasants would only recognize in the Jew the real religious and economic enemy, then they would be so busy hating and killing Jews that they would not have time to think of their own troubles or to demand redress from the despotic Russian state. It was this state and its tsars that organized and even financed massacres of the Jews as late as the beginning of the 20th century, during the reign of Nicholas II. This policy found a wider application than ever before in Russia's crisis years 1904–06. Russia's ignominious defeat by Japan in 1904–05 was followed by a working-class revolution which developed into a serious threat to the established order. The Jews were made responsible for all these events; the "Black Hundreds." consisting of heterogeneous reactionary elements, were organized to carry out the policy in the name of the tsar. Here was the classical diversion and scapegoat maneuver which was to be emphasized so effectively in the 1930s by Adolf Hitler.

The pogroms killed Jews but did not stop the social revolutionary fervour of the Russians. The defeat of Russia in World War I was followed by the Revolution. and under the liberal government of Prince Lvov, the Jews of Russia were emancipated for the first time, on April 2, 1917. The Bolsheviks. who came to power in November, made no changes in that respect.

Poland. which for the larger part of the 19th century enjoyed a sort of shadowy political existence in the larger Russian empire, did nothing for its Jews. Ever since the four years' diet of 1788–91. when the Jewish problem was first seriously debated, the forces of anarchy and bigotry, procrastination and rabid nationalism had made an equitable solution difficult. The Jews fought and died in the Polish revolution of 1831. only to be ignored in the brief moments of Polish triumph. When in 1919 the new Polish republic was created, minority rights for the Jews were forced upon Poland against the protests of its political leaders. The Allied powers at Versailles were determined to guarantee a large measure of political, cultural and social freedom to the various minorities incorporated in practically all the states in southern and eastern Europe. In the Poland of 1919, for instance, almost half the population was of minority stock, including White Russians, Ukrainians. Germans, Jews, etc. The means adopted by the Allied Powers were the minority protective clauses. The clauses stipulated that the various religious and ethnic minorities were to be granted religious liberty, all rights of citizenship. the privilege of their own language and the right to their own school systems. The Jews were specifically excused from appearing in court on the Sabbath. and no elections were to be held on that day; they were also guaranteed a proportionate share of public funds for their own schools. The vigorous protests made by the Poles against the adoption of these minority rights — some of which prevailed even under the tyrannical tsars — proved the necessity for their enactment.

Rumania, too. nas asked to subscribe to these minority right provisions. Rumanian history had been a repetition of that of Russia, if not worse. The story of the Rumanian Jews in the Turkish provinces of Moldavia and Wallachia in the 19th century was a story of cruel, brutal mistreatment. To stop this international scandal the Congress of Berlin insisted on the emancipation of Rumanian Jewry. This stipulation was laid down in the famous article 44. Rumania assented and then blandly followed a procedure which enabled it to circumvent the spirit of that clause: by declaring that Jews were "aliens" who would have to be naturalized individually by act of parliament; in the entire period from 1878 to 1919 only a few thousand Jews were naturalized, out of a Jewish population that was never less than 200,000. In the 50 years before World War I. Jewish disabilities, as reflected in petty oppression and limitations in educational and economic opportunities, were at their worst in Rumania. In view of such a history, it was imperative that the rights of the Jewish minority be protected. This the minority rights guaranteed by the League of Nations were expected to do. All in all, a dozen or more states and free cities declared their willingness to observe these and similar rights with respect to their minorities. This was in 1919 and 1920. The struggle that had begun in 1791 was finally over. The liberalistic age had reached its climax. Now, practically for the first time since the 4th century, the Jews all over the world were enfranchised and free—on paper.

2. Attempts by Jews to Expedite Emancipation. — The process of acquiring political and economic rights and, to a certain degree, social recognition was a long one. As has been seen, it began in 1791 and did not end until 1919. During this long century of liberalism. many Jews who appreciated the values of western education thought it necessary to do what lay in their own power to expedite the emancipatory process. As they conceived it, there was a double obligation: the obligation of the Jew to emancipate himself spiritually. culturally and aesthetically, and the obligation of the non-Jew to receive the Jew and to accord him, at the very

least, political equality. One of the first Jews to begin the drive for the entrance of the Jew into western culture was Moses Mendelssohn.

Mendelssohn was the first Jewish modern educator and emancipator. By translating the Pentateuch into German he encouraged his generation to divorce itself from the Judaeo-German vernacular. Through the simple and rational commentary to the Bible which he sponsored (the *Biur*), he taught his generation to think rationally. Through his philosophic writings the Jew was again encouraged to view his religion from the perspective of contemporary philosophy. He strove to modernize the Jew and to make him acceptable to his non-Jewish fellow men. although he was always scrupulously orthodox in religious practice. His disciples carried on his heritage of a cautious assimilation of western cultural values in their Hebrew periodical *Ha-Me'assef* ("The Gleaner").

In the next generation, Leopold Zunz (*q.v.*; 1794–1886), striving to achieve the same ends which had motivated Mendelssohn, proceeded from a different viewpoint. It was his belief that if the Jew could demonstrate to the world the worth and grandeur of his culture. a new respect for the Jew would be engendered that would make for his acceptance into the family of nations. He insisted, however, that this evaluation of Israel's past should be made in a rigidly scientific spirit. and thus he gave birth to the *Wissenschaft des Judentums,* the "science of Judaism." As a result of his influence, of his writings and of the "school" that he inspired, the entire past of the Jews in all its cultural phases was opened to the scholarly world. Hundreds of popular and scientific Jewish periodicals were established, schools for higher Jewish learning were set up, chairs for the science of Judaism n-ere created in the world's universities, Jewish museums were founded and great publishing societies were formed to popularize Jewish knowledge in the Zunzian spirit.

The desire to find a place in the sun of world culture and to enjoy the advantages of political, economic and social equality also stirred up individuals among the east European masses. Some of these men had served their cultural apprenticeship under Moses Mendelssohn. They attempted to introduce the *Aufklärung,* the Enlightenment. into the Russian empire. They became the Enlighteners. the *Maskilim,* finding authority for their name. if not their activity, in the verse from Daniel xii, 3: "And they that be wise shall shine as the brightness of the firmament." The medium they employed was not Yiddish, the vernacular of the masses. not Russian, the language of the overlords, but the classical Hebrew of the Bible. This drive for enlightenment in eastern Europe. however, met with vigorous objections from rabbinical and lay leaders. It was their contention that after Jews achieved a secular education and learned to appreciate its benefits, they would be willing to surrender their Judaism, if the enjoyment of this culture were made conditional to their acceptance of Christianity. The demand — whether voiced or not—of .the Jewish religious leaders was that the Russian government first emancipate its Jews; then cultural assimilation would be safe. This the government refused to do, and the Jewish masses consequently turned a deaf ear to the pleas of the *Maskilim. Haskalah,* the Enlightenment, never penetrated deeply into the consciousness of the Jewish masses. for it furthered the assimilation of the despised culture of the Russian oppressors, and its use of Hebrew as a medium limited its usefulness. Yet it was this very creation of a modern Hebrew literature that served as a valuable instrument of the Jewish nationalist or Zionist movement that made itself felt in Russia in the 1870s. *Haskalah,* which was basically assimilationist. did an about face and became particularistic, Jewishly nationalistic, and placed itself at the service of the Zionist movement after the pogroms of the 1880s. The desire for the acquisition of modern rights and culture moved thousands, but the hope of many of these people lay in the enjoyment of these rights in a free and restored Palestine.

3. Assimilation and Environment. — Whenever the "medieval" Jew came in contact with the world of culture without, he was faced with the problem of establishing a balance between his Judaism and the outside world. Many Jews during the struggle for emancipation thought to solve their problems by outright conversion. It was this attitude that brought about the conversion of many persons who were to become distinguished in the 19th century. including Friedrich Stahl, one of the founders of German political conservatism. and Heinrich Heine, the poet. Similar motives prompted Jewish parents to have their children baptized; *e.g.,* Karl Marx, the socialist. was baptized when he was six years old, and Benjamin Disraeli, the English statesman, at the age of 12. Others, eager to become an integral part of their environment, leaned toward Christianity, which they identified with patriotism and culture. It was the desire to prevent the secession of these cultured Jews that prompted German Jewish laymen such as Israel Jacobson (1768–1828) to initiate the Reform movement in Judaism which sought to tone down the traditional character of its religious services by the introduction of the vernacular and contemporary musical standards. A later generation, led by Samuel Holdheim. Abraham Geiger and others in Germany. introduced the far more radical principle that only the moral law was binding on the Jews, and that ceremonial and ritual institutions must change in accordance with the needs of the time. This movement, designed to save Judaism from complete assimilation and disappearance. failed to become dominant in Germany or in the rest of Europe, because its break with the past was too abrupt and it excised too much of the strong emotional appeal of the Orthodox service. The *coup de grâce* for Reform as a mass movement was given in 1823 when the Prussian state closed its conventicles and forbade the slightest deviation from the Orthodox service.

Those Jews who were convinced of the necessity of an adjustment between the rigid ghetto pattern of the 18th century and the demands of western culture, but were also of the belief that the reformers had gone too far, established the Conservative and the Neo-Orthodox movements. The Conservative Jews held to the authority of rabbinic law, at least formally; in actuality. they compromised with it by ignoring it or reinterpreting it where it conflicted with the demands of everyday life. The Conservatives, led by Zecharias Frankel (1801–75), took over all the externals of decorum and the use of the German vernacular introduced by the reformers; by improving their services without modifying the liturgy itself, they cut the ground from under the feet of the reformers. They applied themselves wholeheartedly to secular education and became an integral part of the movement of the "science of Judaism." Even the extreme Orthodox dared not oppose the inroads of modernism if they intended to hold the younger generation. Cnder the aegis of Rabbi Samson Raphael Hirsch (1808–88) they surrendered themselves to modern education but attempted. at the same time, to observe the precepts of orthodoxy in every detail. Practically all Jews, in America and Europe, made a successful transition. spiritually and culturally, from the ghetto to the modern world. The world offered them political and economic and cultural opportunity; it was to their advantage to accept.

4. Anti-Semitism: The Minority Gentile Reaction to Jewish Assimilation. — As the Jew was confronted by manifold problems in adjusting to a new and better world, so the Gentile, too. was confronted by a serious problem in adjusting to the new Jew. For at least 1,500 years, practically every instrumentality of church and state had been employed to vilify the Jew and to undermine his position in society. Contempt for him. or at best pity, was traditional in all circles; hatredwas frequent. The Gentile who had been taught to disregard or despise the Jew as an inferior now found the Jew at his side as an equal. as an economic rival or as a professional peer. It was an emotional wrench for the average non-Jew to adjust himself to the new Jew, yet the great mass of non-Jews made this adjustment successfully. If they had not, Jews everywhere uould be suffering disabilities. The fact that they have made it is a triumph of the democratic state and of modern Christianity. There was a small minority that would not reconcile itself to the changed status of the Jew; it was this irreconcilable minority that created the modern movement of anti-Semitism (*q.v.*).

Unlike the anti-Jewish feeling which had preceded it. the new anti-Semitism was neither feudal nor church-inspired. The former motivations were not virulent enough to put into effect a scapegoat policy. Consequently, the modern anti-Semite politician abandons the arguments deriving from the middle ages and tries to exploit

the desire of the *déclassé* lower middle class for a scapegoat. He can succeed only if his appeal is broad, and it can be broad only if he builds on foundations with rationalistic and scientific pretensions. The modern anti-Semite politician is the typical quack of politics. In order to succeed he must be first and foremost plausible. He cannot admit to any type of prejudice. He is not opposed to the "Jew." He is opposed to the "Semite" and on "scientific" grounds. The Jew, he insists, has no capacity for participation in modern culture; on the contrary, he is a menace to it because of his inherent "racial" traits. Anti-Semitism purports to be motivated by biological facts and cultural dictates. It declares that inasmuch as the Jew can only contaminate the world, he must be isolated or eradicated. Anti-Semitism, therefore, is dedicated to the destruction of the Jew. In this respect it is the very converse of the medieval religiously prompted dislike of the Jew. The ambition of the medieval church, it was said, was not to burn but to convert the Jew. The church yearned to receive him; the modern anti-Semite yearns to annihilate him.

Because anti-Semitism is a pseudoscientific movement, it has an appeal for certain types of intellectuals. It is dangerous because it manifests itself in the organization of political parties determined to acquire power and to settle the "Jewish problem" by violence. Unscrupulous political leaders and demagogues have encouraged anti-Semitism in order to acquire a political following in a hurry by an appeal to a traditional latent prejudice. This explains the anti-Semitic line followed by demagogues in Europe and America from 187j to the present day.

Anti-Semitism was early recognized and adopted by clever politicians and certain industrialists as a convenient tool to further political and economic reaction. In France, in the Dreyfus case (1894; *see* DREYFUS, ALFRED), it was an instrument used by the royalists and the clericals in the attempt to overthrow the third republic; in Russia and Rumania, through legal disabilities and outright massacres, it served to deflect the masses of the population from the task of creating a truly democratic state and of solving their own social, economic and political difficulties. In Hohenzollern Germany it served to divert the people from the social demands of the rising labouring classes. Anti-Semitism was to become an important factor in the age of reaction which succeeded the age of liberalism (see below). *(See* also ANTI-SEMITISM.)

5. Zionism: The Reaction to Anti-Semitism.—Anti-Semitism, as a formal movement, was the reaction of non-Jews to Jewish emancipation. The organized Jewish reaction to anti-Semitism took the form of Zionism (*q.v.*), the most vigorous and successful movement in modern Jewish life. Toward the close of the 19th century, many Jews, especially cultured Europeans. who sincerely believed that they had completely identified themselves with their environment, were shocked by the recrudescence in modern guise of this ancient hatred of the Jew. They became convinced that if anti-Semitism could rise as a "scientific" and "intellectual" movement. and in France. the very source of Jewish freedom, then assimilation for the Jew was indeed hopeless. Yet these very persons had been influenced by the same political nationalism which in part had served to reject them. It was only natural. then. that they should seek a nationalistic interpretation of Jewish destiny.

The western and central European Jews who founded the Zionist movement found a mass following not in their own countries but among the Jews of eastern Europe, in Russia. Poland and Rumania, where Jews had been "Zionists" for centuries. Every page of Jewish liturgy and the vast rabbinical literature vibrated with love for the Holy Land, and the Bible inspired them with messianic ideals of a better life and a more just society. They refused to identify themselves with the pan-Slavism of their Russian oppressors or to assimilate the cultural ideas of the other east European states; in the orthodox Christian lands this could be done only in terms of religious conversion, and they refused to pay this price for a questionable security. Under the influence of the Russian pogroms. they followed enthusiastically the call for a Zionist congress which met at Basle in 1897 under the leadership of a Viennese journalist. Theodor Herzl (*q.v.;* 1860–1904). It was at this congress that the Basle program was formulated: "Zionism aims at establishing for the Jewish people a politically and legally assured home in Palestine." Herzl and some of his immediate followers had conceived of their problem as a political one; they were interested primarily in a political state for Jews, and if Palestine, the perferable location, was not available, then some other area, such as British East Africa, might do. But the east European masses were Palestinian nationalists, true Zionists. They insisted that Palestine alone was to be the Jewish homeland, and they carried this point *(see* below).

6. Jewish Cultural and Social Development to 1919.—A comparison of the intellectual and cultural status of the average Jew before 1791 with that of the 20th-century Jew would demonstrate that his progress has been exceptional. The Jew of the 18th century was behind his non-Jewish contemporaries in secular education, literary taste, science, the arts and the social amenities of the western European world. Since then the Jew has become completely modernized. There is no field of art, science, literature or music into which he has not entered and made a positive contribution. There is no democratic land in which he has not held high and responsible office. Paul Ehrlich. August Wassermann and Sigmund Freud in medicine, Richard Willstatter and Fritz Haber in chemistry. A. A. Michelson and Albert Einstein in physics. Luigi Luzzatti, Disraeli, Lord Reading and Léon Blum in politics, Giacomo Meyerbeer, Jacques Halévy, Felix Mendelssohn-Bartholdy, Anton Rubinstein, Gustav Mahler and Arnold Schönberg in music and Marcel Proust in literature are but a few of the men who made distinguished contributions.

In the economic field the social stratification in Jewish life was not so profoundly modified by capitalism as was the life of other groups. The middle class had been the dominant class in Jewry for more than a thousand years. The tendency of capitalism was to strengthen this large middle class further and to bring into sharp relief the two extremes: the few wealthy capitalists and the emerging Jewish proletariat. The Jewish middle class in Europe and in the Americas concentrated in white-collar jobs, in the professions and in the manufacture and sale of consumers' goods. especially garments and furnishings. In almost every country there were a few wealthy capitalists outstanding not only for their wealth but also for their lavish philanthropy. Distinguished among them were the English and French Rothschilds, Baron Maurice de Hirsch who endowed the Jewish Colonization association (ICA), the Schiffs, the Warburgs, the Rosenwalds. Nathan Straus and the Guggenheims. All these men gave millions for both Jewish and Gentile philanthropies. Julius Rosenwald alone helped establish more than 5,300 Negro schools in the United States.

It was, of course. the same system that made possible the large fortunes that also brought to birth the Jewish proletariat. Large numbers of Jews were artisans in the Moslem lands, in the east European areas and in the United States. Through the teachings of socialism these European and American workers became a class-conscious group, united into proletarian friendly societies and into special Yiddish-speaking trade unions. In nearly all lands where Jews settled there were individual Jews active in socialist and trade-union movements: Karl Marx. Ferdinand Lassalle and Eduard Bernstein in Germany; L. D. Trotsky, L. B. Kamenev and G. E. Zinoviev in Russia; the Adlers in Austria; Samuel Gompers, one of the founders of the American Federation of Labor. and Sidney Hillman of the Amalgamated Clothing Workers in the United States.

One of the characteristics of this age of the development of the factory system was the right of free movement. This right was vital in a period of an expanding and changing economy when millions of skilled and unskilled labourers were required for the exploitation of new continents. There were mass migrations of Jews and non-Jews through the 19th century, first from central and then from eastern Europe, as facilities of transportation made travel easier for the restless masses. As a matter of fact. this westward movement of Jewry from central and eastern Europe had already begun in the 17th century as a result of the Thirty Years' War and of the massacres during the Cossack and peasant revolts. Jews then fled to western Europe, not only to find a refuge but also to take advantage of the new economy on the North Atlantic littoral

which had been stimulated by colonial growth abroad and mercantilist protectionism at home. The Jews of central and eastern Europe who continued this westward movement in the 19th and 20th centuries were impelled by a desire to escape from the legal and social disabilities in the Germanic lands and from outright pogroms in the Russian. Polish and Rumanian areas. In 1879 there were only about 250,000 Jews in the Cnited States: it was an outlying colony of Jewish life. By the time World War I broke out in 1914 Jewish communities with established traditions of service and responsibility to world Jewry had been established in the Americas; there were no less than 3,500,000 Jews in the United States and Canada.

7. World War I and the Jew, 1914–19.—World War I affected the Jews primarily in the eastern European zones. Hundreds of thousands of Jews were uprooted from their homes by the Russian overlords and shipped back to the lines in the most brutal fashion. Their emancipation, along with that of the Russian masses in 1917, did not immediately ameliorate their position. The attempt of the Soviets to maintain themselves in power and the effort of the Russian counterrevolutionaries, the Poles and the Ukrainians, supported by the Allies, to drive them out, turned western Russia into a bloody battlefield in the civil wars of 1918–20. The Jews of the Ukraine were butchered by the thousands by invading troops and local guerrillas. The Soviets finally gained the upper hand and all discriminations — political and economic — against the Jews were abolished. A vigorous effort was made to crush anti-Semitism by outlawing it. No concessions, however, were given to Jews in the field of religion; religious services were grudgingly tolerated, but any attempt to impart group instruction to Jewish youth under 18 years of age was vigorously punished as a counterrevolutionary act. Individual instruction by parents was cancelled out by the widespread propaganda against religion in every public institution. As a consequence of these activities. Judaism, as a religion, had no future in Russia because it could not reach its youth. But the Soviet authorities permitted a wide latitude in cultural affairs as long as social indoctrination remained in their hands. Jews were allowed the Yiddish vernacular, their own schools, courts and theatres, although the general tendency on the part of Jews was toward acceptance and assimilation of the nationalistic Russian culture.

B. The Age of Reaction, 1920–48

1. Postwar Reaction in Eastern Europe, 1920–39.—The social status and the political, economic and religious rights of the Jews in Russia were of the same quality as those of all other citizens in the Soviet federation. Nevertheless, the majority of the Jews became declassed because of their bourgeois economic activities. The desperate economic plight of these declassed unfortunates was alleviated only by the large-scale philanthropy of the American Jewish Joint Distribution committee and similar organizations in England and other lands. In 1924 the U.S.S.R. began to work with the American Jewish Joint Agricultural corporation (Agro-Joint) to settle the declassed Jews on the land, and the government made an earnest and successful effort to help them become artisans and industrial workers.

Thousands were also taken into the various state services. In accordance with established Stalinist policies they were permitted and encouraged to have their own agricultural colonies in the Ukraine, Crimea and finally in the Jeaish autonomous region (Biro-Bidjan) on the Amur. Biro-Bidjan, established in 1928. was not a conspicuous success as a Jewish state. The Jewish masses preferred to remain in Russia proper.

In marked contrast, the conditions of the Jews in the Soviet Union's neighbour states, Poland and Rumania, were most miserable. The Committee of Jewish Delegations at the Peace Conference, which petitioned the Allied Powers at Paris in 1919, believed, mistakenly. that they had adequately protected the Jews and all other minorities through the establishment of minority rights. Within a few years, however. these rights proved altogether ephemeral. The League of Nations procedure for guaranteeing them did not work. With few exceptions the countries which subscribed to them set out to cancel or to circumvent them. There were no effective sanctions. The war had engendered a fierce spirit of chauvinism which was heightened by the creation of large armies, customs barriers, economic autarchy and a consciously developed policy of nationalizing all minorities even when these were on a superior cultural plane. Ruthless Polonization and Rumanization was the order of the day. The huge taxation inspired by this nationalistic program aroused the ire of the peasants and the industrial proletariat. This was only partially relieved by throwing the burden of taxation on the urban shopkeepers, a large number of whom were Jews. The Polish peasants and workers were miserable, for the closing of German and Russian markets was a severe blow to the Polish economy. The obvious remedy was to initiate widespread political, economic and social reforms. This the reactionary forces that now seized control refused or failed to do. There was another way.

There were about 3,000,000 Jews in Poland! most of them, it is true. in desperate economic plights, but some of them did manage to exist as artisans, petty traders and shopkeepers. The state believed that if these Jews could be compelled to migrate they would make room economically for the hungry peasants. To stimulate this migration the Polish government and all rightist parties engaged in a tacit conspiracy to make the life of the Jew so unpleasant that he would be compelled to migrate. This was in reality a policy of anti-Semitism, although the Polish and Rumanian governments were very careful not to issue laws disabling Jews as such. The chief medium of discrimination encouraged by the state was the economic boycott. Jews were kept out of the civil services. the co-operatives and the government monopolies; .they were discriminated against in the licensing of traders and craftsmen, refused bank loans, limited in the practice of law and medicine and in many instances driven out of the universities. The anti-Semitism of the authorities served a manifold purpose; above all, it diverted the attention of the oppressed Polish masses from their own distress and the ineptitude of the government. Anti-Semitism, apparently, was good politics, for it cut the ground from under the feet of the oppositional political parties such as the National Democrats (Endeks) and National Radicals (Naras) who were outspokenly anti-Semitic; it satisfied the traditional current of anti-Semitism and. apparently, placated the growing colossus on the west, anti-Semitic Germany. where Hitler had come to power in 1933. The result of the state's attitude was that the status of the Jew constantly worsened in Poland; riots broke out, millions of dollars worth of damage was done, and hundreds of Jews were wounded and killed. This was the situation when the Germans invaded the land in 1939.

2. **Postwar Reaction in Central Europe, 1920–39.**—During the period of the long armistice. 1919–39, the position of the Germans had changed radically. World War I had left them crushed, they had lost millions in men and money, their economic and political position was bad, their morale was low and their pride was wounded. In this crisis there arose Adolf Hitler with an economically and socially appealing political platform and a promise of work, glory and a scapegoat. The Jew, together with the social democrats, the liberals and other "traitors," Hitler maintained, was responsible for the downfall of Germany. This appeal to anti-Semitism was supported by many of the Junkers, the militarists, the old diplomatic corps, some of the industrialists, the struggling "little man" and the phrenetic fringe. The ultimate purpose of many in these groups was actually to destroy the Weimar Republic. This task would be made easier if the republic could be equated with "Jewishness," which meant, of course, political and social liberalism and consequent justice to the Jew. Hitler, after 13 years of brilliant, persistent effort, finally became chancellor of Germany (Jan. 1933) and immediately set out to implement his program which included the destruction of what was probably the most distinguished Jewry in Europe. Although less than 1% of the total population, the Jews stood out as a group noted for their interest in and contributions to German culture. They were—so they believed—completely integrated into the civilization and life of the land; about 27% of all Jewish marriages in Germany were intermarriages with non-Jews. Those Jews who did remain in the fold. however, frequently showed an unusual appreciation of Jew-

ish cultural and spiritual values.

In a series of laws. confiscations and pogroms between 1933 and 1938, Hitler succeeded in undermining the political and economic foundations of German Jewry. which according to him included thousands of German Christians of Jewish origin. By the Nuremberg laws of 1935 Jews lost their citizenship completely and were forbidden to intermarry with other Germans. As a result of the pogrom of Nov. 9–10, 1938, practically every synagogue in Germany was destroyed, thousands of Jews were imprisoned in concentration camps, and the major part of German Jewish wealth was confiscated by a huge punitive fine. By the time World War II broke out in 1939, Jews were no longer citizens, could attend no public schools, engage in practically no business or profession, own no land, associate with no non-Jew or frequent no park, library or museum, and were ordered to live in ghettos. By 1941 boys over 12 were conscripted into munition factories. all use of the telephone and public transportation systems was forbidden, and all Jews over six years of age were required to wear the yellow badge. This was the fate of the 1% of Germans who had given Germany 29% of its Nobel laureates.

The Nazis became convinced, after a few propaganda successes, that anti-Semitism could serve as an entering wedge into every country of Europe and the Americas. This was important in their scheme of world penetration and conquest. A residual spark of anti-Semitism existed in all Christian and Moslem lands, they believed, and would make those countries amenable to Nazi advances. Vast sums were spent for this purpose in practically every country in the world, with considerable success. By Sept. 1938 Mussolini in fascist Italy had issued an anti-Jewish law modelled on German anti-Semitic racial legislation; and the conquest and incorporation of Austria in 1938 and of Bohemia-Moravia in 1939 brought about the subjection of their Jewries. Hungary. with a background of anti-Semitism and of a *numerus clausus* (limited number) in the professions. enacted its first anti-Semitic statute on the Hitlerian model in 1938. Rumania reached a climax of anti-Semitism in Dec. 1937 by the appointment of the demagogue Octavian Goga as premier. In the short period of a month Goga sponsored a series of Nazi anti-Semitic laws which threatened the complete ruin of Rumanian Jewry. He was speedily deposed by King Carol, but. nevertheless. by Nov. 1939. more than one-third of Rumanian Jewry was disenfranchised. This meant that, as aliens. they were not permitted to work.

3. Methods of Alleviation of Distress, 1920–39.—What forces were at work stemming this postwar reaction? The League of Nations did succeed, if only by virtue of its existence. in preventing widespread bloody excesses against minorities. Enlightened public opinion, particularly in England and the Cnited States: was a strong factor for several years in restraining the brutalities of anti-Semitic rowdies in several European lands.

Those forces, however, which might have been expected to rise to the support of the oppressed minorities in Europe between the wars failed to do so. The student bodies of central and eastern Europe, following old traditions, refused to line up with the liberals. With rare exceptions they were a prime source of reaction and violence. The liberal political parties had been crushed or suppressed. In Germany the Socialists, who might have joined forces with other liberals. were seized with a paralysis which prevented any effective resistance to the Nazis; their strength was spent in struggle with the Communists. The protests of the churches, when they were made. were feeble and ineffective; certain individual churchmen and prelates were outright anti-Semites.

The methods of self-help employed by the Jews themselves served in a small degree to ameliorate their position. Some solved their problems by committing suicide; the majority hoped for emigration. The United States' restrictions on immigrants, introduced in 1921 and 1924 and not greatly altered until 1943, were a blow to Jewish hopes. From 1931 to 1941, 580,207 immigrant aliens were admitted to the United States; of these. 161,262 were Jews. Inasmuch as about 4,000,000 Jews were continuously suffering under reactionary European governments at this time, this small number of immigrants into the United States over a period of 11 years did little to alleviate their miserable condition. Many Jews believed that if Palestine could be opened to immigration, the situation might be relieved. In this belief the Jews and the Polish government were in agreement, but the British authorities, for economic reasons and because of considerations of Arab strategy, refused to permit unlimited migration of Jews to the mandated state.

If the Jews were to improve their position in Europe between the wars, it had to be done largely through their own efforts and in the land in which they lived, and not through emigration. The refusal of the National Socialists, from 1933 on, to promulgate a charter defining even minimal Jewish rights made any cultural or economic program in Germany futile. Little but the relief of physical needs could be contributed by foreign Jews.

When disabilities were decreed in southern and eastern Europe, however, trade schools were set up, Jews were urged to make a vocational shift where this was thought to be helpful. a vast network of Jewish *kassas*, or loan banks, was established to provide credit for petty businessmen, and a system of hospitals, clinics and summer camps for adults and children was supported. Much of this activity was financed by the American Jewish Joint Distribution committee.

The distress of the Jew, both economic and political, was in a large measure inherent in the national and international economic-political situation. Many Jews, therefore. attempted to help themselves by joining political parties dedicated to social improvement. In some lands, particularly Poland, many Jews supported the socialist parties; some individuals, particularly among the disillusioned and embittered but still idealistic youth, were sympathetic to communism. The mass of Jews all over Europe, who still enjoyed the franchise, supported the bourgeois. liberal and democratic parties. This helped but little, for when the attack came in 1933 it came not from the international left but from the anti-Semitic right, which was dedicated to the destruction of Jewry.

4. Jewish Cultural Development, 1920–39.—The general reactionary trend in European politics after 1920 and the rapid deterioration of civil and political rights after 1933 did not, as might be expected. bring about an immediate deterioration in Jewish cultural productivity. Religious, cultural and social organizations pursued their activities vigorously and on a high plane. In England a relatively small Jewry, primarily through the Soncino Press, issued a translation of *Midrash Rabba*, the Kabbalistic *Zohar*, the Pentateuchal commentaries of Rashi and an almost complete translation of the Babylonian Talmud. (It was eventually completed, in 35 volumes, after World War II, in 1948.) German Jewry, in spite of serious handicaps after 1933, continued. until prevented, to publish two historical magazines and maintained great theological schools. publication societies and academies for research. The encyclopaedic *Judisches Lexikon* (four volumes) had already appeared in 1930; the *Encyclopaedia Judaica* reached the tenth volume between 1928 and 1934 before it was forced to discontinue publication for economic and political reasons. Prague, in Czechoslovakia. was a centre of Jewish belles-lettres. Historical research in this small Jewry was encouraged through *Jahrbücher* and periodicals. Jewry in Poland, in spite of its poverty, maintained a vigorous intellectual life. In 1934, for instance. it supported 175 Yiddish magazines and published 565 books of Jewish content in Hebrew. Yiddish. Polish and German. It had a network of Yiddish and Hebrew schools, making more intense Jewish training available to thousands. Small Lithuania, with about 165,000 Jews in 1939, was the home of the Yiddish Scientific institute (YIVO), which, using Yiddish as a lingua franca, published an excellent magazine. *Jioo Bleter*, and several other publications in history, pedagogy, economics and philology. all conceived and executed in the scientific spirit. (The central offices of this institute were moved to New York city in 1940.) An indication of the cultural activity of even a small land may be judged from the fact that Bulgaria, in 1939, with a population of fewer than 50,000 Jews, had more than 80 Jewish cultural and philanthropic organizations.

5. World War II and the Jews.—The victories of the German armies in the early years of World War II brought the overwhelming majority of European Jewry under the sway of the Nazis and their satellites. From the Atlantic to the Volga, from Norway to Sicily. Jews were deprived of all human rights. Their property

confiscated. most of them were herded in ghettos and concentration camps and eventually deported under inhuman conditions to Poland, which Hitler had selected as the scene for his "final solution" of the Jewish problem. In 1941 the German government was determined to exterminate all the Jews it could lay its hand on by more scientific and effective methods than mass shooting and starvation and disease. which were too slow as well as too "expensive" for Germany. The most effective method for mass extermination was gassing in specially constructed gas chambers, from which the bodies were removed to adjacent crematoriums. In this manner, about 4,000,000 Jews were put to death in Oswiecim (Auschwitz), Majdenik, Treblinka, Dachau, Buchenwald, Bergen-Belsen and other camps. The total number of Jews exterminated by the Nazis during the war has been computed at about 5,750,000. It may have been considerably more, especially when indirect victims of Nazi brutality, half-Jews and persons previously not registered as Jews are included.

This plan of genocide was carried out with efficiency, and the victims, whose will to resist had been sapped by prolonged starvation and disease. were often unaware until the last moment that they were going to be gassed. Nevertheless there was some Jewish resistance, both passive and active. to this revolting crime. Where the population was friendly to the Jews. as in Denmark, France, Itaiy and Bulgaria, it proved possible to save considerable numbers of Jews by hiding them. furnishing them with false documents and even evacuating them to neutral countries. Thus a large part of Danish Jewry was secretly transferred en masse to Sweden, while some French Jews found refuge in Spain, Portugal and Switzerland. In eastern Europe, however. the Germans exploited the traditional anti-Semitism of the peasant, so that hardly any aid reached the Jews from the mass of the people, while not a few non-Germans were among the most brutal agents in carrying out the extermination campaign. Notwithstanding these unfavourable conditions, thousands of young Jews joined the various underground resistance movements and the partisans in Poland, the U.S.S.R. and Lithuania, France and Italy. Jewish partisans often formed their own units, and in France there was a special Jewish section of the maquis which distinguished itself in attacks against the Germans. But it was above all in the major ghettos of Poland, Warsaw, Bialystok and Vilnius that Jewish risings took place against overwhelming odds. In Warsaw, where at one time nearly 500,000 Jews had been concentrated, the last 40,000, almost unarmed, resisted the German deportation order and held out for nearly a month against regular German troops armed with flame throwers. armoured cars and tanks (April–May 1943). The reaction of the outside world to this tragedy was one at first of incredulity and later of horror and indignation. In a memorable scene on Dec. 17. 1942, the British house of commons rose in tribute to the Jeaish martyrs on the continent of Europe. Unfortunately, the Allied governments were too preoccupied with their own effort to render effective aid in saving Jews from the Nazi hell, and throughout the war the gates of most countries remained closed to all but a handful of'refugees.

The subsequent years tended to heal a few individual wounds, but the damage suffered by organized Jewry on the continent of Europe could not be repaired. Jeury's hopes became concentrated on Israel. the United States and Great Britain.

C. The Creation of the State of Israel

The Jewish independent state of Israel (*q.v.*) was proclaimed in Tel Aviv on May 14, 1948. Its Declaration of Independence read: "The State of Israel will be open for the immigration of Jews from all the countries of their dispersion." Thus were fulfilled the hopes of 2,000 years.

The establishment of Israel as a state was brought about by a combination of the forces of liberalism. which culminated in the treaty of Versailles. with the forces of reaction, which reached their climax in the events of World War II. The first real gesture toward the creation of an independent sovereign Jewish state in Palestine had been made in 1917. On Nov. 2 of that year Arthur James Balfour, secretary of state for foreign affairs of Great Britain, formally declared that "His Majesty's government view with favour the establishment in Palestine of a national home for the Jewish people, and will use their best endeavours to facilitate the achievement of this object, it being clearly understood that nothing shall be done which may prejudice the civil and religious rights of existing non-Jewish communities in Palestine or the rights and political status enjoyed by Jews in any other country." Three years later, in April 1920, the Supreme council of the Allies at San Remo included this declaration in the mandate for Palestine which was to be assigned to Great Britain by the League of Nations.

Yet, in spite of the Balfour declaration and the mandate, the evolution of a Jewish state in Palestine was marked by many problems. There were internal Jewish conflicts: the struggle between a socialist and capitalist economy; the demands of orthodoxy and the indifference of secularists. Nevertheless, within the ambit of the authority accorded to them by the Jewish community regulations, the Jews managed to effect a satisfactory modus vivendi.

The problem of Arab-Jewish relations was a far more serious one. Palestinian Arab nationalism, in turn, was furthered by politically ambitious Arab townsfolk, by the wealthy Arab landed class which feared the growing power and the liberal social program of the Jews, by some British authorities in Palestine and London who did not approve of the domination of the Jew in Palestine, and by Nazi and fascist propagandists who hoped thereby to tear Palestine away from the British sphere of influence. The Arabs maintained that Palestine was theirs by virtue of occupancy and numerical superiority; the Jews asserted their right to the country based on historic tradition and ties, on their desperate need for a land of their own and on the record of what they had already done and what they expected to do for the country itself. And the British, in the Balfour declaration and, apparently, in the letters from Sir Henry M'Mahon, high commissioner for Egypt, to Sherif Husain of Mecca, promising the creation of an Arab state in the Arabic-speaking provinces of the Ottoman empire (1915), made commitments to both sides. The struggle between Jews and Arabs was epitomized in the Jewish demands for the right to free migration into the country and the freedom to purchase land in an open market. The Arabs and the British denied both. In order to emphasize their opposition to Jewish objectives, the Arabs in the period from 1920 to 1937 created many riots in the cities and in the farm settlements and took a considerable toll of Jewish lives. The embittered Jews defended themselves vigorously and successfully, but were convinced that these riots could not have taken place without the connivance of the local British authorities. To bring peace to the embattled land the British appointed a series of commissions beginning with the Shaw commission in 1929 and ending with the London conferences and the White Paper of May 17, 1939.

The general tendency of these commissions, conferences and White Papers, which reflected British colonial and foreign office policy, was to scrap the Balfour declaration. This was already evident in June 1922—before the mandate was even ratified—when Winston Churchill, as colonial secretary, issued the White Paper which detached a considerable part of Palestine to form the Transjordan state. The (Peel) Royal Commission of Inquiry in 1937 suggested the partition of the remaining part of Palestine between Jews, Arabs and English. This proposal was repeated by the British in 1938, and in May 1939 the British government proposed "freezing" Jewish settlement in Palestine by limiting immigration and by circumscribing land purchases. This was the status of the Palestinian Jewish situation when World War II broke out in Sept. 1939. (See also PALESTINE.)

With the outbreak of hostilities the problem was temporarily shelved. About 30,000 Jews in Palestine volunteered for service with the Allies and saw service in every theatre of war, and in 1944 these Jewish volunteers formed themselves into the Jewish brigade, which distinguished itself in the Italian campaign.

Later, during the war, there was increasing pressure put upon the British government to allow the immigration of more Jews into the country. The British refused, and as a result there were numerous violent outbreaks by terrorist elements which were condemned by the responsible Jewish authorities. After the war, an Anglo-American committee of inquiry visited Palestine and made

certain recommendations which the British government refused to accept. Instead it decided to refer the problem of the mandate to the Cnited Nations. In Nov. 1947 the United Nations decided by a large majority to terminate the British mandate and to establish in the area two independent states, one Arab and the other Jewish. The Arab states refused to abide by this decision and went to war in order to obliterate it *(see* ISRAEL) On May 14, 1948, however. the Jewish independent state of Israel was proclaimed in Tel Aviv, and Chaim Weizmann became the first president.

Israel had won the "war of independence." but war left in its wake tragic consequences. Although armistice agreements were concluded in 1949 with the help of United Nations mediators, the Arabs steadfastly refused to recognize the new state of Israel. During the war thousands of Arabs left the country and became refugees. Israel took back about 80,000 of these refugees, but the bulk of them remained in the Arab states. Israel's offer of compensation for resettlement in the large undeveloped and underpopulated areas in the Arab states was refused. The Arabs also declared an economic boycott of the state of Israel. In addition, there were numerous incidents on the borders of Israel resulting in much loss of life and damage to the economy.

Yet notwithstanding all its dangers and difficulties, the state of Israel developed rapidly in population, in the setting up of agricultural settlements and in the establishment of industry. For a detailed account of its development. see ISRAEL. Like the Zionist movement which brought it into existence. the Jewish state is inspired by ideals of social experimentation and democracy. All available land is purchased by the Jewish National Fund for the Jewish people and is never alienated Various types of cooperatives and collective settlements, kibbutzim, for buying, selling. building, farming and manufacturing, are in operation; and the General Federation of Labour, the Histadruth, provides housing, hospitals, libraries, banks, crbches and social services for its members.

The influence of the tiny Jewish state on world Jewry has been profound. It has inspired a renascence of the Hebrew language and culture throughout the world, stimulated Jewish studies, intensified Jewish loyalties and imparted to Jews everywhere a dignity. a self-realization and an inner security which hitherto they did not possess.

The establishment of the Jewish state did not render superfluous the continuation of the Zionist movement, which with its long tradition of service to the cause of Jewish statehood remained the most effective instrument for mobilizing the resources of world Jewry in the service of Israel. (See also ISRAEL; PALESTINE; ZIONISM.) (J. R. Ms.; I. E.)

D. Jews in the United States

With the arrival of the first group of 23 Jewish refugees from Brazil in New Amsterdam (New York) in 1654. the history of the Jens on the North American continent started. After three centuries in the United States, American Jewry became numerically the strongest Jewish community in the world, with a population of more than 5,000,000—about 3½% of the total population of the United States.

1. The Sephardic Period (1654–1830).—The early Jewish immigrants were called Sephardim Jews because they followed the Spanish Jewish rite and many had actually stemmed from Spain or Portugal. Soon after their arrival in New Amsterdam they organized their religious and community life, although the first synagogue building in New York came into being many decades later. One of the leaders of these Sephardic immigrants, Xsser Levy, who arrived penniless in 1654, rose to wealth and distinction, built together with Jacob Barsimson a slaughterhouse and became an executor of many Jewish and Christian estates; through his efforts Jenish settlers in New Amsterdam were admitted by the court to the burghership in 1657. In 1658 an additional group of Jewish immigrants from Amsterdam settled in Newport, R.I., possibly stimulated by the more favourable attitude of Roger Williams and his fellow colonists, and made Newport the second largest Jewish community at that time.

Among the many enterprising Jews of Newport were Jacob Rivera and Aaron Lopez, the latter a big shipowner, importer and exporter who developed an extensive trade in whale and sperm oil and in other goods to and from Europe. Following the foundation of the first synagogue in New York, Shearith Israel (Remnant of Israel), the Jews in Newport established the synagogue Yeshuat Israel (Salvation of Israel). later called Judah Touro synagogue after the great Jewish philanthropist: the oldest synagogue building in the United States still standing. it was declared a national shrine. Among the visiting scholars to Newport was Isaac Karigal from Hebron in Palestine (1773), who became a close friend of Ezra Stiles, later president of Yale college.

Soon new groups of Sephardic Jews from Holland, England and the West Indies settled in other towns along the Atlantic seaboard and along the highways of transportation. engaged mainly in mercantile pursuits. By 1776 organized Jewish communities existed in five towns of the original 13 colonies—New York, Newport. Philadelphia, Charleston (S.C.) and Savannah (Ga.). One of the outstanding patriots and rabbis in the Revolutionary War period was Gershom Mendez Seixas (1745–1816). After the capture by the British of New York. where Seixas served Shearith Israel, he became the hazzan or minister and counselor of the Jewish congregation in Philadelphia when it established its first synagogue. Mikveh Israel (Hope of Israel). Among the leaders of this congregation were Haym Salomon (1740–85), a prominent merchant and broker to the office of finance who was entrusted with many diplomatic missions to Europe: the Gratz brothers, merchants. shippers and army purveyors; and the enterprising Joseph Simons of Lancaster, Pa., an Indian trader, merchant and landowner on a large scale—one of the first Jews to be naturalized in Lancaster (1749).

In 1790 there were not more than 2,500 Jews in the United States, but by 1830 there were about 10,000 U.S. Jews, under the spiritual leadership of the Sephardic Spanish Jews, though most of the rank and file were of German origin.

2. The German Period (1830–81).—Among the early Jewish immigrants there were already those of Ashkenazic stock (from central and eastern Europe), such as the Gratz brothers and Haym Salomon. It was not, however, until the Metternich age (1815–48) that the German Jews, particularly of the smaller towns of south Germany, despairing of opportunities at home, began to migrate to North America in large numbers. The number of Jews in the United States grew rapidly, and by 1860 about 275,000 had been settled. The majority of these immigrants were petty traders and peddlers, but they rapidly rose in social and economic status and by the time the Civil War broke out a number had become successful merchants and garment manufacturers; a few, such as the Speyers and Seligmans, were bankers.

During the Civil War the Jewish bankers of the North helped open the German market to U.S. bonds; thousands of Jews fought in the armies on both sides; there were also about nine Jewish general officers in the north; the former U.S. senator from Louisiana. Judah P. Benjamin (1811–84), was secretary of state and secretary of war in the Confederate cabinet.

After the Civil War, Jews continued their activity as merchandisers of consumers' goods. As garment manufacturers, they helped to introduce factory-made clothes. Thousands of Jews began to move inland and westward and became pioneer merchants. Towns and hamlets were named after Jews all the way from Frankstown in Pennsylvania to Roseville in California and Marcus in the state of Washington. Second and third generations of German Jews later entered the professions and politics.

By 1871 the complete emancipation of German Jewry stopped emigration from central Europe, but approximately at the same time there began an ever-increasing flow of immigration of Jews fleeing from the economic and political distress of eastern Europe. This migration began to assume mass proportions by 1881 as a result of the Russian massacres and discriminating decrees against the Jews.

3. **East European Period** (1881–1924).—Though the Sephardic Jews ceased to emigrate to the United States after 1800. they continued to dominate American Jewry spiritually at least until

1830. German Jews, who began to arrive in larger numbers by that time, held undisputed snay over the cultural and administrational destinies of American Jenry until 1918. The new Jewish immigrants who flocked to the United States as early as 1870 were fleeing from pogroms in Russia, the Ukraine, Poland and Rumania. By the time the Johnson-Lodge bill of 1924 finally halted their immigration, 2,500,000 settlers had already arrived. The east European Jews' migration brought about changes in the economic and social characteristics of American Jewry, in occupational structure and in distribution, and raised nuinerically the Jemish population from about 0.6% to 3% of the total population in the United States

Unlike the German Jews. the bulk of these immigrants concentrated in New Tork and became workers in the clothing industry, though many raised their standard of living and some of their children went into the professions. Some entered the labour movement and engaged in reform and socialist politics.

These immigrants were by no means a homogeneous group. They transferred many of the cultural and religious institutions of their homeland to their new country and organized *Landsmannschaften*, groups consisting of former residents of the same native town or province. Yet they had in common with earlier waves of immigrants the cultural-religious heritage, the knonledge of Hebrew and Yiddish. were orthodox in their practice and fervently Zionist, and passionately desired survival and freedom. They courageously opposed civil and political discrimination. Their hopes and sentiments were eloquently expressed by the Jenish poet Emma Lazarus (1849–87), nho pleaded for the rights of the individual everywhere and nhose poem "The New Colossus" was engraved at the base of the Statue of Liberty

4. Modern Wave **(1936–46).**—From 1936 a new migratory wave followed the east European immigration. Consisting of refugees who fled from Germany, Austria. Czechoslovakia and other European countries which had been overrun by Nazi Germany, about 150,000 Jewish immigrants entered the United States in this period. Most of them were of high social an3 economic status, a cross section of the prosperous and cultured Jemish population of central Europe. This group of the U.S. Jenish population soon adjusted itself nell and rapidly achieved responsible positions.

Another stream of Jewish refugees numbering about 100.000 was comprised of those who had survived the concentration camps of the Nazi regime. They arrived after World War II virtually penniless and destitute.

5. The Emerging Type of the American **Jew.**—With the end of migration, Jews found themselves in a melting pot out of which was coming an American Jew who was distinguished from other citizens only by a different cultural and religious heritage, by his strong sense of kinship for Jens abroad and by his determination to help them attain necessary political, economic and cultural opportunities and security.

The economic prosperity of the United States caused alro a rapid rise in the socio-economic position of American Jewry. The economic and occupational distinction between the east European and German immigrants disappeared, and the formerly distinct elements merged into a single strong U.S. Jeaish community.

The number of Jews who are annually assimilated completely into the larger Christian American community reached considerable proportions; it was probable that 5% of all Jewish marriages — outside the areas of mass settlement — were intermarriages. The percentage in the metropolitan areas was probably smaller, but it was still increasing in the latter 1950s.

In business, Jews continued to be active in merchandising and in garment manufacturing, although there was hardly any form of business or professional activity in nhich they were not represented.

Following the trend for the entire U.S. population. Jews concentrated in the larger cities In large part through the efforts of the Jewish Agricultural society, however, there were still more than 100,000 Jewish settlers on farms throughout the United States in the mid-1950s. The integration of the vast Jewish population into the U.S. economy was greatly facilitated by technical expansion and the era of rapid industrialization during the time of the Jewish mass migration. Jewish economic adjustment in the United States proved thorough and far-reaching, and Jews achieved the status of a prosperous community. Yet there were occupational restrictions for the Jew. Whether as a manual labourer, a clerical norker or executive, it was difficult for him to secure entry into heavy industry, high finance, transportation, mining, public banking. insurance and public utilities To a marked degree he experienced discrimination in the labour market. This discrimination nas part of an anti-Semitic sentiment that was most vigorous in social affairs, less obvious in business and professional fields and even less expressive in political activity. The first vigorous expression of anti-Semitism modeled on European patterns occurred in the United States in the period from 1920 to 1924. The post-World War I wave of prejudice associated with the Deavbovn Independent of Henry Ford, the forgery of the so-called "Protocols of the Learned Elders of Zion" and the revived Ku Klux Klan, however, was short-lived and by 1927 had withered and faded out. (See also ANTI-SEMITISM.)

6. Civic and Protective Agencies.—To defend their civil and political liberties, Jen s created their own civic defense organizations. Since the establishment of the Board of Delegates of American Israelites in 1859, Jens have set up civic and protective agencies. The leading four agencies were the American Jeuish committee (1906), which reflected primarily the point of view of the wealthier and more conservative groups and whose leaders included J. Schiff. L. Marshall, J. Rosenwald, Felix Warburg, Cyrus Adler and Judge Joseph M. Proskauer; the Anti-Defamation league of the B'nai B'rith (1913), which spoke for middle-class Jenry; the American Jewish congress (1922), the spokesman of the Zionist movement and the proponent of a more democratic American Jewish life; and the Jewish Labor committee (1934), uhich represented organized Jewish labour.

7. Education.— The various types of Jewish educational institutions, such as Talmud Torah, Yeshiboth and Heder, which were developed by the successive waves of Jewish immigrants over the decades, gradually were transformed into more modern patterns, into congregational schools. Sunday schools and Hebrew weekday schools, all of which supplemented public school education, the cornerstone of democracy for all Jewish children.

In New York the Bureau of Jemish Education (from 1910), aith branches all over the country, guided Jewish educators of every shade to promote higher standards and goals of Jewish education.

Three major ideologies developed in Jewish life during the latter part of the 19th century: the Orthodox, Conservative and Reform. Despite their liturgical and theological differences, the three groups continued to be dedicated to the maintenance and furtherance of Jewish religious and cultural heritage.

The Hebrew Union college in Cincinnati, O.. founded in 1875 by Isaac M. Wise (1819–1900) and merged in 1950 with the Jewish Institute of Religion (founded by Stephen S. Wise in 1922), is the oldest U.S. rabbinical seminary and became the major training centre for rabbis and teachers of the Reform movement. The Union of American Hebrew Congregations organized a number of auxiliary organizations which welded large segments of American Jewry together, such as the National Federation of Temple Sisterhoods (1913), Kational Federation of Temple Brotherhoods (1923) and National Federation of Temple Youth (1939), and the Los Angeles College of Jewish Studies (1947).

The Conservative movement created the Jewish Theological Seminary of America in New York city (founded by Sabato Morais in 1886) and developed it under the leadership of its president Solomon Schechter (1847–1915) into one of the most important spiritual forces in the life of American Jenry. Many affiliated organizations and activities were established. including a teachers' institute, a unique library of Hebrew manuscripts, a Jeuish museum, a popular weekly television and radio program, "The Eternal Light" (from 1944), a women's league and a branch in Los Angeles, Calif, the University of Judaism (1947).

Out of the Conservative movement, though still associated with it despite basic ideological differences, grew the so-called Recon-

structionist movement led by Mordecai M. Kaplan which stressed Judaism as a religious civilization; its principal views are expounded in its biweekly magazine, the *Reconstructionist* (1934).

Orthodox Judaism created the Rabbi Isaac Elchanan Theological seminary in New York (1896), which developed into the Yeshiva university, a liberal arts college, to which was added the Albert Einstein college of medicine in 1954. Its learned publications include, besides the *Scripta Mathematica, Talpioth, Horeb* and *Sura* in Hebrew. The Orthodox movement also organized the Hebrew Theological College of Chicago (founded by a group of Chicago Jews headed by Ben Zion Lazar in 1922, first president, Rabbi Saul Silber).

Each of these religious movements in American Judaism has an organization of its own rabbinical leaders and congregations, while the Synagogue Council of America (1926), an organization representing all Jewish religious groups in the United States. acts in the interest of Orthodox, Conservative and Reform Judaism alike.

Without any particular ideological affiliation stands the Dropsie college in Philadelphia, Pa. (1907), a nonsectarian postgraduate institute which trains scholars in Hebrew and Semitic subjects. Brandeis university in Waltham, Mass., is a nonsectarian Jewish-sponsored university (1947).

The training of Jewish leaders and teachers is supplemented through intensive cultural and religious programs by colleges of Jewish studies in the larger Jewish communities, as well as by summer camps such as the Brandeis Youth foundation (1941) and similar institutions.

The Hillel foundation was established by the B'nai B'rith (1923) at more than 70 U.S. universities and colleges as a counseling service for Jewish students and as an agent for Jewish cultural and social activities on the university campuses. The Jewish Chautauqua society (1893), sponsored by the National Federation of Temple Brotherhoods, brings knowledge of Judaism to the students and faculties of U.S. universities.

8. Scholarship. — Collective efforts of U.S. Jewish scholars created *The Jewish Encyclopedia,* a 12-volume work (New York, 1901–06), perhaps the greatest co-operative work by Jewish scholars in the U.S. and a landmark to Jewish learning. It was not superseded by the later *Universal Jewish Encyclopedia* (ten volumes. New York. 1939–1943). Other co-operative endeavours stimulating Jewish historical, religious, literary and social studies include the *American Jewish Year Book* (sponsored by the American Jewish committee since 1889), with sociological and statistical surveys of American and world Jewry; such learned journals as the *Jewish Quarterly Review* (published by Dropsie college from 1910); the *Proceedings* of the American Academy for Jewish Research (1920); the Hebrew Gnion college *Annual* (1924); the *Jewish Social Studies* sponsored by the Conference on Jewish Relations (1939); and *Historia Judaica* (1938).

Devoted to the preservation and study of American Jewish historical records are the publications of the American Jewish Historical society (since 1893) and the *American Jewish Archives* (1948) of the Hebrew Union college. The Yale publications in Judaica of the Rabbinowitz foundation were later products of Jewish scholarly work.

The Jewish Publication Society of America (established in Philadelphia in 1888) provides important books in English on Jewish history, religion and current events; among its major contributions was a new English translation of the Holy Scriptures which became the authorized translation of the Bible for English-speaking Jews. The *Jewish Book Annual* (sponsored by the National Jewish Welfare board from 1940) is a bibliographical guide published in English, Hebrew and Yiddish.

The number of Jewish periodicals and journals published quarterly, monthly and weekly in the United States is large; they include *Commentary* (sponsored by the American Jewish committee from 1945), *Judaism* (published by the American Jewish congress from 1952) and the *Jewish Frontier* (sponsored by the League for Labor Palestine); all were dedicated to a wide range of religious, social and cultural problems.

9. Yiddish and Hebrew Cultural Values. — The cultural influence of eastern European immigrants expressed itself in a continuous literary productivity in Yiddish as well as in Hebrew. Yiddish secular schools, newspapers and theatre and a considerable Yiddish literature were created which continued to attract a not insignificant sector of American Jewry. The Yiddish Scientific institute (YIVO) with its large library of Judaica was transferred in 1940 to New York, where it continued its scholarly publications.

Although the interest in Yiddish was declining in the 1950s, the interest of American Jewish circles in Hebrew was substantially increasing. The Hebrew language was brought with the first immigrants and remained basically the language of the synagogue and of the prayers. With the arrival of eastern European immigrants in the 19th century, a distinguished group of Hebrew writers arose who made notable contributions to modern Hebrew prose and poetry and who, from 1871 to 1914, published many Hebrew periodicals.

The Histadruth Ivrith (1922) became the rallying point of creative Hebrew writers in the United States, the central agency for the dissemination and furtherance of Hebrew language and literature. Under the editorship of Menachem Ribalow (1899–1953) appeared for almost three decades *Hadoar* ("The Post"), the only Hebrew weekly outside Israel. *Bitzaron,* a Hebrew scholarly monthly (founded by Chaim Tchernowitz in 1939), and other learned Hebrew periodicals and books continue to appear. Many U.S. Jewish scholars made lasting contributions to their field of scholarship in the Hebrew language. The emergence of the state of Israel with Modern Hebrew as its official language greatly stimulated the study of Hebrew. The establishment of chairs of Modern Hebrew and of Jewish history and literature in many U.S. universities and colleges was an indication of this awakened interest in Hebrew culture.

American Jewry's social and philanthropic activities are highly organized. Many lodges, benevolent societies, fraternal orders, free loan agencies, community centres, Young Men's Hebrew associations and other similar groups were organized.

Prominent agencies such as the ORT (an abbreviation for three Russian words meaning Organization for Rehabilitation and Training) federation (1924) sponsored vocational training, and the Hebrew Immigrant Aid society (1884) was principally concerned with sheltering and advising new immigrants. The National Council of Jewish Women (1893) also actively helped immigrants. The National Jewish Welfare board (1917), an organization which served the religious needs of Jewish men and their families during wartime. also set as its major task the supplying of Jewish chaplains for the armed forces in war and peace.

For co-ordination in fund-raising activities. most of the social and philanthropic agencies were absorbed by such national agencies as the Jewish Welfare funds, United Charities, the Federation of Jewish Philanthropies or Jewish community chest.

10. Overseas Aid and Israel. — The prosperity of American Jewry. together with its keen sense of religious solidarity, enabled U.S. Jews to give financial aid to Jews in other countries; such organizations as the United Jewish Appeal and the American Jewish Joint Distribution committee (organized in 1914) became the major fund-raising instruments for overseas aid, for pogrom victims, for rehabilitation and relief, for physical care, vocational training and religious education.

Many American Jews were sympathetic toward the Jewish resettlement in Palestine. The idea of Zionism was not new in the U.S In 1825 Mordecai Manuel Noah (1785–1851), a leading Jew of Philadelphia, presented to uorld Jewry a bold plan to settle Jews on Grand Island in the Niagara river near Buffalo. N.Y.. as a temporary haven for persecuted European Jews; the scheme, called "Ararat." failed. however. With the publication of Theodor Herzl's *Der Judenstaat* (1896) and the issuance of the Balfour declaration in 1917 and under the leadership of men like supreme court Justice Louis Brandeis, Richard Gottheil, Judah L. Magnes, Aaron Friedenwald and Stephen S. Wise, the ideology of Zionism achieved a firm foothold among American Jewry. Apart from the Zionist Organization of America and its many affiliated groups, it

was Hadassah, the Women's Zionist Organization of America (established by Henrietta Szold of Baltimore, Md., in 1912), which made and continued to make major contributions to the welfare of the state of Israel. All U.S. Zionist groups were united under the auspices of the American Zionist council, the official spokesman of the movement.

The philanthropic aid of American Jews reached a climax of unprecedented generosity with the rise of the Nazis and the subsequent destruction of more than 5,000,000 Jews in central and eastern Europe. Enormous sums were collected for the rehabilitation of the remnants of shattered European and middle eastern Jewry.

The emergence and rise of the state of Israel (1948) had a great effect on American Jewish life. Financial and technical aid to Israel on a large scale became a prominent feature of American Jewish philanthropy. Its help was expressed through a variety of channels, including also commercial investment in Israeli bonds.

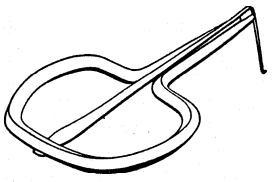
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JEWSBURY, GERALDINE ENDSOR (1812–1880), an English writer of fiction, daughter of Thomas Jewsbury. a Manchester merchant, was born in 1812 at Measham, Derbyshire. Her first novel. *Zoe: The History of Two Lives,* was published in 1845, and was followed by *The Half Sisters* (1848). *Marian Withers* (1851) and others. For many years she was a frequent contributor to the *Athenaeum* and other journals and magazines. Carlyle described her, after their first meeting in 1841. as "one of the most interesting young women I have seen for years; clear delicate sense and courage looking out of her small sylph-like figure." From this time till Mrs. Carlyle's death in 1866. Geraldine Jewsbury was the most intimate of her friends. The selections from Geraldine Jewsbury's letters to Jane Welsh Carlyle (1892; ed. by Mrs. Alexander Ireland) cover a quarter of a century. In 1854 Miss Jewsbury moved from Manchester to London to be near her friend. To her Carlyle turned for sympathy when his wife died; and at his request she wrote down some "biographical anecdotes!' of Mrs. Carlyle's childhood and early married life. Carlyle's comment was that "few or none of these narratives are correct in details. but there is a certain mythical truth in all or most of them"; and he added, "the Geraldine accounts of her (Mrs. Carlyle's) childhood are substantially correct." He accepted them as the groundwork for his own essay on "Jane Welsh Carlyle," with which they were therefore incorporated by Froude when editing Carlyle's *Reminiscences.*

For Miss Jewsbury's influence on Froude's biography of Carlyle *see* CARLYLE, THOMAS. She died in London on Sept. 23, 1880.

JEW'S-EAR, the common name for *Auricularia auricula,* an edible jelly fungus belonging to the Basidiomycetes *(see* FUNGI). The fruiting body varies in shape from cuplike to that of the human ear. It is pinkish-brown to dark brown, very tough and flexible. It grows on the wood of both conifer and hardwood trees. Watering the infected wood will produce successive crops of fruiting bodies. In the orient it is harvested, dried and sold commercially. (AR. H. S.)

JEW'S-HARP or JEW'S-TRUMP, a small musical instrument of percussion, known for centuries all over Europe. "Jew's-trump" is the older name. Attempts have been made to derive "Jew's" from "jaws" or Fr. *jeu,* but, though there is no apparent reason for associating the instrument with the Jews, it is possible that "Jew's" is the original form. The instrument consists of a slender tongue of steel riveted at one end to the base of a pear-shaped steel frame, the other end of the tongue being left free so that it can be set in vibration by the player, while firmly pressing the branches of the frame against his teeth. At the beginning of the 19th century Heinrich Scheibler, in Germany, achieved astonishing effects by employing a number of Jew's harps combined in one instrument which he called an aura. Another German, Eulenstein, of Württemberg, created a sensation in London in 1827 by playing on no fewer than 16 of the instruments.



BY COURTESY OF THE METROPOLITAN MUSEUM OF ART

JEW'S-HARP: FOUND IN ALL PARTS OF THE WORLD UNDER VARIOUS NAMES

JEX-BLAKE, SOPHIA LOUISA (1840–1912), British physician, influential in opening the medical profession to women, was born Jan. 21, 1840, at Hastings, Sussex. She studied at Queen's College for Women, London, and in 1865 went to the United States to study education under Lucy Sewell, returning to England three years later. In 1869 she was admitted to classes in medicine at Edinburgh and in 1871 to hospitals. She returned to London in 1874 and was instrumental in establishing the London School of Medicine for Women. In 1877 she obtained the M.D. of Berne and became a licentiate of the College of Physicians, Dublin. In 1886 she established the Edinburgh School of Medicine for Women. She retired in 1899 and died at Rotherfield, Sussex, Jan. 7, 1912. Her written works include *Medical Women* (1872) and *American Schools and Colleges* (1886).

See M. Todd, *Life of Sophia Jex-Blake* (1918).

JEZEBEL, (in the Douai version of the Bible, JEZABEL), daughter of Ethbaal "king of the Sidonians" and priest of Astarte, became the wife of Ahab (*q.v.*), king of Israel. She was a woman of virile character, and offended Israelite political and religious feeling, the former by introducing those autocratic theories of monarchy so common in the east. the latter by her attempt to supersede the worship of Yahweh by that of the Tyrian Baal. Melkart. The first tendency is illustrated by the story of Naboth (I Kings xxi), the second by her persecution of the prophets of Yahweh (I Kings xviii, 4–13). In both directions the national feeling found expression in the prophet Elijah, whose challenge to the authority of Baal on Mt. Carmel resulted in the destruction of the Tyrian prophets (I Kings xx, 20–46), while his curse on Ahab and Jezebel was fulfilled in the massacre of the house of Ahab by Jehu (*q.v.*). Jezebel's name is often used in modern English as a synonym for an abandoned woman.

JEZREEL, an ancient city of Palestine, in the tribe of Issachar, and capital of the northern kingdom under Ahab. now a village on a spur of Mt. Gilboa in the territory of Israel. There Saul was slain in a battle with the Philistines. Saul's son. Ishbosheth, had it. and it mas the residence of Ahab and Jezebel. Close by on the eastern side was the vineyard of Naboth. It mas called Esdraelon in the book of Judith; to the crusaders it was Parvum Gerinum.

The valley of Jezreel (Emeq Yizrel), or Plain of Esdraelon. was an ancient trade route between the Jordan valley and the coastal plain. In postbiblical times it became swampland. The modern Jewish pioneering movement early turned its attention to it. and the region became Israel's main granary. (E. RO.)

JHABUA, a town. with tehsil (subdivision), and a district in Madhya Pradesh, India. The town is on a tributary of the Mahi, 22 mi. E.S.E. of Dohad on the main Ratlam-Godhra railway line. Pop. (1951) town 4,591; tehsil (495 sq.mi.) 88,588.

JHABUA DISTRICT (2,616 sq.mi.; pop.! 1951, 382,673) was formed following the absorption into Madhya Bharat on June 15,

1948, of Alirajpur, Jobat and Jhabua, principalities of the former Central India agency. The largest town is Alirajpur (1951, 7,739), 73 mi. E. of Baroda. The district is hilly (1,000–1,800 ft., falling away westward) and inhabited by many aboriginal Bhils.

JHALAWAR, a district in Rajasthan state, India. Area 2,405 sq.mi.; pop. (1961) 490.635. Part of the district (824 sq.mi.) formed a princely state of the same name in the Rajputana agency (Eastern Rajputana subagency) and was merged in Rajasthan on March 25, 1948. The ruling family of Jhalawar belonged to the Jhala clan of Rajputs, and their ancestors were petty chiefs of Halwad in Kathiawar. Early in the 18th century a cadet of the house, Madhu Singh, found favour with the maharaja of Kotah, and received an important post. which became hereditary. On the death of one of the Kotah rajas (1771) the country was left to the charge of Zalim Singh, a descendant of Madhu. From that time Zalim was the real ruler of Kotah. In 1838 it was resolved. with the consent of the chief of Kotah, to dismember the state and to create the new principality of Jhalawar as a separate provision for the descendants of Zalim. A later Zalim Singh. who had succeeded in 18; 5, was deposed in 1896 because of persistent misgovernment: the administration was placed in the hands of the British resident. The government resolved in 1897 to break up the state. restoring the greater part to Kotah, but forming the two districts of Shahabad and the Chaumahla (n-hich were separated by Kotah territory) into a new state. which came into existence in 1899. and of which Kunwar Bhawani Singh, a descendant of the original Zalim Singh. was appointed chief.

The district headquarters are at Jhalarapatan (pop. [1951] 6,967), 160 mi. S. of Jaipur. Old Jhalarapatan town, also called Patan. was founded close to an old site by Zalim Singh in 1796. beside an artificial lake. Four miles north is the modern Jhalarapatan, or Jhalarapatan Chhaoni, with the district headquarters, the palace of the princely family and the military cantonment. Jhalarapatan is a centre of trade, chief products of the district being oilseeds and cotton. Near the town was the city of Chandrawati. said to have been destroyed in the time of Aurangzeb. The finest of its remains is the temple of Sitaleswar Mahadeva (c. A.D. 600).

JHANG, a district in the Sargodha division of West Pakistan. The district extends along both sides of the Chenab, including its confluence with the Jhelum. Area. 3.301 sq.mi.; pop. (1961) 1,078,747. The principal industries are the ginning, pressing and weaving of cotton.

Jhang contains the ruins of Shorkot. identified by some with one of the towns taken by Alexander. In modern times the history of Jhang centres in the famous clan of Sials. who exercised an extensive sway over a large tract between Shahpur and Multan. with little dependence on the imperial court at Delhi, until they finally fell before the all-absorbing power of Ranjit Singh. In 1847, after the establishment of the British agency at Lahore, the district came under the charge of the British government; and in 1848 Ismail Khan. the Sial leader, rendered important services against the rebel chiefs. During the 1857 Mutiny the Sial leader again proved his loyalty by serving in person on the British side.

The headquarters of the district are in the municipality of Jhang (pop. [1961] 94,971), 117 mi. W.S.W. of Lahore and 3 mi. from the left bank of the Chenab. The municipality was formed by combining Jhang with the newer and more important contiguous town of Maghiana, which is a manufacturing centre for leather. soap and metalware. The other main town is Chiniot (pop. 47.099). 52 mi. N.E. of Jhang.

JHANSI, a city, the headquarters of a tehsil (subdivision), a district and a division of Uttar Pradesh. India. The city. 130 mi. S.W. of Kanpur. is the centre of the Indian Midland system of the Central railway, with lines radiating off to Gwalior and Agra, Kanpur, Allahabad and Bombay via Bhopal. Pop. (1961) of city and cantonment. 170.209: pop. (1951) of tehsil (482 sq.mi.) 232,-632. Jhansi is the principal centre for the agricultural trade of the district.

JHANSI DISTRICT was enlarged in 1891 by the incorporation of the former district of Lalitpur. which extends farther into the hill country, and in 1950 by the mergers of three small princely states and parts of four others. Combined area. 3,888 sq.mi. Pop. (1961) 1,086,219. The district forms a part of the hill country of Bundelkhand,' sloping down from the outliers of the Vindhyan range on the south to the tributaries of the Jumna on the north. The extreme south is composed of parallel rows of long and narrow-ridged hills. Through the intervening valleys the rivers flow down impetuously over ledges of granite or quartz. North of the hilly region, there is a considerable expanse of black cotton soil. The district is intersected or bounded by three principal rivers, the I'ahuj. Betwa and Dhasan. Its principal crops are millet, cotton, oilseeds. pulses. wheat, gram and barley. The destructive *kans* grass proved as great a pest there as elsewhere in Bundelkhand. Jhansi is especially exposed to blights, droughts, epidemics and famine.

Apart from Jhansi the only other considerable places in the district are Lalitpur (20,792), a trade centre for oilseeds. hide:: and clarified butter (ghee), and with fine Jain and Hindu temples: and the twin municipality of Mau Ranipur (15,981), where a widely used red cotton cloth called *kharua* is made.

JHANSI DIVISION is composed of the districts of Jhansi, Jalaun, Hamirpur and Banda. To the period of Chandel rule, about the 11th century, must be referred the artificial reservoirs and ruined fortresses of the hilly region. though the division is not lacking in far more ancient monuments such as the famous Gupta temple at Deogarh. The Chandels were succeeded by their servants the Khangars. About the 14th century the Bundelas poured down upon the plains and gradually spread themselves over the whole region which now bears their name. The Mohammedan governors were frequently making irruptions into the Bundela country. and in 1732 Chhatar Sal, the Bundela chieftain. called in the aid of the Marathas. who were rewarded by the bequest of one-third of his dominions. Their general founded the city of Jhansi. In 1806 British protection was promised to the Maratha chief, and in 1817 the Maratha king or peshma ceded to the East India company all his rights over Bundelkhand.

In 1853 the raja died childless, and his territories lapsed to the British. The widow of the raja considered herself aggrieved because she was not allowed to adopt an heir and because the slaughter of cattle was permitted in the Jhansi territory; and when the Mutiny broke out in 1857, she put herself at the head of the rebels, and died bravely in battle.

JHELUM, a municipality, cantonment. tehsil (subdivision) and district in the Rawalpindi division of West Pakistan. The town is 103 mi. N. of Lahore, on the right bank of the river Jhelum, there crossed by a bridge of the North-Western railway. Pop. (1961) 52,585, including 11.425 in the cantonment. Jhelum is a modern town with river and railway trade (principally in timber from Kashmir), boatbuilding and cotton textile manufactures. JHELUM TEHSIL had a population in 1961 of 291,193.

JHELUM DISTRICT stretches from the river Jhelum halfway across the Potwar plateau toward the Indus. Area 2.772 sq.mi. Pop. (1961) 749,229. Salt is quarried at Khewra and other places in the Salt range; coal is mined at Dandot, 48 mi. S.W. of Jhelum. The river Jhelum is navigable throughout the district. Between it and the Salt range lies an alluvial riverain plain with an average breadth of about 8 mi. The backbone of the district is formed by the Salt range, a double line of parallel hills running across it from east to west. The range rises in bold precipices. broken by gorges, clothed with brushwood and traversed by streams which are at first pure but soon become impregnated with the saline matter over which they pass. Between the lines of hills lies a tableland, fairly level. fertile and picturesque in the west and cut by ravines and traversed by dwindling hills in the east. North of the Salt range the country runs upward in an elevated plateau, diversified by countless ravines and gullies until it loses itself in the tangled masses of the Rawalpindi mountains.

The history of the district dates back to the semimythical period of the *Mahabharata*. Hindu tradition represents the Salt range as the refuge of the five Pandava brethren during their exile, and every salient point in its scenery is connected with some legend of the national heroes. Modern research has fixed the site of the conflict between Alexander and Porus its within Jhelum district. although the exact point at which Alexander effected the passage of

the Jhelum (or Hydaspes) is disputed. After this event, there is little information about the district until the Moslem conquest. During the flourishing period of the Mogul dynasty, the Ghakkar chieftains were prosperous and loyal vassals of the house of Babur; but after the collapse of the Delhi empire Jhelum: like its neighbours, fell to the Sikhs.

In 1849 the district passed, with the rest of the Sikh territories, to the British.

JHELUM (Greek HYDASPES), a river of Kashmir and West Pakistan, the most westerly of the "five rivers" (*Panch-ab*) of the Punjab region. It rises in Kashmir and at first flows northwest through the vale between the main Himalaya and the Pir Panjal. In this section it passes the city of Srinagar and through Walar lake. After leaving the lake the river flows southwest through the Baramula pass in the Pir Panjal and then northwest again to Muzaffarabad. From that town for about 110 mi. southward to near Jhelum city in West Pakistan it forms the frontier between that country and Kashmir. The city controls the important river crossing on the northern highway followed by many invaders in the past and is used by the Grand Trunk road from Calcutta to Peshawar and by the main railway. Between Rasul and Pind Dadan Khan the river crosses the Salt range and enters the Punjab plains. It completes its 450 mi. course at Trimmu where it joins the Chenab. From the Kashmiri foothills the Jhelum forms an important geographical boundary. East of its low left bank most of the land is irrigated, cultivation is general and there is the closest railway network in the whole peninsula. Beyond its high western bank is an arid land, almost without cultivation. and with only two railways. from Jhelum and from Shahpur. to the Indus. The famous Triple Canals project, completed in 1917, carries the surplus water of the Jhelum at Rasul to the Upper Jhelum canal. which discharges into the Chenab at Khanki, thus helping to feed the lower Chenab canal, and is thence carried across the Ravi at Balloki to assist in maintaining the Lower Bari Doab canal system.

(T. HER.)

JHERING, RUDOLF VON (1818–1892) German legal scholar, who developed a philosophy of social utilitarianism which, unlike Jeremy Bentham's individualist theory, gave social needs the dominant position, was born at Aurich, East Friesland, on Aug. 22, 1818. In the early period of his career he wrote a treatise on possession (1868), using the traditional legal method of conceptual analysis. He soon, however, abandoned conceptualist jurisprudence, and wrote a famous book on purpose in law (Der Zweck in Recht, 2 vol., 1877–83; Eng. trans., *Law* as *a* Means to an End [1924]), maintaining that purpose is just as important in human conduct and law as cause is in the physical world. The book reflected Jhering's sensitivity to social and economic changes and the need to express relevant theories in jurisprudence. There were at the time many important social and economic changes going on in Germany, which were reflected in the first modern social legislation on employers' liability and in sickness, accident and old-age insurance.

In addition to these contributions to sociological jurisprudence, Jhering emphasized social and psychological aspects of the judicial process. He ridiculed "concept jurisprudence" (*Begriffsjurisprudenz*) and the strictly logical, mechanical decision of cases. In his greatest work, on the spirit of the Roman law (Der Geist des romischen Rechts, 4 vol., 1852–65), he elaborated the relations of law to social change.

He died at Gottingen on Sept. 17, 1892.

See Jerome Hall (ed.), *Readings in Jurisprudence (1938)*; Munroe Smith, "Four German Jurists," in *A General View of European Legal History* (1927). (J. HL.)

JIBUTI: see DJIBOUTI.

JÍCAMA, the Spanish name for three of the six known species of *Pachyrrhizus*, a perennial genus in the bean family (*Leguminoseae*), native from central Mexico to Argentina, but now widely cultivated in the tropics and subtropics of the world. The English name is yam bean and many vernacular names are used in Oceania and Asia. The stems are vinelike, the flowers white or blue, the roots tuberous, sweet and watery. The roots, which contain 38% starch and 16% sugar, are eaten raw or cooked. The green pods of P. *erosus* are edible when cooked, but ripe seeds are poisonous and are used to kill fish and insects. Propagation is by seed or small tubers and the roots are dug 4 to 18 months after planting.

Tno morning-glories, *Exogonium bracteatum* and *Ipomoea jicama,* and a dahlia, Dahlia *coccinea,* also are called jicama in Mexico. (I. L. W.)

JICIN, a town of the Hradec Kralove administrative region of Czechoslovakia in what was formerly northnestern Bohemia. Established as a town by Wenceslas II in 1302, it was owned in the 17th century by Albrecht von Wallenstein who made it the capital of the duchy of Friedland. Wallenstein's castle as well as the church modeled after the pilgrims' church of Santiago de Compostela in Spain. and medieval fortifications are still to be seen. It was at Jicin that Francis II (q v), the last of the Holy Roman emperors. conferred with representatives of Russia and Prussia before the battle of Leipzig (1803). In the middle of a large fertile plain, Jicin is a market centre and manufactures machinery, motors and pianos. Pop (1950) 11,329.

JIDDA, a town of Saudi Arabia on the Red sea 21° 28′ N., 39° 10′ E., chief seaport of Hejaz and principal landing place for pilgrims to Mecca, about 46 mi. away: it has about 160.000 inhabitants (1955 est.) of numerous different stocks—Arab, Persian, Indian, Negro, etc.—and is surrounded by a wall dotted at intervals with bastions and pierced by three gates (Bāb al-Madina on the north, Bib Mecca on the east, and Bib al-Sharif, usually called Bib al-Yemen, on the south). The main *sūq* (bazaar) runs N. and S. for about three-fourths the length of the town, and an important secondary *sūq* runs up from the customs gate across the main bazaar to the Mecca gate; this is partly roofed over with corrugated iron. Much of the western part of Jidda has been built on land reclaimed from the sea and, the subsoil water being briny or brackish, the town depends for its drinking water largely on sea water condensed by two plants capable together of producing 200 tons a day. Two wells supply fresh water partly through a rehabilitated Turkish aqueduct and partly through pipe lines. The northern quarter is most favoured for residential purposes and there reside the diplomatic representatives of various countries—Great Britain, France, Italy, Netherlands. U.S., U.S.S.R., Turkey, Egypt, Iraq, Afghanistan and Iran. The European and U.S. firms include an oil company, a mining company, one British, one British-Dutch and three Saudi-Arabian shipping export-import houses. Gasoline and diesel oil storage tanks are owned by the government and the mining company. The latter has a pier with cranes for handling up to 15 tons. Motor trucks of 10-ton capacity operate between Jidda and Medina, Jidda and Riyadh and j-ton trucks run from Riyadh to Jubail and al-Qatif besides the oil port of Ras al-Tannura and the oil town of Dhahran. The houses are mostly built of coral rock with much picturesque woodwork. The chief public buildings are the customhouse, the municipal offices. the condensers, the government offices and, outside the north gate, the barracks and aeroplane hangar. The tomb of Eve, formerly a favourite pilgrim resort especially for women, was demolished by the Wahhabi government in 1927.

Jidda has a governor (qā'im-maqām) at the head of the general administration and a municipal committee under a president for purely domestic administration. The old site of the town appears to have been at Ras al-Aswad about 12 mi. south and the modern location of Jidda dates only to the 17th century. The original settlement is attributed to Persian merchants during the caliphate of 'Uthman, but its commercial importance dates from the 15th century when it was apparently a trade centre between India and Egypt; the general introduction of steamers rapidly deprived Jidda of its position as an emporium though this loss was made good by its increasing importance as a pilgrim port. Jidda successfully resisted the Wahhabi attacks of the early 19th century and remained in the Ottoman empire till June 1916, when the Turks surrendered to a British naval bombardment and the town became part of the new Hejaz kingdom. During World War I it was important as the political centre of the Hejaz operations. From Nov. 1924 to Dec. 1925 it was besieged by the Wahhabis

and on Dec. 23 it surrendered to Ibn-Sa'ud after the abdication and withdrawal of King 'Ali. Later its prosperity rapidly increased and in 1927 there was a record overseas pilgrimage of 130,000 as against a pre-World War I average of 70,000 to 80.000. The depression of the 1930s caused a decrease to an average of about 20,000. By 1939 the number had risen again to 65,000 and in Dec. 1941, despite World War II, 80,000 made the pilgrimage to Mecca. Its imports in ordinary times probably exceed £5,000,000 annually. Exports (mainly hides and *samn)* are small. and the adverse balance is met from the cash proceeds of the annual pilgrimage. (H. ST. J.B.P.; P.K.H.)

JIG is a device used for accurately locating a piece of aork for machining. When a casting or forging has to be machined to shape and size it must be held firmly in the lathe, or the drilling,

FIG. 1.— DRILLING JIG WHICH ACCURATELY LOCATES AND HOLDS A SWIVEL AXLE

boring. planing, milling or other machine, a chuck, vice or bolts and clamps being used for the purpose. Careful setting is necessary, which sometimes takes a considerable time. In mass production, or even in dealing with a moderate number of pieces, this setting can be reduced considerably by providing a jig or a fixture which is constructed with means for accurately locating the article by certain surfaces, and of then clamping it with total absence of slip. A fixture holds without exercising any other function, while a jig holds and also has means for guiding the tool exactly to position, a necessity in most drilling, reaming and boring. The guide or guides take the form of top or side plates, with holes of suitable size to receive the tools as they pass down on to the work, and usually the holes are filled each with a hardened steel bush of long wearing qualities.

Jigs may be of plate or open type, or of box type. The former are simple and suited to many of the flatter objects, or those which need drilling on a top face, from which the jig plate can be set by its ledges embracing the sides. A box jig surrounds the casting or forging, and locates by several spots, while a hinged cover is often fitted rapidly to release the piece and to put in a fresh one. Sometimes the location is effected by means of a part already machined instead of from a rough untooled portion, either a flat, or a cylindrical, or a bored hole. Fig. 1 shows this feature in regard to a familiar motor car detail, the swivel-axle, the box jig taking the turned part through a hole at the back, and locating the main holes by a long mandrel passed through. Then the two holes are drilled with the bushes for guides. Many jigs are built to turn over on to various faces so as to drill holes from each side, or may swivel on trunnions for a similar reason. With a conveyor system running past the machines, as in car factories. the jigs are mounted on wheels.

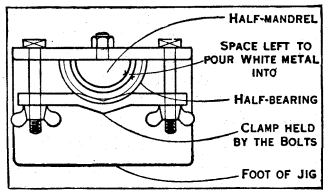


FIG. 2.— METALLING JIG FOR HOLDING A HALF-BEARING AND HALF-MANDREL OR CORE

Fixtures are used in the lathe, planer, shaper, slotter, miller, grinder, gear-cutter, also on broaching machines, and frequently for use in assembling mechanisms quickly. The clamping arrangements have to be devised for quickness, and in some cases automatic clamps are fitted which loosen and tighten at the correct periods.

Other jigs which are not concerned with cutting processes include those for holding articles in correct position for soldering or brazing, and the moulds which hold connecting rods and bearings while being run up with white metal. Forms vary according to the shape of the work, but an angle-plate shape, seen in fig. 2, is suitable to clamp a half-bearing against the upright face, while a half-mandrel of appropriate radius is bolted also, leaving a space for the white metal to run into, so forming a new bearing surface.

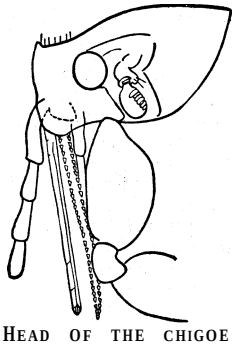
Jig refers also to a reciprocating movement, such as that of a jig saw which operates similarly to a fret saw, and is designed either for wood or metal, in the latter case being much used for cutting dies. A jigging screen also possesses the to and fro action necessary to keep material in motion while being separated or sifted. The jig for concentrating minerals consists of a series of boxes with a shaft running above and having eccentrics that impart the jigging motion. A water supply is provided. Diamonds and other precious stones are recovered in this kind of jig.

(F. H.)

JIG, a brisk lively dance, the quick and irregular steps of which have varied at different times and in the various countries in which it has been danced. The music of the "'jig," or such as is written in its rhythm, is in various times and has been used frequently to finish a suite, *e.g.,* by Johann Bach and G. F. Handel. The word has usually been derived from or connected with Fr. *gigue,* Ital. *giga,* Ger. *Geige,* a fiddle. The idea of jumping. jerking movement has given rise to many applications of "jig" and its derivative "jigger" to mechanical and other devices, such as the machine used for separating the heavier metal-bearing portions from the lighter parts in ore dressing.

JIGGER, a hoist or winch of moderate power, which can be arranged in any fashion, on a floor, wall, pillar or in any confined situation, to perform lifting and hauling. The hydraulic jigger has a cylinder, ram and pulleys to operate the hoisting rope, and the latter may be led off in any desired direction. For general use, *e.g.* in unloading ships, the hydraulic jigger is mounted on a low frame with trolley wheels. On some electric cranes an electric jigger runs up and down the underside of the jib and is employed for light lifting, but more usually to assist the main hoisting hook by being attached to some part of the suspended load. In a bridge-erecting crane the jigger hoist is used to bring the various girders and other structural members into exact position for final attachment. In mining, a jigger or shaker conveyor is used to transport coal from the face to the tubs, or as a gate conveyor. A long trough is built up in sections to the required length and mounted on rollers at intervals. An electric or air-driven jigger engine is coupled up to the trough so as to impart a succession of jerks or kicks, causing the coal to travel along the trough.

JIGGER,' CHIGGER or **CHIGOE,** the common name of a small flea, also known as the sand flea, which burrows into the skin of man and animals, causing considerable damage. The term chigger is more appropriately applied to the larvae of certain mites which parasitize vertebrates, and should not be used for the flea *(see* HARVEST BUG). The chigoe flea occurs in the American tropics and in Africa, but is not established in the U.S.A., although records of its occasional occurrence in Florida. Louisiana and Texas have been published.



HEAD OF THE CHIGOE FLEA (TUNGA PENETRANS) MALE

Structure **and** Life History.— The chigoe flea is an exceedingly small insect, the male being one-twenty-fifth of an inch or less in length. From the accompanying illustration it will be seen that the front of the head is produced into an angular tubercle, the eyes are prominent, and the mouth parts include long formidable mandibles which are strongly toothed on both sides. In general appearance the chigoe flea resembles the sticktight or chicken flea *(Echidnophaga gallinacea),* which affects poultry, but is distinguished from the latter by various microscopical differences, as well as by its habits. The males and the unfertilized females have the same general habits as other fleas, but the fertilized females are remarkable because they penetrate deep into the skin of the host. The gravid female fixes herself by her

angular head in the skin and little by little forces her way into the flesh so deeply that only the latter segments of the abdomen remain outside. She engorges on blood and in a few days swells to many times the original size until she is as big and round as a pea, and her abdomen is full of innumerable eggs. Frequently the gravid female dies in the wound, producing an abscess in the secretions of which the eggs are expelled. Otherwise the eggs are laid at hazard and drop to the ground. The immature stages occur in habitations! stables and the field and abound in the resting places of the hosts. In two or three weeks the entire life cycle is completed.

Pathogenesis, Treatment and Control. — The chigoe attacks not only man but many domestic and wild animals. Hogs are particularly susceptible to infection and these as well as other animals serve as a source of human infestation. The flea may attack any part of the body of man, but prefers the extremities. Treatment consists in removing the insect with a sterilized needle, preferably before it has a chance to engorge. The wound should then be treated with an antiseptic such as tincture of iodine. (See FLEA.) (I. Fx.)

JIHAD (Arabic, lit. striving, effort), the religious duty inculcated in the Koran (ii, 214–215; viii, 39–42; ix, 5–6, 29) on the followers of Mohammed to wage war upon those who do not accept the doctrines of Islam. Modern Moslem apologists maintain that Jihad in the Koran does not mean the waging of war, and explain it in terms of the spiritual life. (See ISLAMIC INSTITUTIONS.)

JIHLAVA (German, *Iglau*), an old town of Czechoslovakia, in the upper valley of the Jihlava, a tributary of the Morava, at the junction of routes from Prague, Czech., to Vienna, Aus., and Prague to Brno, Czech. This critical strategic position led to an early settlement and contributed to an interesting history of struggles for control of the site. Silver mines in the vicinity are believed to have been worked in the 9th century. During the 13th century a mint and mining office were established. The town is remarkable for the collection of municipal and mining laws, dating back to the 14th century. Jihlava is an important market and in the middle ages held the largest fairs between Linz and Pilsen, a prosperity evident from its fine monuments and churches. Pop. (1957 est.) 34,891.

JIMÉNEZ, JUAN RAMÓN (full surname JIMÉNEZ MANTECÓN; 1881–1958), Spanish poet, winner of the Nobel prize for literature in 1956, was born at Moguer, Huelva, on Dec. 24, 1881. Educated by the Jesuits and at Seville university, he spent the better part of his adult life in Madrid. From 1912 to 1916 he lived in the Residencia de Estudiantes, enjoying the company of other poets, for instance Antonio Machado, who lived there also. In 1916 he married Zenobia Camprubi (d. 1956), the translator of Rabindranath Tagore. When the Spanish civil war broke out, he remained for some time in Madrid. Eventually he went into exile and lived in various countries including Cuba. the United States and Puerto Rico. He died on May 29, 1958, at San Juan, P.R.

Jiménez' life was devoted almost wholly to his writing. Though a very prolific poet, he yet took great pains not only with the continual revision of his published texts but even with the details of typography, in which he was responsible for some innovation in Spanish practice. His early work is characterized by a preoccupation with idealized landscape and with metrical experiment and shows the influence of the writers most widely admired by his generation: of the French Symbolists (especially Albert Samain) and of Jean Moréas on the one hand and of Rubén Dario on the other. The *Sonetos espirituales, 1914–1915,* however, are more reminiscent of the 16th-century Spanish lyric; and the period immediately following the poet's marriage was distinguished hy the appearance of *Diario de un poeta recién casado* (1917), *Eternidades, 1916–1917* (1918) and *Piedra y cielo* (1919), as well as by an anthology of his own poems, *Poesias escojidas, 1899–1917* (1917). His *Segunda antolojia poética 1898–1918* was to have followed in 1920, but the author's afterthoughts delayed its actual appearance till 1922. In the work of these years may be discerned the early stages of Jiménez' progress in his effort to achieve a *poesia desnuda* or "naked poetry," the simple and graceful expression of intimate perceptions in detachment from all extraneous contingency and iree irom any regulation by rhyme or fixed metre (this consideration underlies the qualiiying words in the titles of two books of 1923: *Poesia, en verso, 1917–1923* and *Belleza, en verso, 1917–1923*). It is not surprising that one critic can describe Jiménez as "the poet of the ineffable" while another reproaches him for "egocentricity". He pursued his new ideal of poetry in subsequent works: *Unidad* (1925), *Obra en marcha* (1928), *Sucesidn* (1932), *Cancidn* (1936), *Antologia poética* (1944), *Voces de mi copla* (1945), *La Estacidn total con las canciones de la nueva luz, 1923–1936* (1946), *Romances de Coral Gables* (1948); *Animal de fondo* (1949); and *Diario de poeta y mar* (1955).

Apart from the main current of his writing, three prose works by Jiménez must be mentioned: *Platero y yo* (1914; Eng. trans. by T. W. and M. Roberts, *Platero and* I, 1956; also by E. Roach, 1957), a classic both for adults and for children, on his life with his donkey, constantly reprinted; *Españoles de tres mundos: viejo mundo, nuevo mundo, otro mundo* (1942); and the Spanish translation (1920), in collaboration with his wife, of J. M. Synge's *Riders to the Sea.*

JIMENEZ (or XIMÉNEZ) **DE CISNEROS, FRANCISCO** (1436–1517), Spanish cardinal and statesman, was born at Torrelaguna (Castile). He studied at Alcalá de Henares and at Salamanca, took holy orders and in 1459 went to Rome. On his return to Spain (1465), he claimed (1473) the archpriestship of Uzeda (Toledo) in virtue of an "expective" letter from the pope. Carrillo, archbishop of Toledo, opposed him and threw him into prison, restoring him to his benefice only in 1480. This Jiménez changed almost at once for a chaplaincy at Sigiienza under Pedro Cardinal Mendoza, bishop of Sigiienza, who shortly appointed him vicar-general of his diocese. Abruptly resolving to become a monk, Jiménez threw up all his benefices and entered the Franciscan monastery of San Juan de los Reyes, founded shortly before by Ferdinand and Isabella at Toledo. In 1492. at Mendoza's recommendation and against his will, he became Isabella's confessor. The post was politically important, for Isabella submitted to the judgment of her father-confessor not only her private affairs but also matters of state. Appointed in 1494 provincial of the order of St. Francis, Jiménez reduced the laxity of the Conventual to the strictness of the Observantine Franciscans; he met with intense opposition, but his stern inflexibility, backed by the influence of the queen, subdued every obstacle. At the death of Cardinal Mendoza (1495) Jiménez was nominated to his diocese of Toledo. In 1499 Jiménez accompanied the court to Granada, where he joined the archbishop of Talavera in his efforts to convert the Moors. But Jiménez's coercive methods provoked open revolt, which was quelled with difficulty.

Upon Isabella's death on Nov. 24, 1504, Ferdinand resigned in favour of Joanna and her husband, the archduke Philip. The latter died suddenly in 1506, Joanna's intellect gave way completely, their son Charles was still a child and Ferdinand was at Naples. In this crisis. the nobles of Castile entrusted affairs to Jiménez, and on Ferdinand's return in 1507 he was made cardinal and grand inquisitor-general for Castile and León. Ferdinand died in 1516, leaving Jiménez as regent: Charles, then a youth of 16 in the Netherlands, appointed Adrian, dean of Louvain, as his choice Jiménez admitted Adrian to a nominal equality and, in violation of the laws, acceded to Charles's desire to be proclaimed king His position was rendered peculiarly difficult by the haughty, turbulent Castilian nobility and the jealous intriguing councilors of Charles; he ruled, notwithstanding, in a firm and even autocratic manner. In 1517 Charles landed in the Asturias; Jiménez, who had hastened to meet him, fell ill on the way and received a cold note from his king thanking him for his services and dismissing him to his diocese. He died—some say without seeing the letter—at Roa on Nov. 8, 1517.

In 1500 he iounded the University of Alcalá de Henares, within whose walls at one time 7,000 students met In 1836 the university was moved to Madrid. He revived the Mozarabic liturgy, and endowed a chapel at Toledo in which it was to be used. His most famous literary service was the printing at Alcalá (Lat. *Complutum*) of the Complutensian Polyglott, the first edition of the Scriptures in the original text.

The work by A. Gomez de Castro, *De Rebus Gestis a Francisco Ximenio* (Alcala, 1650), has provided material ior biographies of Jimenez

JIMÉNEZ DE QUESADA, GONZALO (c. 1500–1579), Spanish conqueror of New Granada (Colombia), was born about the year 1500, probably in Granada, Spain, where he was carefully trained for the law. In 1535 he accompanied Pedro Fernández de Lugo, *adelantado* of Santa Marta (northern Colombia), as auditor and *justicia mayor* of his colony; and in the following year. although he had had no military experience, Lugo chose him to command an expedition to the headwaters of the Magdalena. In Jan. 1537 he found himself on the great central plain of Colombia, inhabited by a race called Chibchas. who had at-

tained a high state of aboriginal culture. The ruler of the country, the Zipa of Bogotá, fled at the approach of the Spaniards and Quesada occupied his capital. Toward the end of 1538 Quesada was preparing to start for the coast, when two more conquerors appeared—Sebastián Benalcázar from Quito and Nicolás Federman from Venezuela. Quesada successfully maintained the priority of his rights, and on July 8, 1539, sailed from Cartagena for Spain to urge his claims to the government, but his efforts were of no avail. On his return to New Granada he became at once the most influential person in the colony, protecting the colonists from the severity of officials and restraining the impetuosity of the *comenderos*. In 1569 he set out with 500 men on a quest for the fabulous El Dorado which carried him into the trackless swamps of the Orinoco, from which he returned after nearly two years' wanderings, with only 25 of his original company. Retiring to La Suesca, his country house, he turned to literature and composed *Los Ratos de Suesca* and a series of *Sermones*. Early in 1579 he moved to Mariquita, where he died on Feb. 16 of leprosy. (W. B. P.; X.)

JIMSON WEED. JAMESTOWN WEED or THORN APPLE: *see* DATURA; SOLANACEAE.

JIM THORPE, a borough of eastern Pennsylvania, U.S., and the seat of Carbon county, nestles in a narrow valley on the edge of the coal region where the Lehigh river cuts a deep gorge through the Blue Ridge mountains. Its original Indian name, Mauch Chunk ("bear mountain"), refers to a circular mountain east of the river. A summer resort, its scenic beauty can be viewed from Flagstaff park high above the town.

In 1954 Mauch Chunk and East Mauch Chunk merged, and adopted the name of Jim Thorpe, famous Indian football player whose body was brought there for burial.

The discovery of anthracite (1791) attracted settlers. The Lehigh Coal and Navigation company laid out the town and built the first railroad in the Cnited States (1828), a gravity switchback line which hauled coal to the Lehigh canal. Asa Packer, coal baron, whose home still stands, founded the Lehigh Valley railroad to replace the canal in 1855.

Mining has given way to the manufacture of textiles, clothing, handbags and furniture. For comparative population figures see table in PENNSYLVANIA: *Population.* (J. C. A.)

JINGO, a legendary empress of Japan. wife of Chuai, the 14th mikado (191–200). On her husband's death she assumed the government. and fitted out an army for the invasion of Korea (*see* JAPAN: *History).* She returned to Japan completely victorious after three years' absence. Subsequently her son Ojen Tenno, afterward 1jth mikado, was born. and later was canonized as Hachiman, god of war. The empress Jingo ruled over Japan till 270. The political use of the word as indicating an aggressive patriotism originated in 1877. during the weeks of national excitement precluding the dispatch of the British Mediterranean squadron to Gallipoli, which frustrated the Russian designs on Constantinople.

JINNAH, MOHAMMED ALI (1876–1948), Pakistani statesman, was born in Karachi, Dec. 2j. 1876, the son of a merchant. He studied law at Lincoln's Inn, London (1892–96), and built up a good practice as a barrister in Bombay.

In politics Jinnah followed the moderate leaders of the Indian National Congress party, Dadabhai Naoroji and Gopal Krishna Gokhale (*q.v.*). He was elected to a Moslem seat in the central legislative council (1910), and joined the Indian Moslem league in 1913 when it extended its platform to include Indian self-rovernment. Jinnah for many years consistently advocated Hindu-Moslem unity in the cause of Indian nationalism and the consequent necessity of constitutional safeguards to give a sense of security to the minority. As president of the league in 1916, he sponsored a joint Congress-league scheme of constitutional reiorms; part of this, the Luclinom pact, provided for separate Moslem electorates and weighted representation ior Moslem minorities on a basis which was largely adopted in later reforms. Jinnah strongly disapproved, however, of M. K. Gandhi's nonco-operation campaign (1919–22) and hroke with Congress on this issue. Entering the reiormed central legislature as an independent, Jinnah took a prominent part in its work. Hindu-Moslem relations meanwhile deteriorated; in 1938–39 an interparty conference on further constitutional reforms rejected Jinnah's view, but an all-India Moslem conierence endorsed his "fourteen points" program, which, besides formulating other saieguards, aimrd at strengthening the position of the Moslem provinces. After attending the London round-table conference (1930–32), Jinnah withdrew temporarily from politics but in 1934 resumed his leadership of the Moslem league. He considered the provincial part of the 1935 reforms worth a trial and still hoped to secure Moslem interests by an entente with Congress. But the latter's attitude aiter the provincial elections of 1937 permanently antagonized him. Reorganizing the league as an effective opposition party, he greatly increased its influence and became known as *Qaid-i-Azam* ("great leader"). In 1940 he adopted the policy of establishing a separate Moslem state ("Pakistan") by partitioning India. Once committed to this, he rejected British proposals regarding transfer of power in India (the Sir Stafford Cripps offer, 1942, and the cabinet mission's plan, 1946) and advances made by Gandhi (1944). When in 1947 Congress consented to a modified basis of partition, Jinnah became Pakistan's first governor general. Besides organizing the new state, he had immediately to deal with the crises of the Punjab riots and consequent mass migrations, and the Kashmir dispute. He died at Karachi on Sept. 11, 1948.

See Sir Reginald Coupland, *India: a Restatement* (1946); Richard Symonds, *The Making of Pakistan* (1950). (J. C. W.)

JINNI (pl. JINN), in Arabic mythology, is the general term for supernatural beings below the level of angels and devils. From the intervention of jinn in human affairs, the *Arabian Nights* derives much of its charm and motion. Belief in their existence was common in early Arabia and has continued through, the centuries among Arab and Moslem peoples. The jinn were believed capable of taking the forms of human beings, male and female, and of many different animals. notably snakes. They dwelt in all conceivable inanimate objects — stones, trees, ruins — underneath the earth. in the air and in the fire. At times they were friendly to human beings. but mostly sought to punish them for some harm done the jinn intentionally or unintentionally. Jinn were responsible for many diseases and all kinds of accidents. Although they shared the bodily needs of human beings and could even be killed, they were free from all physical restraints and possessed extraordinary powers. These could be exploited by fortunate human beings who knew the proper magical procedure. In the Koran the jinn are repeatedly mentioned, and this gave rise to many subtle speculations that aimed at explaining their nature in terms of medieval science. According to Avicenna, "a jinni was an airy and rational animate being with a transparent body, capable of assuming various shapes — this being not a true definition but the idea suggested by the term." Avicenna's veiled skepticism was shared by many medieval scholars. It did not affect the popular belief. which. honever. in modern times is losing ground steadily. as the jinn are said to dislike all innovafions of modern technology. (F. RL.)

JIRASEK, ALOIS (1851–1930), was the most important Czech novelist of the period before 1914 as well as a great national figure. Born at Hronov. Bohemia, on Aug. 23, 1851, he was a secondary-school teacher until his retirement in 1909 He nrote a series of historical novels imbued with faith in his nation and in progress toward freedom and justice. He was particularly attracted by the Hussite period. to which he devoted his most famous work, the trilogy *Mezi proudy* ("Between the Currents"; 1891), *Proti všem* ("Against All the World"; 1894) and *Bratrstvo* ("Brotherhood"; 1899–1908). Artistically more significant is the five-volume portrayal of the Czech national revival, F. L. *Věk* (1888–1906); and his best uork is probably his last major novel, *Temno* ("Darkness"; 1915), in which he painted a vivid picture of Bohemia in the grip of the Counter-Reformation. His novels are based on careful historical reading; and his rich and detailed descriptive passages give his work a colour and individuality which offset the conventionality of the characterization. During World War I he publicly expressed the desire for national independence, notably when he read out the "national oath" at a demonstration in Prague on April 13, 1918. He died in Prague on March 12, 1930. (R. Ay.)

JITTERBUG, name applied from the latter 1930s to an exuberant. youthful form of ballroom dancing of U.S. origin. It is danced to bright, syncopated fox trots in 4/4 time. and in what is variously described as swing jive or jump tempo. Patterns include lindy hop steps (1929; name inspired by Charles Lindbergh's transatlantic flight) and sectional teen-age dances, such as the flea hop, Jersey bounce and west coast swing. Jitterbug nas spread internationally by the U.S. armed forces during World War II. A later evolution of jitterbug was rock 'n' roll (1955). (A. MU.)

JIVARAN, an independent linguistic stock of South American Indians, so called from the best knoun tribe. the Jivaros. The Jivaran tribes live in eastern Ecuador and the adjacent

portions of Peru in the area comprising the basins of the Santiago, Morona and upper Pastaza rivers. Rivet has enumerated the large number of tribes belonging to this group. The Jivaros proper live on the upper Pastaza, and may be taken as representatives of the stock. They are a warlike and numerous tribe, widely known from their practice of preparing the shrunken human heads, called "tsantsas," often seen in museum collections. The head, taken from an enemy, is carefully skinned, sewed up the back and then shrunk and dried by an elaborate process accompanied by much ceremony. The finished "tsantsa" is about the size of the head of a small monkey, and preserves strikingly the human expression. The Jivaros are to be carefully distinguished from the Jeberos living in their immediate vicinity, a tribe of the Mainan (*q.v.*) stock with whom they have often been confounded.

See P. Rivet, *Les Indiens Jivaros* (*L'Anthropologie,* vol. xvii., pp. 333—vol. xix., pp. 235–260); R. Karsten, *Blood-revenge, war and victory feasts among the Jivaro Indians of eastern Ecuador* (Bull. 79, Bureau of American Ethnology).

JOAB, in the Bible, the son of Zeruiah, David's sister (1 Chron. ii. 16). His brothers were Asahel and Abishai. All three were renowned warriors and played a prominent part in David's history. Abishai on one occasion saved the king's life from a Philistine giant (z Sam. xxi. 17), and Joab as warrior and statesman was directly responsible for much of David's success. Joab won his spurs, according to one account, by capturing Jerusalem (1 Chron. xi. 4–9); with Abishai and Ittai of Gath he led a small army against the Israelites who had rebelled under Absalom (2 Sam. xviii. 2); and he superintended the campaign against Ammon and Edom (z Sam xi. 1, xii. 26; 1 Kings xi. 15). He showed his sturdy character by urging the king, after the death of Absalom, to place his duty to his people before his grief for the loss of his favourite son (2 Sam. xix. 1–S), and by protesting against David's proposal to number the people, an innovation which may have been regarded as an infringement of their liberties (z Sam. xxiv., 1 Chron. xxi. 6).

JOACHIM I. (1484–153j), surnamed Nestor, elector of Brandenburg, elder son of John Cicero, elector of Brandenburg, was born on Feb. 21, 1484. He became elector in January 1499, and married Elizabeth, daughter of John, king of Denmark. By stern and cruel measures he succeeded in restoring some degree of order in Brandenburg. He improved the administration of justice, aided the development of commerce, and befriended the towns. In the imperial election of 1519, Joachim voted for Charles. But relations between the emperor and the elector were not friendly, and Joachim was frequently in communication with Charles's enemies. Joachim was a pugnacious adherent of Catholic orthodoxy. He urged upon the emperor the enforcement of the Edict of Worms, and at several diets was prominent among the enemies of the Reformers. His wife adopted the reformed faith, and in 1528 fled for safety to Saxony. Joachim, who was a patron of learning, established the university of Frankfort-on-the-Oder in 1506. He died at Stendal on July 11, 1535.

JOACHIM II. (1505–1571), surnamed Hector, elector of Brandenburg, the elder son of Joachim I., elector of Brandenburg, was born on Jan. 13, 1505. He became elector of Brandenburg on his father's death in July 1535, and undertook the government of the old and middle marks, while the new mark passed to his brother John. He was twice married, his second wife being Hedwig, daughter of Sigismund, King of Poland. Joachim made repeated attempts to make peace between the Protestants and the emperor Charles V. at Frankfort in 1539, and elsewhere. In 1542 he led the German forces on an unsuccessful campaign against the Turks. With Maurice, elector of Saxony, he persuaded Philip, landgrave of Hesse, to surrender to Charles after the imperial victory at Miihlberg in April 1547, and pledged his word (which Charles failed to honour) that the landgrave would be pardoned. He supported the *Interim,* which was issued from Augsburg in May 1548, and took part in the negotiations for the Treaty of Passau (1 552), and the religious peace of Augsburg (1555). In domestic politics he consolidated the power of his house by treaties with neighbouring princes, and secularized the bishoprics of Brandenburg, Havelberg and Lebus. In 1539 he allowed free entrance to the reformed teaching in the electorate, He took the communion himself in both kinds, and established a new ecclesiastical organization in Brandenburg, but retained much of the ceremonial of the Church of Rome. His position was not unlike that of Henry VIII. in England, and may be partly explained by a desire to replenish his impoverished exchequer with the wealth of the Church. By his lavish expenditure on public buildings he piled up a great accumulation of debt, which was partly discharged by the estates of the land in return for important concessions. He secured the archbishopric of Magdeburg and the bishopric of Halberstadt for his son Frederick in 1551; on Frederick's death in 1552, the sees passed to his brother Sigismund. Joachim died at Kopenick on Jan. 3, 1571, and was succeeded by his son, John George.

See Steinmiiller, *Einführung der Reformation in die Kurmark Brandenburg durch Joachim II.* (1903).

JOACHIM OF FIORE or FLORIS (c. 1135–1202), biblical commentator and philosopher of history, was influential in the later middle ages and Renaissance in reformist circles, and indirectly even in modern totalitarianism. He is in some respects a precursor of the Renaissance.

The loss of most southern Italian archives and the tendency for legends to cluster around Joachim's name make the reconstruction of his biography difficult. He was born in Celico in Calabria, probably the son of a notary. The traditional biography has him educated at the court of Roger II and making a trip to Constantinople and Palestine. when he is supposed to have been converted from his worldlv life to God. Around 1160 he returned to Calabria to become a Cistercian monk at Sambucina. By 1177 he was abbot of the monastery at Corazzo. Attaining a great reputation as a prophet and holy man in the last decades of his life, Joachim visited popes and royalty, including Richard the Lion-Hearted in Messina during the third crusade, 1190–91. In 1188 or 1189 he left Corazzo and retired to the Sila (a barren Calabrian plateau) where he founded a community of hermits at San Giovanni in Fiore, from which the Florensian order arose Its rule was approved in 1196 by Pope Celestine III, and it carried on a rather undistinguished existence until 1633. The departure of Joachim from the Cistercians aroused some bad feeling at the time, but it is doubtful whether Cistercian hostility persisted for long. Joachim died March 30, 1202.

Because of the wealth of pseudo-Joachite writings, Joachim's canon is in some doubt. Definitely authentic are his three major works—*Concordia novi et veteris Testamenti* (1519), *Expositio in Apocalypsim* (1527) and *Psalterium decem chordarum* (1527)—and the following shorter tractates which, unlike the preceding, have all been edited in modern times: *De articulis fidei, Adversus Iudeos, Tractatus super quatuor Evangelza* and *De vita sancti Benedicti et de officio divino secundum eius doctrinam.* Most probably by him, or by a close disciple reflecting his views, is the book of coloured drawings and figures, *Liber figurarum,* discovered in 1937, giving a new insight into Joachim's thought. It possibly influenced Dante. A lost tractate, *De essentia seu unitate Trinitatzs,* attacking Peter Lombard's concept of the Trinity was condemned by the fourth Lateran council in 1215, the only work of Joachim ever expressly and fully censured by Rome. The most notable and influential of the pseudo-Joachite writings are commentaries on Jeremiah (*c.* 1240) and Isaiah (c 1260).

In general Joachim's teachings were on two subjects—the nature of the Trinity and the meaning of history. Joachim attacked the Lombard for separating too sharply the unity of God from the Persons so that he, in effect, made a quaternity of God. The relations of Joachim's trinitarianism with the many other 12th-century theories in both east and west have yet to be worked out, but his stress on the threeness of God is distinctly Byzantine.

Joachim argued, on analogies between the Old Testament and Christian history and on the equality of Persons in God, that a new third age was soon to appear, an advance on the second as the second had been an advance on the first. The period of the Old Testament had been primarily the age of the Father, characterized by law and fear; the period from Jesus to about 1260 was that of the Son, characterized by grace and faith; and the third

age, which would complete history, was that of the Holy Ghost, characterized by love and spirit. Each age recapitulated on a higher level the first, so that certain general predictions could be made. Each age, like the first, was to last for 40 generations and have a precursor as well as an initiator. The birth throes of each were violent, producing a series of antichrists (*q.v.*). Around 1260 the Saracens and Jews would be converted and mankind would enter on its highest destiny. St. Benedict had been the precursor of the final age, which would be a spiritual age led by *viri spirituales*, who would be monks. The monastery, traditionally the prototype of paradise, would embrace all mankind.

Although essentially conservative and even backward looking, Joachim became a chief impetus or justification for radical movements in the later middle ages and Renaissance. His views were bandied about shortly after his death by various sides in the struggle between Frederick II and the papacy. Joachite activities reached a peak near the crucial date of 1260 at the University of Paris and in movements, at least partially inspired by the abbot, like those of the Flagellants and "Apostles." The rigorist wing of the Franciscans known as the Spirituals ("Fraticelli"; *q.v.*) saw in their founder the initiator and in their order the "spiritual men" of the new age. In spite of the disappointment of 1260, attempts to sustain Joachim's reputation as a thinker and prophet were more or less successful, and he enjoyed a high reputation, although not unassailed, until the 17th century.

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(M. W. BD)

JOACHIM, JOSEPH (1831–1907), Hungarian violinist and composer, was born at Kittsee, near Pressburg, on June 28, 1831, the son of Jewish parents. His family moved to Budapest when he was two years old, and he studied there under Serwaczynski, who brought him out at a concert when he was only eight years old, and then under the elder Hellmesberger and Joseph Bohm in Vienna. In 1843 he went to Leipzig to enter the newly founded conservatorium. Mendelssohn, after testing his musical powers, pronounced that the regular training of a music school was not needed, but recommended that he should receive a thorough general education in music from Ferdinand David and Moritz Hauptmann.

In 1844 he visited England, and made his first appearance at Drury Lane theatre, where his playing of Ernst's fantasia on *Otello* made a great sensation; he also played Beethoven's concerto at a Philharmonic concert conducted by Mendelssohn. In 1847–49 and 1852 he revisited London; he appeared regularly at the famous Monday and Saturday popular concerts from 1859 onward. On Liszt's invitation he accepted (1850) the post of *Konzertmeister* at Weimar, but his sympathies were with the older school of Schumann, and he was probably glad to leave Weimar for Hanover, where, in 1853, he became *Konzertmeister* to the king. In 1869 Joachim was appointed head of the newly founded *konigliche Hochschule fur Musik* in Berlin. The famous Joachim Quartet was started in the *Sing-Akadamie* in the following year. The original members of the quartet were Joachim, Ernst Schiever, Heinrich de Ahna and Wilhelm Muller. Of Joachim's later life, continually occupied with public performances, there is little to say except that he remained, even in a period which saw the rise of numerous violinists of the finest technique, the acknowledged master of all. He died on Aug. 15, 1907.

Joachim interpreted Bach, Mozart. Beethoven and Brahms with a degree of insight that has never been surpassed, and thereby established a standard of performance by which all subsequent players have been judged. His absolute freedom from tricks or mannerisms, his dignified bearing and his unselfish character won the respect of all, though his devotion to the highest ideals. combined with a certain austerity and massivity of style, brought against him an accusation of coldness from admirers of a more effusive temperament. His biographer (1898), Andreas Moser, expressed his essential characteristic in the words: "He plays the violin, not for its own sake, but in the service of an ideal "

Joachim's compositions are distinguished also by a certain austerity of character; but they are full of beauty of a grave and dignified kind. His "Hungarian" concerto for the violin. the Romance in B flat for violin and the variations for violin and orchestra are among his finest things. But he is remembered, not as a composer, but as a great musician and a great interpreter.

See A. Moser, *Joseph Joachim, ein Lebensbild* (1898; Eng. trans., 1901). Moser published (1908) Joachim's correspondence with Brahms and nith himself, 3 vol. (1911–13; Eng. trans. by N. Bickley, 1914).

JOAN, a mythical female pope (fl. 855), between Leo IV (847–855) and Benedict III (855–858). One account has it that she was born in England, another, in Germany of English parents. After an education at Cologne, she fell in love with a Benedictine monk and fled with him to Athens, disguised as a man. On his death she went to Rome under the alias of Joannes Anglicus (John of England) and entered the priesthood, eventually receiving a cardinal's hat. According to the fable, she was elected pope under the title of John VIII and died in childbirth during a papal procession.

A French Dominican, Steven of Bourbon (d. *c.* 1261), gives the legend in his *Seven Gifts of the Holy Spirit.* He is believed to have derived it from an earlier writer. More than a hundred authors between the 13th and 17th centuries gave circulation to the myth. Its explosion was first seriously undertaken by David Blondel, a French Calvinist, in his *Éclaircissement de la question si une femme a été assise au sikge papal de Rome* (1647); and *De Joanna Papissa* (1657). The refutation was completed by Johann Dollinger in his *Papstfabeln des Mittelalters* (1863; Eng. trans. 1872).

JOANES (or JUANES), **JUAN DE:** *see* MACIP, VICENTE JUAN.

JOANNA THE MAD, "LA LOCA" (1479–1555), queen of Castile and mother of the emperor Charles V, daughter of the Catholic rulers, Ferdinand and Isabella, was born at Toledo on Nov. 6, 1479. She married (1496) the archduke Philip, son of the German king, Maximilian I, and by the death of her brother John, of her eldest sister Isabella, queen of Portugal, and of the latter's infant son Miguél, became heiress of the Spanish kingdoms. Soon after 1502, her reason began to give way. She mourned extravagantly for her absent husband, whom at length she joined in Flanders; there her passionate jealousy, although justified by Philip's conduct, led to deplorable scenes. His death (1506) completely unhinged her mind; she remained nominally queen, but perforce took no part in the business of state and died after a miserable existence at Tordesillas, on April 11, 1555.

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JOANNA I (c. 1327–1382), queen of Naples, was the daughter of Charles, duke of Calabria (d. 1328), and became sovereign of Naples in 1343 in succession to her grandfather King Robert. Her first husband, Andrew, son of Charles Robert, king of Hungary, was assassinated (1345) at Aversa, possibly with his wife's connivance; at once Joanna married Louis, son of Philip, prince of Taranto. King Louis of Hungary then came to Naples to avenge his brother's death, and the queen took refuge in Provence—which came under her rule at the same time as Naples—purchasing pardon from Pope Clement VI by selling to him the town of Avignon, then part of her dominions. Having returned to Naples in 1352 after the departure of Louis, Joanna lost her second husband in 1362 and married James, king of Majorca (d. 1375); later she married Otto of Brunswick, prince of Taranto. The queen had no sons, and as both her daughters were dead. she made Louis I, duke of Anjou and brother of Charles V of France, her heir. Charles, duke of Durazzo, who regarded himself as the future king of Naples. then seized the city. Joanna was captured and was put to death at Aversa on May 22, 1382. The queen sought the society of the poets and scholars of her time, including Petrarch and Boccaccio.

JOANNA II (1371–1435), queen of Naples, was descended from Charles II of Anjou through his son John of Durazzo. She had been married to William, son of Leopold III of Austria, and

at the death of her brother King Ladislaus in 1414 she succeeded to the Neapolitan crown. Although now a widow of 45, she chose as her lover Pandolfo Alopo, a youth of 26, whom she made seneschal of the kingdom. He and the constable Muzio Attendolo Sforza completely dominated her, and the barons determined to provide her with a husband who would break her favourites and yet not make himself king. The choice fell (1415) on James of Bourbon. James at once declared himself king, had Xlopo killed and Sforza imprisoned and kept his wife in a state of semiconfinement; this led to a counteragitation on the part of the barons, who forced James to liberate Sforza! renounce his kingship and eventually to quit the country. The queen now sent Sforza to re-establish her authority in Rome, whence the Neapolitans had been expelled after the death of Ladislaus; Sforza entered the city and obliged the *condottiere* Braccio da Montone, who was defending it in the pope's name, to depart (1416).

But when Oddo Colonna was elected pope as Martin V. he allied himself with Joanna, who promised to give up Rome, while Sforza returned to Naples. The queen was, however, completely dominated by her new lover Giovanni (Sergianni) Caracciolo. Sforza then favoured the pretensions of Louis III of Anjou to Naples as Joanna's successor. Joanna refused to adopt Louis as her heir, and appealed to Alfonso of Aragon, promising to make him her heir. War broke out between Joanna and the Aragonese on one side and Louis and Sforza, supported by the pope, on the other. After much fighting by land and sea, Alfonso entered Naples, and in 1422 peace was made. But dissensions broke out between the Aragonese and Catalans and the Neapolitans. and Alfonso had Caracciolo arrested: whereupon Joanna. fearing for her own safety, invoked the aid of Sforza, who. with difficulty, carried her off to Xversa. There she was joined by Louis, whom she now adopted as her successor. Sforza was accidentally drowned, but when Alfonso returned to Spain, leaving only a small force in Naples, the Angevins with the help of a Genoese fleet recaptured the city. For a few years there was peace in the kingdom, but in 1432 Caracciolo, having quarreled with the queen. was seized and murdered by his enemies. Internal disorders broke out, and Gian Antonio Orsini, prince of Taranto, led a revolt against Joanna in Apulia; Louis of Anjou died while conducting a campaign against the rebels (1434), and Joanna herself died on Feb. 11, 1435, after having appointed his brother René her successor.

JOANNES SGYLITZA (JOHN SCYLITZES) (fl. 2nd half of the 11th century). Byzantine historian, was the author of a *Synopsis historiarum* dealing with the years 811–1057. Known as the "Thracesion." *i.e.*, apparently originating from the Thracesion theme in Asia Minor, he was a high officeholder at the Byzantine court. being described in manuscripts as *curopalates* and *drungarios tes vigles* (commander of the imperial guard). According to Georgius Cedrenus he was also a *protobestiarios* (grand chamberlain). He was known as a contemporary of Michael Psellus (*q.v.*) and may have written a legal work for Alexius I in 1092.

In his history he drew on the work of Theophanes Continuatus for the early part, and then largely relied on sources no longer extant and on contemporary oral tradition. In some manuscripts the work is extended to cover the years 1057–79; this section is of little independent value and is known as *Scylitzes Continuatus*. There is no edition of the Greek text of this important historian, who is known through the almost literal reproduction of his work by Georgius Cedrenus (*q.v.*).

See bibliography and list of manuscripts in G. Moravcsik, *Byzantinoturcica*, 2nd ed., vol. i, pp. 335–340 (1958); G. Ostrogorsky, *History of the Byzantine State*, p. 188 (1956). (J. M. HY.)

JOAN OF ARC, SAINT (1412–1431), French patriot. Joan of Arc was known in the countryside of Domremy as Jeannette, with the surname of Arc or Romée, and is mentioned in contemporary documents as Jeanne, commonly called the Maid (*la Pucelle*). She was *horn*, probably on Jan. 6, 1412, at Domremy on the Meuse. Her father was Jacques d'Arc, a native of Ceffonds in Champagne, and her mother Isabelle de Vouthon, called "la Romée," either because she had made a pilgrimage to Rome, or, more probably, from a family surname. Both husband and wife were of farming stock and devout Catholics. Jacques owned horses and cattle; he was the *doyen* of the village and was its spokesman in a lawsuit. He may be regarded, in fact, as the headman of Domremy, a kind of mayor. With others he rented the Château de l'Ile, its gardens and pasturage. Hardly anything is known of Joan's childhood; from her mother she learned her prayers and the lives of the saints, and she played until she was 12 or 13 with the other village children. The boys, of Domremy, who were French in their sympathies. were at frequent odds with the boys of the Burgundian village on the other side of the Meuse. Saint Remy, patron saint of the cathedral of Reims, was also that of the church at Domremy. Joan, who was baptized by the *curé* Minet, was a pious child and often went with her companions to bear wreaths of flowers to Notre Dame de Bermont. She had heard, without believing, the story of the fairies who haunted the spring among the bushes. She was almost certainly ignorant of Merlin's prophecy that a maid should come from the Bois Chenu to do great deeds.

Joan helped her parents in tillage, tended the animals and was skilled with her needle and in other feminine arts. She was pious and often went to church when the other girls were dancing. She was in her 13th year when, in her father's garden, she heard for the first time a voice from God. Thereupon she vowed to remain a virgin and to lead a godly life. During the next five years she heard the voices two or three times a week. Among them she distinguished those of Saint Catherine and Saint Margaret, who appeared to her in the guise of queens, wearing rich and precious crowns. Sometimes their coming was heralded by Saint Michael. With these visions Joan became still more serious and more given to prayer. The troubles of Domremy between 1419 and 1428 made her early acquainted with the horrors of war. Her voices commanded her to go to France and to help the dauphin Charles (eventually Charles VII of France) to be crowned.

The exact moment at which Joan decided to obey her voices and to go to France is not known. The captain of the fortified town nearest to Domremy on the French side was Robert de Baudricourt, commandant at Vaucouleurs, four leagues away. Joan approached him for the first time in May 1428, accompanied by a relative on her mother's side, one Durand Laxart or Lassois. She was in her 16th year. At this time an army was being raised in England for the conquest of the dauphin's territory south of the Loire. The journey was made without the knowledge of her family. for when Joan had spoken of going into France her father had said that he would rather drown her with his own hands. She told the dauphin's commandant that she was sent by Our Lord. and asked him to write to the dauphin saying that, by the will of God, she was to lead him to his crowning. Baudricourt attached no importance to the visit and sent her back to her parents. At home Joan talked more and more of her great mission. In July 1428 the governor of Champagne, Antoine de Vergy, undertook to subdue the country round Vaucouleurs for the English. The people of Domremy retreated with their cattle to Neufchâteau where Joan spent a fortnight with a woman called La Rousse. who kept an inn. This is the origin of the false Burgundian legend that she was a light woman, liking the company of men-at-arms. Some time after, she was summoned for breach of promise of marriage, before the magistrates of Toul, by a young man who had sought her hand. On the return of the family to Domremy, they found the village burned to the ground, and Joan had to attend the church of Greux. Toward the end of October she learned that Orléans was besieged by the English, who had garrisoned the towns along the Loire.

To break the resistance on the Loire by taking Orléans was indeed a hazardous undertaking. The English made careful preparations and amassed a large quantity of military material for the siege. The earl of Salisbury had assembled a force of about 2,500, to which were joined spearmen and archers under Bedford. The English army may have numbered about 4,000 men, in addition to the Burgundian forces, which were soon withdrawn. Orléans was strongly fortified and possessed 250 cannon of various calibres. To invest the town the English had surrounded it with about a dozen bastions, which were then called bastilles. The siege

began on Oct. 12, and on Oct. 24 Salisbury was mortally wounded by a bullet as he was about to reconnoitre the town from one of the windows of the Tourelles. The citizens of Orléans were commanded by Dunois (the Bastard of Orléans) and by La Hire (Étienne de Vignoles). The fighting amounted to no more than skirmishing, and French reinforcements continued to enter the beleaguered town. Although the situation was not so critical as it has been represented, the news of the siege aroused great emotion throughout France. When it reached Domremy, Joan decided to set out. About Jan. 12, 1429, she went to her cousins, the Lassois of Petit Burey. She soon reached Vaucouleurs and stayed there three weeks, seeking to convince the incredulous captain, Robert de Baudricourt, of her mission. She met there a bold young squire, Jean de Metz, in whom she confided. Her idea was that the country should save itself rather than wait for the help of the Scots and the arrival of Margaret, daughter of James of Scotland, who was to marry the dauphin's son Louis.

When she realized that Robert de Baudricourt would do nothing to bring her to the dauphin, she borrowed clothes from Jean de Metz and set out for France. Charles II of Lorraine having sent her a safe-conduct as far as Nancy, she went first to him. She begged him to allow his son-in-law René to escort her to France, promising to pray for the duke's better health. Joan and her companions returned to Vaucouleurs, where Baudricourt, who had just learned of the disaster of Vouvray, was less unwilling to let the Maid try her fortune. He authorized her departure for Chinon, and Jean de Metz and Bertrand de Poulengy advanced money for the journey. The people of Vaucouleurs bought her a horse, and Joan exchanged her suit of red cloth for a page's dress. Baudricourt gave her a sword saying: "Go, and let come what may." Travelling by night the little band evaded English and Burgundian marauders. They passed through Saint-Urbain, Auxerre, Gien and Fierboys, near Chinon, to which soldiers made pilgrimages to invoke Saint Catherine. From there Joan wrote to the dauphin, asking for permission to go to Chinon to give him information that she alone possessed. The council met to discuss whether he should hear her or not. Louis de Bourbon, the count of Vendôme, brought her into the presence of Charles, who kept back in the midst of his knights. Joan came forward with meekness and simplicity and said to him, "Most noble Dauphin, I have come from God to help you and your kingdom." The dauphin took her aside and talked with her for more than two hours. According to her confessor, Jean Pasquerel, she said to him, "*Je te dis de la part de Messire que tu es le vrai héritier de France et fils du roi*" (I am God's messenger, sent to tell you that you are the true heir to France and the king's son). This was doubtless the sign, which Joan would never explain. Lodged in the tower of Coudray, Joan was burning to be at work, but Charles was unwilling to make use of her until she had been examined by an assembly of learned theologians. She was sent therefore to Poitiers, seat of the chief university and of the courts of justice. She lived in the household of Jean Rabateau, the advocate-general, and was examined by a commission presided over by Regnault de Chartres, archbishop of Reims and chancellor of the kingdom. She assured them that she would raise the siege and have the king crowned and dictated a letter commanding the English to depart. The Poitiers commission made inquiry at Domremy. Nothing but what was honest and true was reported of Joan, and in April they pronounced in her favour. Joan was accordingly sent to Tours to take up arms. She lodged with the lady in waiting upon Charles's mother-in-law, Yolande of Aragon, duchess of Anjou and titular queen of Sicily (Naples). In this city, famous for its armourers, she put on "white armour." She had brought to her from the church of Sainte-Catherine-de-Fierboys a sword on which were five crosses, doubtless an *ex-voto* that she had seen in its place behind the altar. At the wish of the dauphin she appointed a suite, including her confessor, Jean Pasquerel, a squire, Jean d'Aulon, and two pages. Like other company commanders, she carried a banner; on it she had painted the King of Heaven holding an orb, with the motto "Jesus Maria."

The French army for the relief of Orleans numbered about 4,000 men. This force left Tours for Blois and, on April 28, escorted by a procession of priests, arrived before Orleans along the left bank of the Loire, accompanied by a convoy of cattle and several boats. They were met by Dunois. The Loire was crossed with a favourable wind. On the night of April 28, Joan entered Orléans, bringing hope to the beleaguered citizens. She was taken to the church of the Holy Cross and then to the house of Jacques Boucher, treasurer to Charles duke of Orléans. On April 30 Joan summoned the English to be gone. Next day she sent them a further proclamation. On May 5 she and her companions stormed the bastille of the Augustines, and on May 7, they captured the Tourelles, which commanded the head of the bridge. Joan herself planted the first scaling ladder and was wounded in the shoulder by an arrow. Orléans was saved. On May 8 was held the first thanksgiving procession, the origin of the great festival of Orléans. Within a week the French captured Jargeau, where the earl of Suffolk was taken prisoner, and Beaugency. Sir John Fastolf was defeated at Patay. Joan entered Orléans in triumph, followed the king to Gien and prevailed upon, him to march on Reims. She reached Troyes on July 10 and Reims on July 14. Two days later the king was crowned. Beside him stood the Maid, a banner in her hand. "Gentle King," she said, kneeling before him, "now is fulfilled the will of God that I should raise the siege of Orléans and lead you to the city of Reims to receive the holy coronation, to show that you are indeed the king and the rightful lord of the realm of France." It was agreed to advance on Paris on July 18. Bedford was aware of the plan and had informed the English council. Charles, however, wasted time negotiating with the envoys of Philip the Good of Burgundy, whom Joan had told to make peace with France, and she did not leave Reims until July 21. Instead of marching on Compikgne, which was preparing to receive him, the king turned back toward the Loire. The Maid wished to continue the march on Paris, whence Bedford had withdrawn his army. Between Aug. 18 and Aug. 22 Charles and Joan received the submission of Compikgne, Senlis and Beauvais, from which they expelled the bishop Pierre Cauchon.

Regnault de Chartres supported the policy of detaching the English from the Burgundians. Joan left the king at Compikgne on Aug. 23 and arrived at Saint Denis on Aug. 26. On Aug. 28 an armistice was signed between France and Burgundy. On Tuesday, Sept. 8, Joan, at the head of the royal forces, made an assault on the Porte Saint Honoré at Paris. It failed. Joan was wounded in the thigh by an arrow, but they had to drag her from the field by force. Since the king of France had disbanded his army, she had to rejoin the court and remain there practically inactive. In Oct. 1429, however, she took part in the capture of Saint-Pierre-le-Moustier. At La Charité, which was held by Perrinet Gressart for the duke of Burgundy, she suffered a reverse. In recognition of what she had done for France she was ennobled on Dec. 29, 1429, and her village was exempted from taxation.

The truce with Burgundy, which was to last until Easter, was drawing to a close. Philip the Good had moreover succeeded in persuading Bedford to promise him Champagne in return for allowing recruitment by the English among his subjects. As a counterstroke to the coronation of Charles VII, the English were preparing to bring to France the young King Henry VI. The Anglo-Burgundian allies made a great effort to ensure the safety of Paris by repossessing themselves of the neighbouring towns. Compibgne was their first objective.

Joan, who followed these plans attentively, decided to bring help to her "good friends" of Compiègne. Leaving Sully-sur-Loire where she had been in the care of Georges de la Trémoïlle, she set out, with a few companions but no official instructions. She passed from Melun to Lagny and Senlis and, after a brisk series of skirmishes, arrived at Compibgne, which she entered without resistance on May 23. The town was commanded by Guillaume de Flavy. The Burgundian camp was at Margny opposite the bridgehead; the forces of the veteran Burgundian John of Luxembourg were at Clairoix, and the English, under Montgomery, at Venette. Toward five o'clock in the afternoon, Joan, Poton the Burgundian and some other captains with four or five hundred men made a sortie over the bridge against the Burgundian camp. Their men fell to looting and were driven back into the

town. Flavy had the drawbridge raised in order to secure their retreat. Joan, who had charged the enemy in an attempt to save her comrades, was left outside and was taken prisoner, together with her brothers and Jean d'Aulon. Her captor was an archer in the service of the Bastard of Wandomme. She was taken to the Burgundian camp and interviewed by Philip the Good, while the Bastard was ordered to surrender his prisoner to his chief, John of Luxembourg.

Bedford realized the importance of destroying the influence of the Maid on the people by whom she was regarded as a saint; he hoped in this way to discredit the king, whom she had awakened from his lethargy. The English did not wish summarily to execute her, as they could have done, but to defame her by condemnation in a spiritual court. Both the university of Paris, which was strongly Burgundian, and the vicar-general of the inquisition wrote as early as May 26 to the duke of Burgundy to ask that Joan be surrendered to the ecclesiastical court. The English had from the outset announced their intention of burning her alive if they could get hold of her; but members of the university and French lawyers took the first practical steps to send her on her way to the stake. A letter from Regnault de Chartres to the people of his episcopal city of Reims, who loved the Maid, shows that no grief was felt in Charles VII's council over her capture; on the contrary, the archbishop of Embrun was alone in exhorting Charles to make every effort to recover her. The king did, in fact, nothing at all. On July 14 Pierre Cauchon, bishop of Beauvais, who had been driven from his bishopric by French soldiers, appeared at John of Luxembourg's camp before Compiègne; he was an ambitious man who hoped to obtain the vacant see of Rouen and whose sole desire was to serve his masters. He asked to be allowed to judge the prisoner and maintained that Henry VI had the right to redeem any prisoner of war for an indemnity of ten thousand livres.

Joan was taken first to Beaulieu, then to Beaurevoir to the castle of the Luxembourgs. She thought of nothing but the people of Compiègne and, after a long consultation with her "voices," made an attempt to go to their assistance by jumping from the tower. She injured herself, but not seriously. She was then taken to Arras, in Burgundian territory. John of Luxembourg decided to sell her to the English, and she was moved to Crotoy. On Nov. 21 the university of Paris accused Cauchon of lack of zeal and urged that, for the glory of God, Joan should be tried in Paris. The English then decided to take her to Rouen, their military centre in France. She was imprisoned in a tower of the castle of Philip Augustus, chained in a dark cell, under the guard of John Gray and William Talbot, in the charge of the earl of Warwick.

On Jan. 3, 1431, Joan was handed over to Cauchon, who was to be her judge. The English, having bought her, declared that they would seize her again if she was not convicted for her many crimes and of high treason against God. The authentic records of the trial have been preserved; they are among the most pathetic documents in history and are the best source of information as to Joan herself. The original, which still bears the remains of Pierre Cauchon's seal, is preserved in the library of the Chambre des Députés. The tribunal, skilfully selected by Cauchon, consisted of ten members of the university of Paris, strong Burgundians and intolerant theologians, 22 canons of Rouen all completely in the hands of the English government because of the vacancy in the see, and some monks of different orders, minor friars or Dominicans. A judge who declared the procedure irregular was imprisoned, and a certain number of others withdrew from the case.

The interrogatory began on Feb. 21. There were no sittings between Feb. 24 and Feb. 27, probably because of Joan's illness. On March 12 the vice-inquisitor appeared, accompanied by a Dominican friar; on March 15 Joan was asked if she would submit to the judgment of the church. The judgment was to be based on a list of 12 points. They included the opinion of her judges as to the worthlessness of her visions and her different accounts of the sign given to the king; they denied her the gift of prophecy, censured her masculine dress, her disobedience to her parents, her attempt to escape and the sinful pride that had led her to believe that she would go to Paradise and that she was responsible only to God and not to the church, which the judges represented. The last offense was that which chiefly incensed the theologians and led to her condemnation. On April 18 Cauchon visited her in her cell to try the effect of mild exhortation. Delegates were sent to Paris with the 12 points. On May 2 Cauchon pronounced a public admonition against her in the hall of the castle, and Joan appealed to be sent before the pope. On May g she was taken to the torture chamber, but in spite of the opinion of several advisers the Maid was spared the torture. Joan was by this time worn out by the length and severity of the examination. On May 23 she was taken to the cemetery of Saint-Ouen and had read to her the sentence which condemned her to be burned unless she submitted. Without clearly understanding its terms, she signed an abjuration, of which the text has been lost, and was taken back to her prison amidst the noisy protests of the English. She was condemned to imprisonment for life. "We will recapture her," said Warwick in a rage. A woman's gown was brought to her, and she was asked to put it on. She remained in prison between May 24 and May 27 and was rumoured to have resumed masculine dress. Cauchon came to see for himself: the prisoner, he found, had relapsed. The judges then decided that she must be delivered to the secular arm, and she was ordered to appear on May 30 in the Old Market square of Rouen.

These facts are known only by means of a nonofficial report, annexed to the minute of condemnation. They bear, however, the stamp of probability, and it is certain that Joan regretted her momentary and easily understood weakness in the tumult of the cemetery of Saint-Ouen, with the thought of the stake before her. She received communion in her prison and was once more dressed as a woman before being taken to the stake prepared in the Old Market square. She listened patiently to the sermon of Nicolas Midy, and Cauchon read the sentence delivering her over to the secular arm. Joan asked the priests present to say each a mass for her soul and was then handed over to the bailiff of Rouen. An English soldier gave her a cross made of two pieces of wood, but she asked Jean Massieu to bring her the cross from the neighbouring church. She kissed it while she was being chained to the stake and, as the smoke went up, was heard to call in a loud voice: "Jesus." Her ashes were thrown into the Seine from the bridge of Rouen.

The account of the trial of Joan of Arc was published far and wide. Five authentic copies still exist. This monument of an iniquitous deed, a masterpiece of composition and procedure, drawn up in Latin by Thomas de Courcelles, a rising light of the university, bore fruit. Joan's condemnation by the church appeared to be in order. The English government could send to the chancelleries of Europe a copy of the sentence, together with an account of the whole matter which placed the king of France in a most unfavourable light. The report of the trial became a useful weapon. Pierre Cauchon did not obtain the see of Rouen, which he had administered both spiritually and temporarily. The Holy See appointed him bishop of Lisieux in 1432 with the customary papal commendation. At the congress of Arras he maintained the right of Henry VI to the crown of France. He narrowly escaped being taken prisoner when the French retook Paris in 1436. He paid several visits to England, where he assisted in making terms of peace between the two countries. He died in 1442, rich and honoured, and was buried in the magnificent chapel of the Virgin at Lisieux, which he had rebuilt and decorated at his own expense.

It was not until after Normandy had been conquered that Charles VII made the slightest effort to wipe out the stain cast on his name by the sentence of 1431. In 1450 he instituted a preliminary inquiry, but nothing further was done until the arrival in France of the cardinal Guillaume d'Estouteville, the legate of Pope Nicholas V. The first attempt was checkmated, because the English protested to the Holy See. Charles VII's government found a way out of the difficulty by giving place as petitioner to Joan's family. Her mother, Isabelle Romée, who was living in retirement at Orléans with her two sons, Pierre and Jean du Lys, obtained from Calixtus III permission to draw up the case. To this end the pope appointed Jean Jouvenel des Ursins, archbishop of Reims, Guillaume Chartier, bishop of Paris, and Richard

Olivier, bishop of Coutances, to act in concurrence with the grand inquisitor of France. It was admitted that the university of Paris had been led into error by the fraudulent drawing up of the 12 articles. All the blame for this was cast on the dead bishop of Beauvais. Inquiries were held at Domremy, at Orléans, in Pans and at Rouen, and evidence was given by all the surviving witnesses of Joan's early days and of her gallant deeds (Dunois, Jean d'Aulon, the duke of Alençon, etc.). The grand inquisitor, Jean Bréhal, published a long memorandum establishing Joan's orthodoxy. On June 16, 1456, the judgment of 1431 was annulled.

No authentic portrait of Joan can be traced, although contemporary drawings were in existence. At Arras, for instance, she saw in the hand of a Scotsman a painting in which she was shown kneeling and presenting a letter to the king. The little pen drawing by the clerk Fauqueinbergue on May 10, 1429, on a register of the *parlement* of Paris is simply a note that served him as a reference. The contemporary German tapestry showing her mounted and in armour is of value only for the costume.

It is known from contemporary testimony that Joan was handsome, wellbuilt, with a bright and smiling face, and that she wore her dark hair cut short like a soldier's. She was courtesy itself and liked a good horse and a good sword and fine clothes. She was indifferent to pain and always ready to run physical risks.

Joan was beatified in Rome in 1909 and canonized by Benedict XV in 1920. The festival of Joan of Arc was kept annually on May 8, the anniversary of the procession commemorating the capture of the Tourelles, from 1435–1793. The local festival was re-established by Bonaparte in the year X and was declared a *fête* nationale in 1920.

BIBLIOGRAPHY.—The authentic story of Joan's life was put together first by Edmond Richer, the great Gallican historian and theologian of the early 17th century, whose work (published by Ph. H. Dunand, Paris, 1911) was for many years kept in manuscript at the Bibliothèque Nationale (Fonds français, 10,448); then by Nicolas Lenglet du Fresnoy (1753), who had access to Richer's ms.; and finally by Jules Quicherat, who assembled the records of the trials and the evidence relating to Joan, 5 vol. (Paris, 1841–49). Germain Lefèvre-Poutalis edited the *Chronique* of the Venetian merchant Antonio Morosini, 4 vol. (Paris, 1898–1902), and the testimony of Eberhard Windeck *(Les Sources allemandes de l'histoire de Jeanne d'Arc,* vol. 1, Paris, 1903). Noel Valois published a document from Vienna (*Un nouveau témoignage sur Jeanne d'Arc,* Paris, 1907). Documents from the Vatican were edited by H. S. Denifle in the *Chartularium Universitatis Parisiensis* (Paris, 1889 *et seq.),* vol. 4. For a French translation of the records of the trials *see* Pierre Champion (ed.), *Procès de condamnation de Jeanne d'Arc: texte et traduction,* 2 vol. (Paris, 1920–21). For iconography and letters in facsimile *see* A. Marty, *L'Histoire de Jeanne d'Arc* (Paris, 1907).

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JOAN (JOANNA) **OF NAVARRE** (*c.* 1370–1437) was the wife of Henry IV of England and the daughter of Charles the Bad, king of Navarre. In 1386 she was married to John IV or V, duke of Brittanv; they had eight children. John died in 1399 and Joan was regent for her son until 1401. At the outset of 1402 a marriage was arranged between Joan and Henry IV (*q.v.*) of England. and the ceremony took place by proxy on April 3, 1402. Since Brittany was not on good terms with England, the Bretons did not favour the match, so that when Joan embarked for England an agreement was made by which she consented to leave her older children with the duke of Burgundy. Her coronation took place on Feb. 26, 1403, at Westminster. She had no children by this marriage.

After Henry IV died in March, 1413, Joan maintained for a time good relations with her stepson, Henry V (*q.v.*). After a few years, however, her situation became awkward since Brittany. ruled by Joan's son. was still hostile to England. In 1419 she was accused of witchcraft and. although the whole matter was vague. was imprisoned. Joan's life was uneventful after her release in 1422. She died at Havering-atte-Bower, July 9, 1437.

JOÃO PESSOA (formerly PARAÍBA), a city and port of Brazil, capital of Paraiba state, on the right bank of the Paraiba do Norte river, 11 mi. above its mouth and 65 mi. N. of Recife. Pop. (1950) 89,517. João Pessoa is connected by rail with Natal to the north and with Recife and Maceió to the south; it is also served by air. Its port is Cabedelo. with which it is connected by rail. The entrance to the Paraiba do Norte river being obstructed by a stone reef and sand bars, only vessels drawing less than 14 ft. can effect an entrance. The "Varadouro," as the lower part of the city is called, is built on the margin of the river and is devoted principally to commerce. Behind this is a low hill on whose northern slope and broad summit the upper city is built and a tramway line runs to the suburb of Trincheira. There are some good public buildings. including the parish church (*matriz*) of N.S. das Neves, the old Franciscan convent and church, the government palace and the treasury. Among its industries are a portland cement plant and factories producing cigars and footwear.

Founded in 1585, the city was successively known as Filipea, Frederickstadt and Paraiba. In 1930 the name was officially changed to João Pessoa (Js. J. P.)

JOASH (JEHOASH: in the Douai version of the Bible, JOAS), the name of two kings in the Bible.

JOASH, son of Ahaziah (see AHAZIAH, 2) and king of Judah, obtained the throne by means of a revolt in which Athaliah (*q.v.*) perished; his accession was marked by a solemn covenant and by the overthrow of the temple of Baal and of its priest. In this the priest Jehoiada took the leading part. The Second Book of Chronicles adds several new details, including a tradition of a conflict between the king and priests after the death of Jehoiada (xxii, 11; xxiv, 3, 15 et *seq.*). The king perished in a conspiracy, the origin of which is not clear.

JOASH, son of Jehoahaz and king of Israel. Like his grandfather, Jehu he enjoyed the favour of the prophet Elisha. nho promised him a triple defeat of the Syrians at Aphek (II Kings xiii, 14 et seq.). The cities which had been taken from Jehoahaz by the Syrians were recovered and the relief gained by Israel prepared the way for its speedy extension of power. When challenged by Amaziah of Judah. Joash uttered the famous fable of the thistle and cedar, and a battle was fought at Beth-shemesh. in which Israel was completely successful (II Kings xiv, 9–12).

JOB. The book of Job in the Bible is an acknowledged masterpiece, both as an expression of religious experience and as a work of poetic genius. Its theme is the struggle of a deeply religious soul with the doubts aroused by undeserved suffering.

Contents.—Job is a man of exemplary piety, but in heaven "the adversary" charges that he is pious because he is prosperous. To disprove this God permits the destruction of Job's property, his children and his health. Job's patient endurance under these afflictions at length gives way to bitter lamentation. His friends—Eliphaz, Bildad and Zophar—maintain that he is suffering for his sins, but this he indignantly denies. One after another they reason with him, and to each he replies in turn. A second and a third time they speak, advancing from gentle suggestions to specific accusations, while Job, vehemently asserting his innocence, is driven not only into anguished perplexity regarding God's ways but even to outright denial of His justice. Nevertheless from the cruel dogmatism of his friends he turns again and again to God, increasingly confident that the very One who seems so unjust will ultimately vindicate him. A young man named Elihu now enters the debate and eloquently but vainly enlarges upon what the friends have been saying. Finally in the majestic voice of a whirlwind the Almighty Himself replies to Job, reviewing the marvels of Creation until Job confesses that his denial of God's justice was due to ignorance. God then condemns the friends, declares that Job has spoken rightly of Him and restores the sufferer to wealth and happiness.

Literary Form and Relationships.—Two introductory chapters of prose narrative present the characters and bring the story to the point where Job's patience breaks down. The conclusion of the book, narrating the condemnation of the friends and the restoratinn of Job's fortunes, is also prose (xlii. 7–17).

Between these lies the main body of the work, including Job's first passionate complaint (ch. iii.), the three successive rounds of argument with his friends (iv.–xxxi.), the long harangue of Elihu (xxxii.–xxxvii.) and the divine speeches with Job's submission (xxxviii.–xlii. 6). All this is written in the form of poetic dialogue.

Commentators have sometimes compared the book of Job with the Greek philosophical dialogue. Job's problem is distinctly philosophical, but its treatment is poetic. The author was more closely related to the dramatists than to therphilosophers of Greece. Parallels between Job and the Prometheus Bound of Aeschylus have often been pointed out. A comparative study of these products of Aryan and Semitic thought, and of such modern works as Faust or Manfred, is very instructive, though the Greek poet's theme was the jealous hostility of the gods to man's progress in civilization rather than the difficulty created for ethical theism by a righteous man's suffering.

In form as well as subject Job somewhat resembles a Greek tragedy. Many interpreters, both ancient and modern, have treated it as a drama. Others object that there is no action, yet "the varying attitude of Job's mind toward God exhibits dramatic action and tragic interest of the highest kind, though the movement is internal." The fact that we find no other drama in ancient Semitic literature is not conclusive. Greek influence, though improbable at the time when Job was written, was not impossible. All interpretations of the book as a drama include portions which modern critics do not accept as belonging to the original work; but if the book as a whole fitted naturally into the classical form of the drama, only the most compelling critical arguments could outweigh that fact. As a matter of fact, this is not the case. Not a little revision is necessary to make Job a Greek tragedy, and the result proves only that the book can be arranged as a drama, not that it was so intended.

Hebrew literature developed its own forms. Peculiarly Hebrew is the group of writings known as the Wisdom literature (*q.v.*). It deals with the lessons of practical experience. Religion is regarded as essentially a way of life. The value of rites and institutions is not considered, and if beliefs are discussed at all it is in relation to moral experience. The unique position and prerogatives of the Chosen People are not emphasized: only in the apocryphal books does this interest creep into the Wisdom literature.

For the antecedents of this type of writing we must look, not to the Greeks, but to the Egyptians and Babylonians. Long before the time of the Hebrew Wisdom literature the Egyptians had writings resembling them in form and spirit. None of these, however, have any noteworthy relationship to Job. Less material of this character has been found in Babylonian literature, yet there is one remarkable composition known to scholars as "the Babylonian Job." It is the poetic monologue of a pious king who, like Job, suffered grievous maladies until delivered by his god. Not only the situation but even the language reminds us of Job, but there is no dialogue nor any discussion of moral retribution. That the Hebrew writer was acquainted with this Babylonian poem is improbable. A few scholars believe that the book of Job is of Edomitic origin. The setting of the story, the personal names and the author's theology have been cited in support of this hypothesis. The folk-tale upon which the poem was doubtless based may have come from the Edomites. This would account for the setting and the names. We know too little about the Edomites to speak confidently of their theology, but the main problem of our book grows directly out of the historical situation of post-exilic Judaism.

Whatever may be said of the form and relationships of Job, there can be no difference of opinion regarding the sublimity of the style, the vividness and beauty of the figures, the keenness of the author's insight into human nature and the depth and earnestness of his thinking. His work has a universal quality and a note of reality which can be found only in the greatest literature.

Date, Integrity **and Authorship.**—"The tendency among recent scholars is to put the book of Job not earlier than the 5th century B.C. There are good reasons for putting it in the 4th century." Its place in the history of the problem of suffering among the Hebrews (see below) favors this date. There are also indications of literary dependence (cf. Job vii. 17 and Ps. viii. 4; Job iii. 3–12 and Jer. xx. 14–18). On the relation between Job and Is. xl. seq. scholars are not agreed. Ezekiel (xiv. 14, 20) mentions Job by name, but the reference may be merely to a hero of popular tradition

Not all of the book was produced in the 4th century. The story may have circulated in both oral and written form considerably earlier. The opening and closing narratives of our book of Job were probably parts of such a composition, for they imply a conversation between Job and his friends quite different from the present dialogue. Apparently the poet has adapted the older book to his purpose by simply removing the middle portion and putting his own work in its place. There are also passages which must be later than the main body of the book. The speeches of Elihu "destroy the dramatic effect by introducing a lengthened break between Job's challenge and the answer of God." In style they differ from the rest of the book, while the arguments largely reproduce those of the friends. Furthermore there is no reference to Elihu anywhere else in the book. Most critics agree, therefore, that the whole section is a later addition. "The position taken by Elihu is almost that of a critic of the book"—perhaps this reveals the purpose for which he was created.

The lovely lyric on wisdom in ch. xxviii. is complete in itself and is out of place where it stands or anywhere else in the book. We may be grateful, however, to the editor, who, by interpolating it, preserved it for us. Less perfect, though interesting and impressive, are the descriptions of Behemoth and Leviathan in ch. xl. 15–xli. They destroy the force of the second divine speech, making it only a weaker copy of the first, and if they are joined to ch. xxxviii.–xxxix. as one speech, their inferiority to those chapters becomes all the more evident. Possibly they were added by a writer who supposed that something had been lost from the second speech, which is very brief without them, and therefore undertook to restore the missing material after the pattern of the preceding chapters. In the third round of the dialogue the speech of Bildad is short, and Zophar has none. Moreover in some of the passages attributed to Job he says precisely what his friends have been urging against him. Both difficulties are met by rearranging the text. The dislocation, if not accidental, may have been designed to represent Job as convinced by the orthodox arguments of his friends. Possibly the book has suffered still further interpolation and dislocation. Several scholars have undertaken to restore the original poem. Only continued study can determine how far their schemes are justified, but in general they assume an almost incredible amount of alteration by scribes and editors.

Of the author we know only what we can infer from his work. That he was a lover and a keen observer of nature is evident. He was also conversant with the conditions and problems of human life, in the desert and in the city, and had either travelled widely or listened attentively to the reports of travellers. What he heard and saw, moreover, entered into his soul; he thought and felt profoundly. And he had a divine gift of utterance. Beyond this we cannot safely go. Like many others whose work is immortal, he himself is forgotten.

History of the Problem.—So long as primitive man believed that the beings to whose anger he attributed his misfortunes were capricious and irresponsible, there was no problem of divine justice. Even when men worshipped an ethical deity, who dealt with them according to their deeds, they might explain undeserved calamities by the malignity of other gods or spirits. Only when they believed their god to be omnipotent was this impossible. The problem of divine justice therefore presupposes ethical monotheism.

The early Hebrew prophets and historians felt no problem, because they thought in terms of the nation, which had sinned. The problem of individual retribution emerges with Jeremiah Unable to understand why his fidelity only brought persecution, while sinners were at ease, Jeremiah found strength to endure

in consecration to his task and communion with God. Many of the Psalms emphasize the oppression of the righteous by the wicked, though it is not clear whether individuals are meant or Israel and its enemies. The Psalmists complain of God's apparent indifference, but neither question nor defend His justice. Intermediate between national and individual retribution was the doctrine that men suffered for their fathers' sins. This seemed to explain undeserved suffering; but to meet the objection that it was unfair, Ezekiel unequivocally asserts exact individual retribution. Whether the book of Ezekiel belongs to the exile or a later period, this doctrine was an accepted tenet of post-exilic Judaism and as such underlies all the Wisdom literature. It sets the problem for the book of Job.

When experience did not verify the doctrine, most of the Jews found comfort in believing that undeserved affliction and happiness were temporary (Ps. xxxiv., xxxvii., lxxiii.). The prosperity of the wicked was explained as part of God's plan for their destruction (Ps. xcii.); no explanation was attempted for the suffering of the faithful. For the nation promises of renewed glory were made by Ezekiel and Isaiah xl. *seq.* The latter also had an explanation for Israel's afflictions: as the Servant of the Lord, Israel suffered that the Gentiles might be saved. But apparently this was not generally accepted. Ps. xxii., though dependent upon Is. xl. *seq.,* has not the doctrine of vicarious suffering, nor is the idea developed in any of the later books of the Old Testament.

The period following the exile was one of hope deferred. Haggai and Zechariah traced the people's misfortunes to failure to rebuild the temple; when this was done, they repeated the earlier promises. Scepticism was evidently rife when Malachi wrote, but again we have only promises without explanation. Habbakuk complains of Israel's oppression by a wicked nation, and the answer is that deliverance will come at the appointed time. Continued frustration forced the Jews to look beyond this life. In Ps. xlix. and lxxiii. the righteous sufferer takes refuge in a relationship with God which is apparently regarded as outlasting death. This conception is not found elsewhere in the Old Testament. More congenial to Judaism was the idea of resurrection, which played a prominent part in the apocalyptic hopes of the Greek and Roman periods. Only the beginnings of this development are found in the Old Testament (Is. xxvi. 19; Dan. xii. 2). In Daniel Israel is still the primary object of concern, though righteous and wicked within the nation are distinguished and the ideal of martyrdom is introduced. The book of Ecclesiastes shows that there were some who had no satisfying hope for the future. They could meet the problem only by resignation to the inevitable and unquestioning enjoyment of the good things in life, with a reasonable degree of piety and virtue.

While still largely attributing Israel's sufferings to the sins of the people and their fathers, a few books suggest another explanation. Zechariah represents "the Satan" as a supernatural enemy of God's servants. In the extra-canonical book of Enoch the nations are governed by angels who are responsible for wrongs done to Israel, and this may be the meaning of the "gods" of Ps. lxxxii. 1, 6 *seq.* (cf. lviii. 1, RV margin), the "high ones" of Is. xxiv. 21, and the "princes" of Dan. x. 13, 20; xii. 1. Doubtless all this reflects popular theology. In effect it is a reversion to primitive conceptions.

Purpose **and** Teaching.— The book of Job is a poem, not a treatise. "In the history of a soul, rather than the discussion of a problem, lies the supreme interest of the book" (Peake). But the author is interested in the problem. "No Hebrew writer is merely a poet or a thinker. He is always a teacher." Only the individual aspect of the problem is considered; like the other Wisdom writers, the poet is not concerned with the nation According to the prologue Job's affliction was a test of his piety. That religion can be disinterested is the moral of the story (as, doubtless, of the original folk-tale). It is not, however, the theme of the book. Nor is the testing of the righteous the poet's own solution of his problem. The implication that what is inexplicable on earth is not so in heaven suits his purpose, but the function of the prologue in the present book is to show the reader in advance that the friends' explanation of Job's suffering was unfounded. The conception of "the Satan" (adversary), which is precisely that noted in Zechariah, was probably not taken literally by the poet. The dialogue revolves about the doctrine of retribution. Job's friends admitted that wicked men prospered but regarded such prosperity as short-lived. Adversity might lead to repentance, but one would not suffer if he had not sinned. "Job agreed that afflictions came directly from the hand of God, and also that God afflicted those whom He held guilty of sins. But his conscience denied the imputation of guilt, whether insinuated by his friends or implied in God's chastisement of him."

Modern scepticism, assuming God's goodness, questions His omnipotence. Job's God is the irresistible Power manifest in nature and destiny; what is doubtful is His justice. Having formerly believed that God was good to him, Job tries to reconcile God's past and present dealings with him. He can see no benevolence behind his affliction; therefore he concludes that what seemed kindness was but cruel deceit, designed to make his fall more crushing. It is a frightful thought, but he knows he is guiltless. Gradually his passionate sincerity leads him into a deeper spiritual experience. Faith reasserts itself: "he appeals from God to God, and beseeches God to pledge Himself that he shall receive justice from God (xvi. 19; xvii. 3)." The passage in which his growing assurance reaches its triumphant climax (xix. 25 *seq.)* seems to imply a vindication after death, but the text is uncertain. Once before (xiv. 13) the idea of a resurrection has appeared, only to be rejected. Whether Job here adopts it must remain an open question; in any case the hope of future recompense does not salve Job's problem. Some commentators find a solution in the speeches of Elihu, but these were not a part of the original book, and what Elihu really adds to the debate "is not his position but his arguments." Even in the divine reply to Job, where, if anywhere, we should expect to find the author's view of the problem, God only rebukes Job's presumption and shows him his ignorance. The epilogue provides his vindication, though it does not state that he has lived righteously but that he has spoken rightly of God.

Taking the book as a whole, we must admit that its meaning is not altogether clear. The many interpretations offered have just one point in common: certainly the doctrine of exact retribution in this life is definitely rejected and refuted. Both its incompatibility with the facts of life and its evil consequences are demonstrated. In the friends it produces a false interpretation of Job's misfortunes which makes them miserable comforters indeed. In Job himself it leads to a denial of God's justice and a feeling of estrangement from Him. Many believe that this negative teaching exhausts the author's purpose. It is quite enough to mark the book as one of the greatest products of Hebrew thought.

More than this, however, is involved in the poem. No explanation of the mystery is given because man is not in a position to understand the government of the universe. The poet does not tell us whether or not he believes that God cares for the individual, though he forcibly suggests that the universe does not exist for man alone. What he emphasizes is that God's ways are beyond all human comprehension. It is presumptuous to suppose that man is or ought to be able to explain them.

But if an explanation is impossible, it is also unnecessary. Job does not understand, but he sees God. Unfortunately the significance of his final confession is uncertain; it hinges on the meaning of xlii. 6, which in the present text is ambiguous, if not unintelligible. Whether it implies loving trust or mere submission we cannot tell. In either case Job has had a personal experience of the reality and majesty of God. Thus the poet shows how the heart may find peace, though neither tradition nor speculation can answer the questions of the intellect. The primary purpose of the book is therefore practical, including comfort for those who suffer undeservedly, emancipation from a dogma which puts an unnecessary strain upon their faith and hardens their friends against them, realization of the intellectual presumption of questioning God's justice, and satisfaction in immediate personal communion with Him.

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JOBBER, an individual, firm or corporation engaged in wholesaling as a merchant middleman; *i.e.,* a middleman who buys merchandise outright and resells on his own account, usually to the retailer.

Normally, the jobber performs all of the principal wholesale functions: (1) assembling, storing and delivering merchandise stocks; (2) selling stocks through a regular sales force; (3) extending credit to customers; (4) providing retailers with advice and assistance in matters of stock turn, stock control, selling methods and other aspects of retail store management; (5) assuming risks of price fluctuation, wastage and deterioration. Hence the term jobber can seldom be distinguished from the term wholesaler upon the basis of functional differences. Originally, of course, the term jobber denoted a wholesale merchant middleman who specialized in buying and selling odd, isolated or job lots, while the term wholesaler denoted a wholesale merchant middleman who specialized in buying and selling more or less complete offerings and who maintained continuous stocks. This distinction has almost completely disappeared in the marketing of manufactured consumer goods. The jobber (or wholesaler) occupies a most significant place in the marketing of groceries, hardware, drugs and dry goods. For years the bulk of such goods has passed through the hands of the jobber (or wholesaler) and hence these four staple lines of merchandise are often referred to as jobbing lines. (G. R. C.; X.)

JOBBER (LONDON STOCK EXCHANGE). Every member or applicant for re-election, admission or readmission to the London Stock exchange must declare to its council whether he proposes to act as a broker, a dealer or a clerk. No member or authorized clerk is allowed to carry on business in the double capacity of broker and dealer. A dealer may not deal for or with a nonmember of the stock exchange; he cannot, that is to say, buy or sell for a client outside the stock exchange. Partnerships between brokers and dealers are prohibited. The stock exchange dealer is nearly always termed a jobber, but the stock exchange rules, from which the foregoing statements are extracted, hardly use the word jobber, familiar as it is through use during more than a century. Put simply, the London Stock exchange rules forbid jobbers to deal with anyone except a broker, an authorized clerk or a fellow jobber, while a broker acts as an agent between members of the public and members of the stock exchange.

The Jobber a Principal.—While the broker acts as intermediary or agent, the jobber's status is that of a principal. He buys from one man the securities that he hopes to sell to another; or he sells in the expectation of being able to replace the stock or shares at a lower figure. He has to deal in the dark, for the broker who approaches him with business in those shares in which he, the jobber, specializes, does not say whether the order is to buy or to sell. This is the reason for the double prices always quoted in the stock exchange. The jobber, in making a price, thereby commits himself to buy at the lower or to sell at the higher of the two prices mentioned. He is not compelled to make a price. In times of panic, when sellers greatly preponderate, it might be financial suicide for a jobber to continue making prices in stocks that he could feel practically certain would be sold to him, though he himself had little chance of finding buyers. In booming markets, he hesitates to continue making prices in some shares of which there may be only a scanty supply, since the brokers, acting for the public, would insist upon buying if he made a price. In the case of a slump, the jobber might find himself with much more stock than he wanted; in a boom, he might be left in the position of having sold shares that he could not get back again.

The Jobber's Book.—Such being the possible conditions in a stock exchange slump or boom, it will be seen that the jobber makes a book, and that this book may lead either to profit or to loss. The prices that the jobber makes are regulated mainly by the public supply and demand. If the jobber finds himself being left with more shares than he sells, he lowers his price; if he keeps on selling shares in response to demand, he puts it up, hoping to induce people either to buy from him or to sell to him, as the case may be. He is running risks all the time, through the system of making a price and not knowing whether he will be called upon to take or to supply the stock. If, having sold £500 War Loan to a fellow member, he could be certain that his next bargain would be the purchase of £500 of the same stock at a fraction below the price of his previous sale, all would be plain sailing; but uncertainty waits upon every bargain that a jobber books. There may be a profit: the double price gives the jobber room in which to turn round. On the other hand, the transaction may easily end in loss to the jobber. He takes the rough with the smooth and hopes that the profits will outweigh losses. If they did not, there would soon be no jobbers; but in a market where prices are moving rapidly under the influence of substantial public orders to buy or sell or both, the jobber stands to be "shot at," as the expressive phrase goes. He frequently has the unpleasant experience of finding that, at the end of a day's heavy business, all the profits that he has made on jobbing are swallowed by a loss on his book. He may have bought more, on balance, than he has sold and the price may have then moved down; or he may have sold and been unable entirely to replace shares that have risen in price at the end of the day.

The Jobber a Specialist.—Whereas the stock exchange broker receives orders in stocks and shares of every description, the jobber confines his book to a specialized market. If he deals in Coats, he will not touch Canadian Pacifics. The dealer in Shell Transports has nothing to do with British Celanese. Where there are partners in a firm of jobbers, some of them will probably act in various markets, but one man confines his attention to a particular class or set of securities. He studies the companies, knows the brokers who are likely to be buyers or sellers of his own special shares and may keep a stock of these shares on his book for the brokers who, he hopes, will come and buy them from him on behalf of their clients. Experience gives him a sense of possible movements, rise or fall; though, in practice, even experience can prove a very misleading guide. As a principal, liable to make either loss or profit, the jobber is not tied down by any official scale of minimum remuneration. He makes what he can, competition serving to keep the "turns" within reasonable limits. The jobber's life involves more risks, more excitement, and more stagnation—according to the state of public interest in the jobber's market—than the life of a broker. The jobber has shorter hours than the broker, his expenses are on a more modest scale and the drudgery is much less; but the fact that a census of London Stock exchange members usually reveals about the same number acting in each class proves that the profits are divided more or less evenly between brokers and jobbers. (W. L.)

JOB EVALUATION is a widely used method of determining wages in industry and in the government. It provides a basis for comparing the human requirements of different jobs within a factory or industry. so that persons holding jobs with relatively higher requirements will be paid relatively more, in a consistent manner. Formal job evaluation plans of one type or another have been used seriously since World War I. These plans have been used primarily for hourly paid workers, whose jobs can be relatively accurately and completely described. The pressure to have orderly and systematic wage plans grew as factories grew in size and number of employees, to deal with recurring difficulties in settling wage disputes among employees and between management and union.

Job evaluation and its resulting wage policy has come to be one of the major parts of industrial relations.

Techniques of Job Evaluation.— several systems of job evaluation are used in practice; in increasing order of complexity, these are: (1) the job ranking system, (2) grade description, (3) factor comparison. (4) the point system. In job ranking, the earliest system, several raters rank a set of jobs in, what in their judgment. is the proper order, from the most important (or difficult) to the least.

Accurately written job descriptions, organization charts indicating the relative importance of each job and discussions with supervisors usually are the basis for ranking jobs. Jobs are then grouped and standard wage rates are assigned to each level. The grade description system defines broad classifications or grades of work. such as skilled. semiskilled, unskilled, clerical, etc., to which jobs are assigned. Ordinarily, then, jobs are ranked within grades and wage rates are assigned to each grade and job.

The factor comparison system, originated in 1926 at the Philadelphia Rapid Transit Co., involves ranking a small set (1; or 20) of widely diversified key jobs within each of a limited number of job factors, such as mental, physical and skill requirements. responsibility and working conditions. The wage rate currently paid each key job is then divided among the factors in a manner consistent with the original rankings, with the result that a key job earns a certain number of dollars or cents for each of the five factors.

All the other jobs in the factory or industry are then compared with the key jobs (or benchmarks) and a dollar amount is allotted for each factor; the final wage rate is added up over the factors for each job.

What appears to have been the first point system of job evaluation was designed by Merrill Lott about 1925; it is the most systematic or scientific of the four techniques, and the one that has come to be most commonly used. The first step in this method is the selection and definition of a group of factors which seem to be influential in the determination of wage rates. Originally, as many as 50 factors were described, but the tendency in later years has been to reduce the number to about 10.

A representative list of factors for hourly paid factory jobs is: (1) educational background, (2) job training, (3) mental effort, (4) visual effort. (5) physical effort. (6) responsibility for material or product. (7) responsibility for tools and equipment. (8) responsibility for safety of others, (9) work surroundings and (10) unavoidable hazards. (Other sets of factors are used for office jobs, for salaried factory jobs and for executive or administrative jobs.)

The next step then is to analyze each job, using concise job descriptions, in order to assign a level of each factor to the job. Handbooks on job evaluation stress that it is important when doing this work to analyze the job itself, independent of the particular person who happens to hold the job at the time. apparently because organizational science has not yet been developed to the point where it can handle the effect of a large number of individual personalities. The obtaining and recording of job information represents one of the major costs of a job evaluation program. and it is essential that this phase of the work be done effectively.

After all jobs have been analyzed in terms of levels of the factors, a number of points (or a weight) must be allotted to the levels of each factor. Each job is worth the total of these points. summed over factors, and the wage rate for the job is a simple multiple of the total points for the job. This calculation is in one sense a calculation of how important different levels of the factors are in the determination of the wage structure. The weighting of each factor should be designed to reflect the current wage structure or over-all job relationships as closely as possible.

It must be recognized that an improper weighting of factors may create actual distortions in the wage structure. If a particular wage rate prescribed by the job evaluation plan is less than employees are currently receiving for the job, it will be difficult or impossible to reduce their wages to comply with the plan. although it may be possible to reduce them relatively at the time of a general wage increase by raising them less than other rates. On the other hand, if a prescribed rate is above that currently paid, the company will have to increase the rate to have a consistent wage administration policy.

Another difficulty is that if the wages for a particular job are below the community average for that job, it may not be possible to find satisfactory employees. Methods used to compute the weights (points) to be attached to the levels of the different factors range from trial-and-error (which is tedious and may not lead to satisfactory results) to multiple regression. a mathematical method of weight determination that minimizes the sum of squared differences between rates specified by the plan and a sample of existing wages. For a linear programing approach, *see* section below.

Industrial Psychology.— It is possible to use the job analyses and descriptions prepared for job evaluation for other purposes, such as employee selection and screening, although these studies were not intended for that use. One part of the field of industrial psychology is concerned with the determination of what physical and psychological characteristics are related to success in a particular job.

The main characteristics (factors) considered include such diverse ones as education, intelligence, emotional stability, tact, health, popularity, persistence, body weight and height. These are individual characteristics of persons holding a certain kind of job. rather than characteristics of the job itself, and are designed for the particular purpose of selection and screening.

Executive Compensation.— Construction of a salary or a wage plan for executives uses some of the features of both hourly wage plans and psychological characterization. "In executive compensation plans, as distinct from the usual wage evaluations, it is important to consider both the man as well as the job. Persons occupying executive positions may contribute to an organization in a variety of ways, many of which are only indirectly associated with the job they happen to hold." (A. Charnes, W. W. Cooper and R. O. Ferguson, "Optimal Estimation of Executive Compensation by Linear Programming," *Management Science,* vol. 1, no. 2 [Jan. 1955].)

The factors these authors used to analyze executive jobs include effectiveness with others. acceptance of responsibility, initiative, experience. education. self-expression. planning ability, mental ability and ability to get things done. As criteria for the selection of weights for these factors, they require. among other things, that resulting salaries do not violate the ranked position hierarchy of the company and that they meet competitive conditions so that the company will not tend to lose executives to other companies. The mathematical method of linear programing is used to determine factor weights in this application.

See also MANAGEMENT SCIENCES; PSYCHOLOGY. APPLIED: *Industrial Psychology: Personnel Selection, Placement and Training.*

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JOBST or JODOCUS (*c.* 1350–1411), margrave of Moravia, was a son of John Henry of Luxembourg, margrave of Moravia, and grandson of John, the blind king of Bohemia. He became margrave on his father's death in 1375, and mas chosen German king on Oct, 1, 1410, in opposition to Sigismund. who had been elected a few days previously.

Jobst died on Jan. 17, 1411.

JOB'S-TEARS, the popular name for *Coix lacryma-jobi,* a species of grass. of the tribe Maydeae, which also includes the maize *(see* GRASSES). The seeds, or properly fruits! are contained singly in a stony involucre or bract which does not open until the enclosed seed germinates. The young involucre surrounds the female flower and the stalk supporting the spike of male flowers, and when ripe has the appearance of bluish-white porcelain. Being shaped somewhat like a large drop of fluid, the form has suggested the name. The fruits are esculent and the involucres are used for

making necklaces and other ornaments. The plant is a native of the Indian subcontinent. but is now widely spread throughout the tropical zone. It grows in marshy places and is cultivated in China, the fruit having a supposed value as a diuretic and antiphthisic. Forms of it are used as cereal foods in parts of eastern Asia and in the Philippines where it is called *adlay*.

JOCASTA: *see* OEDIPUS.

JODELLE, ÉTIENNE, seigneur de Limodin (1532–1573), French dramatist and poet, belonged to the Pléiade (*see* DORAT, JEAN) and proceeded to apply the principles of the reformers to dramatic composition. He aimed at creating a classical drama that should be in every respect different from the moralities and *soties* then occupying the French stage.

His first play, *Cléopâtre captive,* was represented before the court at Reims in 1552. Jodelle took the title rôle, and the cast included his friends Remy Belleau and Jean de la Péruse. In honour of the play's success the friends organized a little fête at Arcueil when a goat garlanded with flowers was led in procession and presented to the author—a ceremony exaggerated by the enemies of the Ronsardists into a renewel of the pagan rites of the worship of Bacchus. Jodelle wrote two other plays, *Eugène* and *Didon* se *sacrifant.* He died in poverty in July 1573.

JODHPUR, a city and district in Rajasthan state: India. The city is 64 mi. by road N.W. of Marwar junction on the Western railway. Pop. (1961) 224,723. It was built by Rao Jodha in 1459. The city is surrounded by a strong wall nearly 6 mi, in extent, with seven gates. The fort, which stands on an isolated rock. contains the maharaja's palace, a large and handsome building completely covering the crest of the hill overlooking the city. The city contains palaces of the maharaja, and town residences of the *thakurs* or nobles. besides numerous fine temples and water tanks. Building stone is plentiful and close at hand. and the architecture is solid and well designed. Five miles north of Jodhpur are the ruins of Mandor, the site of the ancient capital of the Parihar princes of Marwar before its conquest by the Rathors. Jodhpur has four colleges, which are affiliated with the University of Rajputana at Jaipur.

JODHPUR DISTRICT has an area of 8.773 sq.mi.; pop. (1961) 883,380. The general aspect of the district is that of a sandy plain dotted with picturesque cornical hills, in places attaining heights of 3,000 ft. The Luni river rises in the sacred lake of Pushkar in Ajmer and flows through the district in a southwesterly direction. The principal crops are millet, oil seeds and cotton but wheat and barley are produced in the fertile tract watered by the Luni river. Salt is extracted from Didwana and Samhhar lakes. The manufactures include cotton textiles and metal work. Leather bags, turbans, scarfs, embroidered shoes and gold and silver laces are specialities of the country. An irrigation and power project was completed in the 1950s.

Until its merger in Rajasthan on March 30, 1949, Jodhpur, or Marwar, was the largest princely state in the Rajputana agency, and subject to the subsidiary Western Rajputana agency. The area was 36,120 sq.mi.; pop. (1941) 2,555,904. The present district is only a part of it. The population centres contain many Jains, and by association Jain merchants and moneylenders have come to be known as Marwaris throughout northern India.

The ruling house belonged to the Rathor clan of Rajputs. claiming descent from the legendary hero Rama. After the downfall of the Rathor dynasty of Kanauj in 1194, Sivaji, the grandson of Jai Chand, the last king of Kanauj, entered Marwar on a pilgrimage to Dwarka, and laid the foundation of the state. but it was not till the time of Rao Chanda, the tenth in succession from Sivaji, that Marwar was actually conquered. His grandson Jodha founded the city of Jodhpur, which he made his capital. In 1561 the country was invaded by Akbar, and the chief was forced to submit. Aurangzeb invaded Marwar in 1679, plundered Jodhpur, sacked all the large towns, and commanded the conversion of the Kathors to Islam. This cemented all the Rajput clans into a bond of union, and a triple alliance was formed by the three states of Jodhpur. Udaipur and Jaipur, to throw off the Mohammedan yoke. One of the conditions of this alliance was that the chiefs of Jodhpur and Jaipur should regain the privilege of marriage with the Udaipur family. which they had forfeited by contracting alliances with the Mogul emperors, on the understanding that the offspring of Udaipur princesses should succeed to the state in preference to all other children.

The quarrels arising from this stipulation lasted through many generations. and led to the invitation of Maratha help from the rival aspirants to power, and finally to the subjection of all the Rajput states to the Marathas. In 1818 Jodhpur was taken under British protection. In 1843. the chief having died without a son, and without having adopted an heir, the nobles and state officials were left to select a successor from the nearest of kin. They chose Raja Takht Sinh. chief of Ahmednagar. This chief, who served the British during the 1857 mutiny, died in 1873. After 1896 there was a succession of minorities, during which Sir Pertab Singh of Idar carried on the government of the state as regent.

The Jodhpur style of riding breeches (also seen, made of cotton, as normal walking garb in northern India) comprises breeches and gaiters in one, full above the knee, tight below. They began to be used in England and elsewhere in the west in the 1890s.

JODL, ALFRED (1890–1946), German army officer, Adolf Hitler's chief adviser on strategy and operations throughout World War II, was born at Wiirzburg, Bavaria, May 10, 1890. He was assigned to staff rather than command duties during World War I and thereafter. On Aug. 22, 1939, he became chief of the armed forces operations staff and in this capacity directed, under Hitler and Wilhelm Keitel, all the campaigns except that against Russia (which was conducted by the army general staff). In 1944 he attained the rank of colonel general, and he signed the capitulation of the German armed forces at Reims, France, on May 7, 1945. Jodl, as chief of operations staff, had countersigned many orders requiring the shooting of hostages and other acts contrary to international law. He was sentenced to death for war crimes by the International Military tribunal at Niirnberg and was hanged on Oct. 16. 1946. A faithful servant of Hitler, Jodl had little military acumen and no moral courage. (P. N. T.)

JOEL. The second of the "Minor Prophets" in the Old Testament.

Contents.—The book falls into two parts: (a) i. 2–ii. 17, (b) ii. 18–iii. 21. (a) The occasion of the prophecy is a plague of locusts. Addressing the people the prophet vividly describes the calamity which threatens complete destruction owing to repeated ravages of the locusts: even the Temple services cannot be maintained because all agricultural produce is destroyed. In this visitation of locusts the prophet sees signs of the approaching "Day of Yahweh" (i. 15): there is no hope save in repentance and prayer, so the prophet urges priests and people to penitence and intercession that the "destruction from the Almighty" may be stayed. He bases his exhortation on an appeal to the obvious facts (i. 16–18). In ii. 1–17 the call to repentance and prayer is repeated and emphasized by a fuller description of the locust plague. This second description is influenced by experience of the scourge already well-known; the stress is laid not upon the result of the visitation but upon the irresistible terror of the approaching hordes. The locusts of this future visitation are the "army" of Yahweh used by him as his agents in "the Day of Yahweh" to execute final judgment. It is not too late to avert destructive judgment by solemn fast and penitence: it must be sincere repentance —"rend your heart and not your garments."

(b) Between ii. 17 and 18 there is an interval, during which it is left to be understood tliat the call to repentance (ii. 12–17) had been obeyed. (The verbs in ii. 18 are in the past tense, so R.V., not future as A.V.) The second part of the book (ii. 17–iii. 21) opens with Yahweh's promise to remove the plague of locusts and restore fruitful seasons. In the new prosperity of the land the union of Yahweh and his people will be sealed anew, spiritual gifts will descend upon them so that all will be endowed with clearer perception of divine truth. Signs in heaven and earth announce "the Day of Yahweh." In the crisis there will be no terror for the Jews, they will be delivered and restored; judgment will overtake the nations doomed to destruction for their oppression of Yahweh's people. A digression in prose (iii. 4–8) follows in which special mention is made of the doom of Phoenicia and Philistia.

Then (iii. 9–17) the nations are summoned to prepare for war, not against the Jews but against Yahweh and his supernatural warriors, by whom they will be annihilated. In contrast to the fate of the nations, Yahweh will be a "refuge unto his people," who, by his intervention, are set free to enjoy the benefits he will send. Henceforth Judah and Jerusalem will be secure.

Interpretation.—There has been difference of opinion as to whether the description of devastation by the locusts is to be regarded as literal or allegorical. Is the visitation of locusts with which the book begins historical, or is it a figurative description of an event yet future? In the latter case: are the locusts real locusts (in the future) which supply the imagery of the prophet's message? The allegorical interpretation is found in the Fathers, and was held by Pusey, who considered the book to have been written before Amos. Hilgenfeld, accepting a late date, took the four swarms of locusts to represent Persian invasions. Merx has suggested that the locusts are neither real nor symbolic but ideal, and the rest of the book a late compilation from the prophets. A distinction between the two parts of the book is made by Duhm: according to his view i. 1–ii. 17 deals with a historical visitation of locusts, and ii. 18–iii. 21 is a long apocalyptic expansion from the Maccabaean age. Sellin modifies this view: he considers that Joel used an earlier poem dealing with a historical plague of locusts; this poem, from the 1st century after the Exile, was transformed by Joel into an apocalypse. This transformation was based upon an older tradition which pictured locusts as a kind of demonic army forming one of the eschatological plagues (Gressmann).

A literal interpretation of the locust swarms is generally held by modern authorities and there is a tendency to regard the apocalyptic characteristics as interpolations into the original work of Joel. An argument advanced against the literal interpretation is the description of the locusts as "the northerner" (ii. 20, *haṣ-ṣephōnî*). Locusts as a rule enter Palestine from the south or south-east; thus it is considered that "the northerner" can only refer to an invading army from the north, *e.g.*, Assyrians, Scythians, Babylonians. But it is evident from the rest of the verse that "the northerner" must refer to locusts. The expression has no connection with the origin of the locusts; it is an epithet denoting the dread which Hebrew thought associated with the north, the region of the uncanny and mysterious. By a common usage the etymological sense of "the northerner" is discarded and the term has assumed a symbolical significance—any agent through which calamity came (Wade).

With the possible exception of iii. 4–8 it appears unnecessary to regard the book as other than the work of one author. At a time when real locusts had brought calamity upon the land Joel calls the inhabitants to repentance. He then turns from the present to the future and describes "The Day of Yahweh" in language suggested to him by experience of actual locusts. The locusts of ii. 1–17 are eschatological, they usher in "the Day of Yahweh." The people repent either in direct response to the prophet's call, or, possibly. in the ideal future to which the prophet looks, and obtain mercy from Yahweh. Thus, in the ideal future as Joel wished to see it, when "the Day of Yahweh" comes it will bring punishment to Israel's foes, to Israel relief and hope.

Date.—The absence of any statement which serves to indicate the precise occasion of the prophecy has caused the book of Joel to be assigned to dates ranging over a period from 835 B.C. to 360 B.C. Many allusions are furnished by the general background of the book, but these are such as lend themselves to explanation in the circumstances of different periods.

Credner in 1831 argued that the conditions implied by internal evidence gave sufficient justification for dating the prophecy in the early days of Joash, king of Judah, 837–801, during whose minority the government was in the hands of Jehoiada the priest (2 Kings xi. 4–21). A division of the book has been suggested by Vernes and Rothstein, assigning i. and ii. 1–27 to the time of Joash, ii. 28-32 and iii. to the post-exilic period. On account of linguistic and other affinities with Jeremiah, Konig has placed the date in the last years of Josiah Each of these views is open to serious objection in its interpretation of the evidence and fails to give a satisfactory explanation of a number of passages.

A post-exilic date was first proposed by Vatke; this view is now generally accepted. (Driver, Gray, G. A. Smith, Wade, Merx, Marti, Nowack, Wellhausen.) The style and language of the book have characteristics similar to the earlier prophetic books; but there are late elements, such as the general apocalyptic conceptions, which mark Joel as the work of a post-exilic writer who was acquainted with and influenced by earlier literature. Though in iii. 1 the phrase "bring again the captivity of Judah . . ." may be rendered "retrieve the fortune of Judah . . .," the statement (iii. 2, 3) that the Jews have been dispersed among the nations has no adequate explanation in any event except the overthrow of Judah in 586 and its subsequent effect upon the fortunes of the people. It is therefore necessary to seek a period after the exile when there is an undivided nation which maintains the true worship of Yahweh in the Temple. A time when there is no king: the elders and priests are the leaders of the people. Judah has suffered at the hands of foreign nations; these are not Assyrians nor Babylonians but the people of Tyre, Sidon, Philistia and Greece. Conditions such as these are only satisfied at a period after the settlement of the restored community at Jerusalem; and, since the worship is associated with the Temple, it is implied that the second Temple is in existence. Thus Joel must be later than Haggai and Zechariah i.–viii. (Driver) and cannot be earlier than c. 520 B.C. (Wade). The reference to "the wall" in ii. 7, 9 seems to imply that the wall of Jerusalem has been rebuilt and presupposes that the book was written after Nehemiah (c. 445 B.C.). Omission of any mention of the Persians as oppressive foes is due to the leniency with which they usually treated the Jews. It was not until the reign of Artaxerxes Ochus (358–337) that Jewish subjects were ill-treated: a period subsequent to this is not supported by internal evidence.

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JOFFRE, JOSEPH JACQUES CÉSAIRE (1852–1931), French soldier, was born Jan. 12, 1852, at Rivesaltes, at the edge of the eastern Pyrénées. According to a tradition preserved in the family, his stock is Spanish and noble, and its proper name is Goffre. His great-grandfather fled from Spain for political reasons, came to France, gave his name the French spelling of Joffre, and became a merchant, The grandson of this first Joffre adopted the trade of a cooper. He had 11 children, one of them being the future victor of the Marne.

The studies of young Joffre at the École Polytechnique were interrupted by the Franco-German War ard he took part in the defence of Paris in 1870. Afterwards he passed out from the Polytechnique into the engineers and worked on the fortification of Paris. In 1876 he was promoted captain. The loss of his wife so affected him, however, that he applied for a transfer to Indo-China, where he took part in the occupation of Formosa in 1885 and remained three years at Hanoi as chief of engineers. In 1888 he returned with Gen. Mensier to Paris. In 1889 he entered the railway regiment. In 1892 he was sent to Senegal to build a railway from Kayes to Bafoulabe. At the end of 1893, a column commanded by Col. Bonnier marched on Timbuktu via the Niger. Joffre, who was a major, was ordered to form a second column, which was also to march to Timbuktu by the left bank of the river. He left Segou on Dec. 27, to receive the news at Goundam at the end of January that Col. Bonnier had been murdered on the 11th. Nevertheless, he continued his march on Timbuktu undaunted, and entered the town on Feb. 12, 1894, after marching 813 kilometres. Some years later he went to Madagascar to form the base at Diego-Suarez. He was appointed general of brigade in 1900 and general of division in 1905. While commander of the and Army Corps at Amiens he was called to the Conseil Supérieur de la Guerre in 1910. This council, re-established in 1872, consisted of the generals who in time of war would have the chief commands Gen. Joffre was entrusted wit' the direction of the lines of communication,

Under the system then existing, the vice-president of the Higher Council became in time of war commander in chief of the armies in the field. But in time of peace he had very little authority over his future subordinates. He could not determine either promotion or commands. The real authority lay with the chief of general staff of the army. General Michel, vice-president of the Higher Council, resigned in July 1911, and the minister of war, M. Messimy, decided to unite the functions of vice-president and those of chief of staff of the army in one person, so that in the eventuality of war the chief of the general staff would become commander in chief. Who was to exercise these united duties, which constituted a position of considerable power? Messimy thought of General Pau, who refused on the ground that he had only 18 months' more service on the active list. General Galliéni was due to pass into the reserve even sooner. Messimy's choice accordingly fell on Joffre, who was only 59 years old, and had therefore five years more on the active list.

For three years Joffre exercised complete authority over the army. He had laid his plan of campaign, known as plan 17, before the Conseil Supérieur on April 18, 1913. Germany having declared war on France on Aug. 3, 1914, he took up the post of commander in chief on the 5th.

Early failures in the war, following on rash promises and high hopes, now alarmed public opinion. A campaign was conducted against the commander in chief by the friends of Galliéni, who accused general headquarters of having stolen the glory of the Marne, and by friends of Sarrail, whom Joffre had relieved of his command in July 1915. So long as Millerand was minister for war he protected the commander in chief. But Millerand was replaced on Oct. 30, 1915, by Galliéni. On Dec. 3, 1915, Joffre received the supreme command of all the French armies, an appointment which put Sarrail under his authority. On Dec. 16 the minister for war demanded information on the state of the defenses before Verdun. On the 18th he received a stiff reply from Joffre, who offered to resign. Galliéni answered on the 22nd that Joffre enjoyed the complete confidence of the government. Nevertheless, two months later, on Feb. 21, 1916, the Germans attacked in front of Verdun, and the defenses, which were incomplete, were forced in as far as the line of forts, to a depth of 8 km. in four days. On March 7, Galliéni read to the council of ministers a memorandum pointing out the necessity of reforming the high command. His advice was not accepted; he was also ill; he therefore resigned, and was replaced on March 17 by General Rocques. The new minister was a personal friend of Joffre. Nevertheless, the campaign against him lasted throughout 1916. Finally, General Nivelle, commander of the 2nd army operating before Verdun, having retaken the fort of Douaumont, appeared as a possible successor to Joffre.

A decree of Dec. 13, 1916, conferred on Joffre the title of technical adviser to the government in matters concerning the direction of the war. He continued to hold the title of commander in chief of the French armies. M. Briand, as prime minister, explained to a secret senate committee that his title of commander in chief implied no authority either over Nivelle or Sarrail, who remained free to conduct operations as they wished. However, General Lyautey, who succeeded Galliéni, considered the posts granted to Joffre incompatible with the authority of the minister for war. These two offices were suppressed, but in compensation Joffre was created marshal of France on Dec. 26. He died Jan. 3, 1931. *See* WORLD WAR I. (H. Bi.)

See J. J. C. Joffre, *Opérations de la Colonne Joffre avant et après l'occupation de Timbouctou* (1895); *My March to Timbuktu . . .* (1915). *See* also C. Dawbarn, *Joffre* and *his Army* (1916).

JOGJAKARTA (Dutch DJOKJAKARTA), the chief town of the province of Jogjakarta. Java, Indonesia. lies about 230 mi W.S.W. of Surabaya, approximately 18 mi. N. from the southern coast and about 20 mi. S.S.W. of the active volcano Mt. Merapi. Pop. (1957 est.) 289.422; province, 2.084.417. This cultural and trade centre was from 1945 to 1950 the capital of the new Indonesian republic and a focus for resistance against the Dutch.

The town has wide main streets, notably Malioboro street and Patjinan street, the shopping centre, which are parts of one long road running through Jogjakarta from north to south. There is comparatively little motor traffic, the majority of vehicles being bicycles and *bechaks* (pedal carriages). A river with steep banks flows through the middle of the town, lending it a picturesque touch. There is an interesting native market place and bazaar, known throughout Java. Jogjakarta has two universities, the Gadjah Mada university founded in 1949 and the first university in Indonesia to be established after the country's independence, and a university established by an Islamic organization. There are four academies and colleges including a teachers' training college and an academy of design. Of the four libraries in Jogjakarta the best known is the Hatta foundation library. The Sono-Budoyo is a museum of national culture. In the middle of the town is the large 18th-century Rraton (sultan's palace) and there is a special building, the Gedung-Negara, for accommodating distinguished guests. Jogjakarta has rail and road communications with the biggest towns of Java, and an airfield, called Adisutjipto, 4 mi. from the centre. The town is a market for a large agricultural area famed for its tobacco growing, and there is considerable general trade. Besides a sugar estate, the industries include the manufacture of cigars, cigarettes and tea as well as leather, iron-, silver- and copperwork and making of batik cloth. Handmade batik. silver and leather goods, mostly from Pasar Gedeh, a village 4 mi. south, are exported to other parts of Indonesia.

JOHANAN BEN ZAKKAI, Palestinian rabbi, contemporary of the Apostles. He was a disciple of Hillel (*q.v.*), and after the destruction of the Temple of Jerusalem by Titus was the main instrument in the preservation of the Jewish religion.

During the last decades of the Temple Johanan was a member of the Sanhedrin and a skilled controversialist against the Sadducees. He is also reported to have been head of a great school in the capital. In the war with Rome he belonged to the peace party, and finding that the Zealots were resolved on carrying their revolt to its inevitable sequel, Johanan had himself conveyed out of Jerusalem in a coffin.

In the Roman camp the rabbi was courteously received, and Vespasian permitted him to found a college at Jamnia (Jabneh), which became the centre of Jewish culture. It practically exercised the judicial functions of the Sanhedrin. The Mishnah was the outcome of the work begun at Jamnia.

JOHANNESBURG, a city of Transvaal. S.Af., the largest city of South Africa, is situated on the southern slopes of the Witwatersrand range. Metropolitan population (1960) 1,096,541.

Johannesburg owes its existence to the discovery of gold in 1886. The origin of its name is uncertain; it has been stated that it was after Johann Rissik, first clerk to the surveyor general at the time, but it is more likely to have been named after Johannes Meyer, *Veldcornet* of Ward Klip river and responsible for all matters relating to the new gold field prior to the arrival of a mining commissioner. In 1903 the first town council was elected and on Sept. 5, 1928, Johannesburg was created a city. It lies mainly to the north of the belt of gold mines that intersects it.

The University of the Witwatersrand (founded in 1903 as the School of Mines and Technology) occupies an 80-ac. site to the northwest of the civic centre; it received its charter in 1921 and includes a medical school. The union observatory (26½-in. telescope) is situated in the northeast suburban area; the University of Leyden maintains an observatory in its grounds. The Africana museum (historical and ethnological), the war museum (in the spacious park adjoining the zoological gardens) and the art gallery in Joubert park, attract many visitors.

The average mean temperature is 60° F., varying from 47.9° to 70.7° F. The average rainfall is about 30 in. a year and there is an average of 8.7 hours of sunshine daily.

Johannesburg is the centre of one of the world's richest gold fields. In an area covering about 150 mi. east. west and southwest of the city lie the gold mines, with their man-made mountains of white sand, the residue of the crushed rock after the gold has been extracted. On the older mine dumps grass and trees have been planted. Three of the mines in the municipal area are among the deepest in the world, and have working levels of nearly 10.000 ft. below surface. Gold contributes 7.6% of South Africa's gross

national income; secondary industries yield 23.6% (1953–54) Johannesburg is the centre of a concentration of highly developed industrial activities, nhich include metal manufactures. engineering, clothing. furniture, diamond cutting and others. Most of the unskilled labour hired by these industries is non-European and is housed mainly southwest of the city. (B. O P.)

JOHN, SAINT, THE APOSTLE. in the Bible. was the son of Zebedee, a Galilean fisherman. and Salome. It is probable that he was born at Bethsaida, where along with his brother James he followed his father's occupation. The family appears to have been in easy circumstances; at least we find that Zebedee employed hired servants. and that Salome was among those women who contributed to the maintenance of Jesus (Mark i, 20, xv. 40. 41, xvi, 1). John's "call" to follow the Lord occurred simultaneously with that addressed to his brother, and shortly after that addressed to the brothers Andrew and Simon Peter (Mark i, 19, 20). John speedily took his place among the 12 apostles, sharing with James the title of Boanerges ("sons of thunder." perhaps strictly "sons of anger"; *i.e.*, men readily angered), and became a member of that inner circle to which. in addition to his brother. Peter alone belonged (Mark v, 37, ix. 2. xiv, 33). John appears throughout the Synoptic record as a zealous; fiery Jew-Christian. It is he who indignantly complains to Jesus, "We saw one casting out devils in Thy name, and he followeth not us," and tells Him, "We forbade him" for that reason (Mark ix, 38); and who with his brother, when a Samaritan village will not receive Jesus: asks Him. "Wilt thou that we command fire to come down from heaven and consume them?" (Luke ix, 54). The Book of Acts confirms this tradition. After the departure of Jesus, John appears as present in Jerusalem with Peter and the other apostles (i, 13); is next to Peter the most prominent among those who beat testimony to the fact of the resurrection (iii, 12–26, iv, 13, 19–22); and is sent with Peter to Samaria to confirm the newly converted Christians there (vii, 14, 25). St. Paul tells us similarly that when. on his second visit to Jerusalem, "James," the Lord's brother, "and Cephas and John, who were considered pillars, perceived the grace that was given unto me, they gave to me and Barnabas the right hand of fellowship, that we should go unto the heathen, and they unto the circumcision" (Gal. ii, 9). John thus belonged in 46–47 to the Jewish-Christian school; but we do not know whether to the stricter group of James or to the milder group of Peter (Gal. ii. 11–14). Subsequent history of the apostle is obscure. Polycrates, bishop of Ephesus (in Euseb., H. E., iii, 31; v, 24), attests in 196 that John "who lay on the bosom of the Lord rests at Ephesus"; but previously in this very sentence he has declared that "Philip one of the twelve apostles rests in Hierapolis," although Eusebius (doubtless rightly) identifies this Philip not with the apostle but with the deacon-evangelist of Acts xxi, 8. Polycrates also declares that John was a priest wearing the πέταλον ("gold plate") that distinguished the high-priestly mitre. Irenaeus in various passages of his works, 181–191, holds a similar tradition. He says that John lived up to the time of Trajan and published his Gospel in Ephesus, and identifies the apostle with John the disciple of the Lord, who wrote the Apocalypse under Domitian. whom Irenaeus' teacher Polycarp had known personally and of whom Polycarp had much to tell. These traditions are accepted and enlarged by later authors, Tertullian adding that John was banished to Patmos after he had miraculously survived the punishment of immersion in burning oil. As it is evident that legend was busy with John as early as the time of Polycrates, the real worth of these traditions requires to be tested by examination of their ultimate source. This inquiry has been pressed upon scholars since the apostolic authorship of the Apocalypse or of the Fourth Gospel or of both has been disputed. (See JOHN, GOSPEL OF ST.; APOCALYPSE.)

The opponents of the tradition lay weight on the absence of positive evidence before the latter part of the 2nd century. especially in Papias and in the epistles of Ignatius and of Irenaeus' authority, Polycarp. They find it necessary to assume that Irenaeus mistook Polycarp; but this is not a difficult task, since already Eusebius (c. 310–313) is compelled to point out that Papias testifies to two Johns, the apostle and a presbyter, and that Irenaeus is mistaken in identifying those two Johns, and in holding that Papias had seen John the Apostle (H.E., iii, 39, 5, 2). Irenaeus tells us. doubtless correctly, that Papias was "the companion of Polycarp": this fact alone would suffice, given his two mistakes concerning Papias, to make Irenaeus decide that Polycarp had seen John the Apostle. The chronicler George the Monk (Hamartolus) in the 9th century and an epitome dating from the 7th or 8th century but probably based on the Chronicle of Philip of Side (c. 430) declare, on the authority of the second book of Papias, that John the Zebedean was killed by Jews (presumably in 60–70). Adolf Harnack, Chron. d. *altchr.* Lit. (1897, pp. 656–680), rejects the assertion; but a number of scholars accept it as correct. (F. v. H.)

JOHN, SAINT, THE BAPTIST, the "forerunner" of Jesus in the Gospel story. His preaching made a great impression upon his contemporaries (cf. Josephus, Ant., xviii. 5). According to the birth narrative in Luke i and ii, he was born in "a city of Judah" (read, "the province of Judah"), in "the hill country" (possibly Hebronj. In this narrative his father. Zacharias, is represented as a priest "of the course of Abijah," and his mother Elizabeth (also of priestly descent) as related to Mary, the mother of Jesus. This narrative. which embodies some very primitive features Palestinian in character (it probably depends upon a Hebrew original and reflects the point of view of the early Palestinian Christian Church); manifests a strong tendency to bring the Baptist into close connection with Jesus.

In the 15th .year of the emperor Tiberius (?A.D. 28–29) John began his public life in the "wilderness of Judea," the wild district between the Kedron and the Dead sea, especially near the Jordan. According to the Spnoptics his preaching was essentially eschatological in character, being concerned with the nearness of the Messianic kingdom and the consequent urgency for preparation by repentance.

Possibly as Streeter (*J.Th.S.*, July 1913) suggests, John's baptism was eschatological. "It was regarded as a 'sealing' or symbolical act entitling to admission to the coming kingdom. . . . The essential meaning of the rite would be rather aspiration for the future than regret for the past." Josephus, as cited, seems to suggest that John's baptism must be regarded as a bodily purification corresponding to an inward change, not as a means of remitting sins; in fact Josephus does not agree with the Synoptic accounts in this respect.

Jewish scholars (*e.g.*, Kohler and I. Abrahams) insist on the Essene affinities of John. though John was less rigid. The Fourth Gospel preserves a trustworthy tradition in locating one place of John's baptism at "Aenon near to Salim" (John iii, 23). This must be the modern 'Ainun. nearly 8 mi. N.E. of Salim (a town east of Nablus). This fact confirms the view that John preached to the Samaritans, and the persistent tradition that he was buried at Sebaste in Samaria. See W. F. Albright, *Harvard Th.* Rev., xvii, p. 193 f.

If, as has been suggested. John's preaching was first of all directed to those who practised an ascetic mode of life, there must have followed a later period when the scope of his mission was widened and he delivered his message to the masses of the people, "the people of the land." He had disciples who fasted (Mark ii, 18, etc.), who visited him regularly in prison (Matt. xi, 2, xiv, 12) and to whom he taught special forms of prayer (Luke v, 33, xi, 1). Some of these afterward became followers of Christ (John i, 37). John's activity indeed had far-reaching effects. It profoundly influenced the Messianic movement depicted in the Gospels. The preaching of Jesus shows traces of this, and the fourth Gospel (as well as the Synoptics) displays a marked interest in connecting the Johannine movement with the beginnings of Christianity, though in fact the original connection may have been exaggerated. The existence of disciples of John at Ephesus after the lapse of 2j years is significant (Acts xviii, 2j. xix, 3). It is curious that the Mandaeans or Sabians (from Saba— "baptize"). called also "Christians according to John," have preserved some confused traditions about the Baptist. For Christ's estimate of John. *cf.* Matt. xi. 7 f. John was imprisoned in the fortress of Machaerus. and executed by order of Herod Xntipas.

See Kohler in *Jew. Encyc.*, vii, p. 218 f.; I. Abrahams, *Studies in*

Phar. and Gospels, 1st series, pp. 30 ff.; F. Jackson and K. Lake, *Beginnings of Christianity*, i, pp. 101 ff. *See* also MANDAEANS

(G. H. B.)

JOHN, SAINT, OF BEVERLEY (d. 721), English bishop, was educated at Canterbury under Archbishop Theodore. He was for a time a member of the Whitby community under St. Hilda; in 687 he was consecrated bishop of Hexham and in 706 was promoted to the bishopric of York. He resigned the latter see in 718 and retired to a monastery which he had founded at Beverley, where he died on May 7, 721. He was canonized in 1037, and his feast is celebrated on May 7.

The following works are ascribed to John by J. Bale: *Pro Luca exponendo* (an exposition of Luke); *Homiliae in Evangelia; Epistolae ad Herebaldum, Audenam, et Bertinum; Epistolae ad Hyldam abbatissam* *See* life *by* Folcard, based on Bede, in *Acta SS. Bolland.*

JOHN, SAINT, OF CAPISTRANO (GIOVANNI DA CAPISTRANO, JOHANNES CAPISTRANUS) (1386–1456), Italian theologian and preacher, was born at Capistrano in the Abruzzi, son of a baron in Louis of Anjou's army. Trained in law at Perugia. he became magistrate and captain of his native town. As an intermediary in a civil quarrel arising from the power struggles of the great western schism, he was imprisoned, experienced an emotional conversion while in prison, and dedicated his life to healing the wounds caused by the schism. After dissolving his unconsummated marriage, he became a Franciscan in 1416, being ordained a priest in 1426. St. John was the most famous Franciscan preacher of the century. He tried to restore doctrinal and civil harmony, to promote education and care of the sick. Alert to the danger of Turkish invasion, he helped to raise the army nhich lifted the siege of Belgrade in 1456, the year he died (Oct. 23, of plague) at Ilok on the Danube. He nas canonized in 1724, and his feast day is March 28.

See John Hofer, *St. John Capistran* (1943). (A. S. TR)

JOHN, SAINT, OF THE CROSS (Spanish, SAN JUAN DE LA CRUZ) (1542–1591), the name in religion of JUAN DE YEPES Y ÁLVAREZ, the most profoundly lyrical of Spanish poets and one of the great mystics of all time. Born at Fontiveros (in the modern province of Avila) in 1542, John became a Carmelite in 1563, attended the Cniversity of Salamanca and was ordained priest in 1567. St. Theresa of Ávila enlisted his help in her work of reform (from 1568) and he subsequently participated in the founding of Discalced Carmelite monasteries. For this he had to endure persecution by Carmelites hostile to the reform (he was twice kidnapped and imprisoned, 1jj6 and 1577–78) and to face charges before the authorities. Eventually he won high office in his order—vicar provincial of Andalusia, 1585–87. John died at Úbeda in the early morning of Dec. 14, 1591. He was beatified in 1674, canonized in 1726 and pronounced a doctor of the church in 1926.

In the work of St. John of the Cross poetry and prose are closely linked the prose being primarily the exegesis of the mystical poetry. First, however, the short poems for which the author did not provide any prose commentary must be mentioned. This group comprises *romances* (ballads) and *glosas* (stanzas built up to a key line selected for paraphrasing or expatiation). All fall within the established Castilian tradition, but some are especially remarkable: for instance the *glosa* beginning "Tras de un ainoroso lance . . ." ("On an impulse of love . . ."), a short poem of great mystical intensity; "El cantar del alma que se huelga de conocer a Dios" ("Song of the Soul Delighted by the Knowledge of God"), the verse form of which involves an unusual sort of parallelism, with the constant refrain ". . . aunque es de noche" (" . . . though it be night"); and the charming poem beginning "Un pastorcico solo está penado . . ." ("A lonely shepherd boy is grieving . . .").

It was, however, in the poems with commentaries that St. John was to express himself incomparably: *Clintico espiritual, Noche oscura* and *Llama de amor viva*. These are all in the *lira* form (stanzas of 5 lines, the first, third and fourth of 7 syllables, the others of 11, rhyming *a* b *a b* b), in the polished style introduced by Boscán and Garcilaso de la Vega. They provide an account of mystical experience in terms of the most intense poetry.

In *Cántico espirztual,* the kernel of which he derives from the biblical Song of Songs, St. John gives an exposition of mysticism on classical lines, in the three stages of purgation, illumination and union, as he himself explains in the foreword to the commentary, addressed to Ana de Jesús, prioress of the Discalced nuns of San José de Granada. The lyric of the *Noche oscura* consists of eight stanzas "in which the soul sings of the fortunate adventure that it had in passing through the dark night of faith . . . to union with the Beloved"; on this St. John wrote two commentaries, the *Subida del monte Carmelo* in three books and the shorter work itself entitled *Noche oscura*. The *Llama de amor viva* consists of four songs, each with a prose commentary, and provides the conclusion to John's theory of mysticism: every line is exclamatory, as pure exclamation alone can convey his meaning.

St. John reaches high peaks of lyrical poetry, but he also presents considerable difficulties to the reader, as his approach is not only poetic but also rigorously intellectual. Words being inadequate to express mystical rapture, he is often obliged to use symbolism; and as his vocabulary is rather restricted (words suggestive of something consuming, such as "flame" and "fire," are very frequent, and "dark night" is a typical symbol), the same word may recur twice within four lines of a poem with a different symbolism on each occasion. Of his exclamatory phrases and comparisons some are derived from the Bible, others are of his own invention. He also uses antithesis (*e.g.,* in the phrases *soledad sonora* ["resounding solitude"] and *música callada* ["tacit music"], which he elucidates in prose of great poetic quality). The line "El silbo de los aires amoroses" ("the whistling of the breezes full of love") is a strikingly beautiful example of his mastery of alliterative onomatopoeia. The musicality of his lines serves to enhance the expression of his feeling.

BIBLIOGRAPHY.—St. John's *Obras espirituales* mere first printed in 1618. *See* the modern edition by P. Silverio de Santa Teresa, *Obras de San Juan de la Cruz,* 4 vol (1929–31). *See* also P. Crisógono de Jesús, *Vida y obras de San Juan de la Cruz* (1946); *Edgar* Allison Peers (tr. and ed), *St. John of the Cross* (1932) and *Handbook to the Life and Times of St. Teresa and St John of the Cross* (1954); Dámaso Alonso, *La Poesía de San Juan de la Cruz* (1942); also *Poems of St. John of the Cross,* Eng. trans *by* R. Campbell (1951). (J. M. BA.)

JOHN, SAINT, OF DAMASCUS (JOHANNES DAMASCENUS) (d. before 754), an eminent theologian of the Eastern Church, derives his surname from Damascus, where he was born about the close of the 7th century. His Arabic name was Mansur ("the victor") and he received the epithet Chrysorrhoas ("gold pouring") because of his eloquence. His father Sergius, a Christian, held high office under the Saracen caliph, in which he was succeeded by his son. John wrote (*c.* 730) several treatises in defense of image worship, which the emperor Leo the Isaurian was making strenuous efforts to suppress. He then surrendered his worldly goods and entered the monastery of St. Sabas, near Jerusalem, where he spent the rest of his life. He was ordained priest by the patriarch of Jerusalem. In his last years he traveled through Syria contending against the iconoclasts and visited Constantinople at the risk of his life during the reign of Constantine Copronymus. With him the "mysteries" (entire ritual) are an integral part of the Orthodox system, and all dogma culminates in image worship. He died probably about 752. John Damascenus is a saint in both Greek and Latin churches, his festivals on Dec. 4 and May 6, respectively.

The most important of the treatises of Damascenus contains three parts under the general title *Pege gnoseos* ("Fountain of Knowledge"). The first part is an exposition and application of theology of Aristotle's *Dialectic.* The second is a reproduction of the earlier work of Epiphanius, with a continuation giving an account of the heresies that arose after the time of that writer. The third part is the most important; it contains a complete system of theology founded on the teaching of the fathers and church councils, from the 4th to the 7th century. It thus embodies the finished result of the theological thought of the early Greek Church. Through a Latin translation by Burgundio of Pisa in the 12th century, it was well known to Peter Lombard and Aquinas, and in this way it influenced the scholastic theology of the west.

Another well-known work is the *Sacra parallela,* a collection of biblical passages followed by illustrations drawn from other scriptural sources and from the fathers.

BIBLIOGRAPHY.—*Life* of John of Damascus by John, patriarch of Jerusalem, 10th century (Migne, *Patrol. Graec.,* xciv, 429–489). The works, edited by Le Quien, 2 vol. (1712), form vol. 94–96 in Migne's Greek series. *See* also A. Harnack. *History of Dogma,* vol. iii, iv, iv: O. Bardenhewer, *Patrologie;* F. Kattenbusch's article in Herzog-Hauck, *Realencyklopädie,* vol. ix.

JOHN, SAINT, OF GOD (1495–1550), founder of the Order of Charity for the Service of the Sick (Brothers Hospitalers), was born at Montemor, Novo, Port., on March 8, 1495. From the life of a shepherd he turned to that of soldiering in the Austrian army, then in active conflict with the Turks. In this process he turned away from religion, but at about the age of 40 he repented. On returning to Granada, after service in north Africa, he was so deeply impressed by the sermons of John of Ávila that he determined to devote his life to the care of the poor and the sick, so rented a house for that purpose. When he died on March 8, 1550, his companion Antonio Martino, succeeded him as head of the institution. Other houses, including the large hospital at Madrid, richly endowed by Philip II, were soon opened; in 1572 Pius V raised the lay society to an order with the Augustinian rule. The order flourishes especially in Italy, Spain, France and central Europe, conducting at the 1960s about 100 hospitals. John was canonized in 1690 and declared the patron of hospitals and sick persons in 1886. His feast day is March 8,

JOHN, the name of 21 canonical popes (numbered I-XV, XVII-XIX and SXI-XXIII), of an antipope (XVI) and of a schismatic (also XXIII). Two causes may be adduced to account for the irregularity of the numbering. First, the antipope Philagathus seems to have been allowed as John XVI in a list of popes current five years after his deposition, when Sicco became pope as John XVII. Secondly, in a list brought into use between 1024 (when Romanus of Tusculum took the style John XIX) and 1276, there appeared an imaginary "John XV" interpolated between John XIV and Boniface VII's successor (the actual John XV), this last and all subsequent Johns (still including the antipope Philagathus) being therein accordingly assigned an additional digit in their numeration, with the result that Petrus Juliani took the style John XXI, as if John XIX had been John XX.

JOHN I. SAINT, pope from 523 to 526, Tuscan by birth, was consecrated pope in succession to Hormisdas on Aug. 13, 523. Theodoric sent him to Constantinople on an embassy to Justin in 525 to secure toleration for the Arians. He was suspected of lukewarmness in his mission and was imprisoned by Theodoric on his return. He died in prison on May 18, 526, and was canonized as a martyr; his feast day is May 27.

JOHN II (Mercurius), pope from 533 to 535, was priest of the title of San Clemente before succeeding Boniface II on Jan. 2, 533. Justinian sought his co-operation in quelling the Christological disputes in the Byzantine Church. At the emperor's instance he accepted the formula *unus* de *Trinitate passus est in carne* as orthodox and approved the application of the title *Theotokos* ("Mother of God") to the Blessed Virgin. He died on May 8, 535.

JOHN III (Catelinus), pope from 561 to 574, was descended from a noble Roman family. He was consecrated as successor to Pelagius I on July 17, 561, and is said to have prevented an invasion of Italy by the recall of the deposed exarch Narses. The Lombards, however, continued their incursions. John died on July 13, 574.

JOHN IV, pope from 640 to 642, a Dalmatian by birth, succeeded Severinus after an interval of rather more than four months. He adhered to his predecessor's repudiation of the Monothelite doctrine and tried to interpret the replies of Honorius I on the subject in an orthodox sense. He died on Oct. 12, 642.

JOHN V, pope from 685 to 686, a Syrian by birth, succeeded Benedict II on July 23, 685. In 680 he had been Pope Agatho's legate to the sixth ecumenical council at Constantinople. He died on Aug. 2, 686.

JOHN VI, pope from 701 to 705, a Greek, was consecrated to succeed Sergius I on Oct. 30, 701. He assisted the exarch Theophylact, who had been sent into Italy by the emperor Justinian II, and prevented him from using violence against the Romans. John induced Gisulf, the Lombard duke of Benevento, to withdraw from the duchy of Rome into his own territory. He died on Jan. 11, 705.

JOHN VII, pope from 705 to 707, successor of John VI, was also of Greek nationality. He was consecrated on March 1, 705. The emperor Justinian II submitted to him the decrees of the Quinisext or Trullan council of 692, but the pope seems to have returned them without either approving or rejecting unambiguously. He died on Oct. 18, 707.

JOHN VIII, pope from 872 to 882, confidant of Nicholas I and successor of Adrian II, was a Roman by birth. He was consecrated pope on Dec. 14, 872. He was one of the makers of the doctrine of papal theocracy. The death of the emperor Louis II in 875 without male heirs opened the thorny question of the imperial succession. John saw his opportunity and designated Charles the Bald as emperor and anointed and crowned him (Christmas day, 875). Charles was not, however, an adequate protector of the Roman Church. By 877 the Saracens based in southern Italy were pressing hard on Rome, and Carloman, son of Charles's half-brother and former rival Louis the German, descended into Italy to demand the imperial crown. Charles, who had come to the pope's assistance, withdrew and, while repassing the Alps, died. For a qeriod in 878 John was a prisoner in the Leonine city, while Lambert of Spoleto, a partisan of Carloman, occupied Rome. The pope, however, refused all concessions and took ship for Provence on his way to France to seek a new protector. Once more a disputed imperial succession offered him the opportunity to assert the papal right to scrutinizing and designating the candidate for the empire. Charles's son Louis the Stammerer was too feeble to be of use, and for a time John seems to have contemplated elevating Boso of Provence, Louis II's son-in-law, to the imperial dignity. With this in view he adopted him as a son. But Boso also proved to be a broken reed. In despair, the pope turned to a younger son of Louis the German, namely to Charles the Fat, who promptly entered Italy and received the imperial crown in 881. The pope emerged from these events as the arbiter in theory and practice of the imperial office. John worked tirelessly to organize and unite the states of southern Italy against the Saracen menace, but after the departure of Charles the Fat he fell a victim to an intrigue in the Lateran and was murdered by members of his household (Dec. 16, 882).

JOHN IX, pope from 898 to 900, was elected in the first half of 898 as the successor of Theodore II. His election was disputed by partisans of the future pope Sergius III, whom he excommunicated. He rehabilitated the memory of Formosus (*q.v.*) in a Roman synod and decreed that the records of the scandalous posthumous trial of Formosus should be burned. John confirmed the imperial consecration of Lambert of Spoleto and agreed that henceforth the consecration of the popes should take place only in the presence of the imperial legates. The sudden death of Lambert shattered the hopes which this alliance seemed to promise. John died early in 900.

JOHN X, pope from 914 to 928, was deacon at Bologna when he won the affection of Theodora, wife of the senator Theophylact, then the most powerful of the Roman nobles. Through her favour he was raised to the archbishopric of Ravenna (905) and then to the papacy as the successor of Lando (c. March 914). Allying himself with Theophylact and with Alberic, marquis of Camerino and governor of the duchy of Spoleto, he took the field in person against the Saracens, over whom he won a great victory on the banks of the Garigliano in Aug. 915. In the following December he crowned Berengar of Friuli as emperor. Berengar's death in 924 frustrated the pope's plans for stabilizing the situation in Italy, and in June 928 he was deposed through the intrigues of Theodora's daughter Marozia. He died in prison shortly afterward, probably in the following year.

JOHN XI, pope from 931 to 935, son of Marozia and reputed son of Sergius III, was chosen to succeed Stephen VIII (VII) at the age of 21, being consecrated in Feb. or March 931. He was the mere exponent of the purposes of his mother, until his uterine brother Alberic in 933 overthrew their authority. The pope was a virtual prisoner in the Lateran, where he is said to have died in Dec. 935 or Jan. 936.

JOHN XII (Octavian), pope from 955 to 964, was the son of

Marozia's son Alberic, whom he had succeeded as "prince and senator of the Romans" at the age of 16 in 954. Next year he was elected pope in succession to Agapetus II, being consecrated on Dec. 16. In order to protect Rome from the threats of Berengar II. king of Italy. he appealed to the German king Otto I. who, nothing loth. accepted the imperial crown from the pope's hand on Feb. 2. 962. But when Otto marched into the Pentapolis it became clear that the papacy had acquired a master instead of a protector. and John threw in his lot with Berengar. On returning to Rome. Otto summoned a council which deposed John (who had fled to the Campagna) on Dec. 4. 963, and elected Leo VIII in his place. These events gave rise to the much-discussed *Ottonianum* or Ottonian privilege. which guaranteed the Carolingian donations to the papacy but required the pope to take an oath of obedience to the emperor before consecration. After Otto's departure early in 964, John mas welcomed back by the Roman nobility, but he died on May 14 of the same year.

JOHN XIII. pope from 965 to 972, a member of a noble Roman family and bishop of Narni, was consecrated successor to Leo VIII on Oct. 1, 965. His election had been supervised by the bishops of Speyer and of Cremona, representing the emperor Otto I. Pope Benedict V, if not already dead, was safely out of the way. John's submissive attitude toward the imperial power mas so distasteful to the Romans that they expelled him from the city Otto secured his return and took savage vengeance on his enemies. Shortly after holding a council with the emperor at Ravenna in 967. he gave the imperial crown to Otto II at Rome in assurance of his succession to his father; and in 972 he also cronned Theophano as empress immediately before her marriage. He died on Sept. 6, 972.

.JOHN XIV (Petrus Canepanova), pope from 983 to 984, had been bishop of Pavia and archchancellor for Italy to the emperor Otto II. Otto designated him pope as successor to Benedict VII but died shortly after the pope's election, 'which took place in Nov. or Dec. 983. Then Boniface VII, on the strength of the popular feeling against the new pope, returned from Constantinople and placed John in prison, a-here he died (Aug. 20, 984) either of starvation or of poison.

JOHN XV, pope from 985 to 596, the successor of Boniface VII, was the son of Leo, a Roman presbyter. He became pope late in the summer of 985. His authority was hampered by Crescentius II, patrician of Rome. whose ambition was restrained by the presence of the empress-mother Theophano in Rome from 989 to 990 but became troublesome again after her departure. John died in March or April 596.

JOHN XVI (Philagathus), antipope from 997 to 998, a Calabrian Greek by birth from Rossano, was a favourite of the empress Theophano, from whom he had received the bishopric of Piacenza. In 995 he was sent by Otto III on an embassy to Constantinople to negotiate a marriage with a Greek princess. On his way back he either accidentally or at the special request of Crescentius II visited Rome. A little before this, Pope Gregory V, at the end of 996, had been compelled to flee from the city, and Philagathus in April or May 997 took the papal tiara from the hands of Crescentius. On Otto's advance on Rome at the end of the year John fled. In the following spring he was caught by a party of cavalry, blinded. mutilated and brought back to Rome. where he was degraded and relegated to a monastery. He is alleged to have survived until 1013.

JOHN XVII (Sicco), pope in 1003, succeeded Silvester II. It is disputed whether his consecration took place on May 16 or on June 13 and his death likewise on Nov. 6 or in December.

JOHN XVIII (Fasanus), pope from 1003 to 1009, a Roman, the successor of John XVII, was the mere creature of the patrician John Crescentius. who had him consecrated on Dec. 25, 1003. He eventually abdicated and retired to a monastery, where he died shortly afterward (June or July 1009).

JOHN XIX (Romanus, count of Tusculum), pope from 1024 to 1032, succeeded his brother Benedict VIII in April or May 1024. He took orders to enable him to ascend the papal chair, having previously been consul and senator. He agreed, on the payment of a large bribe, to grant to the patriarch of Constantinople the title of ecumenical bishop, but the general indignation compelled him almost immediately to withdraw from his agreement. On the death of the emperor Henry II in July 1024 he gave his support to Conrad II, who was crowned at St. Peter's on Easter Sunday. 1027. John died in 1032 (probably Oct. or Nov.)

JOHN XXI (Petrus Juliani, or Petrus Hispanus, that is, Peter of Spain): pope from 1276 to 1277, was a native of Lisbon. It is probably correct to identify him with the celebrated Portuguese physician and philosopher Petrus Hispanus. author of the ophthalmological treatise *Libev de oculo* (ed. with Ger. trans. by A. M. Berger, Munich, 1899) and of the textbook of logic *Summulae logicales,* who studied in Paris and taught for a time in Siena. In any case, the future pope was archbishop of Braga from about 1272 to 1275 and cardinal bishop of Tusculum from 1273. He was elected pope in succession to Adrian V and consecrated on Sept. 20, 1276, as John XXI (but for the error explained above, he would have been John XX). He was entertaining diplomatic relations with the Tatars with a view to joint action against the Moslems when he died, on May 20, 1277, of injuries caused by the fall of a newly constructed ceiling in his palace at Viterbo. His scientific skill gained him a reputation for magical powers.

(C. H. LE.; X.)

JOHN XXII (Jacques Duèse), pope from 1316 to 1334, a Frenchman, was born at Cahors *c.* 1244. After studying law at Montpellier, he became canon of Périgueux and Albi, dean of Puy and, in 1300, bishop of Fréjus. He was made chancellor to the Angevin king Charles II of Naples in 1308, bishop of Avignon in 1310, cardinal priest of San Vitale in 1312 and cardinal bishop of Porto in 1313. He had established himself at the papal court as legal adviser in the affair of the Templars. On the death of Clement V, the cardinals assembled at Carpentras were divided betn-een the Gascon and Italian interests! and it was only after the conclave had moved to Lyons and had been subjected to pressure from Philip of Poitiers (the future Philip V of France, at this time regent for the unborn John I) that they agreed on Duèse as a compromise candidate. On account of his advanced age, it was thought that his pontificate would be a short one, and he was elected on Aug. 7, 1316. After his coronation (Sept. 5), the pope moved in Oct. 1316 to Avignon, where he spent the rest of his life. The discovery that Hugues Géraud, bishop of Cahors. had made an attempt on the pope's life presaged a stormy pontificate.

John was faced with the task of restoring the prestige and independence of the papacy, which had been brought low by the subservience of Clement V to the French king. Moreover, Clement's huge bequests had emptied the papal treasury. John centralized ecclesiastical patronage to an extent hitherto unknown and, to finance the growing complexity of papal administration, created a new fiscal system. He extended to all countries the payment of annates and claimed for the papacy the right of spoil over vacant bishoprics. He extended the system of direct papal provision to benefices in all parts of the church, while his bull *Execrabilis* (1317) against plurality placed a new reservoir of vacant benefices at the pope's disposal. By these measures the rights of normal patrons were almost extinguished, direct papal provision becoming the regular method of filling bishoprics. The papal court at Avignon thus became the resort of all those who sought ecclesiastical preferment whether for themselves or for others, numbering king, bishops and universities among its clients.

The centralization of ecclesiastical appointments was accompanied by important changes in the pastoral organization of the church. The huge diocese of Toulouse was divided into six bishoprics and a new province was created. Eight other dioceses of southern France were subdivided. In Xragon. the province of Tarragona was divided into two archbishoprics. Tarragona and Saragossa An important achievement was the establishment of the ecclesiastical hierarchy in Persia and the setting up of the archbishopric of Soltania (Sultanieh) in 1318.

John's policy aroused strong opposition, especially from the Franciscan order, and many malcontents found a refuge at the court of Louis the Bavarian. who had been chosen as German king by the electors opposed to Frederick of Austria in Oct. 1314 *(see* LOUIS IV, Roman emperor). The pope and Louis came into bitter

conflict. The theocratic doctrine of papal sovereignty over the empire had been restated by Clement V, and as the German electors were still divided between Louis and Frederick, John maintained his predecessor's attitude. He called the dispute before him and in the meantime acted on the assumption that the empire was vacant, dismissing the officers of the former emperor and confirming Clement's appointment of Robert of Naples (son and successor of his old patron Charles) as imperial vicar in Italy. Louis's victory over his rival at Mühldorf (Sept. 1322) and his invasion of Lombardy were met by a sentence of excommunication (March 23, 1324). Louis appealed from the pope's sentence to a general council and accused John of heresy. The conflict gave rise to an ideological controversy which swept the European centres of learning. The doctrine of the lay state was expounded by William of Occam, by John of Paris and by Marsilius of Padua and was contested by the theorists of papal theocracy, the foremost of whom was Agostino Trionfo, a pupil of Thomas Aquinas. The unpopularity of Angevin rule in Italy enabled Louis to enter Rome in Jan. 1328 and to seek investiture from the deputies of the Roman people, and on Jan. 17 he was crowned emperor by Sciarra Colonna, the captain of the people. He then published a decree announcing the deposition of John XXII and caused a specially constituted college of 13, drawn from the Roman clergy, to elect instead a Franciscan Spiritual, Pietro Rainalducci, who took the name of Nicholas V. This antipope, however, found himself abandoned by all after Louis's departure from Italy (Jan. 1330) and soon submitted to John. John now placed his hopes in John, king of Bohemia, who was authorized to establish a kingdom in upper Italy. The prospect of Louis's being forced to abdicate the empire was dissipated by the pope's death, which took place on Dec. 4, 1334.

The contest between the papacy and the empire became linked with two bitter theological controversies which disturbed John's pontificate. One was the debate on the nature of evangelical poverty, the other concerned the doctrine of the Beatific Vision. For many years the Franciscan order had been rent between the Spirituals (those who maintained that poverty should be rigorous and absolute) and the Conventuals (who believed it lawful for the friars to possess property in common). In 1317 John's bull *Quorumdam exigit* settled against the Spirituals the vexed question of the Minorite habit and the legitimacy of keeping reserves of food, and protests from the Spirituals were firmly dealt with. But in 1321 an appeal by a Franciscan from the Inquisition of Narbonne reanimated the whole question of evangelical poverty. John threw the question open to discussion by cardinals and theologians. In 1322, however, the Franciscan general chapter at Perugia drew up an encyclical stating that the doctrine of Christ's poverty which the Inquisition had condemned was perfectly orthodox. John then issued two bulls, one of them *(Ad conditorem canonum,* 1322) renouncing Franciscan property which had been held to belong to the Holy See and of which the order was supposed merely to have the usufruct, the other *(Cum inter nonnullos,* 1323) condemning the declaration of Perugia as heretical. The Franciscan minister-general, Michael of Cesena, was cited to Avignon, where he was imprisoned. Michael escaped in May 1328 and fled with William of Occam and Bonagratia of Bergamo to the court of Louis the Bavarian. While the majority of the Franciscans submitted to the pope, a number followed the rebels into schism.

Late in 1331, John, who was not a trained theologian, preached a series of sermons at Avignon in which he advanced the novel doctrine that the souls of the just do not enjoy the Beatific Vision until after the general resurrection. The schismatical Franciscans seized eagerly on this statement and accused the pope of heresy. All his enemies called for a general council to judge him. Shortly before his death, however. John retracted these opinions in the presence of the cardinals gathered round his bed. It should be noted that John only claimed to be expressing an opinion as a private theologian on a point of doctrine which the church had never defined. The debate continued to rage after his death until it was closed by a dogmatic decision given by his successor Benedict XII in the constitution *Benedictus Deus* (1336). The fierce animosities aroused by John's policies have often obscured his real merits as an able and energetic governor of the church. His decretals, later gathered together under the title of *Extravagantes Iohannis XXII,* formed a significant addition to the corpus of canon law. (C. H. LE.)

JOHN XXIII (Baldassare Cossa), schismatic pope from 1410 to 1415, born of a good Neapolitan family, is said to have been a corsair before entering the service of the church under Boniface IX. Created cardinal deacon of S. Eustachio on Feb. 27, 1402, he later served as legate in Romagna and at Bologna. He was one of the cardinals who seceded from the obedience of Gregory XII in the summer of 1408 and joined with those who had at the same time deserted the antipope Benedict XIII to convene the council of Pisa (*q.v.*). This council elected a third rival pope in the person of Alexander V in June 1409; but he died in the following May. At Bologna, then, on May 17, 1410, Cossa was elected pope, apparently by a unanimous vote. Ordained priest on May 24, he was consecrated next day, taking the name of John XXIII. France, England and some of the Italian and German states recognized him as head of the church.

The struggle in which he and Louis II of Anjou were engaged with Ladislaus of Durazzo, king of Naples and Gregory XII's chief protector in Italy, at first went in John's favour. Louis's victory at Roccasecca (May 19, 1411) enabled him to enter Rome, but in 1412 he abandoned Louis and came to terms with Ladislaus. He then opened an abortive council in Rome. In the summer of 1413, however, Ladislaus turned against him and drove him from Rome, which was put to sack (June). John fled to Florence and appealed for help to Sigismund. king of the Romans. Sigismund made it a condition that the forthcoming council should meet at Constance, and, accordingly, John dispatched the bull of summons on Dec. 9, 1413. On Nov. 5, 1414, John opened the council of Constance. It soon became evident that his position was untenable. He had to take a solemn oath to abdicate if his two rivals, Benedict XIII and Gregory XII, would do the same. On the night of March 20–21, 1415, disguised as a layman, he escaped from Constance and eventually took refuge at Brisach. The news of his escape was received at Constance with an outburst of rage and led to the revolutionary decrees of the fourth and fifth sessions, which proclaimed the superiority of the council over the pope. His protector Frederick IV of Habsburg, duke of Further Austria and Tirol, was compelled to abandon John, who was taken to Radolfzell.

He was suspended from his functions as pope on May 14 and deposed on May 29. This act was irregular from the canonical point of view because the accusers do not seem to have actually proved the crime of heresy. Yet the condemned pope confirmed it, thus converting it into an act of abdication. He declared the council to be infallible and renounced any rights which he might still have in the papacy. This act of abdication can be cited against those who have appealed to the events of 1415 to maintain that a council can depose a pope who is *scandalizator ecclesiae.*

Cossa uas held prisoner for three years in Germany in the custody of the elector Louis III of the Palatinate but in 1418. on the elector's quarreling with Sigismund, he bought his freedom. He then threa himself on the mercy of the legitimate pope, Martin V. who on June 23, 1419, appointed him cardinal bishop of Tusculum, a dignity which he only enjoyed for a few months. He died on Nov. 22 (or, according to his epitaph, Dec. 22), 1419. There is a recumbent effigy of him, sculptured by Donatello at the behest of Cosimo de' Medici, on his tomb in the baptistery at Florence. (C. H. LE.; X.)

JOHN XXIII (Angelo Roncalli). elected pope on Oct. 28. 1958, was born on Nov. 25, 1881, in Sotto il Monte. Bergamo (Po valley), Italy. He studied at the Bergamo seminary and the Pontifical seminary in Rome, where he received his doctorate in theology. and was ordained on Aug. 10. 1904. He returned to Bergamo and became the bishop's secretary and professor in the seminary there. In World War I he served as an army chaplain. He went to Rome in 1921 as president of the Italian Society for the Propagation of the Faith, and in 1925 entered the diplomatic service of the Holy See. Consecrated March 19, 1925, as titular archbishop of Areopolis, he was appointed apostolic visitator in Sofia, Bulgaria

On Nov. 30, 1934, he was named titular archbishop of Mesembria and apostolic delegate in Istanbul, serving as papal envoy to both Greece and Turkey. In 1944 he was named apostolic nuncio to France and served in that post for eight years. Pope Pius XII proclaimed him cardinal on Jan. 12, 1953. Three days later the pope named him archbishop of Venice and patriarch of Venice. On Oct. 28, 1958, he was elected pope to succeed Pius XII, taking the name of John XXIII. In his first public address, on Oct. 29. he called on the leaders of all nations to use "the resources of human genius and the riches of the peoples" for peace.

JOHN I (JOHN TZIMISCES) (924–976), Byzantine emperor, was of noble Armenian descent. In 969, already a distinguished general and commander of the east, he gained the throne by the assassination of Nicephorus Phocas. He conciliated the patriarch by making various concessions to the church, but had to put down serious opposition, chiefly from the Phocas family, before he could concentrate on an energetic foreign policy. In his campaigns of 970 and of 971 he crushed the newly established Russian power, then threatening Constantinople, and extended theimperial frontier to the Danube, thus paving the way for the subjugation of the whole of Bulgaria. In the west, Tzimisces welcomed the emperor Otto I's overtures, and the princess Theophano, probably his niece, was married to Otto II. He sent an expedition to renew the war against the Arabs in 973 and himself led campaigns in 974 and in 975, recovering the middle reaches of the Euphrates and the inland parts of Syria. Before he could follow up these victories he died, probably of typhoid, in 976. In his short reign, he had given attention to all the frontiers of the empire, and he left it much strengthened. (T. A. R.)

JOHN II (JOHN COMNENUS) (108s–I143), Byzantine emperor, succeeded his father Alexius I Comnenus in 1118 and devoted his great gifts to raising the power and prestige of the empire further. An invasion of Petchenegs was quelled in 1122, and the Serbs were compelled to recognize imperial suzerainty. The threat from the growing Norman power in southern Italy was countered by an alliance with the western Roman emperor. Above all, John continued Alexius' reconquest of the eastern provinces. He subjugated the Armenians of Cilicia, drove the Turks from Anatolia and recovered domination of the seaboard of Asia Minor, both on the Black sea and on the Mediterranean, so that the empire again became a leading maritime power, although efforts to make Venice cede its trading privileges failed. His attempts to recover Antioch from the Franks were inconclusive, cut short as they were by his death in 1143. Outstanding for his humanity and for his moral qualities as well as for his military successes, John has been called "the greatest of the Comneni."

See F. Chalandon, ***Jean II Comnène et Manuel I Comnène*** (Paris, **1912).** (T. A. **R**)

JOHN III (JOHN VATATZES or DUCAS) (1193–1254), Byzantine emperor, succeeded his father-in-law Theodore I Lascaris in 1222, at Nicaea. By his skilled administration and diplomacy John built up the prosperity of the state of Nicaea and made it a strong political and military power. Having secured his eastern frontier by agreement with the Turks, he extended his European domination, obtaining supremacy over the despotates of Thessalonica and Epirus, while his fleet harassed the Latins in the Aegean and the provinces of Asia Minor were recovered. Constantinople was thus gradually encircled. Although he failed to take it himself, John made possible its recovery by the Byzantines.

(T. **A.** R.)

JOHN IV (JOHN LASCARIS) (c. 12 50– *c.* 1300). Byzantine emperor, was the son of Theodore II, who died in 1258, when John was eight. Michael Palaeologus conspired to make himself regent and, in 1261, dethroned and blinded the young emperor and imprisoned him in a remote castle, where he died c. 1300.

See A. Gardner, ***The Lascarids of Nicaea*** (London, 1912).

(T. **A.** R.)

JOHN V (JOHN PALAEOLOGUS) (1332–1391), Byzantine emperor, succeeded his father Andronicus III in 1341 as a child of nine and became sole ruler after the abdication of John VI Cantacuzenus (*q.v.*) in 1355. John Palaeologus tried in vain to get effective help from the west against the ever-increasing encroachments of the Turks. He sent appeals to the pope and, in 1355, signed a treaty promising the submission of the Byzantine Church to the papacy. Although this was done as the condition demanded for a crusade and, in any case, bore little relation to facts, it was not insincere, for John was Latin in sympathy through the influence of his mother, Anne of Savoy.

In 1369 he travelled to Rome, where he solemnly abjured the Orthodox faith before the pope on the steps of St. Peter's and became a Latin Catholic. But the western rulers remained indifferent. No crusade materialized. and in 1381 John was forced to recognize the suzerainty of the Ottoman sultan Murad I. Disintegration was completed by family discords. From 1376 to 1379 his son Andronicus was usurping his place in Constantinople; and in 1390 his grandson John (see JOHN VII) revolted against him. In 1391 the sultan Bayezid, enraged to hear that John had rebuilt some of the city fortifications, threatened to put out the eyes of his favourite son Manuel, whom he held as a hostage; Manuel escaped, but John had died under this last blow.

See O. Halecki, ***Un empereur de Byzance à Rome*** (Warsaw, 1930); also Averkios Papadopulos, ***Versuch einer Genealogie der Palaiologen*** (Speyer, 1938). (T. **A.** R.)

JOHN VI (JOHN CANTACUZENUS) (c. 1292–1383), Byzantine emperor, had been the friend and first minister of Andronicus III, on whose death in 1341 he acted as regent for the nine-year-old heir, John V Palaeologus. He was crowned emperor at Didymoteikhon when the opposition of the empress-mother Anne of Savoy and a powerful party drove him to civil war. In 1347 he was reconciled with John V, who married his daughter Helen; and Cantacuzenus became virtually sole ruler. His foreign policy was built on Turkish alliances, to enable him to deal with the menace of the new and ambitious Serbian empire and to strike at the Genoese, who were fighting for the monopoly of trade at Constantinople and in the Black sea. He tried to strengthen his government by establishing his sons as governors of Thrace and of the Peloponnesus, but the different factions opposing him gathered to support John V, who in 1352 reopened the war and in 1355 took the capital. Cantacuzenus abdicated shortly afterward and retired to a monastery. A man of letters, Cantacuzenus wrote an important history of his own times and was especially interested in theology. He supported the monk Palamas in the Hesychast controversy and read Thomas Aquinas with delight, discovering him through the translations made by his secretary Cydones.

(T. A. R.)

JOHN VII (JOHN PALAEOLOGUS) (*c.* 1370–1408), Byzantine emperor, was the son of Andronicus IV Palaeologus. Following his father's example and encouraged by the Ottoman sultan Bayezid I, he rebelled against John V in 1390 and held Constantinople for several months until driven out by his uncle Manuel. In 1399 Manuel, then emperor, was forced by Bayezid to make John his colleague; but he dethroned him in 1402. John's career illustrates the thoroughness of the Ottoman policy of destroying the Palaeologi by every means. (T. A. R.)

JOHN VIII (JOHN PALAEOLOGUS) (c. 1394–1448), Byzantine emperor, succeeded his father Manuel in 1425, after having already ruled with him since 1421. John made valiant attempts to organize his defense against the Turks without waiting for the attack. Campaigns in Greece (1427–29) led to the recovery of most of the Morea from Frankish hands; and in 1428 the great wall of Constantinople was restored. But the power of the Turks steadily increased under sultan Murad II and John took up the question of religious reunion as the only way to obtain assistance from the Christian west. After many delays the council of Ferrara-Florence was convened in 1438. John attended with numerous Orthodox prelates; and in 1439 compromise had been reached and the union was ratified. But on his return to Constantinople, John found new difficulties in the opposition of the majority of the Orthodox clergy and people to the union; nor, contrary to his expectations, did the decree of union produce immediate effective help from the west. The crusade was preached and some expeditions were attempted which inflicted damage on Murad, but they were ill-planned and rather halfhearted. Venice in particular followed only its own interests. Yet the Palaeologi themselves, with equal

iack of public concern, pursued their own quarrels, and John's reign was troubled by discord and civil war fostered by Murad, among his onn family. The news of a disaster inflicted by Murad on the latest crusade hastened his death, in 1448. (T. A. R.)

JOHN, Latin emperor of Constantinople: see JOHN (of (Brienne), king of Jerusalem.

JOHN II (1397–1479), king of Aragon, son of Ferdinand I and Eleanor of Albuquerque. born on June 29,1397, was one of the most stirring and unscrupulous kings of the 15th century. He was in continual conflict from boyhood to old age His efforts to deprive Charles, prince of Viana. his son by his first wife, Blanche of Navarre. of his constitutional right to act as lieutenant general of Aragon led to a long conflict with the Xragonese. which only ended with the death (1461) of the prince. caused, it was thought, by poison given him by his stepmother, Joan Henriquez. The Catalans had espoused Charles's cause and called in a succession of pretenders until they were reduced in 1472. John's war with the French king, Louis XI, leading to the cession of Roussillon to France, continued until his death (Jan. 20, 1479). He was succeeded by Ferdinand. his son by his second wife, and king of Castile by his marriage with Isabella.

See *Crdnicas de los reyes de Castilla,* Bib. de Autores Esp., Ixvi, lxvii; G. Zurita, *Anales de Aragon* (Saragossa, 1610); W. H Prescott, *History of the Reign of Ferdinand and Isabella* (1854); *G* Desderises du Dezert, *Don Carlos d'Aragón . . . Etude sur l'Espagne du Nord au XVe siècle* (Paris, 1889).

JOHN (1296–1346), king of Bohemia, was a son of the emperor Henry VII by his wife Margaret, daughter of John I, duke of Brabant, and was a member of the family of Luxembourg. Born on Aug. 10, 1296, he became count of Luxembourg in 1309, and about the same time was offered the crown of Bohemia, which, after the death of Wenceslas III, the last Premyslide king, in 1306, had passed to Henry, duke of Carinthia. The emperor accepted this offer on behalf of his son, who married Elizabeth (d. 1330), a sister of Wenceslas, and after Henry's departure for Italy John was crowned king of Bohemia at Prague (Feb. 1311). Henry of Carinthia was driven from the land, order restored and Moravia again united with Bohemia.

As imperial vicar John represented his father at the diet of Nuremberg (Jan. 1313), and was leading an army to his assistance in Italy when he heard of the emperor's death (Aug. 1313). John's claim to the imperial throne was disregarded on account of his youth, and he became a partisan of Louis, duke of Upper Bavaria, afterward the emperor Louis the Bavarian, whom he helped in his struggle against the rival claimant, Philip the Fair of Austria. While Bohemia) where John and his German followers were unpopular, relapsed into revolt and anarchy, he himself fought campaigns over all Europe.

He fought against the citizens of Metz and against his kinsman, John III, duke of Brabant; he led the knights of the Teutonic Order against the heathen in Lithuania and Pomerania and promised Pope John XXII to head a crusade; and. claiming to be king of Poland, he attacked the Poles and brought Silesia under his rule. He obtained Tirol by marrying his son. John Henry, to Margaret Maultasch, the heiress of the county, assisted the emperor to defeat and capture Frederick the Fair at the battle of Miihldorf (1322) and was alternately at peace and at war with the dukes of Austria and with his former foe, Henry of Carinthia. He several times assisted his brother-in-law, Charles IV of France, and his successor Philip VI, whose son John, afterward King John II, married a daughter of the Bohemian king. Soon after the battle of Miihldorf, the relations between John and the emperor became strained, partly because of the king's growing friendship with the papacy and with France, and partly because of territorial disputes. An agreement, however, was concluded, and John invaded Italy with a small following and made himself ruler of much of the peninsula (1331).

But John's soldiers were few and his enemies were many, and a second invasion of Italy in 1333 was followed by the dissipation of his dreams of making himself king of Lombardy and Tuscany, and even of supplanting Louis on the imperial throne. The fresh trouble between king and emperor, caused by this enterprise, mas intensified by a quarrel over the lands left by Henry of Carinthia, and still later by the interference of Louis in Tirol; and with bewildering rapidity John was allying himself with the kings of Hungary and Poland, fighting against the emperor and his Austrian allies, defending Bohemia, governing Luxembourg, visiting France, and negotiating with the pope. About 1340 the king was overtaken by blindness, but he continued to lead an active life, successfully resisting the attacks of Louis and his allies, and campaigning in Lithuania. In 1346, acting in union with Pope Clement VI, he secured the formal deposition of Louis and the election of his own son Charles, margrave of Moravia, as German king (July 1346). Then, journeying to help Philip of France against the English, he fought at the battle of Crécy, where his heroic death (Aug. 26, 1346) was a fitting conclusion to his adventurous life.

John was a chivalrous and romantic personage, but as a ruler he was careless and extravagant, interested only in his kingdom when seeking relief from his constant pecuniary embarrassments. According to Camden the crest of three ostrich feathers, with the motto *Ich dien,* borne by the prince of Wales, was originally that of John of Bohemia and was first assumed by Edward the Black Prince after the battle of Crécy. There is no proof, however, that this badge was ever worn by John—it certainly was not his crest—and its origin must be sought elsewhere.

See J. Schotter, *Johann, Graf von Luxemburg und Konig von Bohmen* (Luxembourg, 1865); *F.* von Weech, *Kaiser Ludwig der Bayer und Konig Johann von Böhmen* (Munich, 1860); U. Chevalier, *Répertoire des sources historiques,* tome v (Paris, 1905).

JOHN I (1358–1390), king of Castile, son of Henry II and Joan, daughter of John Manuel de Villena. Brought into conflict with John of Gaunt, who claimed the crown by right of his wife, Constance, daughter of Peter the Cruel, he bought off his English competitor by arranging a marriage (1387) between John of Gaunt's daughter Catherine and his son Henry. He settled his quarrel with Portugal, John of Gaunt's ally, by marrying Beatrix, daughter of the Portuguese king Ferdinand. On Ferdinand's death (1383), John claimed the Portuguese crown. He was resisted by the national sentiment and utterly defeated at Aljubarrota on Aug. 14, 1385. He died at Alcalá on Oct. 9, 1390.

JOHN II (1405–1454), king of Castile, son of Henry III of Castile and Catherine, daughter of John of Gaunt, born March 6, 1405. He succeeded his father on Dec. 25, 1406. One of the most incapable of kings, weak, amiable and dependent, he had no taste except for ornament, no serious interest except in amusements, verse making and tournaments. At first the tool of his favourite, Alvaro de Luna, he was persuaded to overthrow him by his second wife, Isabella of Portugal (mother of Isabella the Catholic). He died at Valladolid, July 20, 1454.

JOHN (1167–1216), king of England, the youngest son of Henry II by Eleanor of Aquitaine, was born at Oxford on Dec. 24, 1167. He was given the nickname of Lackland because, unlike his elder brothers, he received no apanage in the continental provinces. When only five John was betrothed to the heiress of Maurienne and Savoy, a principality which, as dominating the chief routes from France and Burgundy to Italy, enjoyed a consequence out of all proportion to its area. Later, when this plan had fallen through, he was endowed with castles, revenues and lands on both sides of the channel; the vacant earldom of Cornwall was reserved for him (1175); he was betrothed to Isabella, the heiress of the earldom of Gloucester (1176); and he was granted the lordship of Ireland with the homage of the Anglo-Irish baronage (1177). Henry II even provoked a civil war by attempting to transfer the duchy of Aquitaine from the hands of Richard Coeur de Lion to those of John (1183). In spite of the incapacity which he displayed in this war, John was sent a little later to govern Ireland (1185); but he returned in a few months, having alienated the loyal chiefs by his childish insolence and failed to defend the settlers from the hostile septs. He joined with his brother Richard and the French king Philip Augustus in the great conspiracy of 1189, and the discovery of his treason broke the heart of the old king (see HENRY II).

Richard on his accession confirmed John's existing possessions, married him to Isabella of Gloucester and gave him, besides

other grants, the entire revenues of six English shires, but excluded him from any share in the regency which was appointed to govern England during the third crusade and only allowed him to live in the kingdom because urged to this concession by their mother. Soon after the king's departure for the Holy Land it became known that he had designated his nephew, the young Arthur of Brittany, as his successor. John at once began to intrigue against the regents with the aim of securing England for himself. He picked a quarrel with the unpopular chancellor William Longchamp (*q.v.*), and succeeded! by the help of the barons and the Londoners, in expelling this minister. Not being permitted to succeed Longchamp as the head of the administration, John next turned to Philip Augustus for help. A bargain was struck, and when Richard was captured by Leopold. duke of Austria (Dec. 1192), the allies planned a partition of his dominions. They were. however, unable to win either English or Norman support and their schemes collapsed with Richard's return (March 1194). He magnanimously pardoned his brother, and they lived on not unfriendly terms for the next five years. On his deathbed Richard, reversing his former arrangements, caused his barons to swear fealty to John (1199), although the hereditary claim of Arthur was by the law of primogeniture undoubtedly superior.

England and Normandy, after some hesitation, recognized John's title; the attempt of Anjou and Brittany to assert the rights of Arthur ended disastrously with the capture of the young prince at Mirebeau in Poitou (1202). Originally accepted as a political necessity. John was soon detested by the people as a tyrant and despised by the nobles for his cowardice and sloth. He inherited great difficulties — the feud with France. the dissensions of the continental provinces, the growing indifference of England to foreign conquests, the discontent of all his subjects with a strict executive and severe taxation. But he cannot be acquitted of personal responsibility for his misfortunes. Astute in small matters, he had no breadth of view; his policy was continually warped by his passions or caprices; he flaunted vices of the most sordid kind with a cynical indifference to public opinion and shocked an age which was far from tenderhearted by his ferocity to vanquished enemies. He treated his most respectable supporters with ingratitude, favoured unscrupulous adventurers and gave a free rein to the licence of his mercenaries. Each of his great humiliations followed as the natural result of crimes or blunders. By his divorce from Isabella of Gloucester he offended the English baronage (1200); by his marriage with Isabella of Angoulême, the betrothed of Hugh of Lusignan, he gave an opportunity to the discontented Poitevins for invoking French assistance and to Philip Augustus for pronouncing against him a sentence of forfeiture. The murder of Arthur (1203) ruined his cause in Normandy and Anjou, though the story that the court of the peers of France condemned him for the murder is a fable. In the quarrel with Innocent III (1207–13; see LANGTON, STEPHES) he prejudiced his case by proposing a worthless favourite for the primacy and by plundering the clergy who bowed to the pope's sentences. Threatened with the desertion of his barons he drove all whom he suspected to desperation by his terrible severity toward the Braose family (1210); and by his misgovernment he irrevocably estranged the lower classes.

When submission to Rome had somewhat improved his position he squandered his last resources in a new and unsuccessful war with France (1214), and enraged the feudal classes by new claims for military service and scutages. The barons were consequently able to exact. in Magna Carta (June 121j), much more than the redress of legitimate grievances; and the people allowed the crown to be placed under the control of an oligarchical committee. When once the sovereign power had been thus divided. the natural consequence was civil war and the intervention of the French king, who had long watched for some such opportunity. John's struggle against the barons and Prince Louis (1216), afterward King Louis VIII. was the most creditable episode of his career. He died on Oct. 19. 1216.

John's second wife. Isabella of Angoulême (d. 1246). who married her former lover, Hugh of Lusignan, after the English king's death, bore the king two sons, Henry III and Richard, earl of Cornwall, and three daughters, Joan (1210–38), wife of Alexander II, king of Scotland. Isabella (d. 1241), wife of the emperor Frederick II, and Eleanor (d. 1274), wife of William Marshal, earl of Pembroke, and then of Simon de Montfort, earl of Leicester. John had also four illegitimate sons and a daughter, Joan or Joanna, who married Llewelyn I ab Iorwerth, prince of North Wales, and who died in 1236 or 1237.

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(H. W. C. D.)

JOHN I (b. and d. 1316). king of France, son of Louis X and Clemence, daughter of Charles Martel. who claimed to be king of Hungary, was born, after his father's death, on the night of Nov. 13–14, 1316. and died on Nov. 19. five days later. His uncle. later Philip V, has been accused of having caused his death, or of having substituted a dead child in his place; but nothing was ever proven. In 1358 a man called Giannino, in Florence, persuaded Louis I of Hungary that he was John I; but otherwise he met with little success and died in jail in Naples (1363).

See E. Leonard, "Louis I de Hongrie, protecteur du Re Giannino," *Rev. des études hongroises,* vi (Paris, 1928).

JOHN II (1319–1364), surnamed THE GOOD, king of France, son of Philip VI and Joan of Burgundy, succeeded his father in 13jo. At the age of 13 he married Bona of Luxembourg, daughter of John, king of Bohemia. Although an adept of chivalry and the founder of the Order of the Star, he was not popular with the nobility. who accused him of surrounding himself with worthless counsellors such as Simon de Buci, Robert de Lorris and Nicolas Braque. He suspected his vassals of treason and struck blindly at potential plotters. Thus his first act upon becoming king was to order the execution of the constable, Raoul de Brienne.

He was unable to prevent the resumption of the war with England in 1355, for which the states-general granted a liberal subsidy — though. distrusting John. they took upon themselves the control of the taxes. In Sept. 1356 John gathered the flower of his chivalry and attacked the Black Prince at Poitiers, where he mas defeated and made prisoner. Taken to England to await ransom. John was installed at first in the Savoy palace, then at Windsor, Hertford and Somerton and at last in the Tower. He was granted royal state with his captive companions. made a guest at tournaments and supplied with luxuries imported by him from France. The treaty of Brétigny (1360), which fixed his ransom at 3,000,000 crowns, enabled him to return to France, but although he imposed a heavy feudal "aid" on merchandise and various other taxes John was unable to pay the ransom. He returned of his own free will to England in Jan. 1364 and was received with great honour, lodged again in the Savoy and frequently entertained as Edward III's guest at Westminster. He died on April 8, and the body was sent back to France with royal honours.

See Henri, duc d'Aumale, *Notes et documents relatifs à Jean, roi de Franre, rt a sa captivité* (London, 1856); A. Coville in E. Lavisse (ed.), *Histoire de France,* vol. iv (Paris, 1902), and authorities cited there; R. Delachenal, *Histoire dr Charles V,* vol. i and ii (Paris, 1908).

JOHN (ZAPOLYA) (1487–1540), king of Hungary, was the son of the palatine Stephen Zapolya and the princess Hedwig of Teschen, and was born at the castle of Szepesvar. He began his public career at the famous Rakos diet of 1505, when: on his motion, the assembly decided that after the death of the reigning king, Wladislaus II, no foreign prince should be elected king of Hungary. Henceforth he became the national candidate for the throne, which his family had long coveted. In 1510 Zapolya sued in person for the hand of the princess Anne in vain, and his appointment to the voivody of Transylvania (1511) was with the evident intention of removing him far from court. In 1513 he renewed his suit. which was again rejected. In 1514 he stamped out the peasant rising under Dozsa (*q.v.*) with incredible brutality. This increased his popularity with the gentry, and, on the death of Wladislaus II. the second diet of Rakos (1516) appointed him the governor of the infant king Louis II. He now aimed at the dignity of palatine also, but the council of state and the court party combined against him and appointed Istvan (Stephen) Bathory instead (1519). The dissensions between Zapolya and Bathory were responsible for the fall of Belgrade (1521). In 1522 the court made Bathory sole captain general, against the wishes of the diet; thereupon Zapolya attempted to depose the palatine and other great officers of state. In the following year, horn-ever: the revolutionary Hatvan diet drove out all the members of the council of state and made Istvan Verboczy, the great jurist and a friend of Zapolya. palatine. In the midst of this hopeless anarchy, Suleiman I the Magnificent invaded Hungary and the young king perished with his army at Mohacs, Zapolya arriving too late to save the day. The court party accused him, but probably without ground. of deliberate treachery. The diets of Tokaj (Oct. 14) and Székesfehervar (Nov. 10) then elected Zapolya kipg of Hungary. and he mas crowned on Nov. 11.

A struggle with the rival candidate. the German king Ferdinand I, at once ensued (*see* HUNGARY: History). Zapolya receiving support from the Turks. In 1538, by the compact of Nagyvarad, Ferdinand recognized John as king of Hungary, but secured the right of succession on his death. Nevertheless John broke the compact by bequeathing the kingdom to his infant son John Sigismund under Turkish protection.

See Vilmos Fraknoi, *Ungarn vor der Schlacht bei Mohács* (Budapest, 1886); L. Kupelwieser, *Die Kämpfe Ungarns mit den Osmanen bis zur Schlacht bei Mohács* (Vienna, 1895).

JOHN (OF BRIENNE) (G. 1148–1237), king of Jerusalem and Latin emperor of Constantinople. the younger son of a Champenoise family, had reached the age of 60 and won some fame in 40 years of tournaments and fights when. in 1208, envoys from the Holy Land invited Philip II Augustus of France to select a husband for Mary, heiress of the kingdom of Jerusalem (daughter of Isabella and Conrad of Montferrat). Philip selected John, who had already taken part in the fourth crusade. John borrowed money from Philip and the pope. left for Palestine, married Mary and, on Oct. 3, 1210, was crowned at Tyre. In 1211, after desultory negotiation, he made a six-years truce with Malik al-Adil. His wife bore him a daughter, Isabella or Yolande, but died in 1212. John was prominent in the fifth crusade (1218–21); but the legate Pelagius claimed the command and. insisting against John's advice on the advance from Damietta, rejected the sultan's favourable terms, likewise against John's advice, until it was too late. John, however, saved the army when the Moslems surrounded it (July 1221). John then went to Europe to get help for his kingdom. In March 1223 he met Honorius III and the emperor Frederick II at Ferentino, where Frederick betrothed himself to John's daughter Isabella (now heiress of Jerusalem). John then travelled to France. England, Spain (Compostela) and Germany, returning to Rome in 122 j.

Frederick II then married Isabella at Brindisi (Nov. 9. 122 j) and at once demanded that John should abandon the title of king, which. he claimed. had passed to himself together with the heiress. The septuagenarian king was, however, still vigorous enough to avenge himself by commanding the papal troops that attacked southern Italy while Frederick was away on the sixth crusade (1228–29). Then, by the treaty of Perugia (April 1229), he accepted the throne offered to him in 1228 by the barons of the Latin empire of Constantinople. with the proviso that Baldwin of Courtenay should marry his second daughter Mary (the four-year-old child of his marriage to a Castilian princess) and succeed him. He reached Constantinople in the autumn of 1231, with a strong army, but in a reign of five and a half years achieved little toward the strengthening of the empire, though in 123j he repelled, with few troops, a great siege of the city by the Nicaean emperor John Vatatzes and Asen of Bulgaria. This last feat led the Latin chroniclers to compare him to Hector and the Maccabees. He died in March 1237.

See R. Grousset, *Histoire des croisades et du royaume franc de Jerusalem,* 3 vol. (Paris, 1935); J. Longnon, *L'Empire latin de Constantinople* (Paris, *1949);* E. de Montcarmet, *Un chevalier* du *temps passe'* (Limoges, 1876, *1881).*

JOHN III (SOBIESKI) (1624–1696), king of Poland, was the eldest son of James Sobieski. castellan of Cracow, and Theofila Danillowiczowna, granddaughter of the great hetman Zolkiewski. After being educated at Cracow he made the grand tour with his brother Mark and returned to Poland in 1648. He served against Chmielnicki and the Cossacks and was present at the battles of Beresteczko (1651) and Batoka (1652), but when the Swedes invaded Poland in 1654 he at once deserted to them and actually assisted them to conquer the Prussian provinces in 1655.

Next year, however, he again changed coats and helped Czarniecki expel the Swedes from the central Polish provinces. For his subsequent services to King John Casimir, especially in the Ukraine against the Tatars and Cossacks, he received the grand baton of the crown, or commandership in chief (1668). He had already (166 j) succeeded Czarniecki as acting commander in chief. His military capacities were extraordinary, but he was unscrupulous and absolutely self-seeking.

At the election diet of 1669 he accepted large bribes from Louis XIV to support one of the French candidates; after the election of Michael Wisniowiecki (June 19, 1669) he openly conspired, again in the French interest, against the king in an hour of the utmost national danger.

The plot he had formed with the primate Prazmowski and others was discovered in 1670 and disavowed by Louis; the traitors then appealed to the elector of Brandenburg against their own countrymen. Two years later they renewed the plot just as the Turks were advancing into Poland; and the king mas consequently forced to sign the disgraceful peace of Buczacz (Oct. 17. 1672) whereby Poland ceded to the Porte the entire Ukraine with Podolia and Kamieniec.

Sobieski himself partially retrieved the situation by winning four victories in ten days. The peace of Buczacz was repudiated, and Sobieski defeated the Turks brilliantly at Khotin (Nov. 10, 1673). The same day King Michael died, and Sobieski, abandoning the frontier to its fate, hastened to the capital to secure the throne. Appearing at the elective diet of 1674 at the head of 6,000 veterans, he overawed every other competitor and, despite the persistent opposition of the Lithuanians, was elected king (May 21). He was then obliged to return at once to the Ukraine. He attempted to negotiate with the sultan and the Tatar khan; to entrust the whole guardianship of the Ukraine to the Cossacks, and himself concentrate the regulars and militia at Lemberg. The Polish gentry, however, failed to support him, and he faced the Turk alone. with a few devoted lieutenants. Returning to Cracow to be crowned (Feb. 14. 1676), he renewed the campaign and at last recovered by special treaty two-thirds of the Ukraine, but without Kaniieniec (treaty of Zaravno, Oct. 16, 1676).

Sobieski hoped now to establish absolute monarchy in Poland; but Louis XIV looked coldly on the project and relations between France and Poland .gradually grew more strained until on March 31, 1683, Sobieski signed the treaty with the emperor Leopold against the Turks which mas the prelude to the most glorious episode of his life, the relief of Vienna and the liberation of Hungary from the Ottoman yoke. The epoch-making victory of Sept. 12, 1683, was ultimately decided by the charge of the Polish cavalry led by Sobieski in person. Poland profited little by this triumph, being left to fight on in the Ukraine with whatever as-

sistance it could obtain from the unwilling and unready Muscovites. The last 12 years of the reign of John III were a period of humiliation and disaster. A treasonable senate! a mutinous diet, ungrateful allies. surrounded him.

His last campaign (in 1690) was an utter failure, and the last years of his life were embittered by the violence and the intrigues of his dotingly' beloved wife, Marya Kazimiera d'Arquien, by whom he had three sons. James. Alexander and Constantine. He died on June 17, 1696, disillusioned and brokenhearted.

See E. *H.* R. Tatham, *John Sobirski* (Oxford, 1881); Kazimierz Waliszewski, *Archives of French Foreign Affairs, 1674–1696,* v (Cracow, 1881); Ludwik Piotr Leliwa, *John Sobirski and His Times* (Pol.) (Cracow, 1882–85); Georg Rieder, *Johann Sobieski in Wien* (Vienna, 1882.)

JOHN I (1357–1433), king of Portugal, the natural son of Pedro I (el *Justicieiro*), was born at Lisbon on April 22. 13j7. and in 1364 was created grand master of Aviz. On the death of his lawful brother Ferdinand I, without male issue, in 1383, efforts were made to secure the succession for Beatrice: the only child of Ferdinand I, who as heiress apparent had been married to John I of Castile (Spain). John was after violent tumults proclaimed protector and regent in the following December. In April 1385 he mas unanimously chosen king by the estates of the realm at Coimbra. The king of Castile invaded Portugal, but his army was compelled by pestilence to withdraw, and subsequently by the decisive battle of Aljubarrota (Aug. 14. 138j) the stability of John's throne was permanently secured. Hostilities continued intermittently until John of Castile died. without leaving issue by Beatrice. in 1390. In 141j Ceuta was taken from the Moors by his sons who had been born to John by his wife Philippa. daughter of John, duke of Lancaster. John I died on Aug. 14, 1433, in a reign which had been characterized by great prudence, ability and success; he was succeeded by his son Edward or Duarte.

See J. P. Oliveira Martins, *Os filhos de D. João I.* and *A vida de Nun' Alvares,* 2nd ed. (Lisbon, 1894; English translation mith adds, etc. by T. T. Abraham, 1911); F. M. Esteves Pereira, *Livro da Montaria* (1918).

JOHN II (1455–1495), THE PERFECT, king of Portugal. succeeded his father. Alphonso V. in Aug. 1481. He first curtailed the overgrown power of his aristocracy; noteworthy incidents in the contest were the execution (1483) of the duke of Braganza for correspondence with Castile, and the murder. by the king's own hand. of the youthful duke of Viseu for conspiracy. This reign was signalized by Bartholomeu Diaz' discovery of the Cape of Good Hope in 1488. Maritime rivalry led to disputes between Portugal and Castile until their claims were adjusted by the famous treaty of Tordesillas (June 7. 1494). John II died. without leaving male issue. in Oct. 1495, and was succeeded by his brother-in-law Emmanuel (Manoel) I.

See J. P. Oliveira Martins. *O principe perfeito* (Lisbon, 1895).

JOHN III (1502–1557), king of Portugal, born at Lisbon on June 6. 1502, succeeded his father Emmanuel I in Dec. 1521. In 1524 he married Catherine, sister to the emperor Charles V, who shortly afterward married the infanta Isabella. John's sister. John III became subservient to the clerical party among his subjects, with disastrous consequences to the commercial and social prosperity of his kingdom. He died on June 6. 1j57, and was succeeded by his grandson Sebastian. a child aged three years.

JOHN IV (1603–1656), THE FORTUNATE, king of Portugal, founder of the Braganza dynasty, was born at Villaviciosa on March 19, 1603. succeeded to the dukedom of Braganza in 1630 and married Luisa de Guzman, eldest daughter of the duke of Medina Sidonia, in 1633.

By the unanimous voice of the people he was raised to the throne of Portugal (of which he was held to be the legitimate heir) at the revolution effected in Dec. 1640 against the Spanish king. Philip IV. His accession led to a protracted war with Spain, which only ended with the recognition of Portuguese independence in a subsequent reign (1668). He died on Nov. 6, 1656, and was succeeded by his son Alphonso VI.

JOHN V (1689–17jo), king of Portugal. was born at Lisbon on Oct. 22, 1689, and succeeded his father Pedro II in Dec. 1706, being proclaimed on Jan. 1, 1707. One of his first acts was to intimate his adherence to the grand alliance, which his father had joined in 1703. Accordingly his general Das Minas. with Lord Galway, advanced into Castile, but was defeated at Almanza (April 14).

In Oct. 1708 he married Maria Anna, daughter of Leopold I, thus strengthening the alliance with Austria: the series of unsuccessful campaigns which ensued ultimately terminated in a favourable peace with France in 1713 and with Spain in 1715. John was entirely under the domination of the clergy, and the title "Most Faithful King" was bestowed upon him and his successors by a bull of Pope Benedict XIV in 1748. The army. navy and other branches of administration were neglected in favour of the church. John I' died on July 31, 1750, and was succeeded by his son Joseph.

JOHN VI (1769–1826), king of Portugal. son of Peter III, was born at Lisbon on May 13. 1769. and received the title of prince of Brazil in 1788. In 1792 he assumed the reins of government in the name of his mother Queen Mary I. who had become insane. In 1799 he assumed the title of regent, which he retained until his mother's death in 1816. (For the political history of his regency, the French occupation and the English peninsular campaign see PORTUGAL.) In 1816 he was recognized as king of Portugal but he continued to reside in Brazil. whither he had fled from the French in 1807. The consequent spread of dissatisfaction resulted in the peaceful revolution of 1820 and the proclamation of a constitutional government, to which he swore fidelity on his return to Portugal in 1822. In the same year. and again in 1823, he had to suppress a rebellion led by his son Dom Miguel, whom he banished in 1824. John recognized the independence of Brazil in 1825. He died at Lisbon on March 26, 1826, and was succeeded by Pedro IV.

JOHN (JOHN NEPOMUK MARIA JOSEPH (1801–1873), king of Saxony, son of Prince Maximilian of Saxony and his wife Caroline of Parma (d. 1804). was born at Dresden on Dec. 12, 1801. As a boy he took a keen interest in literature and art (also in history. law and political science), and studied with the greatest ardour classical and German literature (Herder, Schiller. Goethe). He soon began to compose poetry himself, and drew great inspiration from a journey in Italy (1821–22), the pleasure of which was however darkened by the death of his brother Clemens. In Pavia the prince met with Biagioli's edition of Dante, and this gave rise to his lifelong and fruitful studies of Dante. The first part of his German translation of Dante was published in 1828. and in 1833 appeared the complete work, with a valuable commentary. Several new editions appeared under his constant supervision, and he collected a complete library of works on Dante.

By his marriage with Amalia of Bavaria. John became the brother-in-law of Frederick William IV. king of Prussia, with whom he had a deep and lasting friendship. His wife died on Nov. 8, 1877, having borne him nine children, two of whom, Albert and George, later became kings of Saxony.

On his return to Dresden, John was called in 1822 to the privy board of finance (*Geheimes Finanzkollegium*) and in 1825 became its vice-president. He entered the privy council in 1830. During the revolution in Saxony he helped in the pacification of the country, became commandant of the new national guard. the political tendencies of which he tried to check. and took part in the organization of the constitution of Sept. 4. 1831. On the death of his brother Frederick Augustus II. John became: on Aug. 9, 1854, king of Saxony. He advocated the formation of a confederation of the smaller German states independent of Prussia and Austria. He supported Austria against Prussia at the diet of princes in 1863. but he rallied to the North German confederation after 1866 and dismissed Beust (*q.v.*), who had hitherto directed Saxon foreign policy. In the war of 1870–71 with France his troops fought with conspicuous courage. He died at Dresden on Oct. 29. 1873.

See H. Ermisch, *Die Wettiner und die Landesgeschichte* (Leipzig, 1902); O. Kaemmel. *Sachsische Geschichte* (Leipzig, 1899, Sammlung Goschen). His son John George edited his correspondence mith Frederick William IV and Wilhelm I (1911), and with George Ticknor (1920)

JOHN I (d. 1294), duke of Brabnnt and Lorraine. surnamed THE VICTORIOUS. was the second son of Duke Henry III (d. 1261)

and Alice of Burgundy. In 126; his elder brother Henry mas deposed in his favour. John married as his first wife Margaret, daughter of Louis IX of France, in 1271. On her death he married (1273j Margaret of Flanders, daughter of Guy of Dampierre. His sister Mary was married in 1274 to Philip III (the Bold) of France. During the reign of Philip and his son Philip IV there were close relations of friendship and alliance between Brabant and France. After Waleran IV's death in 1279 or 1280 the succession to the duchy of Limburg was disputed. His heiress, Ermengardc, had married Reynald I. count of Gelderland. She died childless. but her husband continued to rule in Limburg, although his rights were disputed by Count Adolph of Berg, nephew to Waleran IV. *(See* LIMBURG.)

Not being strong enough to eject his rival. Adolph sold his rights to John of Brabant. who was eager to control the major commercial road from Cologne to Flanders, and hostilities broke out in 1283. Harassed by desultory warfare and endless negotiations and seeing no prospect of holding his own against the powerful duke of Brabant; Reynald made over his rights to Henry III. count of Luxembourg, who was a descendant of Waleran III of Limburg. Henry III was sustained by the archbishop of Cologne and other allies. as well as by Reynald of Gelderland. The duke of Brabant at once invaded the Rhineland and laid siege to the castle of Woeringen near Bonn. There he defeated the forces of the confederacy on June j, 1288. Limburg was henceforth attached to the duchy of Brabant. John consolidated his conquest by giving his daughter in marriage to Henry of Luxembourg (1291). In order to further the economic development of Brabant, he kept on friendly terms with Edward I of England. He died of a wound received at a tournament at Bar (May 3, 1294).

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JOHN or HANS (1j13–1571), margrave of Brandenburg-Ciistrin. was the younger son of Joachim I, elector of Brandenburg, and was born at Tangermünde on Aug. 3, 1513. In spite of the *dispositio Achillea* which decreed the indivisibility of the electorate. John inherited the new mark of Brandenburg on his father's death in July 1535. He had been brought up as a strict Catholic. but in 1538 ranged himself definitely on the side of the Reformers. He joined the league of Schmalkalden, but was won over to the imperial side. After the conclusion of the war. the relations between John and Charles became somewhat strained. The margrave opposed the Augsburg *Interim* (1548), and he was the leader of the princes who formed a league for the defense of the Lutheran doctrines in Feb. 1j50. After some differences of opinion with Maurice, elector of Saxony, however, he returned to the emperor's side.

His remaining years were mainly spent in the new mark. which he ruled carefully and economically. He purchased Beeskow and Storkow, and fortified the towns of Ciistrin and Peitz. He died at Ciistrin on Jan. 13, 1571. His wife Catherine was a daughter of Henry II, duke of Brunswick, and as he left no sons the new mark passed on his death to his nephew John George, elector of Brandenburg.

See Berg, *Beiträge zur Gesckichte des Markgrafen Johann von Küstrin* (Landsberg, 1903).

JOHN (1371–1419), duke of Burgundy, called THE FEARLESS (*Sans Peur*), son of Philip the Bold, duke of Burgundy, and Margaret of Flanders. was born at Dijon on May 28. 1371. On the death of his maternal grandfather in 1384, he received the title of count of Nevers. which he bore until his father's death. He married in 1385 Margaret, daughter of Duke Albert of Bavaria, an alliance which consolidated his position in the Netherlands. In the spring of 1396 he took arms for Hungary against the Turks and on Sept. 28 was taken prisoner by the sultan Bayezid I at the bloody battle of Nicopolis, where he earned his surname of "the Fearless." He did not recover his liberty until 1397, and then only by paying an enormous ransom. He succeeded his father in 1404, and immediately found himself in conflict with Louis of Orléans, the yopng brother of Charles VI. The history of the following years is filled with struggles between these two princes and with their attempts to seize the authority in the name of the demented king.

John endeavoured to strengthen his position by marrying his daughter Margaret to the dauphin Louis and by betrothing his son Philip to a daughter of Charles VI. Like his father, he looked for support to the popular party. to the tradesmen. particularly the powerful guild of the butchers, and also to the University of Paris. In 1405 he opposed in the royal council a scheme of taxation proposed by the duke of Orléans. which was nevertheless adopted. Louis retaliated by refusing to sanction the duke of Burgundy's projected expedition against Calais. whereupon John quitted the court in chagrin on the pretext of taking up his mother's heritage. He was, however, called back to the council to find that the duke of Orléans and the queen had carried off the dauphin. John succeeded in bringing back the dauphin to Paris. and open war seemed imminent between the two princes. But an arrangement was effected in Oct. 1405, and in 1306 John was made by royal decree guardian of the dauphin and the king's children.

The struggle, box-ever, soon revived with increased force. On Nov. 20. 1407, the two princes a-ere formally reconciled by their uncle. the duke of Berry, but three days later Louis was assassinated by John's orders in the Rue Barbette, Paris. John abruptly left Paris. His vassals, however. showed themselves determined to support him in his struggle against the avengers of the duke of Orléans. The court decided to negotiate, and called upon the duke to return. John entered Paris in triumph, and instructed the Franciscan theologian Jean Petit (d. 1411) to pronounce an apology for the murder. But he was soon called back to his estates by a rising of the people of Liège against his brother-in-law, the bishop of that town. The queen and the Orléans party took every advantage of his absence and had Petit's discourse solemnly refuted. John's victory over the Liègeois at Hasbain on Sept. 23, 1408, enabled him to return to Paris. where he was reinstated in his ancient privileges. By the peace of Chartres (March 9, 1409) the king absolved him from the crime, and an edict of Dec. 27, 1409, gave John the guardianship of the dauphin. A new league mas formed against the duke of Burgundy by Bernard, count of Armagnac. from whom the party opposed to the Burgundians took its name. The peace of Bicêtre (Nov. 2. 1410) prevented the outbreak of hostilities; but in 1411, in consequence of ravages committed by the Armagnacs in the environs of Paris, the duke of Burgundy was called back to Paris. He relied more than ever on the support of the popular party. which then obtained the reforming *Ordonnance Cabochienne* (so called from Simon Caboche, a prominent member of the guild of the butchers). But the bloodthirsty excesses of the populace brought a change. John was forced to withdraw to Burgundy (Aug. 1413), and the University of Paris and John Gerson once more censured Petit's propositions. Meanwhile John negotiated with the court and also with the English. His troops took no part in the battle of Agincourt (1415), where. however, two of his brothers, Anthony, duke of Brabant, and Philip, count of Nevers, fell fighting for France.

In 1417 John made an attack on Paris, which failed through his loitering at Lagny; but on May 30, 1418, a traitor, one Perrinet Leclerc, opened the gates of Paris to the Burgundian captain, Villiers de l'Isle Adam. The dauphin. afterward King Charles VII, fled, and John betook himself to the king. who promised to forget the past. John. however, did nothing to prevent the surrender of Rouen. which had been besieged by the English, and on which the fate of the kingdom seemed to depend; and the town was taken in 1419. The dauphin then decided on a reconciliation, and on July 11 the two princes swore peace on the bridge of Pouilly. near Melun. A fresh interview was proposed by the dauphin and took place on Sept. 10, 1419, on the bridge of Montereau, when the duke of Burgundy was felled with an axe by Tanneguy du Chastel, one of the dauphin's companions, and done to death by the other members of the dauphin's escort. His body was removed to the Chartreuse of Dijon and placed in a magnificent tomb sculptured by Juan de la Huerta; the tomb was afterward transferred to the museum in the *hôtel de ville*.

See A. G. P. Baron de Barante, *Histoire des ducs de Bourgogne*

(Brussels, 1835–36); B. Zeller, *Louis de France et Jean sans Peur* (Paris, *1886)*; and E. Petit, *Itinéraire de Philippe le Hardi et de Jean sans Peur* (Paris, 1888).

JOHN (1468–1532), elector of Saxony, called THE STEADFAST, fourth son of the elector Ernest, was born on June 30, 1468. In 1486, when his eldest brother became elector as Frederick III, John received a part of the paternal inheritance. He was an early adherent of Luther and, becoming elector of Saxony by his brother's death in May 152j, helped Philip. landgrave of Hesse, to found the league of Gotha, formed in 1 j26 for the protection of the Reformers. He was active at the diet of Speyer in 1526, and the recess of this diet gave him an opportunity to reform the church in Saxony, where a plan for divine service was drawn up by Luther. He signed the protest against the recess of the diet of Speyer in 1529, being thus one of the original Protestants, and opposed Charles V at the diet of Augsburg in 1530. He signed the Augsburg Confession, and was alone among the electors in objecting to the election of Ferdinand, afterward the emperor Ferdinand **I.** as king of the Romans. He was among the first members of the league of Schmalkalden, assented to the peace of Nuremberg in 1532 and died at Schweidnitz on Aug. 16, 1532.

See J. Becker, *Kurfürst Johann von Sachsen und seine Beziehungen zu Luther* (Leipzig, 1890).

JOHN, DON (1545–1578), of Austria. mas the natural son of the emperor Charles V by Barbara Blomberg, the daughter of an opulent citizen of Regensburg. He was born in Regensburg on Feb. 24, 1545, and at first confided under the name of Geronimo to foster parents of humble birth, at a village near Madrid; but in 1554 transferred to the charge of Madalena da Ulloa, the wife of Don Luis de Quijada, and brought up in ignorance of his parentage at Quijada's castle of Villagarcia, near Valladolid. Charles V in a codicil of his will recognized Geronimo as his son and recommended him to the care of his successor. In Sept. 1 j59 Philip II of Spain publicly recognized the boy as a member of the royal family, and he was known at court as Don Juan de Austria. Although first intended for a monk, Don John preferred a military career. In 1568 he commanded a fleet of galleys against Algerian corsairs; in 1569–70 he conducted operations against the rebel Moriscos in Granada; and in 1571 commanded the fleet which won the great victory of Lepanto against the Turkish fleet (Oct. 7, 1571).

This great triumph aroused Don John's ambition and filled his imagination with schemes of personal aggrandizement. He thought of erecting first a principality in Albania and the Morea, and then a kingdom in Tunis. But the conclusion by Venice of a separate peace with the sultan put an end to the league, and though Don John captured Tunis in 1573, it was again speedily lost. Philip II refused to support Don John's schemes. and even withheld from him the title of infante of Spain. At last. however, he was appointed (1576) governor general of the Netherlands, in succession to Luis de Requesens, in the hope that his prestige and activities would prove sufficient to put down the widespread revolt against Spanish rule headed by William of Orange. Confronted by the refusal of the states-general to accept him as governor unless he assented to the conditions of the Pacification of Ghent, swore to maintain the rights and privileges of the provinces and to employ only Netherlanders in his service. Don John, after several months of fruitless negotiations, was obliged to give way and sign the "perpetual edict" complying with these terms (Huey, Feb. 12, 1577). On May 1 he entered Brussels, but he found himself governor general only in name, and the prince of Orange master of the situation. In July he suddenly betook himself to Namur and withdrew his concessions. William of Orange forthwith took up his residence at Brussels, and gave his support to the archduke Matthias, afterward emperor, whom the states-general accepted as their sovereign. Meanwhile Philip had sent large reinforcements to Don John under his cousin Alexander Farnese. Don John now attacked and defeated the patriot army at Gemblours (Jan. 31. 1578). Lack of funds prevented him, however, from following up his victory. After a summer of forced inactivity, he was attacked by fever and died on Oct. 1, 1578.

See Sir W. Stirling Maxwell, *Don John of Austria 1547–1575* (1883); the bibliography under PHILIP II OF SPAIN.

JOHN, DON (1629–1679), of Austria, the younger, was recognized as the natural son of Philip IV, king of Spain, his mother, Maria Calderon or Calderona, being an actress. Scandal accused her of a prodigality of favours which must have rendered the paternity of Don John very dubious. He was, however, recognized by the king, received a princely education at Ocaiia and was amply endowed with commanderies in the military orders and other forms of income. Don John was sent in 1647 to Naples to support the viceroy against the popular rising led by Masaniello. He was then made viceroy of Sicily but in 1651 recalled to complete the pacification of Catalonia, presiding over the final siege of Barcelona and the convention which terminated the reyolt in Oct. 1652. On both occasions he had played the peacemaker, and this sympathetic part, combined with his own pleasant manners and handsome person with bright eyes and abundant raven-black hair—a complete contrast with the fair complexions of the Habsburgs—made him a popular favourite. In 16j6 he was sent to command in Flanders, in combination with the prince of Condé, then in revolt against his own sovereign. At Valenciennes in 1656 Don John displayed brilliant personal courage at the head of a cavalry charge, but was completely defeated at the Dunes in 1658 by Turenne. During 1661 and 1662 he commanded against the Portuguese in Estremadura. with some success until in 1,663 the Portuguese mere reinforced by English troops and put under the command of the Huguenot Schomberg. By him Don John was cosnpletely beaten at Estremos. The unsuccessful campaign was partly the result of Don John's own indolence; but it was chiefly the jealousy of his father's wife. Queen Mariana, that caused him to be removed from command and sent to his commandery at Consucgra. After the death of Philip IV in 1665 Don John became the recognized leader of the opposition to the government of Phiiip's widow, the queen regent. against whom he headed a rising of Aragon and Catalonia. which led to the expulsion of her favourite. Nithard (1669). Don John was. however, forced to content himself with the viceroyalty of Aragon. In 1677 the queen mother having aroused universal opposition, Don John was able to drive her from court and establish himself as prime minister. Great hopes were entertained of his administration, but it proved disappointing and was of short duration. He died on Sept. 17, 1679.

JOHN OF ASIA (or OF EPHESUS) (b. c. 505), a leader of the Monophysite Syriac-speaking Church in the 6th century and one of the earliest and most important of Syriac historians. Born at Amid (Diarbekr) about 505, he was there ordained as a deacon in 529; but in 534 he'was in Palestine, and in 53j he passed to Constantinople on account of pestilence or persecution. In Constantinople he seems to have early won the notice of Justinian, who desired the consolidation of eastern Christianity as a buln-ark against the heathen power of Persia. He was entrusted with the administration of the entire revenues of the Monophysite Church. He was also sent, with the rank of bishop, on a mission in Asia Minor, and informs us that the number of those whom he baptized amounted to 70,000. He built a large monastery at Tralles on the hills skirting the valley of the Meander, and more than 90 other monasteries. He promoted a mission to the Nubians. In 546 the emperor entrusted him with the task of rooting out the secret practice of idolatry in Constantinople and its neighbourhood. But his fortunes changed soon after the accession of Justin II. About 571 Paul of Asia began (with the sanction of the emperor) a rigorous persecution of the hfonophysite Church leaders, and John was among the sufferers. He died probably soon after 585.

John's main work was his *Ecclesiastical History,* in three parts, which covered more than six centuries, from the time of Julius Caesar to 585. The first part seems to have wholly perished. The second, which extended from Theodosius II to the sixth or seventh year of Justin II, was (as F. Nau has proved) reproduced in the third part of the *Chronicle* once attributed to the patriarch Dionysius Telmaharensis. The third part of John's history, covering the years 571–585, survives in a fairly complete state in Add. 14640, a British Museum manuscript of the 7th century, This third part was edited by Cureton (Oxford, 1853), and was translated into English by R. Payne-Smith (Oxford, 1860) and into German by J. M. Schonfelder (Munich, 1862). John's other known work was a series of *Biographies of Eastern Saints,* compiled about 569. These have been edited by Land in *Anecdota*

Syriaca, ii, 1–288, and translated into Latin by Douwen and Land (Amsterdam, 1889). *See* a memoir read beiore the five French Academies (Oct. 25, 1892) by the abbé Duchesne.

JOHN OF BRIENNE: *see* JOHN (of Brienne), king of Jerusalem.

JOHN OF GAUNT, duke of Lancaster; *see* LANCASTER, JOHN OF GAUNT, duke of.

JOHN OF HEXHAM (*fl.* 1160–1209), English chronicler, is known merely as the author of a work called the *Historia XXV annorum,* which continues the *Historia regum* of Simeon of Durham and contains an account of English events 1130–53. He was prior of Hexham between 1160 and 1209. Up to the year 1139 he follows closely the history written by his predecessor. Prior Richard; thenceforward he is an independent though not a very valuable authority.

The one manuscript of John's chronicle is a 13th-century copy; manuscript C. C. C. Cambridge, cxxxix, 8. The best edition is that of T. Arnold in *Symeonis monachi operq,* vol. ii, "Rolls Series" (1885). There is an English translation in J. Stevenson, *Church Historians of England,* vol. iv (1856).

JOHN OF IRELAND (JOHANNIS DE IRLANDIA) (*fl.* 1480), Scottish writer, perhaps of Lowland origin, was resident for 30 years in Paris and later a professor of theology. He was confessor to James IV and also to Louis X I of France, and was rector of Yarrow (de Foresta) when he completed, at Edinburgh. the work on which rests his sole claim as a vernacular writer.

This book, preserved in manuscript in the Advocates' library, Edinburgh (manuscript 18. 2, 8), and labeled "Johannis de Irlandia opera theologica," is a treatise in scots on the wisdom and discipline necessary to a prince, especially intended for the use of the young James IV. The book is the earliest extant example of original Scots prose.

See the notices in John Lyden's introduction to his edition of the *Complaynt of Scotlande* (1801); ***The*** *Scottish Antiquary,* xiii and xv. Annotated extracts are given in Gregory Smith, *Specimens of Middle Scots* (1902).

JOHN OF RAVENNA. Two distinct persons of this name. formerly confused and identified with a third (anonymous) Ravennese in Petrarch's letters. lived at the end of the 14th and the beginning of the 1 jth century.

1. A young Ravennese born about 1347, who in 1364 went to live with Petrarch as secretary. In 1367 he set out to see the world and make a name for himself, returned in a state of destitution, but, growing restless again, left his employer for good in 1368.

2. Son of Conversanus (Conversinus, Convertinus). He is first heard of (Nov. 17, 1368) as appointed to the professorship of rhetoric at Florence, where he had for some time held the post of notary at the courts of justice. This differentiates him from (1). He entered (*c.* 1370) the service of the ducal house of Padua, the Carraras. in which he continued at least until 1404, during part of which time he was professor of rhetoric at Padua. In 1406 he is last heard of living at Venice. His history of the Carraras, a tasteless production in barbarous Latin. says little for his literary capacity; but as a teacher he enjoyed a great reputation. among his pupils being Vittorino da Feltre and Guarino of Verona.

3. Malpaghini (De Malpaghinis), the most important. Born about 1356, he was a pupil of Petrarch from a very early age to 1374. On Sept. 19. 1397, he was appointed professor of rhetoric and eloquence at Florence. and he died in May 1417. Although Malpaghini left nothing behind him, he did much to encourage the study of Latin; among his pupils was Poggio Bracciolini.

The local documents and other authorities on the subject will be found in E. T. Klette, *Beiträge zur Geschichte und Litteratur der italienischen Gelehrtenrenaissance,* vol. i (1888); *see* also G. Voigt, *Die Wiederbelebung des klassischen Altertums,* 3rd ed. (1893), who, however, identifies (1) and (2).

JOHN OF SALISBURY (*c.* 111j–1180), English author. diplomatist and bishop of Chartres, was born at Salisbury. From his own accounts, he seems to have crossed to France in 1136 and to have studied for the next ten years under Abelard, Alberich of Reims. Robert of Melun. Gilbert de la Porrée, Robert Pullus. Simon of Poissy, William of Conches and Richard l'Evêque. From the last two. who were disciples of Bernard of Chartres. he imbibed his Platonic leanings and especially his love of the Latin classics. The purity of his own style, which was evidently moulded on that of Cicero, was unsurpassed in the middle ages. On the completion of his studies, John stayed for a time with his friend Peter, the Cistercian abbot of Moustier la Celle, near Troyes. In 1148 he was present at the council of Reims, in which St. Bernard opposed Gilbert de la Porrée, and was probably presented to Bernard by Theobald, archbishop of Canterbury, who made him his secretary in 1150. He was frequently sent on missions to the pope, to whose household he seems to have been attached from 1148 onward. After the death of Theobald in 1161, John continued as secretary to Thomas Becket, whom he supported in his long disputes with Henry II. His letters throw light on the constitutional struggle then agitating the English world. In 1163–64 he withdrew with Becket to France during the king's displeasure; he returned with him in 1170, and was present at his assassination. In 1176 he was made bishop of Chartres, where he passed the remainder of his life, taking an active part in the council of the Lateran in 1179. He died at or near Chartres on Oct. 25, 1180.

John's writings, the chief of which are the *Policraticus* and the *Metalogicus,* both completed in 1159, exhibit a highly cultivated intelligence well versed in practical affairs. The former sketches an ideal state not unlike that of Plato: the soul is the clergy, the head is the prince, who is the servant of the clergy, the heart is the senate, the eyes. ears and tongue are the governors of the provinces, the hands are the armed and the administrative classes and the feet are the husbandmen. The prince receives the material sword from the church, but only when he disobeys the law or ceases to rule the people by it can he be deposed. In the *Metalogicus* is found a fusion of Augustinian and Aristotelian philosophy. Thus the doctrine of the necessity of the *rationes aeternae* as the foundation of certitude is combined with a moderate realism. There is also a noteworthy appreciation of the difficulties of such problems as that of substance. the movement of bodies, tides and other natural phenomena. time and space, the nature of the soul, the limits of knowledge and Providence. In addition to these two works. John wrote a *Historia Pontificalis,* a philosophical poem. *Eutheticus de Dogmate Philosophorum,* two lives of St. Anselm and a life of St. Thomas of Canterbury.

His collected works were edited by J. A. Giles, 5 vol. (1848) and reprinted in Migne, *Patrol. Lat.,* vol. 199. The *Polycraticus* has been edited by C. C. J. Webb, 2 vol. (1909) and the *Historia Pontificalis* by *R. L.* Poole (1927); and also in the *Mon. Germ. Hist.* (1868; 2nd ed., 1885). *See* C. Shaarschmidt, *Johannes Savisbeviensis* (1862); *R. L.* Poole, *Illustrations of the Histovy of Mediaeval Thought* (1884; 2nd ed., 1920); "Early Correspondence of John of Salisbury," *Proc. of Brit. Acad.,* vol. xi (1924); articles in the *English Historical Review* for 1920 and 1923 and in the *Dictionary of National Biography; E. F.* Jacob, article in *Social and Political Ideas of Some Great Mediaeval Thinkers,* ed. by Hearnshaw (1923).

JOHN THE PRESBYTER: *see* JOHN: GOSPEL OF ST.; JOHN, THE EPISTLES OF.

JOHN, AUGUSTUS EDWIN (1878–1961), British portrait and mural painter. etcher and lithographer, was born at Tenby, \Vales, on Jan. 4. 1878. He studied art at the Slade school. London (1894–98), winning a scholarship in 1896. He first visited Paris in 1900, traveling later to the Netherlands: Belgium and Provence.

His drawings show great precocity and he was chiefly influenced by Rembrandt. El Greco and the Post-Impressionists. He was a regular exhibitor at the New English Art club from 1900, and taught painting at Liverpool university until 1902. A colourful personality. he roamed over Wales, Ireland and Dorset, painting gypsy life and. after working with J. D. Innes and Derwent Lees (1911–14), developed a bold style of sharply defined areas of bright colour.

His first important oil, "The Smiling Woman" (c. 1908, Tate gallery, London), was a portrait of his second wife Dorelia. His service in World War I as an official war artist in the Canadian corps inspired the large decorative cartoon "Canadians Opposite Lens" (1919), and he painted many leading personalities of the peace conference.

Later portraits include those of the cellist Mme Suggia (1923. Tate gallery), the poet Dylan Thomas (*c.* 1936–40, National museum, Wales) and the artist Matthew Smith (c. 1946, Tate gal-

lery). His landscapes of the 1920s are in a Cézannesque style. Augustus John is well represented in the Tate gallery.

Although elected a royal academician in 1928, he resigned in 1938. He was re-elected in 1940 and in 1942 was awarded the Order of Merit. A retrospective exhibition of his work was held at the Royal Academy in 1954. John died at Fordingbridge, Hampshire, on Oct. 31, 1961.

BIBLIOGRAPHY.—C. Dodgson, *A Catalogue of Etchings by Augustus John 1901–1914* (1920); A. Bertram, *Augustus John* (1923); J. Rothenstein, *Augustus John* (1944); A. John, *Chiaroscuro: Fragments of Autobiography* (1952). (D. L. FR.)

JOHN, GRIFFITH (1831–1912), Welsh missionary, was born at Swansea on Dec. 14, 1831, and was brought up a Congregationalist. His work in China as a missionary covered a period of 55 years. In 1861 he went from Shanghai through the provinces of central China, which he was the first Christian missionary to penetrate. and he claimed that with his colleagues he had established more than 100 stations of the London Missionary society in Hupeh and Hunan. He acquired an intimate knowledge of Chinese language and literature, and translated the New Testament and a great part of the Old into more than one Chinese dialect. In the Yangtze valley he founded a theological college for native preachers which bears his name. He died at Hampstead, London, on July 25, 1912.

JOHN, SIR WILLIAM GOSCOMBE (1860–1952), British sculptor. was born at Cardiff on Feb. 21. 1860, and studied at Cardiff and in London. After gaining the Royal academy gold medal and traveling studentship, he spent a year in Paris (1890–91), and in 1892 gained honourable mention at the Paris Salon. He was elected A.R.A. in 1899 and R.A. in 1909. In 1900 the gold medal was awarded him at the Paris International exhibition, and he was made corresponding member of the Institut de France.

He was knighted at the investiture of the prince of Wales at Carnarvon castle in 1911. Among his best works are his portrait busts, especially of children, and medals. His principal works include "King Edward VII," at Cape Town; "W. E. H. Lecky," at Trinity college, Dublin; "Thomas Sutton, Founder of Charterhouse," at Charterhouse, Godalming; "The Rt. Hon. David Lloyd George." at Carnarvon; '(The Duke of Devonshire," at Eastbourne; "The Marquis of Salisbury," in Westminster abbey; an equestrian statue of King Edward VII, at Liverpool; and also many memorials, among which those of the Coldstream guards and war correspondents in St. Paul's cathedral may be mentioned. The Tate gallery contained "The Boy at Play"; the Glasgow Art gallery, "The Elf"; the Cardiff Art gallery, "Morpheus" and "St. John the Baptist." He designed the king's silver jubilee medal, 1935, and was awarded the gold medal of the Royal Society of British Sculptors in 1942. He died Dec. 15, 1952, in London.

JOHN, THE EPISTLES OF. Three writings appear as such in the New Testament. but none answers exactly to the description. for the so-called "First Epistle" is an address or pastoral letter in epistolary form, in reality a homily, while the two smaller "epistles" are brief notes or letters. The first consists of a series of meditations upon central themes of the faith. which the writer felt to be endangered; it is not so marked a "letter" as, *e.g.*, the addresses to the seven churches in Rev. ii–iii. The second "epistle" is indeed addressed to some Christian community, but it is so brief that it may almost be termed a letter. As for the third, it is a private letter in the strict sense of the term, even more private than Philemon (see PHILEMON, EPISTLE TO).

1. The homily or manifesto which is called "The First Epistle of John" did not arise from any special occasion. The author felt impelled to counteract (i. 4) a tendency in the church which threatened, in his view, both theology and ethics, but there are no indications of where or how the movement worked. No name is mentioned, and there is no indication or watermark of date. All we overhear are some catchwords of the people who were responsible for the movement in question. They claimed to have fellowship with God (i. 6f), for example. and at the same time to be free from sin; "We are not guilty," "We have not sinned." They claimed to "know God" (ii. 4f) and to "abide in God." but this claim was accompanied by uncharitable feelings toward other Christians. Apparently they distinguished between the historical Jesus and the Christ (ii, 22f), depreciating the incarnation (iv, 2f) in the interests of a mystical illumination or a spiritual religion. Against such teachers the writer protests that the real fellowship with God involves a nexus with the historical revelation in Jesus (i, 1f), and that, although the errorists had apparently withdrawn from the church (ii. 19), the evil they had done required to be resisted, *i.e.,* the false, fascinating, "knowledge," which in speculative guise undermined the historical basis of the Gospel. "Fellon-ship with God." implying fellowship with Christians. is the keynote of the homily, and the writer plays on various melodies suggested by the keynote. After describing the fellowship as his subject (i, 1f) he proceeds to mention its tests and conditions. primarily the sense of sin (i, jf), involving a sense of the need of forgiveness through Jesus Christ, and also obedience to the supreme law of brotherly love, which is called the true light of life. Then the dangers of this fellowship are taken up (ii. 18f) under the category of truth and falsehood, belief in the incarnate Christ being the test of Christian truth. The characteristics of the fellowship are once more discussed (iii, 1f), as sinlessness, due to regeneration, and brotherly love, the latter bulking so largely in the writer's mind that he goes into three of its features, confidence toward God (iii, 13f), moral discernment (iv. 1f) and assurance of union with the God of love (iv, 7f), all these being bound up with belief in Jesus as the Christ (v, 1f). A brief epilogue (v. 13–21) sums up the certainties of the Christian knowledge on which any fellowship rests.

It is needless to attempt to identify the tendency attacked in the epistle with any one form of contemporary thought, such as Cerinthianism. The writer seeks to put his readers on their guard against a spirit of the age which assumed a variety of forms but which fundamentally was characterized by an ultraspiritualism. In the background we can detect the Gnostic or semi-Docetic view that the divine power or Christ did not really identify itself with the human Jesus, as though the spiritual God was too fine to come into contact with the flesh or matter; if this divine aeon or Christ withdrew from Jesus before the passion and death. as Cerinthus seems to have taught, entering Jesus only at baptism and leaving Him before the cross, the point of iv, 2f and v, 5f becomes clearer. Again. the claims of the illuminati involved a superior knowledge of God. which led to a disparagement of ordinary Christians; perhaps, too. the overstrained spiritualism led to an antinomianism. by its indiiference to sins of the flesh. At any rate it is plain that the errorists failed to recognize that brotherly love was the cardinal law of God for human fellowship, either because they adhered to the Old Testament law or because they denied the redeeming love of God in the cross, from which, the writer contends, true Christian love flowed. But the teaching of the manifesto is positive. The writer is seeking to recall his hearers to the original faith of the Gospel. to belief and love; it is not an exposure of error which he offers so much as an exposition of the Christian standing.

2. The so-called "Second Epistle" is addressed by the author, who calls himself "the elder" or "presbyter," to an unknown community described as "the elect lady and her children." It is a warning against indiscriminate hospitality toward wandering teachers who were evidently promulgating heretical views of a Docetic character about the person of Christ. It is thought by some that the lady is an individual, but the allusions to the family are much better understood if the family is conceived as a small church. some of n-hose members (verse 4) had commended themselves to the writer.

The note was familiar to Irenaeus, but tradition has not preserved any information as to the church addressed or the authorship of the note. It is only guesswork to fix on Antioch or Rome; if the presbyter be identitied with the author of the Fourth Gospel or of the Apocalypse, some Asiatic church is more likely, but we are in the dark on this matter.

3. The third letter is by the same author as the second, and addressed to an individual. It is one of the letters of commendation. like Rom. xvi, 1f, witnessing to the high character of a certain Demetrius and promising to deal sharply with a local official called Diotrephes who repudiated the writer and his adherents.

It is likely that the allusion in verse 9 ("I wrote to the church") is to the second epistle. Otherwise. we are ignorant of the reasons which led Diotrephes to challenge the presbyter. But it is plain that the presbyter had some authority. whether or not he was a representative of the primitive apostolic band. whose sway over the churches was being resisted by Diotrephes as a monarchical bishop (Harnack). The various theories which attempt to throw light upon the letter by identifying Gaius and Demetrius with the Gaius of Rom. xvi, 23 and the Demas of 2 Tim. iv, 10 or the Demetrius of Acts xix. 24 are fanciful rather than helpful to the serious criticism of the letter.

It is obvious to most critics that the Second and Third "Epistles" came from the same hand. But who the author was depends on the conclusions reached by a study of the Johannine tradition. in connection with the Fourth Gospel and the Apocalypse. Tliose who believe that the apostle John wrote the Gospel are able to go further and add to his credit the three epistles. But if the witness of Papias be true. there were two Johns in Asia Minor, or at least in the early church. one of them John the Presbyter. It is a fair hypothesis that this presbyter wrote the Apocalypse and also the Second and Third Epistles, while the Fourth Gospel and the First Epistle may have come from another author. There is a certain similarity of language, indeed, between the three epistles. which at first sight is striking. But this may be accounted for by their origin in a common circle. And, on the other hand, there are differences between the First Epistle and the Fourth Gospel. which are not inconsiderable (see the present writer's *Introduction* to *the Literature* of *the* NT, pp. 589f). The epistle may have been intended as a tract to supplement the Gospel. or it may be an independent treatise; but identity of authorship is another question. There are scholars still who are prepared to hold that the Fourth Gospel and the Apocalypse were composed by the same writer. If so. there is less difficulty in assuming that he could have written the other two "Johannine" epistles. whoever he may have been. On the other hand. when the Fourth Gospel and the Apocalypse are assigned to different writers. and when the latter in particular is attributed to John the Presbyter, the two smaller epistles not unnaturally follow in its wake, whereas the First Epistle may be left alongside of the Fourth Gospel. either as a product of the same pen or as a kindred document from the same sphere of Christian thought. To sum up—there is sufficient tradition to warrant the belief that in Asia Minor about the end of the 1st century a distinguished presbyter lived who mas called John. "Harnack's conjecture, based upon the most natural interpretation of the fragment of Papias' preface which Eusebius has preserved. that he was a pupil of John the Apostle, and in some sense a disciple of the Lord, is perhaps the hypothesis which leaves fewest difficulties unsolved. That he is the author of the two smaller epistles is the view which seems to be best supported by external tradition and by internal probability" (Brooke, p. lxxvii). It is less likely that he also wrote the First Epistle, since it is closely linked with the Fourth Gospel, and it is unlikely that the same person wrote the Apocalypse and the Gospel. Modern studies of the Jewish background (apocalyptical and mystical) suggest that features common to all these writings can be explained in relation to this environment.

BIBLIOGRAPHY.—The best of the older editions of all three epistles are by Ewald, *Die Johan. Briefe übersetzt und erklärt* (Gottingen, 1862); Alexander, *Speaker's Commentary* (1881); Bernhard Weiss in Meyer's *Commentar* (1900). Later editions of special value are by Westcott, 3rd ed. (1892); Holtzmann-Bauer, *Handcommentar* (1908); Windisch in Lietzmann's *Handbuch* (1911); A. E. Brooke, *International Critical Commentary* (1912); to which may be added Pummer's edition in the *Cambridge Greek Testament;* Gore's English notes in *The Epistles of St. John* (1920). General studies of the three are offered in Schmiedel's critical article in the *Encyclopaedia Biblica,* 2556f; A. V. Green, *Ephesian Canonical Writings,* pp. 128f (1910); H. H. Wendt, *Die Johannische Briefe und das Joh. Christenthum* (Halle, 1925).

The religious ideas and historical environment of the First Epistle are discussed in Wurm, *Die Irrlehrer im ersten Johannishrief* (1904); G. G. Findlay, *Fellowship in the Life Eternal* (1909); R. Lam. *Tests of Life,* 2nd ed. (1909). For the two smaller, consult especially Poggel's monograph, *Der 2 und 3 Briefe des Apostrl Johannes* (1896); J. Chapman's study in *The Journal of Theological Studies,* pp. 357f, 517f (1904); Vernon Bartlet, *ibid.,* 204f (1905); Harnack, *Texte und Untersuchungen,* xv, 3; E. C. Selwyn, *The Christian Prophets and the Prophetic Apocalypse,* pp. 1331 (1900); Jean Reville, *Le quatrième Evangile,* pp. 49f. (J. MOF.)

JOHN, GOSPEL OF ST., the fourth and latest of the Gospels, in the Bible, and. next to that of St. Mark, the shortest. This article will first describe its general structure and more obvious contents, compare it with the Synoptic Gospels, and draw out its leading characteristics and final object; it will then apply the tests thus gained to the narratives special to this Gospel. and point out the book's special difficulties and limits and its abiding appeal and greatness; and finally, consider the questions of its origin and authorship.

Analysis of Contents.—The book's chief hreak is at xiii, 1, the solemn introduction to the feet washing; all up to here reports Jesus' signs and apologetic or polemical discourses to the outer world: hence onward it pictures the manifestation of His glory to the inner circle of His disciples. These two parts contain three sections each.

1. (i) Introduces the whole work (i. 1–ii, 11). (*a*) The prologue (i. 1–18). The Logos existed before creation and time; was with the very God and was God; and all things were made through Him. For in this Logos is Life. and this Life is a Light which, though shining in darkness: cannot be suppressed by it. This true Light became flesh and tabernacled among us; and we beheld His glory, as of an Only-Begotten from the Father, full of grace and truth. John the Baptist testified concerning Him, the Logos-Light and Logos-Life incarnate; but this Logos alone. Who is in the bosom of the Father, has declared the very God. (b) The four days' work (i, 19–51). On the first three days John declares that he is not the Christ, proclaims Jesus to be the Christ and sends his own disciples away to Jesus. On the fourth day Jesus Himself calls Philip and Nathanael. (c) The seventh day's first manifestation of the Incarnate Light's glory (ii, 1–11); Jesus at Cana turns water into wine.

(ii) Records the manifestations of the Light's and Life's glory and power to friend and foe (ii. 22–vi, 71). (*d*) Solemn inauguration of the Messianic ministry (ii. 12–iii. 21): cleansing of the Temple and prophecy of His resurrection; discourse to Nicodemus on baptismal regeneration. (*e*) Three scenes in Judea, Samaria. Galilee respectively (iii, 32–iv, 54): the Baptist's second testimony; Jesus' discourse with the woman at the well concerning the spiritual, universal character of the new religion; and cure of the ruler's son, the reward of faith in the simple word of Jesus. (f) Manifestation of Jesus as the vivifying Life-Logos and its contradiction in Judea, v: the paralytic's cure. (*g*) Manifestation of Jesus as the heaven-descended living Bread and its contradiction in Galilee, vi: multiplication of the loaves; walking on the waters; and His discourse on the Holy Eucharist.

(iii) Acute conflict between the New Light and the old darkness (vii–xii). (*h*) Self-manifestation of the Logos-Light in the Temple (vii. 1–x, 39). Journey to the feast of tabernacles; invitation to the soul athirst to come to Him (the fountain of Life) and drink, and proclamation of Himself as the Light of the world; cure of the man horn blind; allegory of the good shepherd. The allegory continued at the feast of the dedication. They strive to stone or to take Him. (i) The Logos-Life brings Lazarus to life; effects of the act (x. 40–xii, 50). Jesus withdraws beyond Jordan, and then comes to Bethany, His friend Lazarus being buried three days; proclaims Himself the Resurrection and the Life; and calls Lazarus back to life. Some who saw it report the act to the Pharisees; the Sanhedrin meets, Caiaphas declares that one man must die for the people. and henceforward they ceaselessly plan His death. Jesus withdraws to the Judean desert. but soon returns. six days before Passover. to Bethany; Mary anoints Him, a crowd comes to see Him and Lazarus. and the hierarchs then plan the killing of Lazarus also. Next morning He rides into Jerusalem on an ass's colt. Certain Greeks desire to see Him: He declares the hour of His glorification to have come: "Now My soul is troubled. . . . Father, save Me from this hour. But for this have I come unto this hour: Father, glorify Thy Name." A voice answers, "I have glorified it and will glorify it again": some think that an angel spoke; but Jesus explains that this voice was

not for His sake but for theirs. When lifted up from the earth, He will draw all men to Himself; they are to believe in Him, the Light. The writer's concluding reflection: the small success of Jesus' activity among the Jews. Once again He cries: "I am come a Light into the world, that whoso believeth in Me should not abide in darkness."

2. The Logos-Christ's manifestation of His life and love to His disciples. during the last supper, the passion, the risen life (xiii–xx).

(iv) The last supper (xiii–xvii). (*j*) Solemn washing of the disciples' feet; the beloved disciple; designates the traitor; Judas goes forth, it is night (xiii, 1–30). (k) Last discourses, first series (xiii, 31–xiv, 31): the new commandment, the other helper; "Arise, let us go hence." Second series (xv, 1–xvi. 33): allegory of the true vine; "Greater love than this hath no man, that he lay down his life for his friend"; the world's hatred; the spirit of truth shall lead them into all truth; "I came forth from the Father and am come into the world. again I leave the world and go to the Father"; "Be of good cheer, I have overcome the world." (*l*) The high-priestly prayer (xvii). "Father. glorify Thy Son . . . with the glory which I had with Thee before the world was . . . that to as many as Thou hast given Him. He should give eternal life." "I pray for them, I pray not for the world. I pray also for them that shall believe in Me through their word, that they may be all one, as Thou Father art in Me, and I in Thee."

(v) The passion (xviii–xix). (*m*) In the garden: the Roman soldiers come to apprehend Him, fall back upon the ground at His declaration "I am He." Peter and Malchus. (n) Before Annas at night and Caiaphas at dawn; Peter's denials (xviii, 12–27). (*o*) Before Pilate (xviii, 28–40). Jesus declares, "My kingdom is not of this world. I have come into the world that I may bear witness to the truth: everyone that is of the truth, heareth My voice"; Pilate asks sceptically "What is truth?" and the crowd prefers Barabbas. (*p*) The true king presented to the people as a mock king; His rejection by the Jews and abandonment to them (xix, 1–16). (*q*) Jesus carries His cross to Golgotha. and is crucified there between two others; the cross's title and Pilate's refusal to alter it (xix, 17–22). (r) The soldiers cast lots upon His garments and seamless tunic; His mother with two faithful women and the beloved disciple at the cross's foot; His commendation of His mother and the disciple to each other; His last two sayings in deliberate accomplishment of Scripture "I thirst," "It is accomplished." He gives up the spirit; His bones remain unbroken; and from His spear-lanced side blood and water issue (xix. 23–37). (s) The two nobles, Joseph of Arimathaea and Nicodemus. bind the dead body in a winding sheet with 100 lb. of precious spices, and place it in a new monument in a near garden, since the Sabbath is at hand.

(vi) The risen Jesus, Lord and God (xx). (*t*) At early dawn on the first day of the week, Mary Rlagdalen, finding the stone rolled away from the monument, runs to tell Peter and the beloved disciple that the Lord's body has been removed. Peter and the other disciple run to the grave; the latter, arriving first, enters only after Peter has gone in and noted the empty graveclothes—enters and believes. After their departure: Mary sees two angels where His body had lain and turning away beholds Jesus standing, yet recognizes Him only when He addresses her. He bids her "Do not touch Me. for I have not yet ascended," but to tell His brethren "I ascend to My Father and to your Father, to My God and to your God." And she does so. (u) Second apparition (xx, 19–23). Later on the same day, the doors being shut, Jesus appears among His disciples. shows them His (pierced) hands and side and solemnly commissions and endows them for the apostolate by the words: "As the Father hath sent Me, so I send you." and by breathing upon them saying "Receive the Holy Spirit: whose sins ye remit. they are remitted to them; whose sins ye retain, they are retained." (v) Third apparition and culminating saying; conclusion of entire book (xx. 24–31). Thomas, who had been absent, doubts the resurrection; Jesus comes and submits to the doubter's tests. Thomas exclaims, "My Lord and my God"; but Jesus declares "Blessed are they that have pot seen and yet have believed." "Now Jesus," concludes the writer. "did many other signs, . . . but these are written, that ye may believe that Jesus is the Christ. the Son of God, and that believing ye may have life in His name."

This analysis is rough, since the sections, indeed the two parts themselves, are interrelated by delicate complex references; also it omits the account of the adulteress (vii, 53–viii, 11)—a valuable report of an occurrence which probably belonged to some primitive document otherwise incorporated by the Synoptists—because it is un-Johannine in vocabulary, style and character, intercepts the Gospel's thread wherever placed and is absent from its best manuscripts. It also omits xxi. This chapter's first two stages contain an important early historical document of Synoptic type: Jesus' apparition to seven disciples by the Lake of Galilee and the miraculous draught of fishes; and Peter's threefold confession and Jesus' threefold commission to him. And its third stage, Jesus' prophecies to Peter and to the beloved disciple concerning their future, and the declaration "This is the disciple who testifies to these things and who has written them, and we know that his testimony is true," is doubtless written by the redactor of the previous two stages. This writer imitates, but is different from, the great author of the first 20 chapters.

Comparison With the **Synoptists.**—The following are the most obvious differences between the original book and the Synoptists. John has a metaphysical prologue; Matthew and Luke have historical prologues; and Mark is without any prologue. The earthly scene is here Judea, indeed Jerusalem, with but five breaks (vi, 1–vii, 10 is the only long one); while more than two-thirds of each Synoptist deal with Galilee or Samaria. The ministry here lasts about three and a half years (it begins several months before the first Passover, ii, 13; the feast of v. 1 is probably a second; the third occurs vi. 4; and on the fourth. xi, 55. He dies); while the Synoptists have but the one Passover of His death, after barely a year of ministry. Here Jesus' teaching contains no parables and but three allegories. the Synoptists present it as parabolic through and through. Here not one exorcism occurs; in the Synoptists the exorcisms are as prominent as the cures and the preaching. John has, besides the passion. seven accounts in common with the Synoptists: the Baptist and Jesus (i. 19–34); cleansing of the Temple (ii, 13–16); cure of the centurion's (ruler's) servant (son) (iv, 46–54); multiplication of the loaves (vi, 1–13); walking upon the water (vi, 16–21); anointing at Bethany (xii, 1–8); entry into Jerusalem (xii. 12–16); all unique occurrences. In the first. John describes how the Baptist, on Jesus' approach, cries "Behold the Lamb of God, which taketh away the sins of the world"; and how he says "I saw the spirit descending upon Him, and I bore witness that this is the Son of God." But the Synoptists. especially Mark. give the slow steps in even the apostles' realization of Jesus' Messianic character: only at Caesarea Philippi, Simon alone, for the first time, clearly discerns it, Jesus declaring that His Father has revealed it to Him. and yet Simon is still scandalized at the thought of a suffering Messiah (Mark viii, 28–34). Only about two weeks before the end is He proclaimed Messiah at Jericho (x, 46–48); then in Jerusalem. five days before dying for this upon the cross (xi. 1–10. xv, 37). As to the Baptist, in all three Synoptists he baptizes Jesus, and, in Rfark i, 10, 11, it is Jesus who sees the Spirit descending upon Himself on His emerging from beneath the water, and it is to Himself that God's voice is addressed; in John: Jesus' baptism is ignored. only the Spirit remains hovering above him, as a sign for the Baptist's instruction. And in Matt. xi, 2–6, the Baptist, several months after the Jordan scene, sends from his prison to ascertain if Jesus is indeed the Rlessiah; in John, the Baptist remains at large so as again (iii, 22–36) to proclaim Jesus' heavenly provenance. The cleansing of the Temple occurs in the Synoptists four days before His death, and instantly determines the hierarchs to seek His destruction (Mark xi, 1j–18); John puts it three years back, as an appropriate frontispiece to His complete claims and work.

The passion narratives reveal the following main differences. John omits, at the last supper, its central point. the great historic act of the Holy Eucharist, carefully given by the Synoptists and St. Paul, having provided a highly doctrinal equivalent in the discourse on the living Bread, here spoken by Jesus in Capernaum more than a year before the passion (vi, 4), the day after the

multiplication of the loaves. This transference is doubtless connected with the change in the relations between the time of the Passover meal and that of His death: in the Synoptists, the Thursday evening's supper is a true Passover meal, the lamb had been slain that afternoon and Jesus dies about 24 hours later; in John, the supper is not a Passover meal, the Passover is celebrated on Friday, and Jesus. proclaimed here, from the first: the Lamb of God, dies while the paschal lambs, His prototypes, are being slain. The scene in the garden is without the agony of Gethsemane; a faint echo of this historic anguish appears in the scene with the Greeks four days earlier, and even that peaceful appeal to, and answer of. the Father occurs only for His followers' sakes. In the garden Jesus here Himself goes forth to meet His captors, and these fall back upon the ground, on His revealing Himself as Jesus of Nazareth. The long scenes with Pilate culminate in the great sayings concerning His kingdom not being of this world and the object of this His coming being to bear witness to the truth. thus explaining how, though affirming kingship (Mark xv. 2), He could be innocent. In John He does not declare Himself Messiah before the Jewish Sanhedrin (Mark xiv, 61) but declares Himself supermundane regal witness to the truth before the Roman governor. The scene on Calvary differs as follows: In the Synoptists the soldiers divide His garments among them, casting lots (Mark xv, 24); in John they make four parts of them and cast lots concerning His seamless tunic, thus fulfilling the text, "They divided My garments among them and upon My vesture they cast lots": the parallelism of Hebrew poetry, which twice describes one fact, being taken as witnessing to two, and the tunic doubtless symbolizing the unity of the church. as in Philo the high priest's seamless robe symbolizes the indivisible unity of the universe, expressive of the Logos (De ebrietate, xxi). In the Synoptists, of His followers only women—the careful! seemingly exhaustive lists do not include His mother—remain, looking on "from afar" (Mark xv, 40); in John. His mother stands with the two other htarys and the beloved disciple beneath the cross, and "from that hour the disciple took her unto his own (house)." while in the older literature His mother does not appear in Jerusalem till just before Pentecost, and with "His brethren" (Acts i, 14). And John alone tells how the bones of the dead body remained unbroken, fulfilling the ordinance as to the paschal lamb (Exod. xii, 46), and how blood and water flowed from His spear-pierced side: thus the Lamb "taketh away the sins of the world" by shedding His blood which "cleanseth us from every sin"; and "He cometh by water and blood," historically at His baptism and crucifixion, and mystically to each faithful soul in baptism and the Eucharist. The story of the risen Christ (xx) shows dependence on and contrast with the Synoptic accounts. Its two halves have each a negative and a positive scene. The empty grave (1–10) and the apparition to the Magdalen (11–18) together correspond to the message brought by the women (Matt. xxviii. 1–10); and the apparition to the 10 joyously believing apostles (19–23) and then to the sadly doubting Thomas (24–29) together correspond to Luke xxiv, 36–43, where the 11 apostles jointly receive one visit from the risen One, and both doubt and believe, mourn and rejoice.

The Johannine discourses reveal differences from the Synoptists so profound as to be admitted by all. Here Jesus, the Baptist and the writer speak so much alike that it is sometimes impossible to say where each speaker begins and ends; *e.g.*, in iii, 27–30, 31–36. The speeches dwell upon Jesus' person and work: as we shall find, with a didactic directness, philosophical terminology and denunciatory exclusiveness unmatched in the Synoptist sayings. "This is eternal life, that they may know Thee the only true God and Jesus Christ whom Thou hast sent" (xvii. 3), is part of the high-priestly prayer; yet Père Calmes, with the papal censor's approbation, says. "It seems to us impossible not to admit that we have here dogmatic developments explicable rather by the evangelist's habits of mind than by the actual words of Jesus." "I have told you of earthly things and you believe not; how shall ye believe if I tell you of heavenly things?" (iii, 12), and "Ye are from beneath, I am from above" (viii, 23), give us a Plato- (Philo-) like upper, "true" world and a lower, delusive world. "Ye shall die in your sins" (viii, 21); "ye are from your father the devil" (viii, 44); "I am the door of the sheep, all they that came before Me are thieves and robbers" (x, 7, 8); "they have no excuse for their sin" (xv. 22)—contrast strongly with the yearning over Jerusalem: "The blood of Abel the just" and "the blood of Zacharias son of Barachias" (Matt. xxiii, 35–37); and "Father, forgive them; for they know not what they do" (Luke xxiii, 34). And while the Synoptist speeches and actions stand in loose and natural relation to each other, the Johannine deeds so closely illustrate the sayings that each set everywhere supplements the other: the history itself here tends to become one long allegory. So with the woman at the well and "the living water"; the multiplication of the loaves and "the living Bread"; "I am the Light of the world" and the blind man's cure; "I am the Resurrection and the Life" and the raising of Lazarus; indeed even with the Temple-cleansing and the prophecy as to His resurrection; Nicodemus' night visit and "men loved the darkness rather than the light"; the cure of the inoperative paralytic and "My Father and I work hitherto"; the walking, phantomlike. upon the waters (John vi, 15–21; Mark vi. 49); and the declaration concerning the Eucharist, "the spirit it is that quickeneth" (John vi, 63). Only about 16 Synoptic sayings reappear here; but we are given some great new sayings full of the Synoptic spirit.

Characteristics and Object.—The book's character results from the continuous operation of four great tendencies. There is everywhere a readiness to handle traditional, largely historical materials with a sovereign freedom, controlled and limited by doctrinal convictions and devotional experiences alone. There is everywhere the mystic's deep love for double, even treble meanings; *e.g.*, the "again" in iii, 2, means: literally, "from the beginning," to be physically born again; morally, to become as a little child; mystically, "from heaven, God," to be spiritually renewed. "Judgment" (κρίσις) in the popular sense, condemnation, a future act; in the mystical sense: discrimination, a present fact. There is every here the influence of certain central ideas, partly identical with but largely developments of those less reflectively operative in the Synoptists. Thus six great terms are characteristic of or even special to this Gospel. "The Only-Begotten" is most nearly reached by St. Paul's term "His own Son." The "Word," or "Logos," is a term derived from Heracleitus of Ephesus and the Stoics, through the Alexandrian Jew Philo, but conceived here throughout as definitely personal. "The Light of the World" the Jesus-Logos here proclaims Himself to be; in the Synoptists He only declares His disciples to be such. "The Paraclete," as in Philo, is a "helper," "intercessor"; but in Philo he is the intelligible universe, while here He is a self-conscious Spirit. "Truth," "the truth," "to know," have here a prominence and significance far beyond their Synoptic or even their Pauline use. And above all stand the uses of "Life," "Eternal Life." The living ever-working Father (vi, 57; v, 17) has a Logos in whom is Life (i. 4), an ever-working Son (v, 17), who declares Himself "the living Bread," "the Resurrection and the Life," "the Way, the Truth and the Life" (vi, 51; xi, 25; xiv, 16): so that Father and Son quicken whom they will (v, 21); the Father's commandment is life everlasting, and Jesus' words are spirit and life (xii, 50; vi, 63, 68). The term, already Synoptic, takes over here most of the connotations of the "Kingdom of God." the standing Synoptic expression, which appears here only in iii, 3–5; xviii, 36. Note that the term "the Logos" is peculiar to the Apocalypse (xix, 13) and the prologue here, but that, as Light and Life, the Logos-conception is present throughout the book. And thus there is everywhere a striving to contemplate history sub specie aeternitatis and to englobe the successiveness of man in the simultaneity of God.

Narratives Peculiar to John.—Of his seven great symbolical, doctrinally interpreted "signs," John shares three, the cure of the ruler's son, the multiplication of the loaves, the walking on the waters, with the Synoptists; yet here the first is transformed almost beyond recognition, and the two others only typify and prepare the eucharistic discourse. Of the four purely Johannine signs, two—the cures of the paralytic (v, 1–16) and of the man born blind (ix, 1–++)—are,admittedly, profoundly symbolical. In the first case, the man's physical and spiritual lethargy are closely interconnected and strongly contrasted with the ever-

active God and His Logos. In the second case there is also the closest parallel between physical blindness cured and spiritual darkness dispelled, by the Logos-Light as described in the accompanying discourse. Both narratives are doubtless based upon actual occurrences—the cures narrated in Mark ii, iii, viii, x, and scenes witnessed by the writer in later times—yet here they do but picture the Lord's spiritual work in the human soul achieved throughout Christian history. We cannot well claim more than these three kinds of reality for the first and the last signs, the miracle at Cana and the resurrection of Lazarus.

For the marriage-feast sign yields throughout an allegorical meaning. Water stands in this Gospel for what is still but symbol; thus the waterpots serve here the external Jewish ablutions—old bottles which the "new wine" of the Gospel is to burst (Mark ii, 22). Wine is the blood of the new covenant, and He will drink the fruit of the vine new in the Kingdom of God (Mark xiv, 23–25); the vineyard where He Himself is the true Vine (Mark xii, 1; John xv, 1). And "the kingdom of heaven is like to a marriage-feast" (Matt. xxii, 2); Jesus is the Bridegroom (Mark ii, 19); "the marriage of the Lamb has come" (Rev. xix, 7). "They have no wine": the hopelessness of the old conditions is announced here by the true Israel, the Messiah's spiritual mother, the same "woman" who in Rev. xii, 2, j "brought forth a man-child who was to rule all nations." Cardinal Newman admitted that the latter woman "represents the church, this is the real or direct sense"; yet as her man-child is certainly the Messiah, this church must be the faithful Jewish church. Thus also the "woman" at the wedding and beneath the cross stands primarily for the faithful Old Testament community, corresponding to the beloved disciple, the typical New Testament follower of her Son, the Messiah: in each case the devotional accommodation to His earthly mother is equally ancient and legitimate. He answers her "My hour is not yet come," *i.e.*, in the symbolic story, the moment for working the miracle; in the symbolized reality, the hour of His death, condition for the Spirit's advent; and "what is there between Me and thee?" *i.e.*, "My motives spring no more from the old religion," words devoid of difficulty if spoken thus by the Eternal Logos to the passing Jewish church. The transformation is soon afterward accomplished, but in symbol only; the "hour" of the full sense is still more than three years off. Already Philo says "the Logos is the master of the spiritual drinking-feast," and "let Melchisedeck"—the Logos—"in lieu of water offer wine to souls and inebriate them" (De *somn.*, ii, 37; *Legg.* all., iii, 26). But in John this symbolism figures a great historic fact, the joyous freshness of Jesus' ministerial beginnings, as indicated in the sayings of the Bridegroom and of the new wine, a freshness typical of Jesus' ceaseless renovation of souls.

The raising of Lazarus, in appearance a massive, definitely localized historical fact, requires a similar interpretation, unless we would, in favour of the direct historicity of a story peculiar to a profoundly allegorical treatise, ruin the historical trustworthiness of the largely historical Synoptists in precisely their most complete and verisimilar part. For, especially in Mark, the passing through Jericho, the entry into Jerusalem, the Temple-cleansing and its immediate effect upon the hierarchs, their next day's interrogatory, "By what authority doest thou these things?" *i.e.*, the cleansing (x, 46–xi, 33), are all closely interdependent and lead at once to His discussions with His Jerusalem opponents (xii, xiii), and to the anointing, last supper and passion (xiv, xv). John's last and greatest symbolic sign replaces those historic motives, since here it is the raising of Lazarus which determines the hierarchs to kill Jesus (xi, 46–52), and occasions the crowds which accompany and meet him on His entry (xii, 9–19). The intrinsic improbabilities of the narrative, if taken as direct history are also great: Jesus' deliberate delay of two days to secure His friend's dying, and His rejoicing at the death, since thus He can revivify His friend and bring His disciples to believe in Himself as the Life; His deliberate weeping over the death which He has thus let happen, yet His anger at the similar tears of Lazarus' other friends; and His praying, as He tells the Father in the prayer itself, simply to edify the bystanders: all point to a doctrinal allegory. Indeed the climax of the whole account is already reached in Jesus' great saying: "I am the Resurrection and the Life; he that believeth in Me . . . shall not die for ever." and in Martha's answer: "I believe that Thou art the Christ, the Son of God, who hast come into the world" (xi, 26, 27); the sign which follows is but the pictorial representation of this abiding truth. The materials for the allegory will have been certain Old Testament narratives, but especially the Synoptic accounts of Jesus' raisings of Jairus' daughter and of the widow's son (Mark v; Luke vii). Mary and Martha are admittedly identical with the sisters in Luke x, 38–42; and already some Greek fathers connect the Lazarus of this allegory with the Lazarus of the parable (Luke xvi, 19–31). In the parable Lazarus returns not to earth, since Abraham foresees that the rich man's brethren would disbelieve even if one rose from the dead; in the corresponding allegory, Lazarus does actually return to life, and the Jews believe so little as to determine upon killing the very Life Himself.

Special Difficulties and Greatness.—The difficulties, limitations and temporary means special to the book are closely connected with its ready appeal and abiding power;. let us take both sets of things together, in three couples of interrelated price and gift.

The book's method and form are pervadingly allegorical; its instinct and aim are profoundly mystical. Now from Philo to Origen we have a long Hellenistic, Jewish and Christian application of that all-embracing allegorism, where one thing stands for another and where no factual details resist resolution into a symbol of religious ideas and forces. Thus Philo had, in his life of Moses, allegorized the Pentateuchal narratives so as to represent him as mediator, saviour, intercessor of his people. the one great organ of revelation and the soul's guide from the false lower world into the upper true one. The Fourth Gospel is the noblest instance of this kind of literature, of which the truth depends not on the factual accuracy of the symbolizing appearances but on the truth of the ideas and experiences thus symbolized. And Origen is still full of spontaneous sympathy with its pervading allegorism. But this method has lost its attraction; the Synoptists. with their rarer and slighter pragmatic rearrangements and their greater closeness to the Lord's actual words, deeds, experiences, environment, now come home to us as indefinitely richer in content and stimulative appeal. Yet mysticism persists, as the intuitive and emotional apprehension of the most specifically religious of all truths, viz., the already full, operative existence of eternal beauty, truth and goodness, of infinite Personality and Spirit independently of our action, and not, as in ethics, the simple possibility and obligation for ourselves to produce suchlike things. .And of this elemental mode of apprehension and root truth, the Johannine Gospel is the greatest literary document and incentive extant: its ultimate aim and deepest content retain all their potency.

The book contains an intellectualist, static, determinist, abstractive trend. In Luke x, 25–28, eternal life depends upon loving God and man; here it consists in knowing the one true God and Christ whom He has sent. In the Synoptists, Jesus grows in favour with God and man. passes through true human experiences and trials, prays alone on the mountainside and dies with a cry of desolation; here the Logos' watchword is "I am," He has deliberately to stir up emotion in Himself, never prays for Himself and in the garden and on the cross shows but power and self-possession. Here we find "ye cannot hear, cannot believe, because ye are not from God, not of My sheep" (viii, 47, x, 26); "the world cannot receive the spirit of truth" (xiv, 17). Yet the ethical current appears here also strongly: "he who doeth the truth, cometh to the light" (iii, 21), "if you love Me, keep My commandments" (xiv, 15). Libertarianism is here: "the light came. but men loved the darkness better than the light," "ye will not come to Me" (iii, 19, v, 40); hence the appeal "abide in Me"—the branch can cease to be in Him the Vine (xv. 4, 2). Indeed even those first currents stand here for the deepest religious truths, the prevenience of God and man's affinity to Him. "Not we loved God (first), but He (first) loved us"; "let us love Him. because He first loved us" (1 John iv, 10, 19): "no man can come to Me, unless the Father draw him" (vi, 44), a drawing which effects a hunger and thirst

for Christ and God (iv, 14, vi, 35). Thus man's spirit can respond actively to the historic Jesus because already touched and made hungry by the all-actual Spirit-God who made that soul akin unto Himself.

The book has an outer protective shell of acutely polemical and exclusive moods and insistences: while certain splendid Synoptic breadths and reconciliations are nowhere reached; but this is primarily because it is fighting, more consciously than they, for that inalienable ideal of all deepest religion. unity, even external and corporate, among all believers. The "Pneumatic" Gospel comes thus specially to emphasize certain central historical facts; and, the most explicitly institutional and sacramental of the four. to proclaim the most universalistic and developmental of all biblical sayings. Here indeed Jesus will not pray for the world (xvii, g): "ye shall die in your sins," He insists to His opponents (viii, 44, 24); it is the Jews generally who appear throughout as such; nowhere is there a word as to forgiving our enemies; and the commandment of love is designated by Jesus as His, as new, and as binding the disciples to "love one another" within the community to which He gives His "example" (xv, 12, xiii, 34, 15). In the Synoptists, the disciples' intolerance is rebuked (Mark ix, 38–41); Jesus' opposition is everywhere restricted to the Pharisees and the worldly Sadducees; He ever longs for the conversion of Jerusalem; the great double commandment of love is proclaimed as already formulated in the Mosaic law (Mark xii. 28–34); the neighbour to be thus loved and served is simply any and every suffering fellow man; and the pattern for such perfect love is found in a schismatical Samaritan (Luke x. 25–37). Yet the deepest strain here is more serenely universalist even than St. Paul: for here Jesus says: "God so loved the world, that He gave His only begotten Son, that whosoever believeth in Him should . . . have everlasting life" (iii, 16). True, the great prologue passage (i, g) probably reads "He was the true Light coming into the world. that enlighteneth every man." so that the writer would everywhere concentrate his mind upon the grace attendant upon explicit knowledge of the incarnate, historic Christ. Yet Christian orthodoxy, which itself has, all but uniformly, understood this passage of the spiritual radiation throughout the world of the Word before His incarnation, has been aided toward such breadth as to the past by the Johannine outlook into the future. For, in contrast with the earliest Synoptic tradition, where the full Christian truth and its first form remain undistinguished and where its earthly future appears restricted to that generation, in John the Eternal Life conception largely absorbs the attention away from all successiveness; Jesus' earthly life does not limit the religion's assimilation of further truth and experience: "I have many things to tell you. but you cannot bear them now," "the Father will give you another Helper, the spirit of truth. who will abide with you for ever" (xvi, 12, xiv, 15). This universalism is not simply spiritual; the external element, presupposed in the Synoptists as that of the Jewish church within .which Jesus' earthly life was spent, is here that of the now separate Christian community: He has other sheep not of this fold—them also Re must bring. there will be one fold. one shepherd; and His seamless tunic. and Peter's net which, holding every kind of fish, is not rent, are symbols of this visible unity. Ministerial gradations exist in this church; Jesus begins the feet washing with Peter, who alone speaks and is spoken to; the beloved disciple outruns Peter to Jesus' monument, yet waits to go in till Peter has done so first; and in the appendix the treble pastoral commission is to Peter alone: a Petrine pre-eminence which but echoes the Synoptists. And sacramentalism informs the great discourses concerning rebirth by water and the spirit, and feeding on the living Bread, Jesus' flesh and blood. and the narrative of the issue of blood and water from the dead Jesus' side. Indeed so severe a stress is laid upon the explicitly Christian life and its specific means that orthodoxy itself interprets the rebirth by water and spirit, and the eating the flesh and drinking the blood to which entrance into the Kingdom and possession of interior life are here exclusively attached, as often represented by a simple sincere desire and will for spiritual purification and a keen hunger and thirst for God's aid, together with such cultural acts as such souls can know or find, even without any knowledge of the Christian rites. Thus there is many "a pedagogue to Christ," and the Christian visible means and expressions are the culmination and measure of what, in various degrees and forms, accompanies every sincerely striving soul throughout all human history.

Origin and Authorship. — The question as to the book's origin has lost its poignancy through the ever-increasing recognition of its intrinsic character. Thus the defenders of the apostolic authorship, the Unitarian James Drummond (1903), the Anglican William Sanday (1905), the Roman Catholic Theodore Calmes (1904), can tell us: first. that "the evangelist did not aim at an illustrative picture of what was most characteristic of Jesus"; second, that "the author sank into his own consciousness and at last brought to light what he found there!"; third, that "the Gospel contains an entire theological system," "history is seen through the intervening dogmatic development," "the Samaritan woman is . . . a personification," "the behaviour of the Greeks is entirely natural in such a book." We thus get at cross purposes with this powerful, profound work: only some such position as Abbé Loisy's critical summing up (1903) brings out its specific greatness. "What the author was, his book, in spite of himself, tells us to some extent: a Christian of Judeo-Alexandrine formation; a believer without, apparently, any personal reminiscence of what had actually been the life, preaching and death of Jesus; a theologian far removed from every historical preoccupation. though he retains certain principal facts of tradition without which Christianity would evaporate into pure ideas; and a seer who has lived the Gospel which he propounds." "To find his book beautiful and true, we need but take it as it is and understand it." "The church, which has never discussed the literary problem of this Gospel, in nowise erred as to its worth."

Several traditional positions have indeed been approximately maintained or reconquered against the critics. As to the Gospel's date, critics have returned from 160–170 (Baur), 150 (Zeller), 130 (Keim), to 110–115 (Renan) and 80–110 (Harnack): since Irenaeus says its author lived into the times of Trajan (90–117), a date somewhere about 105 would satisfy tradition. As to the place, the critics accept proconsular Asia with practical unanimity, thus endorsing Irenaeus' declaration that the Gospel was published in Ephesus. As to the author's antecedents, critics have ceased to hold that he could not have been a Jew-Christian, and admit that he must have been by birth a Jew of the Dispersion or the son of Christian parents who had been such Jews. And as to the vivid accuracy of many of his topographical and social details: the predominant critical verdict now is that he betrays an eyewitness' knowledge of the country between Sichem and Jordan and as to Jerusalem; he will have visited these places, say in go, or may have lived in Jerusalem shortly before its fall. But the reasons against the author being John the Zebedean or any other eyewitness of Jesus' earthly life have accumulated to a practical demonstration.

As to the external evidence for the book's early date, we must remember that the Epistle to the Hebrews and the Book of Revelation, though admittedly earlier, are of the same school. and, with the great Pauline Epistles. show many preformations of Johannine phrases and ideas. Other slighter prolusions will have circulated in that Philonian centre Ephesus before the great Gospel englobed and superseded them. Hence the precariousness of the proofs derived from more or less close parallels to Johannine passages in the apostolic fathers, Justin Martyr (163–167) certainly uses the Gospel; but his conception of Jesus' life is so strictly Synoptic that he can hardly have accepted it as from an apostolic eyewitness. Papias of Hierapolis, in his *Exposition of the Lord's Sayings* (145–160), appears nowhere to have mentioned it, and clearly distinguishes between "what Andrew, Peter, . . . John or Matthew or any other of the Lord's disciples spoke," and "what Aristion and the presbyter John. the Lord's disciples. say." Thus Papias, as Eusebius, about 314, insists, knew two Johns, and the apostle was to him a faraway figure; indeed early mediaeval chroniclers recount that Papias "in the second book of the Lord's sayings" asserted that both the sons of Zebedee were "slain by Jews," so that the apostle John would have died before 70. Irenaeus'

testimony is the earliest and admittedly the strongest we possess for the Zebedean authorship; yet, as Calmes admits, "it cannot be considered decisive." In his work against the heresies and in his letter to Florinus, about 185–191, he tells how he had himself known Bishop Polycarp of Smyrna, and how Polycarp "used to recount his familiar intercourse with John and the others who had seen the Lord"; and explicitly identifies this John with the Zebedean and the evangelist. But Irenaeus was at most 1 j when thus frequenting Polycarp; writes 35 to 50 years later in Lyons, admitting that he noted down nothing at the time: and, since his mistaken description of Papias as "a hearer of John" the Zebedean was certainly reached by mistaking the presbyter for the apostle, his additional words "and a companion of Polycarp" point to this same mistaken identification having also operated in his mind with regard to Polycarp. In any case, the very real and important presbyter is completely unknown to Irenaeus, and his conclusion as to the book's authorship resulted apparently from a comparison of its contents with Polycarp's teaching. If the presbyter wrote Revelation and was Polycarp's master, such a mistake could easily arise. Certainly Polycrates. bishop of Ephesus, made a precisely similar mistake when about 190 he described the Philip "who rests in Hierapolis" as "one of the twelve apostles." since Eusebius rightly identifies this Philip with the deacon of Acts xxi. A positive testimony for the critical conclusion is derived from the existence of a group of Asia Minor Christians who about 165 rejected the Gospel as not by John but by Cerinthus. The attribution is doubtless mistaken; but could Christians who mere sufficiently numerous to deserve a long discussion by St. Epiphanius in 374–377. and who upheld the Synoptists. stoutly opposed the Gnostics and Montanists and had escaped every special designation till the bishop nicknamed them the "Alogi" (irrational rejectors of the Logos-Gospel), dare, in such a time and country, to hold such views, had the apostolic origin been incontestable? Surely not. The Alexandrian Clement, Tertullian, Origen, Eusebius, Jerome and Augustine only tell of the Zebedean what is traceable to stories told by Papias of others, to passages of Revelation and the Gospel or to the assured fact of the long-lived Asian presbyter.

As to the internal evidence, if the Gospel typifies various imperfect or sinful attitudes in Nicodemus. the Samaritan woman and Thomas; if even the mother appears-to symbolize faithful Israel: then, profoundly spiritual and forward-looking as it is, a type of the perfect disciple, not all unlike Clement's perfect "Gnostic." could hardly be omitted by it; and the precise details of this figure may well be only ideally. mystically true. The original work nowhere identifies this disciple with any particular historic figure. "He who saw" the lance thrust "hath borne witness: and his witness is true." is asserted (xix, 35) of the disciple. Yet "to see" is said also of intuitive faith, "whoso hath seen Me, hath seen the Father" (xiv, 9); and "true" appears also in "the true Light." '(the true Bread from heaven." as characterizing the realities of the upper. alone fully true world. and equals "heavenly" (iii, 12); thus a "true witness" testifies to some heavenly reality, and appeals to the reader's "pneumatic," *i.e.,* allegorical, understanding.

Only in the appendix do we find any deliberate identification with a particular historic person: "this is the disciple who witnessed to and who wrote these things" (xxi. 24) refers doubtless to the whole previous work and to "the disciple whom Jesus loved," identified here with an unnamed historic personage whose recent death had created a shock, evidently because he was the last of that apostolic generation which had so keenly expected the second coming (18–23). This man was so great that the writer strives to win his authority for this Gospel; and yet this man was not John the Zebedean, else why, now he is dead and gone, not proclaim the fact? If the dead man was John the Presbyter — if this John had in youth just seen Jesus and the Zebedean, and in extreme old age had still seen and approved the Gospel — to attribute this Gospel to him. as is done here, would not violate the literary ethics of those times. Thus the heathen philosopher Iamblichus (d. *c.* 330) declares: "this was admirable" among the Neo-Pythagoreans "that they ascribed everything to Pythagoras; but few of them acknowledge their own works as their own" (de *Pythag. vita,* 198). And as to Christians, Tertullian about 210 tells how the presbyter who, in proconsular Asia, had "composed the *Acts* of *Paul and Thecla"* was convicted and deposed, for how could it be credible that Paul should confer upon women the power to "teach and baptize" as these *Acts* averred? The attribution as such, then, was not condemned.

The facts of the problem would all appear covered by the hypothesis that John the Presbyter, the 11 being all dead, wrote the book of Revelation (its more ancient Christian portions) say in 69, and died at Ephesus say in 100; that the author of the Gospel wrote the first draft, here, say in 97; that this book, expanded by him, first circulated within a select Ephesian Christian circle; and that the Ephesian church officials added to it the appendix and published it in 110–120. But however different or more complicated may have been the actual origins, three points remain certain. The real situation that confronts us is not an unbroken tradition of apostolic eyewitnesses, incapable of restatement with any hope of ecclesiastical acceptance, except by another apostolic eyewitness. On one side indeed there was the record, underlying the Synoptists, of at least two eyewitnesses, and the necessity of its preservation and transmission; but on the other side a profound double change had come over the Christian outlook and requirements. St. Paul's heroic labours (30–64) had gradually gained full recognition and separate organization for the universalist strain in our Lord's teaching; and he who had never seen the earthly Jesus, but only the heavenly Christ, could even declare that Christ "though from the Jewish fathers according to the flesh" had died, "so that henceforth, even if we have known Christ according to the flesh, now we no further know Him thus," "the Lord is the Spirit," and "where the Spirit of the Lord is, there is liberty." And the Jewish church, within which Christianity had first lived and moved; ceased to have a visible centre. Thus a superspatial and supertemporal interpretation of that first markedly Jewish setting and apprehension of the Christian truth became as necessary as the attachment to the original contingencies. The Fourth Gospel, inexplicable without St. Paul and the fall of Jerusalem. is fully understandable with them. The attribution of the book to an eyewitness nowhere resolves, it everywhere increases, the real difficulties; and by insisting upon having history in the same degree and way in John as in the Synoptists, we cease to get it sufficiently anywhere at all. And the Fourth Gospel's true greatness lies well within the range of this its special character. In character it is profoundly "pneumatic"; Paul's superearthly Spirit-Christ here breathes and speaks and invites a corresponding spiritual comprehension. And its greatness appears in its inexhaustibly deep teachings concerning Christ's sheep and fold; the Father's drawing of souls to Christ; the dependence of knowledge as to Christ's doctrine upon the doing of God's will; the fulfilling of the cbmmandment of love, as the test of true discipleship; eternal life, begun even here and now; and God a Spirit, to be served in spirit and in truth.

BIBLIOGRAPHY.—*See* JOHN, ST. (the Apostle); REVELATION, BOOK OF. Among the literature of the subject, the following books will be found especially instructive by the classically trained reader: Origen's commentary, *c.* 235–237, ed. by Brooke (1896; Preuschen 1903); St. Augustine, *Tractatus in Joannis Ev. et Ep.* (*c.* 416). The Spanish Jesuit Juan Maldonatus' Latin commentary, pub. 1596 (critical reprint, ed. by Raich, 1874), a pathfinder on many obscure points, is still a model for tenacious penetration of Johannine ideas. Bretschneider's short *Probabilia de Evangelii . . . Joannis Apostoli indole et origine* (1820), the first systematic assault on the traditional attribution, remains unrefuted in its main contention. The best summing up and ripest fruits of the later critical labour are H. J. Holtzmann, *Handkommentar,* and ed. (1893), and the respective sections in his *Einleitung in d. N. T.,* 3rd ed. (1892), and his *Lehrbuch der N. T. Theologie,* vol. ii *(1897).* Among the few critically satisiactory French books, Abbé Loisy, *Le Quatrième évangile,* 2nd ed. (1903, 1921), stands pre-eminent for delicate psychological analysis and continuous sense of the book's closely knit unity; while T. Calmes, *Evangile selon* S. *Jean* (1904), indicates how numerous are the admissions as to the book's character and the evidences ior its authorship made by intelligent Roman Catholic apologists with Rome's explicit approbation. Lightioot, *Essays on . . . Supernatural Religion* (1874–77; collected 1889), are often masterly conservative interpretations

of the external evidence; but they leave this evidence still inconclusive, and the formidable contrary internal evidence remains practically untouched. Much the same applies to Westcott, *Gospel According to St. John* (1882), devotionally so attractive, and in textual criticism excellent. V. H. Stanton, *Gospels as Historical Docunzents,* pt. iii (1920), shows how far conservative scholarship has moved since Westcott's time. F. C. Burkitt, *The Gospel History* (1906), vigorously sketches the book's dominant characteristics and true function. E. F. Scott, *The Fourth Gospel* (1906; 2nd ed., 1909), gives a lucid, critical and religiously tempered account of the Gospel's ideas, aims, affinities, difficulties and abiding significance. Wellhausen, *Das Evang. Johannis* (1908). C. F. Burney, *The Aramaic Origin of the Fourth Gospel* (1922), attempts to prove that the Gospel is based on an Aramaic original; but the thesis has not met with wide acceptance. The origin, authorship and character of the Gospel are considered in B. H. Streeter, *The Four Gospels* (1924). D. W. Bauer, "Das Johannesevangelium" in the *Handbuch z. N.T.,* 2nd ed. (1925), contains elaborate references, giving prominence to the suggested parallels in the Mandaean literature (*see* MANDAEANS). (F. V. H.)

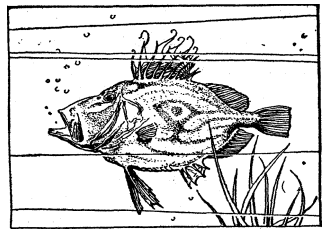
JOHN ALBERT (1459–1501), king of Poland, third son of Casimir IV. king of Poland, and Elizabeth of Austria. As crown prince he distinguished himself by his brilliant victory over the Tatars at Kopersztyn in 1487. He succeeded his father in 1492. Primarily a warrior and adventurer, John Albert desired to pose as the champion of Christendom against the Turks, and in 1494 (conference of Leutschau) arranged a combined campaign with his brother Wladislaus, king of Hungary and Bohemia, the elector Frederick of Brandenburg and John Albert's vassal Stephen, hospodar of Moldavia. In 1496 John Albert collected 80.000 men in Poland, but the hospodar, apparently suspecting his designs, invaded Galicia. The war became one between Poland and Moldavia, in which John Albert! weakened by the insubordination of the *szlachta,* had the worst of matters. He was more successful in the north, compelling the recalcitrant grand master of the Teutonic Order, Frederick of Saxony, to do homage, but a further campaign was frustrated by his sudden death in 1501.

See V. Czerny, *The Reigns of John Albert and Alexander Jagiello* (Pol.) (Cracow, 1882).

JOHN ANGELUS (d. 1244), emperor of Thessalonica. In 1240 he received the throne from his father, Theodore, who made John the nominal sovereign. His reign is chiefly marked by the aggressions of the rival emperor of Nicaea, John Vatatzes, who besieged Thessalonica in 1242 and only withdrew upon John Angelus consenting to exchange the title "emperor" for "despot."

JOHN BULL, a popular name for England, personifying the bluff frankness and solidity of the English character. John Arbuthnot (*q.v.*), though he did not invent John Bull, fixed his lineaments in five tracts, begun in 1712, and printed as "The History of John Bull" in Miscellanies in Prose and Verse (1727), the preface to which is signed by Pope and Swift.

JOHN DORY or DORY (Zeus *faber*), an Acanthopterygian fish! the type of the family Zeidae. The body is much compressed and nearly oval, while the mouth is large and capable of extensive protrusion. It possesses two dorsal fins, of which the anterior is armed with long spines, and the connecting membrane is produced into tendrillike filaments. The side is marked with a prominent dark spot, on account of which the dory divides with the haddock the reputation of being the fish from which Peter took tribute money. It inhabits the Atlantic coasts of Europe and the Mediterranean with a closely related species in Australian seas. It is exceedingly voracious, feeding on molluscs, shrimps and the young of other fish. It is often taken in nets off the Cornwall and Devon coast, having entered these in pursuit of pilchards. It prefers sandy bays, among the weeds growing on the bottom of which it lies in wait for its prey. The dory may attain a weight of 12 lb. It is highly valued as an article of food. (See FISHES.)



BY COURTESY OF THE NATURAL HISTORY MUSEUM, N.Y.
JOHN DORY (ZEUS FABER), A FISH IN GREAT ESTEEM IN EUROPE AS FOOD

JOHN FREDERPCK I (1 jog–I j54), called THE MAGNANIMOUS, elector of Saxony, was the elder son of the elector John the Steadfast, and belonged to the Ernestine branch of the Wettin family. Born at Torgau on June 30, 1503, and educated as a Lutheran, he succeeded his father in Aug. 1532. His lands comprised the western part of Saxony and included Thuringia. but in 1542 Coburg was surrendered to form an appanage for his brother, John Ernest (d. 1553). John Frederick continued the religious policy of his father. His general attitude was one of vacillation between the emperor and his own impetuous colleague in the league of Schmalkalden. Philip, landgrave of Hesse. He was often at variance with Philip, whose bigamy he disliked, and his belief in the pacific intentions of Charles V and his loyalty to the empire prevented him from strong measures for the defense of Protestantism. In 1541 his kinsman Maurice became duke of Saxony and cast covetous eyes upon the electoral dignity. In 1541 John Frederick forced Nicolaus von Xmsdorf into the see of Naumburg in spite of the chapter. which had elected a Roman Catholic. Julius von Pflug; and about the same time he seized Wurzen. the property of the bishop of Meissen. whose see was under the joint protection of electoral and ducal Saxony. Maurice took up arms and war was only averted by the efforts of Philip of Hesse and Luther. In 1542 the elector helped to drive Henry, duke of Brunswick-Wolfenbüttel, from his duchy, but his relations with Charles V at the diet of Speyer in 1544 mere amicable. But the emperor made preparations for attacking the league of Schmalkalden, and especially John Frederick and Philip of Hesse. The neutrality of Maurice was won by the hope of the electoral dignity, and in July 1546 war broke out between Charles and the league. In September John Frederick was placed under the imperial ban, and in November Maurice invaded the electorate. Hastening from iouthern Germany the elector drove Maurice from the land, took his ally, Albert Alcibiades, prince of Bayreuth, prisoner at Rochlitz, and overran ducal Saxony. His progress, however, was checked by the advance of Charles V. He was wounded and taken prisoner at Miihlberg (April 24, 1547), and was condemned to death in order to induce Wittenberg to surrender. The sentence was not carried out. but by the capitulation of Wittenberg (May 1547) he renounced the electoral dignity and a part of his lands in favour of Maurice, steadfastly refusing. however, concessions on religious matters: and remained in captivity until May 1552, when he returned to the Thuringian lands which his sons had been allowed to retain, his return being hailed with wild enthusiasm. During his imprisonment he had refused to accept the Augsburg interim, and had urged his sons to make no peace with Maurice. After his release the emperor had restored his dignities, and his assumption of the electoral arms and title prevented any arrangement with Maurice. After the death of Maurice in July 1553, a treaty was made at Naumburg in Feb. 1554 with his successor Augustus. John Frederick consented to the transfer of the electoral dignity, and was thus the last Ernestine elector of Saxony. He died at Weimar on March 3, 1554, and was succeeded by his eldest son. John Frederick. The elector was a great hunter and a hard drinker, whose dignified bearing in misfortune won for him his surname of Magnanimous, and drew eulogies from Roger Ascham and Melanchthon. He founded the University of Jena and was a benefactor to that of Leipzig.

See Mentz, *Johann Friedrich der Grossmütige* (Jena, 1903); Rogge, *Jokann Friedrich der Grossmütige* (Halle, 1902); L. von Ranke, *Deutsche Geschichte im Zeitalter der Reformation* (Leipzig, 1882).

JOHN FREDERPCK (1529–1595), called DER MITTLERE, duke of Saxony, was the eldest son of John Frederick, who had been deprived of the Saxon electorate by the emperor Charles V in 1547. Born at Torgau on Jan. 8, 1529, he received a good education. and when his father was imprisoned in 1547 undertook the government of the remnant of electoral Saxony left to the Ernestine branch of the Wettin family. After the death of John Frederick the elder in 1554 his three sons ruled Ernestine Saxony together until 1557, when John Frederick was made sole ruler. This arrangement lasted until 1565, when John Frederick shared his lands with his surviving brother, John William (1530–73), retaining for himself Gotha and Weimar. The duke was a strong, even a fanatical, Lutheran. but his religious views were gradually subordinated to the one idea of regaining the electoral dignity then held by Augustus I. He lent a willing ear to the schemes of Wil-

helm von Grumbach (*q.v.*), who offered to regain the electoral dignity and even to acquire the empire for his patron. In **1566** his obstinacy caused John Frederick to be placed under the imperial ban. The execution of the imperial sentence was entrusted to Augustus, who, aided by the duke's brother, John William, marched against Gotha with a strong force. The town surrendered in April **1567,** and John Frederick was imprisoned in Vienna, his lands were given to his brother and he remained in captivity until his death at Steyer on May **6,** 1595. His wife Elizabeth, daughter of the elector palatine, Frederick III, shared her husband's imprisonment for 22 years.

See A. Beck, *Johann Friedrich der Mittlere, Herzog zu Sachsen* (Vienna, 1858); F. Ortloff, *Geschichte der Grumbachischen Händel* (Jena, 1868–70).

JOHN GEORGE I (1585–1656), elector of Saxony, second son of the elector Christian I, was born on March 5, **1585.** succeeding his elder brother, Christian II, in 1611. Though a Lutheran, he voted for the election of Ferdinand, archduke of Styria, as emperor in Aug. **1619,** an action which nullified the anticipated opposition of the Protestant electors. The new emperor secured the help of John George for the impending campaign in Bohemia by promising that he should be undisturbed in his possession of certain ecclesiastical lands. John George occupied Silesia and Lusatia, and had thus some part in driving Frederick V, elector palatine of the Rhine, from Bohemia and in crushing Protestantism in that country, the crown of which he had previously refused. Gradually his policy veered toward the Protestant side, and when the imperial troops under Tilly began to ravage Saxony he concluded an alliance with Gustavus Adolphus in **1631.** The Saxon troops were present at the battle of Breitenfeld, but were routed by the imperialists. Marching into Bohemia the Saxons occupied Prague, but John George soon began to negotiate for peace, and consequently his soldiers offered little resistance to Wallenstein, who drove them back into Saxony. After the death of the Swedish king at Lutzen in **1632,** John George again negotiated for peace, and in May **1635** he concluded the treaty of Prague with Ferdinand II. His reward was Lusatia and other additions of territory; the retention by his son Augustus of the archbishopric of Magdeburg; and some concessions with regard to the edict **(1629)** of restitution of ecclesiastical lands. Almost at once he declared war upon the Swedes, but in Oct. **1636** he was beaten at Wittstock; and Saxony was ravaged impartially by both sides. In Sept. **1645** the elector agreed to a truce with the Swedes, who, however, retained Leipzig; and as far as Saxony was concerned this ended the Thirty Years' War. John George died on Oct. **8, 1656.** He was twice married, and in addition to his successor John George II he left three sons, Augustus (1614–80), Christian (d. **1691)** and Maurice (d. **1681)** who founded cadet branches of the Saxon house.

JOHN GEORGE II (1613–1680), elector of Saxony, was born on May **31,1613.** In 1657, just after his accession, he made an arrangement with his three brothers with the object of preventing disputes over their separate territories, and in **1664** he entered into friendly relations with Louis XIV. The existence of a strong anti-French party in Saxony, however, prevented open hostility to the emperor Leopold I. The elector's primary interests were not in politics, but in music and art. He adorned Dresden, which under him became the musical centre of Germany; welcoming foreign musicians and others he gathered around him a large and splendid court, and his capital was the constant scene of musical and other festivals. His enormous expenditure compelled him in **1661** to grant greater control over monetary matters to the estates, a step which laid the foundation of the later system of finance in Saxony. John George died at Freiberg on Aug. 22, **1680.**

JOHN GEORGE III (1647–1691), elector of Saxony, the only son of John George II, was born on June 20, **1647.** In June **1683** he joined an alliance against France. Having raised the first standing army in the electorate he helped to drive the Turks from Vienna in Sept. **1680,** but disagreed with Leopold I and returned at once to Saxony. However, he sent aid to the emperor in **1685.** When Louis XIV's armies invaded Germany in Sept. **1688** John George took up arms against the French, and after sharing in the capture of Mainz he was appointed commander in chief of the imperial forces. He died at Tübingen on Sept. 12, **1691.**

JOHN GEORGE IV (1668–1694), elector of Saxony, was born on Oct. **18, 1668.** This elector, who only reigned for $2\frac{1}{2}$ years, is chiefly celebrated for his passion for Magdalene Sibylle von Neidschütz (d. 1694), created in **1693** countess of Rochlitz, whom on his accession he publicly established as his mistress. John George left no legitimate issue when he died on April **27,** 1694.

JOHN HENRY is generally known as the Negro Paul Bunyan. A widely sung Negro ballad describes his contest with a steam drill. John Henry crushed more rock than the machine, but he died "with his hammer in his hand." Writers and artists see in John Henry a symbol of man's foredoomed struggle against the machine, and of the Negro's tragic battle with the white man.

Some factual basis exists for the ballad of John Henry. When the Chesapeake and Ohio railroad drove the Big Bend tunnel through the Allegheny mountains in West Virginia, from **1870** to **1873,** "steel drivers" hammered steel drills, held by their partners, into the rock to plant explosives. Since the modern steam drill was introduced into the south in **1870,** the comparative efficiency of the two methods could have been tested at Big Bend.

Although southern Negroes sing about John Henry, they tell few stories of him and, like Paul Bunyan, he is not truly a folk hero. The imaginative treatment by Roark Bradford made the name of *John Henry* (1931), known to many Americans.

See Guy B. Johnson, *John Henry: Tracking Down a Negro Legend* (1929); Louis W. Chappell, *John Henry, A Folk-Lore Study* (1933).

(R. M. Dn.)

JOHN MAURICE OF NASSAU (1604–1679), surnamed THE BRAZILIAN, was the son of John the Younger, count of Nassau-Siegen-Dillenburg, and the grandson of John, the elder brother of William the Silent and the chief author of the union of Utrecht. He fought in the campaigns of his cousin, the stadtholder Frederick Henry of Orange, and was by him recommended to the directors of the Dutch West India company in **1636** to be governor general of the new dominion in Brazil recently conquered by the company. He landed at Recife, the port of Pernambuco, and the chief stronghold of the Dutch, in Jan. **1637.** By successful expeditions he extended the Dutch possessions from Sergipe on the south to S. Luis de Maranham in the north. He likewise conquered the Portuguese possessions of St. George del Mina and St. Thomas on the west coast of Africa. With the assistance of the famous architect, Pieter Post of Haarlem, he transformed Recife by building a new town called after his name Mauritstad. He brought the colony into a flourishing condition, and reconciled the Portuguese settlers to Dutch yule. His large schemes and lavish expenditure, however, alarmed the directors of the West India company, and John Maurice returned to Europe in July **1644.** He was appointed by Frederick Henry to the command of the cavalry in the states army, and he took part in the campaigns of **1645** and **1646.**

After the peace of Munster (1648), John Maurice accepted from the elector of Brandenburg the post of governor of Cleves, Mark and Ravensberg, and later also of Minden. At the end of **1652** he was appointed head of the Order of St. John and made a prince of the empire. In **1664** he came back to Holland; when the war broke out with England he was appointed commander in chief of the Dutch forces on land. In **1673** he was appointed by the stadtholder William III to command the forces in Friesland and Groningen, and to defend the eastern frontier of the provinces. In **1675** he retired. He died at Cleves on Dec. 20, **1679.** The house which he built at The Hague, named after him the Maurits-huis, contains the collections of pictures so well known to all admirers of Dutch art.

JOHN O' GROAT'S HOUSE, a spot on the north coast of Caithness, Scot., $16\frac{3}{4}$ mi. N. of Wick and $1\frac{3}{4}$ mi. W. of Duncansby head. It is the site of the house of the legend. First found in the *Statistical Account of Scotland* (1793), this relates how three brothers, Malcolm, Gavin and John de Groat, Dutchmen, arrived in Caithness under the protection of James IV. They prospered till eight families of the name held lands in Duncansby. An-

nually they celebrated their arrival with a feast and there disputes arose on precedence. These were settled by John de Groat who built a house with an octagonal room and table so that all were "head of the table." References to "Johnny Groat's house" are found in the 17th century, and the family, from 1500, held Caithness lands and the Pentland ferry.

From Land's End to John O'Groat's is a colloquial expression for from end to end of Britain (873 mi.). (F. W. RN.)

JOHNS HOPKINS UNIVERSITY, a nonsectarian U.S. institution of higher education at Baltimore, Md., comprises a faculty of philosophy, four professional schools, a college for part-time students and two separate research units. Most of these divisions are located in Baltimore.

The university was founded by Johns Hopkins, a Quaker merchant and banker of Baltimore who also founded the Johns Hopkins hospital, a separate corporation. Both institutions were incorporated in Aug. 1867, but the initial trustees of each were not in a position to proceed with either undertaking until after the death of the founder. Under the terms of Hopkins' mill, his entire fortune. valued at approximately $7,000,000, was divided equally between the university and the hospital. The university's share included Hopkins' country estate, Clifton, a tract of 330 ac. on the outskirts of Baltimore, and a large holding in the stock of the Baltimore and Ohio Railroad company.

The trustees of the university selected Daniel Coit Gilman as its first president. Gilman, a graduate of Yale university, had served as the secretary of its Sheffield scientific school and later as president of the University of California, Berkeley, from which he was called to organize the new university. He was formally inaugurated as president on Feb. 22, 1876.

In his inaugural address Gilman revealed his ideas of the lines along which the new institution should develop. He wished it to devote its energies primarily to higher education, to research and to the training of individuals for scholarly careers. He recognized that because of its close association with the Johns Hopkins hospital it would have an unusual opportunity to contribute to the advancement of medical education and he began early to make plans to that end.

Gilman was anxious to get the new institution under way as soon as possible, and, since a large building program at Clifton could not be started at once, a lot with two buildings on it. located on the edge of the business district of the city, was purchased. There, in unpretentious quarters, instruction was begun on Oct. 3, 1876. At the time these quarters were thought to be temporary only, but unexpected financial reverses forced the sale of Clifton to the city for a public park and the institution was obliged to remain in the business area until it could move to its present main campus in north Baltimore, known as Homewood, which it acquired by gift in 1902. Instruction began in a modest way. The first faculty to be appointed, that of philosophy, consisted of 6 resident professors, 2 lecturers who were connected with other institutions and came for only part of the academic year and a group of 12 younger associates and assistants.

While the primary purpose of the university has always been to sustain graduate education and research, and to train men for scholarly careers, it also has always provided undergraduate instruction for men in the arts and sciences. In the early days such instruction was organized in several different groups of subjects, depending upon the career the undergraduate had chosen for himself. Certain subjects were common to all groups. The system was Gilman's own idea and was a compromise between a rigid curriculum and a completely free elective system.

All four professional schools which were subsequently established followed the original tradition of fostering research and the training of scholars.

The second faculty to be created was that of medicine. The founder had envisaged a medical school within the framework of his university, but the medical school could not be started at once because of the long interval of time required to build the hospital. When that institution was finally opened in May 1889, the university was not prepared financially to initiate a medical school. A group of women, however, anxious to obtain opportunities in medical education for members of their sex, succeeded in raising an endowment of $500,000, which was offered to establish the proposed medical school on condition that women be admitted on the same terms as men. The gift was accepted and the school was opened in Oct. 1893. Thereafter it was operated in a close relationship with the Johns Hopkins hospital, the heads of the individual departments in that institution being professors in the corresponding disciplines in the university.

At the time of its opening it set a higher standard for admission than any other medical school in the country, all matriculants being required to present evidence of a liberal college education as represented by the possession of the bachelor of arts degree, together with special preparation in the three natural sciences ancillary to the study of medicine—physics, chemistry and biology.

From the beginning the heads of all of the so-called preclinical departments, anatomy, physiology, physiological chemistry, pharmacology and pathology. were on a full-time or university basis. In 1914 this system was extended to the departments of medicine, surgery and pediatrics, and later to nearly all of the other major clinical departments and subdepartments.

The school is in the eastern part of Baltimore in close proximity to the Johns Hopkins hospital.

A school of engineering was established in 1912 on the basis of an initial appropriation by the state of Maryland of $600,000. With this aid two buildings were constructed on the main campus of the university and a faculty assembled, representing the fields of civil. electrical and mechanical engineering. Subsequently departments of chemical engineering. aeronautical engineering, industrial engineering and sanitary engineering and water resources were added.

In 1918 the school of hygiene and public health was opened on the basis of a grant from the Rockefeller foundation. Its purpose has been stated to be "the advancement of knowledge and the training of investigators, teachers, officials and other workers" in the general field of hygiene and public health. It is in the eastern part of Baltimore near the school of medicine and the Johns Hopkins hospital. Many of its students have come from outside the U.S. to be trained to become health officers in their respective countries.

The school of advanced international studies, a graduate school of foreign affairs, was established in the District of Columbia in 1943 by the Foreign Service Educational foundation. In Sept. 1950 it was incorporated in the Johns Hopkins university as one of the graduate schools of the university but it continued to operate in a building at 1830 19th St. N.W., Washington, D.C. The aim of the school is to provide a limited number of qualified students with a type of instruction and training designed to prepare them for careers in the international field. A branch of the school is located at the University of Bologna, It.

McCoy college was established in 1947 to provide a single administrative unit responsible for providing educational opportunities for part-time adult students in particular. Under its supervision'were placed the so-called night courses for technical workers which had been provided for many years and other courses in special fields. such as business and education, which had previously been provided in separate colleges or schools.

It was organized in four divisions: arts and sciences, business, education and engineering. It admits both women and men and is on the main campus.

In addition to the foregoing units, all of which are engaged in the instruction of students, there are two which limit their activities to research in fields of interest to the armed forces. Supported by contracts with the federal government, they were developed as outgrowths of World War II. One, the Applied Physics laboratory, located in Howard county, Md., developed the proximity fuze; the other, the Operations' Research office, at Chevy Chase, Md., carries out research in the general domain of military operations.

The university maintains the Johns Hopkins press, the oldest university press in the Gnited States from the standpoint of continuous operation, and has founded and supported a number of

scientific and literary journals. (A. M. Cy.)

JOHNSON, ANDREW (1808–1875), seventeenth president of the United States, was born at Raleigh, N.C., on Dec. 29, 1808. At the age of ten the boy mas apprenticed to a tailor and learned to read and write. In 1826 he removed to Greeneville in eastern Tennessee, where he married Eliza McCardle (1810–76), who pessessed a fair education and was of considerable assistance to her husband in his pursuit of further learning During the early Tennessee years Johnson earned his living by the practice of his trade. but befure he was 21 he entered local politics, was elected an alderman, and in 1830 became mayor of Greeneville. From 1834 to 1843 he participated in State politics, serving as a Democrat in the State constitutional convention (1834), in the House of Representatives (1835–37; 1839–41) and in the Senate (1841–43). These years marked Johnson's political apprenticeship. His powers were now mature and he was ready to assume the position of champion of his section which was composed in the main of small farmers, suspicious and jealous of the slave-holding plantation owners who dominated the social and political life of middle and western Tennessee.

Generally speaking, during the formative years of Johnson's political career and down to the middle of the 1850's, the Whig Party was the political agent of the plantation interests in Tennessee while the Democratic Party, true to its Jacksonian origin. continued as the exponent of the small farmer-labourer interests As the years passed and the drift of events tended to force slave-owners everywhere to unite in one party, and that party by the force of circumstances became the Democratic, Johnson sometimes found himself in uncongenial company. Nevertheless he preferred the Democratic to the newly-formed Republican Party. As a Democrat he had served as a member of the Federal House of Representatives from 1843 to 1853; from 1853 to 1857 he was governor of Tennessee and from 1857 to 1862 he was a member of the United States senate. In Congress he was in harmony with the pro-slavery element of his party so far as low tariff, territorial expansion, slavery extension and opposition to abolitionist agitation were concerned. He opposed them when they attempted to obstruct the movement for free western land for actual settlers, and as governor of Tennessee when he espoused the cause of popular education at State expense. In 1860 he supported Breckenridge whom he regarded as the true Democratic standard-bearer. However, he did not consider the election of Lincoln a sufficient reason for the Southern States to secede. Accordingly when Tennessee passed an ordinance of secession in June, 1861, he refused to leave his seat in the United States Senate and join the newly organized Confederacy. In March, 1862, President Lincoln appointed him military governor of Tennessee and during the two years he held this position he rendered valuable service to the Union cause, and just before he left the office he succeeded in creating and putting into operation machinery for the restoration of a loyal civil government in the State. During these Civil War years Johnson never ceased to class himself as a Democrat, and when in 1864 he was nominated for vice president on the ticket with Lincoln, it was by a convention that called itself "Union," not "Republican." This distinction is important for it exculpates Johnson from the charge subsequently made that he was an apostate from the Republican Party.

When Lincoln was assassinated in April, 1865, Johnson succeeded to the Presidency. Although he had frequently expressed himself to the effect that secession was treason and that the leaders of the secession movement should be punished as traitors, he did not hold that the late Confederate States were conquered territories to be dealt with in such manner as Congress might see fit. In this his opinions were in harmony with those of Lincoln, who had acted on the theory that the States had never been out of the Union. As commander-in-chief of the army the President had full power to name the conditions upon which military rule might be withdrawn and civil rule substituted. Accordingly, on May 29, 1865, he issued a general amnesty proclamation, granting full pardon to all ex-Confederates (except certain leaders) who would take an unqualified oath of allegiance to the United States. He next appointed provisional governors for the seven rebel States which had not already begun the process of restoration under the direction of Lincoln. To these governors he issued instructions that they provide for State conventions to be elected by such persons as had taken the oath of allegiance and were otherwise qualified to vote under the laws of the respective States. To the conventions he suggested (one might almost say, ordered) that they embody in the State Constitutions a provision for the abolition of slavery, ratify the 13th amendment to the Federal Constitution, nullify the ordinances of secession and repudiate such parts of the State debts as had been contracted in support of the secession movement. These were essentially the same demands that Lincoln had made on the conventions in the States where he had erected loyal civil governments. All this took place during the summer and autumn of 1865 previous to the assembling of Congress on Dec. 4.

That body was overwhelmingly Republican in complexion and most of the Republicans were inclined to take a radical view of the southern situation. It refused admission to the senators and representatives from the rebel States and provided for the creation of a joint committee on reconstruction. The exigencies of politics and the status of the freedmen were the crucial points in the situation The radicals demanded that the late slaves be granted the right to vote forthwith and that a sufficient number of ex-Confederates be disfranchised to assure Republican majorities in most of the Southern States, assuming, of course, that the negroes would vote Republican out of gratitude to the party which had effected their freedom. To none of these demands would the President yield and in the course of three or four months the breach between him and the Republican Congress was wide open. Meanwhile the Southern States remained unrepresented in Congress while the reconstruction committee conducted investigations into southern conditions to ascertain whether any of them were sufficiently loyal to warrant their being represented. In June, 1866, the committee reported that the rebel States were unfit for representation, but presumably would become fit should they ratify the 14th amendment which was reported at the same time. This amendment was defeated in all the late Confederate States except Tennessee. The representatives and senators from this State were forthwith admitted. Soon afterward Congress adjourned and the whole question of reconstruction was submitted to the electorate.

During the course of his contest with the radical Republicans Johnson had gradually drawn the Democrats to his side and hoped to secure the support of enough moderate Republicans to control the next Congress. To this end he took an active part in the campaign but it is a question whether his speeches, some of which were certainly undignified and in bad taste, did more harm than good to his cause. At any rate his hopes were dashed as the new Congress contained an even larger majority of radical Republicans than the old. Accordingly, in 1867 Congress threw aside his work of restoration and proceeded with a plan of its own, the main features of nhich nere the restoration of military control, the enfranchisement of negroes and the disfranchisement of considerable numbers of ex-Confederates. Johnson opposed this plan with all the power he possessed, regarding it as dangerous to the Federal system of government. His opposition was vain but troublesome to the leaders of the radical movement. They therefore determined to deprive the President of practically all power. To this end Congress passed on March 2, 1867, over the President's veto, the Tenure of Office act, prohibiting the President from dismissing from office, unless the Senate should agree, any officer appointed by and with the consent of that body. For a long time Ednin M. Stanton, the secretary of war, had been disloyal to his chief and in league with his enemies. To rid himself of his obnoxious war minister and at the same time test before the Supreme Court the constitutionality of the Tenure of Office act, Johnson removed Stanton without obtaining the consent of the Senate. His plan for bringing the case before the Supreme Court, however, miscarried. Whereupon the House of Representatives brought articles of impeachment against the President, the only important charge being his violation of the Tenure of Office act. The evidence was entirely inadequate for convicting him on the

graver charge before any fair-minded and impartial tribunal. The Senate at that time, however, was extremely partisan, and Johnson escaped conviction by only one vote (35 to 19; a two-thirds majority was necessary for conviction), on May 16, 1868. The remainder of Johnson's term as President was comparatively quiet and uneventful. On March 4, 1869, he left the Presidency a beaten and embittered man, but something of his fighting spirit remained. After a number of unsuccessful efforts, in 1875 his Tennessee constituents returned him to his old place in the Senate. But his triumph was not for long. He made one brilliant speech in the Senate in apology for his own reconstruction policy and in denunciation of that of his opponents. But it was his last. Shortly afterward, on July 31, 1875, he died. Faults of personality were Andrew Johnson's great handicap. He lacked the finish of systematic education. He was frequently tactless and at times even undignified. Though possessing fundamentally a kind and sympathetic disposition, his natural shyness caused him to appear to all except his closest intimates, hard and inflexible. His career as president mas of the essence of tragedy. Of unlimited faith in the people, his reconstruction policies were overwhelmingly rejected by them. Of unswerving devotion to the letter and spirit of the Constitution he was impeached for its violation.

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JOHNSON, DOUGLAS WILSON (1878–1944), U.S. geologist, and, at the time of his death, the country's leading geomorphologist, was born at Parkersburg, W.Va., on Nov. 30, 1878. Educated at Denison, New Mexico, and Columbia universities, he held several teaching appointments before his great teaching career at Columbia from 1912 to 1944. In World War I he rendered notable service as chief, Division of Boundary Geography. American commission to negotiate peace (Paris. 1918–19). His military experiences resulted in *Topography and Strategy in the War* (1917) and *Battlefields of the World War* (1921). An exponent of William Morris Davis (*q.v.*), he wrote such classic works in geomorphology as *Shore Processes and Shoreline Development* (1919), *New England-Acadian Shoreline* (1925), *Stream Sculpture on the Atlantic Slope* (1931), *Origin of Submarine Canyons* (1939), and *Origin of the Carolina Bays* (1942). He edited the *Journal of Geomorphology* from 1938 to 1942. He died at Sebring, Fla.. on Feb. 24, 1944. (F. M. FL.)

JOHNSON, (JONATHAN) EASTMAN (1824–1906), U.S. portrait and genre painter, was born at Lovell, Me., July 29, 1824. He studied at Diisseldorf, Paris, Rome and The Hague. In 1860 he was elected to the National Academy of Design, New York. He made distinctively American themes his own, depicting the Negro, fisherfolk and farm life with unusual interest. Such pictures as "Old Kentucky Home" (1867), "Husking Bee" (1876), "Cranberry Harvest. Nantucket" (1880), and his portrait group "The Funding Bill" (1881), achieved a national reputation. Among his sitters were many prominent men, including Daniel Webster; Presidents Hayes, Arthur, Cleveland and Harrison; William M. Evarts, Charles J. Folger; Emerson, Longfellow, Hawthorne. James McCosh. Noah Porter and Sir Edward Archbald. He died in New York city April 5, 1906.

JOHNSON, EDWARD (1881–1959), tenor, was born at Guelph, Ont., Aug. 22, 1881. Educated at the University of Toronto, he went to New York city as a church soloist in 1907. Turning to light opera, he rapidly became a star. After further study in Italy, he made his operatic debut at Padua in 1911, in *Andrea Chenier*. He sang in Rome, Bologna and at La Scala, Milan, for five seasons. His first operatic appearance in the U.S. was with the Chicago Opera company, Nov. 30, 1919. He joined the Metropolitan Opera company, N.Y., in 1922, and became an American citizen. He was general manager of the Metropolitan (1935–49). He died at Guelph, April 20, 1959.

JOHNSON, HIRAM WARREN (1866–1945), **U.S.** politician, was born at Sacramento, Calif., on Sept. 2, 1866. He entered the University of California. but did not finish his course. He became a reporter, at the same time studying law in his father's office; was admitted to the bar 1888, and practised with his father and his brother in Sacramento. In 1902 he opened an office in San Francisco, where he became widely known in 1906–07, when as prosecuting attorney he proceeded against dishonest public officials and corporations. He was elected governor of California for the term 1911–1j; and in 1912 was an unsuccessful candidate for vice-president (on the ticket with Theodore Roosevelt), as nominee of the National Progressive party, which he had helped to organize. As governor he signed in 1913 the Webb Anti-alien bill, designed to prohibit the ownership of land in California by Japanese, although the president had asked for delay. He was re-elected governor 1915–19, but resigned in 1917 to enter the U.S. senate, where he served continuously until his death. He opposed many of the policies of President Wilson's administration, and declared that a league of nations would involve the United States in European wars. He opposed the third term for President Roosevelt, the attempt to enlarge the supreme court, modification of the Neutralitv act. conscription. and the United Nations World charter. He dikd on Aug. 6. 1945, at Bethesda, Md.

JOHNSON, LIONEL PIGOT (1867–1902), English critic and poet, was born at Broadstairs on March 15, 1867, and educated at Winchester, and at New College, Oxford. He began writing verse while still at school, and his essay on "The Fools of Shakespeare" was published in 1887, in *Noctes Shakesperiance.* In 1890, on leaving Oxford, he settled in London, where he undertook reviewing for the *Academy, Pall Mall Gazette* and other journals. In June 1891, he was received into the Church of Rome, and the influence of his conversion is seen in his poetry after that date. In 1895 the first collected edition of his poems appeared. His second volume *Ireland and other Poems* (1897), reflects his growing interest in Ireland. which he visited in Sept. 1893, and on several later occasions. He died on Oct. 4, 1902.

JOHNSON, LYNDON BAINES (1908–), U.S. vice-president, elected in 1960 on the Democratic ticket. headed by Sen. John F. Kennedy, was born Aug. 27, 1908, near Stonewall, Tex. He received a B.S. degree from Southwest Texas State Teachers' college at San Marcos in 1930 and taught school in Houston until 1932 when he became secretary to Texas congressman Richard M. Kleberg. He studied law at Georgetown university in Washington, D.C.. during 1935 and in that year was appointed Texas director of the National Youth administration. Two years later he won election to congress. Johnson served in the house from 1937 until his election to the senate in 1948. More liberal than most southerners and more conservative than the average Democrat in congress, he was elected leader by his Democratic colleagues in 1953. Johnson soon became recognized as a master of persuasion and compromise. His effectiveness as majority leader undoubtedly was heightened by the fact that he worked with an administration of the opposite party. Instead of being an errand boy for a Democratic president he often was in a position to speak for his party and for the legislative branch.

Johnson married Claudia Alta Taylor on Nov. 17, 1934. They had two daughters, Lynda Bird and Lucy Baines. Johnson is a member of the Christian Church. He served for a time as a lieutenant commander in the U.S. navy during World War II and was decorated for gallantry under fire. (T. N. S.)

JOHNSON, REVERDY (1796–1876), U.S. lawyer, senator and diplomat, was a foremost practitioner at the U.S. supreme court bar. Born at Annapolis, Md., on May 21, 1796, he attended St. John's college there and was admitted to the bar in 1816. He soon acquired great skill and power, both as a trial lawyer and in appeals. As associate of Roger B. Taney he appeared for the state in *Brown v. Maryland* (1827), a great case where the supreme court held invalid a licence tax on wholesalers of foreign goods. Among Johnson's cases before the supreme court were Wheeling Bridge (1852 and 1856), Dred Scott (1857), *Virginia* v. *West Virginia* (1871), and *Railroad Co.* v. *Maryland* (1875).

He served in the U.S. senate, from 1845 to 1849 as a Whig, and

from 1863 to 1868 as a Democrat. Johnson was dubbed "the trimmer" in politics: conciliatory, not inclined to take strong moral ground, he could argue on either side with subtlety and force. He voted for a wartime test oath, and then argued in the court, successfully, that test oaths are unconstitutional. In 1861 he helped to hold Maryland in the Union; thereafter he opposed extreme measures in the conduct of the Civil War, and sought a moderate policy of reconstruction. As minister to Great Britain, 1868–69, he made notable progress in settling the grave issues that had arisen between that country and the United States during the Civil War. He appeared for the defendant in notable cases under the Enforcement act of 1870: in 1871, when Klansmen were convicted in the federal court in South Carolina, and in 1875, when *United States* v. *Cruikshank* was heard in the supreme court. The decision in the last case, shortly after Johnson's death, held that the legislation overreached the constitution. In the senate and before the courts, Johnson was a lawyer of consummate ability.

See Bernard *C.* Steiner, *The Life of Reverdy Johnson* (1914); Charles Warren, *The Supreme Court in United States History (1926).* (FN.)

JOHNSON, RICHARD (1573–1659?), English writer of popular romances whose best-known work is *The Most Famous History of the Seaven Champions of Christendome*, was baptized in London on May 24, 1573. He called himself an apprentice in his *Nine Worthies of London* (1592), and he may have been in the household of Queen Anne, wife of James I. *The Seaven Champions of Christendome* was printed in two parts (1596?–97) and was such a success that Johnson added two more parts in 1608 and 1616. It includes many unacknowledged quotations from Shakespeare. His other works include *The Pleasant Walkes of Moorefields* (1607), *The Most Pleasant History of Tom a Lincolne* (1599, 1607) and *The Pleasant Conceites of Old Hobson* (1607). He also published a book of ballads, *The Crown Garland of Golden Roses* (1612).

JOHNSON, RICHARD MENTOR (1781–1850), ninth vice-president of the United States, was born at Bryant's Station (Ky.) on Oct. 17, 1781. He was admitted to the bar in 1800, and became prominent as a lawyer and Democratic politician serving in the Federal House of Representatives and in the Senate for many years. From 1837 to 1841 he was vice-president of the United States, to which position he was elected over Francis Granger, by the Senate, none of the four candidates for the vice-presidency having received a majority of the electoral votes. The opposition to Johnson within the party greatly increased during his term, and the Democratic national convention of 1840 adopted the unprecedented course of refusing to nominate anyone for the vice-presidency. In the ensuing election Johnson received most of the Democratic electoral votes, but was defeated by the Whig candidate, John Tyler. He died in Frankfort (Ky.) on Nov. 19, 1850.

JOHNSON, SAMUEL (1709–1784), English writer and lexicographer, was the son of Michael Johnson (1656–1731), bookseller and magistrate of Lichfield, who married in 1706 Sarah Ford (1669–1759). Michael's abilities and attainments seem to have been considerable. He was so well acquainted with the contents of the volumes which he exposed for sale that the country rectors of Staffordshire and Worcestershire thought him an oracle on points of learning. Between him and the clergy, indeed, there was a strong religious and political sympathy. He was a zealous churchman, and, though he had qualified himself for municipal office by taking the oaths to the sovereigns in possession, was to the last a Jacobite in heart. The social position of Samuel's paternal grandfather, William Johnson, remains obscure; his mother was the daughter of Cornelius Ford, "a little Warwickshire Gent."

At a house (now the Johnson museum) in the Market Square, Lichfield, Samuel Johnson was born on Sept. 18, 1709 and baptized on the same day at St. Mary's, Lichfield. In the child the physical, intellectual and moral peculiarities which afterwards distinguished the man were plainly discernible: great muscular strength accompanied by much awkwardness and many infirmities; great quickness of parts, with a morbid propensity to sloth and procrastination; a kind and generous heart, with a gloomy and irritable temper. He had inherited from his ancestors a scrofulous taint, and his parents were weak enough to believe that the royal touch would cure him. In his third year he was taken up to London, inspected by the court surgeon, prayed over by the court chaplains and stroked and presented with a piece of gold by Queen Anne. Her hand was applied in vain. The boy's features, which were originally noble and not irregular, were distorted by his malady. His cheeks were deeply scarred. He lost for a time the sight of one eye; and he saw but very imperfectly with the other. But the force of his mind overcame every impediment. Indolent as he was, he acquired knowledge with such ease and rapidity that at every school (such as those at Lichfield and Stourbridge) to which he was sent he was soon the best scholar. From 16 to 18 he resided at home, and was left to his own devices. He learned much at this time, though his studies were without guidance and without plan. He ransacked his father's shelves, dipped into a multitude of books, read what was interesting and passed over what was dull. An ordinary lad would have acquired little or no useful knowledge in such a way; but much that was dull to ordinary lads was interesting to Samuel. He read little Greek; for his proficiency in that language was not such that he could take much pleasure in the masters of Attic poetry and eloquence. But he had left school a good Latinist, and he soon acquired an extensive knowledge of Latin literature. He was peculiarly attracted by the works of the great restorers of learning. Once, while searching for some apples, he found a huge folio volume of Petrarch's works. The name excited his curiosity, and he eagerly devoured hundreds of pages. Indeed, the diction and versification of his own Latin compositions show that he had paid at least as much attention to modern copies from the antique as to the original models.

While he was thus irregularly educating himself, his family was sinking into hopeless poverty. Old Michael Johnson was much better qualified to pore over books, and to talk about them, than to trade in them. His business declined; his debts increased; it was with difficulty that the daily expenses of his household were defrayed. It was out of his power to support his son at either university; but a wealthy neighbour offered assistance; and, in reliance on promises which proved to be of very little value, Samuel was entered at Pembroke College, Oxford. When the young scholar presented himself to the rulers of that society, they were amazed not more by his ungainly figure and eccentric manners than by the quantity of extensive and curious information which he had picked up during many months of desultory but not unprofitable study. On the first day of his residence he surprised his teachers by quoting Macrobius; and one of the most learned among them declared that he had never known a freshman of equal attainments.

At Oxford Johnson resided barely over two years, possibly less. He was poor, even to raggedness; and his appearance excited a mirth and a pity which were equally intolerable to his haughty spirit. He was driven from the quadrangle of Christ Church by the sneering looks which the members of that aristocratical society cast at the holes in his shoes. Some charitable person placed a new pair at his door; but he spumed them away in a fury. Distress made him, not servile, but reckless and ungovernable. No opulent gentleman commoner, panting for one-and-twenty, could have treated the academical authorities with more gross disrespect. The needy scholar was generally to be seen under the gate of Pembroke, a gate now adorned with his effigy, haranguing a circle of lads, over whom, in spite of his tattered gown and dirty linen, his wit and audacity gave him an undisputed ascendancy. In every mutiny against the discipline of the college he was the ringleader. Much was pardoned, however, to a youth so highly distinguished by abilities and acquirements. He had early made himself known by turning Pope's "Messiah" into Latin verse. The style and rhythm, indeed, were not exactly Virgilian; but the translation found many admirers, and was read with pleasure by Pope himself.

The time drew near at which Johnson would, in the ordinary course of things, have become a Bachelor of Arts; but he was at the end of his resources. Those promises of support on which he had relied had not been kept. His family could do nothing for him. His debts to Oxford tradesmen were small indeed, yet larger than

he could pay. In the autumn of 1731 he was under the necessity of quitting the university without a degree. In the following winter his father died. The old man left but a pittance; and of that pittance almost the whole was appropriated to the support of his widow. The property to which Samuel succeeded amounted to no more than twenty pounds.

His life, during the thirty years which followed, was one hard struggle with poverty. The misery of that struggle needed no aggravation, but was aggravated by the sufferings of an unsound body and an unsound mind. Before the young man left the university, his hereditary malady had broken forth in a singularly cruel form. He had become an incurable hypochondriac. He said long after that he had been mad all his life, or at least not perfectly sane; and, in truth, eccentricities less strange than his have often been thought ground sufficient for absolving felons and for setting aside wills. His grimaces, his gestures, his mutterings, sometimes diverted and sometimes terrified people who did not know him. At a dinner table he would absent-mindedly stoop down and twitch off a lady's shoe. He would amaze a drawing-room by suddenly ejaculating a clause of the Lord's Prayer. He would conceive an unintelligible aversion to a particular alley, and perform a great circuit rather than see the hateful place. He would set his heart on touching every post in the streets through which he walked. If by any chance he missed a post, he would go back a hundred yards and repair the omission. Under the influence of his disease, his senses became morbidly torpid, and his imagination morbidly active. At one time he would stand poring on the town clock without being able to tell the hour. At another he mould distinctly hear his mother, who was many miles off, calling him by his name. But this was not the worst. A deep melancholy took possession of him, and gave a dark tinge to all his views of human nature and of human destiny. Such wretchedness as he endured has driven many men to shoot themselves or drown themselves. But he was under no temptation to commit suicide. He was sick of life; but he was afraid of death; and he shuddered at every sight or sound which reminded him of the inevitable hour. In religion he found but little comfort during his long and frequent fits of dejection; for his religion partook of his own character. The light from heaven shone on him indeed, but not in a direct line, or with its own pure splendour. The rays had to struggle through a disturbing medium; they reached him refracted, dulled and discoloured by the thick gloom which had settled on his soul, and, though they might be sufficiently clear to guide him, were too dim to cheer him.

With such infirmities of body and of mind, he was left, at two-and-twenty, to fight his way through the world. He remained during about five years in the midland counties. At Lichfield, his birthplace and his early home, he had inherited some friends and acquired others. He was kindly noticed by Henry Hervey, a gay officer of noble family, who happened to be quartered there. Gilbert Walmesley, registrar of the ecclesiastical court of the diocese, a man of distinguished parts, learning and knowledge of the world, did himself honour by patronizing the young adventurer, whose repulsive person, unpolished manners and squalid garb moved many of the petty aristocracy of the neighbourhood to laughter or disgust. At Lichfield, however, Johnson could find no way of earning a livelihood. He became usher of a grammar school in Leicestershire; he resided as a humble companion in the house of a country gentleman; but a life of dependence mas insupportable to his haughty spirit. He repaired to Birmingham, and there earned a few guineas by literary drudgery. In that town he printed a translation, little noticed at that time. and long forgotten, of a Latin book about Abyssinia. He then put forth proposals for publishing by subscription the poems of Politian, with notes containing a history of modern Latin verse; but subscriptions did not come in, and the volume never appeared.

While leading this vagrant and miserable life, Johnson fell in love. The object of his passion was Mrs. Elizabeth Porter (1688–1752), widow of Harry Porter (d. 1734), whose daughter Lucy was born only six years after Johnson himself. To ordinary spectators the lady appeared to be a short, fat, coarse woman, painted half an inch thick, dressed in gaudy colours, and fond of exhibiting provincial airs and graces which were not exactly those of the Queensberrys and Lepels. To Johnson, however, whose passions were strong, and whose eyesight was too weak to distinguish rouge from natural bloom, and who had seldom or never been in the same room with a woman of real fashion, his Tetty, as he called her, was the most beautiful, graceful and accomplished of her sex That his admiration was unfeigned cannot be doubted; she had, however, a jointure of £600 and perhaps a little more; she came of a good family, and her son Jervis (d. 1763) commanded H.M.S. "Hercules." The marriage, in spite of occasional wranglings, proved happier than might have been expected. The lover continued to be under the illusions of the wedding-day (July g, 1735) till the lady died in her sixty-fourth year. On her monument at Bromley he placed an inscription extolling the charms of her person and of her manners; and when, long after her decease, he had occasion to mention her, he exclaimed with a tenderness half ludicrous, half pathetic, "Pretty creature!"

His marriage made it necessary for him to exert himself more strenuously than he had hitherto done. He took a house at Edial near Lichfield and advertised for pupils. But 18 months passed away, and only three pupils came to his academy. The "faces" that Johnson habitually made (probably nervous contortions due to his disorder) may well have alarmed parents. Good scholar though he was, these twitchings had lost him usherships in 1735 and 1736. David Garrick, who was one of the pupils, used, many years later, to throw the best company of London into convulsions of laughter by mimicking the master and his lady.

At length Johnson, in the twenty-eighth year of his age, determined to seek his fortune in London as a literary adventurer. He set out with a few guineas, three acts of his tragedy of Irene in manuscript and two or three letters of introduction from his friend Walmesley. Never since literature became a calling in England had it been a less gainful calling than at the time when Johnson took up his residence in London. In the preceding generation a writer of eminent merit was sure to be munificently rewarded by the Government. The least that he could expect was a pension or a sinecure place; and, if he showed any aptitude for politics, he might hope to be a member of parliament, a lord of the treasury, an ambassador, a secretary of state. But literature had ceased to flourish under the patronage of the great, and had not yet begun to flourish under the patronage of the public. One man of letters, indeed, Pope, had acquired by his pen what was then considered as a handsome fortune, and lived on a footing of equality with nobles and ministers of state. But this was a solitary exception. Even an author whose reputation was established, and whose works were popular—such an author as Thomson, whose Seasons was in every library, such an author as Fielding, whose *Pasquin* had had a greater run than any drama since The Beggar's *Opera*—was sometimes glad to obtain, by pawning his best coat, the means of dining on tripe at a cookshop underground, where he could wipe his hands, after his greasy meal, on the back of a Newfoundland dog. It is easy, therefore, to imagine what humiliations and privations must have awaited the novice who had still to earn a name. One of the publishers to whom Johnson applied for employment measured with a scornful eye that athletic though uncouth frame, and exclaimed, "You had better get a porter's knot and carry trunks." Nor was the advice bad, for a porter was likely to be as plentifully fed, and as comfortably lodged, as a poet.

Some time appears to have elapsed before Johnson was able to form any literary connection from which he could expect more than bread for the day which was passing over him. He never forgot the generosity with which Hervey, who was now residing in London, relieved his wants during this time of trial. "Harry Hervey," said Johnson many years later, "was a vicious man; but he was very kind to me. If you call a dog Hervey, I shall love him." At Hervey's table Johnson sometimes enjoyed feasts which were made more agreeable by contrast. But in general he dined, and thought that he dined well, on sixpennyworth of meat and a pennyworth of bread at an alehouse near Drury Lane.

The effect of the privations and sufferings which he endured at this time was discernible to the last in his temper and his deportment. His manners had never been courtly. They now became

almost savage. Being frequently under the necessity of wearing shabby coats and dirty shirts, he became a confirmed sloven. Being often very hungry when he sat down to his meals, he contracted a habit of eating with ravenous greediness,. Even to the end of his life, and even at the tables of the great, the sight of food affected him as it affects wild beasts and birds of prey. His taste in cookery, formed in subterranean ordinaries and *à la mode* beef shops, was far from delicate. Whenever he was so fortunate as to have near him a hare that had been kept too long, or a meat pie made with rancid butter, he gorged himself with such violence that his veins swelled and the moisture broke out on his forehead. The affronts uhich his poverty emboldened stupid and low-minded men to offer him would have broken a mean spirit into sycophancy, but made him rude even to ferocity. Unhappily the insolence which, while it was defensive, was pardonable, and in some sense respectable, accompanied him into societies where he was treated with courtesy and kindness. He was repeatedly provoked into striking those who had taken liberties with him. All the sufferers, however, were wise enough to abstain from talking about their beatings, except Osborne, the most rapacious and brutal of booksellers, who proclaimed everywhere that he had been knocked down by the huge fellow whom he had hired to puff the Harleian Library.

About a year after Johnson had begun to reside in London he was fortunate enough to obtain regular employment from Edward Cave (*q.v.*) on the *Gentleman's Magazine*. That periodical, just entering on the ninth year of its long existence, was the only one in the kingdom which then had nhat would now be called a large circulation. Johnson was engaged to write the speeches in the "Reports of the Debates of the Senate of Lilliput" (see REPORTING), under which thin disguise the proceedings of parliament were published. He was generally furnished with notes, meagre indeed and inaccurate, of what had been said; but sometimes he had to find arguments and eloquence both for the ministry and for the opposition. He was himself a Tory, not from rational conviction—for his serious opinion was that one form of government was just as good or as bad as another—but from mere passion, such as inflamed the Capulets against the Montagues, or the Blues of the Roman circus against the Greens. In his infancy he had heard so much talk about the villainies of the Whigs, and the dangers of the Church, that he had become a furious partisan when he could scarcely speak. Before he was three he had insisted on being taken to hear Sacheverell preach at Lichfield Cathedral, and had listened to the sermon with as much respect and probably with as much intelligence, as any Staffordshire squire in the congregation. The work which had been begun in the nursery had been completed by the university. Oxford, when Johnson resided there, was the most Jacobitical place in England; and Pembroke was one of the most Jacobitical colleges in Oxford. The prejudices which he brought up to London were scarcely less absurd than those of his own Tom Tempest. Charles II. and James II. were two of the best kings that ever reigned. Laud was a prodigy of parts and learning over whose tomb Art and Genius still continued to weep. Hampden deserved no more honourable name than that of the "zealot of rebellion." Even the ship-money Johnson would not pronounce to have been an unconstitutional impost. Under a government which allowed to the people an unprecedented liberty of speech and action, he fancied that he was a slave. He hated Dissenters and stockjobbers, the excise and the army, septennial parliaments, and Continental connections. He long had an aversion to the Scots, an aversion of which he could not remember the commencement, but which, he owned, had probably originated in his abhorrence of the conduct of the nation during the Great Rebellion. It is easy to guess in what manner debates on great party questions were likely to be reported by a man whose judgment was so much distorted by party spirit. A show of fairness was indeed necessary to the prosperity of the *Magazine*. But Johnson long afterwards owned that, though he had saved appearances, he had taken care that the Whig dogs should not have the best of it; and, in fact, every passage which has lived, every passage which bears the marks of his higher faculties, is put into the mouth of some member of the opposition.

A few weeks after Johnson had entered on these obscure labours, he published a work which at once placed him high among the writers of his age. It is probable that what he had suffered during his first year in London had often reminded him of some parts of the satire in which Juvenal had described the misery and degradation of a needy man of letters, lodged among the pigeons' nests in the tottering garrets which overhung the streets of Rome. Pope's admirable imitations of Horace's *Satires* and *Epistles* had recently appeared, were in every hand, and were by many readers thought superior to the originals. What Pope had done for Horace, Johnson aspired to do for Juvenal.

Johnson's *London* appeared without his name in May 1738. He received only ten guineasfor this stately and vigorous poem; but the sale was rapid and the success complete. A second edition was required within a week. Those small critics who are always desirous to lower established reputations ran about proclaiming that the anonymous satirist was superior to Pope in Pope's own peculiar department of literature. It ought to be remembered, to the honour of Pope, that he joined heartily in the applause with which the appearance of a rival genius was welcomed. He made inquiries about the author of *London*. Such a man, he said, could not long be concealed. The name was soon discovered; and Pope, with great kindness, exerted himself to obtain an academical degree and the mastership of a grammar school for the poor young poet. The attempt failed, and Johnson remained a bookseller's hack.

It does not appear that these two men, the most eminent writer of the generation which was going out, and the most eminent writer of the generation which was coming in, ever saw each other. They lived in very different circles, one surrounded by dukes and earls, the other by starving pamphleteers and index-makers. Among Johnson's associates at this time may be mentioned Boyse, who, when his shirts were pledged, scrawled Latin verses sitting up in bed with his arms through two holes in his blanket, who composed very respectable sacred poetry when he was sober, and who was at last run over by a hackney coach when he was drunk; Hoole, surnamed the metaphysical tailor, who, instead of attending to his measures, used to trace geometrical diagrams on the board where he sat cross-legged; and the penitent impostor, George Psalmanazar, who, after poring all day, in a humble lodging, on the folios of Jewish rabbis and Christian fathers, indulged himself at night with literary and theological conversation at an alehouse in the City. But the most remarkable of the persons with whom at this time Johnson consorted was Richard Savage, an earl's son, a shoemaker's apprentice, who had seen life in all its forms, who had feasted among blue ribands in St. James's Square, and had lain with fifty pounds weight of irons on his legs in the condemned ward of Newgate. This man had, after many vicissitudes of fortune, sunk at last into abject and hopeless poverty. His pen had failed him. His patrons had been taken away by death, or estranged by the riotous profusion with which he squandered their bounty, and the ungrateful insolence with which he rejected their advice. He now lived by begging. He dined on venison and champagne whenever he had been so fortunate as to borrow a guinea. If his questing had been unsuccessful, he appeased the rage of hunger with some scraps of broken meat, and lay down to rest under the piazza of Covent Garden in warm weather, and, in cold weather, as near as he could get to the furnace of a glass house. Yet in his misery he was still an agreeable companion. He had an inexhaustible store of anecdotes about that gay and brilliant world from which he was now an outcast. He had observed the great men of both parties in hours of careless relaxation, had seen the leaders of opposition without the mask of patriotism, and had heard the prime minister roar with laughter and tell stories not over-decent. During some months Savage lived in the closest familiarity with Johnson; and then the friends parted, not without tears. Johnson remained in London to drudge for Cave. Savage went to the west of England, lived there as he had lived everywhere, and in 1743 died, penniless and heartbroken, in Bristol Gaol.

Soon after his death, while the public curiosity was strongly excited about his extraordinary character and his not less extraordinary adventures, a life of him appeared widely differentfrom the catchpenny lives of eminent men which were then a staple article of manufacture in Grub Street. The style was indeed deficient in

ease and variety; and the writer was evidently too partial to the Latin element of our language. But the little work, with all its faults, was a masterpiece. No finer specimen of literary biography existed in any language, living or dead; and a discerning critic might have confidently predicted that the author was destined to be the founder of a new school of English eloquence.

The *Life of Savuge* was anonymous; but it was well known in literary circles that Johnson was the writer. During the three years which followed. he produced no important work; but he was not, and indeed could not be, idle. The fame of his abilities and learning continued to grow. Warburton pronounced him a man of parts and genius; and the praise of Warburton was then no light thing. Such was Johnson's reputation that, in 1747, several eminent booksellers combined to employ him in the arduous work of preparing a *Dictionary of the English Language,* in two folio volumes. The sum which they agreed to pay him was only fifteen hundred guineas; and out of this sum he had to pay several poor men of letters who assisted him in the humbler parts of his task.

The prospectus of the *Dictionary* he addressed to the earl of Chesterfield. Chesterfield had long been celebrated for the politeness of his manners, the brilliancy of his wit and the delicacy of his taste. He was acknowledged to be the finest speaker in the House of Lords. He had recently governed Ireland, at a momentous conjuncture, with eminent firmness, wisdom and humanity; and he had since become secretary of state. He received Johnson's homage with the most winning affability, and requited it with a few guineas, bestowed doubtless in a very graceful manner, but was by no means desirous to see all his carpets blackened with the London mud, and his soups and wines thrown to right and left over the gowns of fine ladies and the waistcoats of fine gentlemen, by an absent-minded scholar, who gave strange starts and uttered strange growls, who dressed like a scarecrow and ate like a cormorant. During some time Johnson continued to call on his patron, but, after being repeatediy told by the porter that his lordship was not at home, took the hint and ceased to present himself at the inhospitable door.

Johnson had flattered himself that he should have completed his *Dictionary* by the end of 1750; but it was not till 175j that he at length gave his huge volumes to the world. During the seven years which he passed in the drudgery of penning definitions and marking quotations for transcription, he sought for relaxation in literary labour of a more agreeable kind. In January 1749 he published *The Vanity of Human Wishes,* an excellent imitation of the tenth satire of Juvenal, for which he received fifteen guineas.

A few days after the publication of this poem, his tragedy of *Irene,* begun many years before, was brought on the stage by his old pupil, David Garrick, now manager of Drury Lane Theatre. The relation between him and his old preceptor was of a very singular kind. They repelled each other strongly, and yet attracted each other strongly. Nature had made them of very different clay; and circumstances had fully brought out the natural peculiarities of both. Sudden prosperity had turned Garrick's head. Continued adversity had soured Johnson's temper. Johnson saw with more envy than became so great a man the villa, the plate, the china, the Brussels carpet, which the little mimic had got by repeating, with grimaces and gesticulations, what wiser men had written; and the exquisitely sensitive vanity of Garrick was galled by the thought that. while all the rest of the world was applauding him, he could obtain from one morose cynic, whose opinion it was impossible to despise, scarcely any compliment not acidulated with scorn. Yet the two Lichfield men had so many early recollections in common, and sympathized with each other on so many points on which they sympathized with nobody else in the vast population of the capital, that, though the master was often provoked by the monkey-like impertinence of the pupil, and the pupil by the bearish rudeness of the master, they remained friends till they mere parted by death. Garrick now brought *Irene* out, with alterations sufficient to displease the author, yet not sufficient to make the piece pleasing to the audience. After nine representations the play was withdrawn. The poet however cleared by his benefit nights, and by the sale of the copyright of his tragedy, about three hundred pounds, then a great sum in his estimation.

About a year after the representation of *Irene,* he began to publish a series of short essays on morals, manners and literature. This species of composition had been brought into fashion by the success of the *Tatler,* and by the still more brilliant success of the *Spectator.* A crowd of small writers had vainly attempted to rival, Addison. The *Lay Monastery,* the *Censor,* the *Freethinker,* the *Plain Dealer,* the *Champion,* and other works of the same kind had had their short day. At length Johnson undertook the adventure in which so many aspirants had failed. In the 36th year after the appearance of the last number of the *Spectator* appeared the first number of the *Rambler.* From March *1750* to March 1752 this paper continued to come out every Tuesday and Saturday.

From the first the *Rambler* was enthusiastically admired by a few eminent men. Richardson, when only five numbers had appeared, pronounced it equal if not superior to the *Spectator.* Young and Hartley expressed their approbation not less warmly. In consequence probably of the good offices of Bubb Dodington, who was then the confidential adviser of Prince Frederick, two of his royal highness's gentlemen carried a gracious message to the printing office, and ordered seven copies for Leicester House. But Johnson had had enough of the patronage of the great to last him all his life, and was not disposed to haunt any other door as he had haunted the door of Chesterfield.

By the public the *Rambler* was at first very coldly received. Though the price of a number was only twopence, the sale did not amount to five hundred. The profits were therefore very small. But as soon as the flying leaves were collected and reprinted they became popular. The author lived to see thirteen thousand copies spread over England alone. Separate editions were published for the Scotch and Irish markets. A large party pronounced the style perfect, so absolutely perfect that in some essays it would be impossible for the writer himself to alter a single word for the better. Another party, not less numerous, vehemently accused him of having corrupted the purity of the English tongue. The best critics admitted that his diction was too monotonous, too obviously artificial, and now and then turgid even to absurdity. But they did justice to the acuteness of his observations on morals and manners, to the constant precision and frequent brilliancy of his language, to the weighty and magnificent eloquence of many serious passages, and to the solemn yet pleasing humour of some of the lighter papers.

The last *Rambler* was written in a sad and gloomy hour. Mrs. Johnson had been given over by the physicians. Three days later she died. She left her husband almost broken-hearted. Many people had been surprised to see a man of his genius and learning stooping to every drudgery, and denying himself almost every comfort, for the purpose of supplying a silly, affected old woman with superfluities, which she accepted with but little gratitude. But all his affection had been concentrated on her. Ye had neither brother nor sister, neither son nor daughter. Her opinion of his writings was more important to him than the voice of the pit of Drury Lane Theatre, or the judgment of the *Monthly Review.* The chief support which had sustained him through the most arduous labour of his life was the hope that she would enjoy the fame and the profit which he anticipated from his *Dictionary.* She was gone; and in that vast labyrinth of streets, peopled by eight hundred thousand human beings, he was alone. Yet it was necessary for him to set himself, as he expressed it, doggedly to work. After three more laborious years, the *Dictionary* was at length complete.

It had been generally supposed that this great work would be dedicated to the eloquent and accomplished nobleman to whom the prospectus had been addressed. Lord Chesterfield well knew the value of such a compliment; and therefore, when the day of publication drew near, he exerted himself to soothe, by a show of zealous and at the same time of delicate and judicious kindness, the pride which he had so cruelly wounded. Since the *Rambler* had ceased to appear, the town had been enterlained by a journal called the *World,* to which many men of high rank and fashion contributed. In two successive numbers of the *World,* the *Dictionary* was, to use the modern phrase, puffed with wonderful skill. The writings of Johnson were warmly praised. It was proposed that he should be invested with the authority of a dictator, nay, of a pope,

over our language, and that his decisions about the meaning and the spelling of words should be received as final. His two folios, it was said, would of course be bought by everybody who could afford to buy them. It was soon known that these papers were written by Chesterfield. But the just resentment of Johnson was not to be so appeased. In a letter written with singular energy and dignity of thought and language, he repelled the tardy advances of his patron. The Dictionary came forth without a dedication. In the Preface the author truly declared that he owed nothing to the great, and described the difficulties with which he had been left to struggle so forcibly and pathetically that the ablest and most malevolent of all the enemies of his fame, Horne Tooke, never could read that passage without tears.

Johnson's Dictionary was hailed with an enthusiasm such as no similar work has ever excited. It was indeed the first dictionary which could be read with pleasure. The definitions show so much acuteness of thought and command of language, and the passages quoted from poets, divines and philosophers are so skilfully selected, that a leisure hour may always be very agreeably spent in turning over the pages. The faults of the book resolve themselves, for the most part, into one great fault. Johnson was a wretched etymologist. He knew little or nothing of any Teutonic language except English, which indeed, as he wrote it, was scarcely a Teutonic language; and thus he was absolutely at the mercy of Junius and Skinner.

The Dictionary, though it raised Johnson's fame, added nothing to his pecuniary means. The fifteen hundred guineas which the booksellers had agreed to pay him had been advanced and spent before the last sheets issued from the press. It is painful to relate that twice in the course of the year which followed the publication of this great work he was arrested and carried to sponging-houses, and that he was twice indebted for his liberty to his excellent friend Richardson. It was still necessary for the man who had been formerly saluted by the highest authority as dictator of the English language to supply his wants by constant toil. He abridged his Dictionary. He proposed to bring out an edition of Shakespeare by subscription, and many subscribers sent in their names and laid down their money; but he soon found the task so little to his taste that he turned to more attractive employments. He contributed many papers to a new monthly journal, which was called the Literary *Magazine*. Few of these papers have much interest; but among them was one of the best things that he ever wrote, a masterpiece both of reasoning and of satirical pleasantry, the review of Jenyns' Inquiry into the *Nature* and Origin of **Evil.**

In the spring of 1758 Johnson put forth the first of a series of essays, entitled the Idler. During two years these essays continued to appear weekly. They were eagerly read, widely circulated, and indeed impudently pirated, while they were still in the original form, and had a large sale when collected into volumes. The Idler may be described as a second part of the Rambler, somewhat livelier and somewhat weaker than the first part.

While Johnson was busied with his Idlers, his mother, who had accomplished her ninetieth year, died at Lichfield. It was long since he had seen her, but he had not failed to contribute largely out of his small means to her comfort. In order to defray the charges of her funeral, and to pay some debts which she had left, he wrote a little book in a single week, and sent off the sheets to the press without reading them over. A hundred pounds were paid him for the copyright, and the purchasers had great cause to be pleased with their bargain, for the book was Rasselas, and it had a great success.

The plan of Rasselas might, however, have seemed to invite severe criticism. Johnson has frequently blamed Shakespeare for neglecting the proprieties of time and place, and for ascribing to one age or nation the manners and opinions of another. Yet Shakespeare has not sinned in this way more grievously than Johnson. Rasselas and Imlac, Nekayah and Pekuah, are evidently meant to be Abyssinians of the 18th century; for the Europe which Imlac describes is the Europe of the 18th century, and the inmates of the Happy Valley talk familiarly of that law of gravitation which Newton discovered and which was not fully received even at Cambridge till the 18th century. Johnson, not content with turning filthy savages, ignorant of their letters, and gorged with raw steaks cut from living cows, into philosophers as eloquent and enlightened as himself or his friend Burke, and into ladies as highly accomplished as Mrs. Lennox or Mrs. Sheridan, transferred the whole domestic system of England to Egypt. Into a land of harems, a land of polygamy, a land where women are married without ever being seen, he introduced the flirtations and jealousies of our ballrooms. In a land where there is boundless liberty of divorce, wedlock is described as the indissoluble compact. "A youth and maiden meeting by chance, or brought together by artifice, exchange glances, reciprocate civilities, go home, and dream of each other. Such," says Rasselas, "is the common process of marriage." A writer who was guilty of such improprieties had little right to blame the poet who made Hector quote Aristotle, and represented Julio Romano as flourishing in the days of the Oracle of Delphi.

By such exertions as have been described Johnson supported himself till the year 1762. In that year a great change in his circumstances took place. He had from a child been an enemy of the reigning dynasty. His Jacobite prejudices had been exhibited with little disguise both in his works and in his conversation. Even in his massy and elaborate Dictionary he had, with a strange want of taste and judgment, inserted bitter and contumelious reflections on the Whig party. The excise, which was a favourite resource of Whig financiers, he had designated as a hateful tax. He had railed against the commissioners of excise in language so coarse that they had seriously thought of prosecuting him. He had with difficulty been prevented from holding up the lord privy seal by name as an example of the meaning of the word "renegade." A pension he had defined as pay given to a state hireling to betray his country; a pensioner as a slave of state hired by a stipend to obey a master. It seemed unlikely that the author of these definitions would himself be pensioned. But that was a time of wonders. George III. had ascended the throne, and had, in the course of a few months, disgusted many of the old friends, and conciliated many of the old enemies of his house. The city was becoming mutinous; Oxford was becoming loyal. Cavendishes and Bentincks were murmuring; Somersets and Wyndhams were hastening to kiss hands. The head of the Treasury was now Lord Bute, who was a Tory, and could have no objection to Johnson's Toryism. Bute wished to be thought a patron of men of letters; and Johnson was one of the most eminent and one of the most needy men of letters in Europe. A pension of three hundred a year was graciously offered, and with very little hesitation accepted.

This event produced a change in Johnson's whole way of life. For the first time since his boyhood he no longer felt the daily goad urging him to the daily toil. He was at liberty, after 30 years of anxiety and drudgery, to indulge his constitutional indolence, to lie in bed till two in the afternoon, and to sit up talking till four in the morning, without fearing either the printer's devil or the sheriff's officer.

One laborious task indeed he had bound himself to perform. He had received large subscriptions for his promised edition of Shakespeare; he had lived on those subscriptions during some years; and he could not without disgrace omit to perform his part of the contract. His friends repeatedly exhorted him to make an effort, and he repeatedly resolved to do so. But, notwithstanding their exhortations and his resolutions, month followed month, year followed year, and nothing was done. He prayed fervently against his idleness; he determined, as often as he received the sacrament, that he would no longer doze away and trifle away his time; but the spell under which he lay resisted prayer and sacrament. Happily for his honour, the charm which held him captive was at length broken by no gentle or friendly hand. He had been weak enough to pay serious attention to a story about a ghost which haunted a house in Cock Lane, and had actually gone himself, with some of his friends, at one in the morning, to St. John's Church, Clerkenwell, in the hope of receiving a communication from the perturbed spirit. But the spirit, though adjured with all solemnity, remained obstinately silent; and it soon appeared that a naughty girl of eleven had been amus-

ing herself by making fools of so many philosophers. Churchill, who, confident in his powers, drunk with popularity, and burning with party spirit, was looking for some man of established fame and Tory politics to insult, celebrated the Cock Lane ghost in three cantos, nicknamed Johnson Pomposo, asked where the book was which had been so long promised and so liberally paid for, and directly accused the great moralist of cheating. This terrible word proved effectual, and in October 1765 appeared, after a delay of nine years, the new edition of Shakespeare.

This publication saved Johnson's character for honesty, but added nothing to the fame of his abilities and learning. The Preface, though it contains some good passages, is not in his best manner. The most valuable notes are those in which he had an opportunity of showing how attentively he had during many years observed human life and human nature. The best specimen is the note on the character of Polonius. Nothing so good is to be found even in Wilhelm Meister's admirable examination of Ham*let.* But here praise must end. It would be difficult to name a more slovenly, a more worthless edition of any great classic.[1] Johnson had, in his prospectus, told the world that he was peculiarly fitted for the task which he had undertaken, because he had, as a lexicographer, been under the necessity of taking a wider view of the English language than any of his predecessors. But, unfortunately, he had altogether neglected that very part of our literature with which it is especially desirable that an editor of Shakespeare should be conversant. In the two folio volumes of the *English Dictionary* there is not a single passage quoted from any dramatist of the Elizabethan age except Shakespeare and Ben Jonson. Even from Ben the quotations are few. Johnson might easily in a few months have made himself well acquainted with every old play that was extant. But it never seems to have occurred to him that this was a necessary preparation for the work which he had undertaken. He would doubtless have admitted that it would be the height of absurdity in a man who was not familiar with the works of Aeschylus and Euripides to publish an edition of Sophocles. Yet he ventured to publish an edition of Shakespeare, without having ever in his life, as far as can be discovered, read a single scene of Massinger, Ford, Dekker, Webster, Marlow, Beaumont or Fletcher. His detractors were noisy and scurrilous. He had, however, acquitted himself of a debt which had long lain heavy on his conscience and he sank back into the repose from which the sting of satire had roused him. He long continued to live upon the fame which he had already won. He was honoured by the university of Oxford with a doctor's degree, by the Royal Academy with a professorship, and by the king with an interview, in which his majesty most graciously expressed a hope that so excellent a writer would not cease to write. In the interval between 1765 and 1775 Johnson published only two or three political tracts.

But, though his pen was now idle, his tongue was active. The influence exercised by his conversation, directly upon those with whom he lived, and indirectly on the whole literary world, was altogether without a parallel. His colloquial talents were indeed of the highest order. He had strong sense, quick discernment, wit, humour, immense knowledge of literature and of life, and an infinite store of curious anecdotes. As respected style, he spoke far better than he wrote. Every sentence which dropped from his lips was as correct in structure as the most nicely balanced period of the *Rambler*. But in his talk there were no pompous triads, and little more than a fair proportion of words in *-osity* and *-ation*. All was simplicity, ease and vigour. He uttered his short, weighty, and pointed sentences with a power of voice, and a justness and energy of emphasis, of which the effect nas rather increased than diminished by the rollings of his huge form, and by the asthmatic gaspings and puffings in which the peals of his eloquence generally ended. Nor did the laziness which made him unwilling to sit down to his desk prevent him from giving instruction or entertainment orally. To discuss questions of taste, of learning, of casuistry, in language so exact and so forcible that it might have been printed without the alteration of a word, was to him no exertion, but a pleasure. He loved, as he said, to fold his legs add have his talk out. He was ready to bestow the overflowings of his full mind on anybody who would start a subject: on a fellow-passenger in a stage coach, or on the person who sat at the same table with him in an eating-house. But his conversation was nowhere so brilliant and striking as when he was surrounded by a few friends, whose abilities and knowledge enabled them. as he once expressed it, to send him back every ball that he threw. Some of these, in 1764, formed themselves into a club, which gradually became a formidable power in the commonwealth of letters. The verdicts pronounced by this conclave on new books were speedily known over all London, and were sufficient to sell off a whole edition in a day, or to condemn the sheets to the service of the trunkmaker and the pastrycook. Goldsmith was the representative of poetry and light literature, Reynolds of the arts, Burke of political eloquence and political philosophy. There, too, were Gibbon the greatest historian and Sir William Jones the greatest linguist of the age. Garrick brought to the meetings his inexhaustible pleasantry, his incomparable mimicry, and his consummate knowledge of stage effect. Among the most constant attendants were two high-born and high-bred gentlemen, closely bound together by friendship, but of widely different characters and habits — Bennet Langton, distinguished by his skill in Greek literature, by the orthodoxy of his opinions, and by the sanctity of his life, and Topham Beauclerk, renowned for his amours, his knowledge of the gay world, his fastidious taste and his sarcastic wit.

Among the members of this celebrated body was one to whom it has owed the greater part of its celebrity, yet who was regarded with little respect by his brethren, and had not without difficulty obtained a seat among them. This was James Boswell (*q.v.*), a young Scots lawyer, heir to an honourable name and a fair estate. That he was a coxcomb and a bore, weak, vain, pushing, curious, garrulous, was obvious to all who were acquainted with him.

To a man of Johnson's strong understanding and irritable temper, the silly egotism and adulation of Boswell must have been as teasing as the constant buzz of a fly. Johnson hated to be questioned; and Boswell was eternally catechizing him on all kinds of subjects, and sometimes propounded such questions as, "What would you do, sir, if you were locked up in a tower with a baby?" Johnson was a water-drinker and Boswell was a wine-bibber, and indeed little better than an habitual sot. It was impossible that there should be perfect harmony between two such companions. Indeed, the great man was sometimes provoked into fits of passion, in which he said things which the small man, during a few hours, seriously resented. Every quarrel, however, was soon made up. During 20 years the disciple continued to worship the master; the master continued to scold the disciple, to sneer at him, and to love him. The two friends ordinarily resided at a great distance from each other. Boswell practised in the Parliament House of Edinburgh, and could pay only occasional visits to London. During those visits his chief business was to watch Johnson, to discover all Johnson's habits, to turn the conversation to subjects about which Johnson was likely to say something remarkable, and to fill quarto notebooks with minutes of what Johnson had said. In this way were gathered the materials out of which was afterwards constructed the most interesting biographical work in the world.

Soon after the club began to exist, Johnson formed a connection less important indeed to his fame, but much more important to his happiness, than his connection with Boswell. Henry Thrale, one of the most opulent brewers in the kingdom, a man of sound and cultivated understanding, rigid principles, and liberal spirit, was married to one of those clever, kind-hearted, engaging, vain, pert young women who are perpetually doing or saying what is not exactly right, but who, do or say what they may, are always agreeable. In 1765 the Thrales became acquainted with Johnson, and the acquaintance ripened fast into friendship. They were

[1] This famous dictum of Macaulay, though endorsed by Lord Rosebery, has been energetically rebutted by Professor W. Raleigh and others, who recognize both sagacity and scholarship in Johnson's Preface and Notes. Johnson's wide grasp of the discourse and knowledge of human nature enable him in a hundred entangled passages to go straight to the dramatist's meaning

astonished and delighted by the brilliancy of his conversation. They were flattered by finding that a man so widely celebrated preferred their house to any other in London. Johnson soon had an apartment at the brewery in Southwark, and a still more pleasant apartment at the villa of his friends on Streatham Common. A large part of every year he passed in those abodes, which must have seemed magnificent and luxurious indeed, when compared with the dens in which he had generally been lodged. But his chief pleasures were derived from what the astronomer of his Abyssinian tale called "the endearing elegance of female friendship." Mrs. Thrale rallied him, soothed him, coaxed him, and if she sometimes provoked him by her flippancy, made ample amends by listening to his reproofs with angelic sweetness of temper. When he was diseased in body and in mind, she was the most tender of nurses. No comfort that wealth could purchase, no contrivance that womanly ingenuity, set to work by womanly compassion, could devise, was wanting to his sick room. It would seem that a full half of Johnson's life during about 16 years was passed under the roof of the Thrales. He accompanied the family sometimes to Bath, and sometimes to Brighton, once to Wales and once to Paris. But he had at the same time a house in one of the narrow and gloomy courts on the north of Fleet Street. In the garret was his library, a large and miscellaneous collection of books, falling to pieces and begrimed with dust. On a lower floor he sometimes, but very rarely, regaled a friend with a plain dinner —a veal pie, or a leg of lamb and spinach, and a rice pudding. Nor was the dwelling uninhabited during his long absences. It was the home of the most extraordinary assemblage of inmates that ever was brought together. At the head of the establishment Johnson had placed an old lady named Williams, whose chief recommendations were her blindness and her poverty. But, in spite of her murmurs and reproaches, he gave an asylum to another lady who was as poor as herself, Mrs. Desmoulins, whose family he had known many years before in Staffordshire. Room was found for the daughter of Mrs. Desmoulins, and for another destitute damsel, who was generally addressed as Miss Carmichael, but whom her generous host called Polly. An old quack doctor named Levett, who had a wide practice, but among the very poorest class, poured out Johnson's tea in the morning and completed this strange menagerie. All these poor creatures were at constant war with each other, and with Johnson's negro servant Frank. Sometimes, indeed, they transferred their hostilities from the servant to the master, complained that a better table was not kept for them, and railed or maundered till their benefactor was glad to make his escape to Streatham or to the Mitre Tavern. And yet he, who was generally the haughtiest and most irritable of mankind, who was but too prompt to resent anything which looked like a slight on the part of a purse-proud bookseller, or of a noble and powerful patron, bore patiently from mendicants, who, but for his bounty, must have gone to the workhouse, insults more provoking than those for which he had knocked down Osborne and bidden defiance to Chesterfield. Year after year Mrs. Williams and Mrs. Desmoulins, Polly and Levett, continued to torment him and to live upon him.

The course of life which has been described was interrupted in Johnson's sixty-fourth year by an important event. He had early read an account of the Hebrides, and had been much interested by learning that there was so near to him a land peopled by a race which was still as rude and simple as in the Middle Ages. A wish to become intimately acquainted with a state of society so utterly unlike all that he had ever seen frequently crossed his mind. But it is not probable that his curiosity would have overcome his habitual sluggishness, and his love of the smoke, the mud, and the cries of London, had not Boswell importuned him to attempt the adventure, and offered to be his squire. At length, in August 1773, Johnson crossed the Highland line, and plunged courageously into what was then considered, by most Englishmen, as a dreary and perilous wilderness. After wandering about two months through the Celtic region, sometimes in rude boats which did not protect him from the rain, and sometimes on small shaggy ponies which could hardly bear his weight, he returned to his old haunts with a mind full of new images and new theories. During the following year he employed himself in recording his adventures. About the beginning of 1775 his *Journey to the Hebrides* was published, and was, during some weeks, the chief subject of conversation in all circles in which any attention was paid to literature. His prejudice against the Scots had at length becomt little more than matter of jest; and whatever remained of the old feeling had been effectually removed by the kind and respectful hospitality with which he had been received in every part of Scotland. It was, of course, not to be expected that an Oxonian Tory should praise the Presbyterian polity and ritual, or that an eye accustomed to the hedgerows and parks of England should not be struck by the bareness of Berwickshire and East Lothian. But even in censure Johnson's tone is not unfriendly. The most enlightened Scotsmen, with Lord Mansfield at their head, were well pleased. But some foolish and ignorant Scotsmen were moved to anger by a little unpalatable truth which was mingled with much eulogy, and assailed him whom they chose to consider as the enemy of their country with libels much more dishonourable to their country than anything that he had ever said or written. They published paragraphs in the newspapers, articles in the magazines, sixpenny pamphlets, five-shilling books. One scribbler abused Johnson for being blear-eyed, another for being a pensioner; a third informed the world that one of the doctor's uncles had been convicted of felony in Scotland, and had found that there was in that country one tree capable of supporting the weight of an Englishman. Macpherson, whose *Fingal* had been treated in the *Journey* as an impudent forgery, threatened to take vengeance with a cane. The only effect of this threat was that Johnson reiterated the charge of forgery in the most contemptuous terms, and walked about, during some time, with a cudgel.

Of other assailants Johnson took no notice whatever. He had early resolved never to be drawn into controversy; and he adhered to his resolution with a steadfastness which is the more extraordinary because he was, both intellectually and morally, of the stuff of which controversialists are made. In conversation he was a singularly eager, acute and pertinacious disputant. When at a loss for good reasons, he had recourse to sophistry; and when heated by altercation, he made unsparing use of sarcasm and invective. But when he took his pen in his hand, his whole character seemed to be changed. A hundred bad writers misrepresented him and reviled him; but not one of the hundred could boast of having been thought by him worthy of a refutation, or even of a retort. One Scotsman, bent on vindicating the fame of Scots learning, defied him to the combat in a detestable Latin hexameter: —

Maxime, si tu vis, cupio contendere tecum.

But Johnson took no notice of the challenge. He always maintained that fame was a shuttlecock which could be kept up only by being beaten back as well as beaten forward, and which would soon fall if there were only one battledore. No saying was oftener in his mouth than that fine old apophthegm of Bentley, that no man was ever written down but by himself.

Unhappily, a few months after the appearance of the *Journey to the Hebrides*, Johnson did what none of his envious assailants could have done, and to a certain extent succeeded in writing himself down. The disputes between England and her American colonies had reached a point at which no amicable adjustment was possible. War was evidently impending; and the ministers seem to have thought that the eloquence of Johnson might with advantage be employed to inflame the nation against the opposition at home, and against the rebels beyond the Atlantic. He had already written two or three tracts in defence of the foreign and domestic policy of the government; and those tracts, though hardly worthy of him, were much superior to the crowd of pamphlets which lay on the counters of Almon and Stockdale. But his *Taxation no Tyranny* was a pitiable failure. Even Boswell was forced to own that in this unfortunate piece he could detect no trace of his master's powers. The general opinion was that the strong faculties which had produced the *Dictionary* and the *Rambler* were beginning to feel the effect of time and of disease, and that the old man would best consult his credit by writing no more. But this was a great mistake. Johnson had failed, not because his mind was less

vigorous than when he wrote *Rasselas* in the evenings of a week, but because he had foolishly chosen, or suffered others to choose for him, a subject such as he would at no time have been competent to treat. He was in no sense a statesman. He never willingly read or thought or talked about affairs of state. He loved biography, literary history, the history of manners; but political history was positively distasteful to him. The question at issue between the colonies and the mother country was a question about which he had really nothing to say. Happily, Johnson soon had an opportunity of proving most signally that his failure was not to be ascribed to intellectual decay.

On Easter Eve 1777 some persons, deputed by a meeting which consisted of 40 of the first booksellers in London, called upon him. Though he had some scruples about doing business at that season, he received his visitors with much civiiity. They came to inform him that a new edition of the English poets. from Cowley downwards, was in contemplation, and to ask him to furnish short biographical prefaces. He readily undertook the task for which he was pre-eminently qualified. His knowledge of the literary history of England since the Restoration was unrivalled. That knowledge he had derived partly from books, and partly from sources which had long been closed: from old Grub Street traditions; from the talk of forgotten poetasters and pamphleteers, who had long been lying in parish vaults; from the recollections of such men as Gilbert Walmesley, who had conversed with the wits of Button, Cibber, who had mutilated the plays of two generations of dramatists, Orrery, who had been admitted to the society of Swift and Savage, who had rendered services of no very honorable kind to Pope. The biographer therefore sat down to his task with a mind full of matter. He had at first intended to give only a paragraph to every minor poet, and only four or five pages to the greatest name. But the flood of anecdote and criticism overflowed the narrow channel. The work, which was originally meant to consist only of a few sheets, swelled into ten volumes — small volumes, it is true, and not closely printed. The first four appeared in 1779, the remaining six in 1781.

The *Lives of the Poets* is, on the whole, the best of Johnson's works. The narratives are as entertaining as any novel. The remarks on life and on human nature are eminently shrewd and profound. The criticisms are often excellent, and, even when grossly and provokingly unjust, well deserve to be studied. *Savage's Life* Johnson reprinted nearly as it had appeared in 1744. Whoever, after reading that life, will turn to the other lives will be struck by the difference of style. Since Johnson had been at ease in his circumstances he had written little and had talked much. When therefore he, after the lapse of years, resumed his pen, the mannerism which he had contracted while he was in the constant habit of elaborate composition was less perceptible than formerly, and his diction frequently had a colloquial ease which it had formerly wanted. The improvement may be discerned by a skilful critic in the *Journey to the Hebrides*, and in the *Lives of the Poets* is so obvious that it cannot escape the notice of the most careless reader. Among the *Lives* the best are perhaps those of Cowley, Dryden and Pope. The very worst is, beyond all doubt, that of Gray; the most controverted that of Milton.

This great work at once became popular. There was, indeed, much just and much unjust censure; but even those who were loudest in blame were attracted by the book in spite of themselves. Malone computed the gains of the publishers at five or six thousand pounds. But the writer was very poorly remunerated. Intending at first to write very short prefaces, he had stipulated for only two hundred guineas. The booksellers, when they saw how far his performance had surpassed his promise, added only another hundred. Indeed Johnson, though he did not despise or affect to despise money, and though his strong sense and long experience ought to have qualified him to protect his own interests, seems to have been singularly unskilful and unlucky in his literary bargains. He was generally reputed the first English writer of his time. Yet several writers of his time sold their copyrights for sums such as he never ventured to ask. To give a single instance, Robertson received £4.500 for the *History of Charles V.*

Johnson was now in his seventy-second year. The infirmities of age were coming fast upon him. That inevitable event of which he never thought without horror was brought near to him; and his whole life was darkened by the shadow of death. The strange dependants to whom he had given shelter, and to whom, in spite of their faults, he was strongly attached by habit, dropped off one by one; and, in the silence of his home, he regretted even the noise of their scolding matches. The kind and generous Thrale was no more; and it was soon plain that the old Streatham intimacy could not be maintained upon the same footing. Mrs. Thrale herself confessed that without her husband's assistance she did not feel able to entertain Johnson as a constant inmate of her house. Free from the yoke of the brewer, she fell in love with a music master, high in his profession, from Brescia, named Gabriel Piozzi, in whom nobody but herself could discover anything to admire. The secret of this attachment was soon discovered by Fanny Burney, but Johnson at most only suspected it.

In September 1782 the place at Streatham was from motives of economy let to Lord Shelburne, and Mrs. Thrale took a house at Brighton, whither Johnson accompanied her; they remained for six weeks on the old familiar footing. In March 1783 Boswell was glad to discover Johnson well looked after and staying with Mrs. Thrale in Argyll Street, but in a bad state of health. Impatience of Johnson's criticisms and infirmities had been steadily growing with Mrs. Thrale since 1774. She now went to Bath with her daughters, partly to escape his supervision. Johnson was very ill in his lodgings during the summer, but he still corresponded affectionately with his "mistress" and received many favours from her. He retained the full use of his senses during the paralytic attack, and in July he was sufficiently recovered to renew his old club life and to meditate further journeys. In June 1784 he went with Boswell to Oxford for the last time. In September he was in Lichfield. On his return his health was rather worse; but he would submit to no dietary régime. His asthma tormented him day and night, and dropsical symptoms made their appearance. His wrath was excited in no measured terms against the remarriage of his old friend Mrs. Thrale, the news of which he heard this summer. The whole dispute seems, to-day, entirely uncalled-for, but the marriage aroused some of Johnson's strongest prejudices. He wrote inconsiderately on the subject, but we must remember that he was at the time afflicted in body and mentally haunted by dread of impending change. Throughout all his troubles he had clung vehemently to life. The feeling described in that fine but gloomy paper which closes the series of his *Idlers* seemed to grow stronger in him as his last hour drew near. He fancied that he should be able to draw his breath more easily in a southern climate, and would probably have set out for Rome and Naples but for his fear of the expense of the journey. That expense, indeed, he had the means of defraying; for he had laid up about two thousand pounds, the fruit of labours which had made the fortune of several publishers. But he was un illing to break in upon this hoard, and he seems to have wished even to keep its existence a secret. Some of his friends hoped that the Government might be induced to increase his pension to six hundred pounds a year, but this hope was disappointed, and he resolved to stand one English winter more.

That winter was his last. His legs grew weaker; his breath grew shorter; the fatal water gathered fast in spite of incisions which he, courageous against pain but timid against death, urged hie surgeons to make deeper and deeper. Though the tender care which had mitigated his sufferings during months of sickness at Streatham was withdrawn, and though Boswell was absent, he was not left desolate. The ablest physicians and surgeons attended him, and refused to accept fees from him. Burke parted from him with deep emotion. Windham sat much in the sick-room. Frances Burney, whom the old man had cherished with fatherly kindness, stood weeping at the door; while Langton, whose piety eminently qualified him to be an adviser and comforter at such a time, received the last pressure of his friend's hand within. When at length the moment, dreaded through so many years, came close, the dark cloud passed away from Johnson's mind. Windham's servant, who sat up with him during his last night, declared that "no man could appear more collected, more devout or less terrified at the thoughts

of the approaching minute." At hour intervals, often of much pain, he was moved in bed and addressed himself vehemently to prayer. In the morning he was still able to give his blessing, but in the afternoon he became drowsy, and at a quarter past seven in the evening on the 13th of December 1784, in his seventy-sixth year, he passed away. He was laid, a week later, in Westminster Abbey, among the eminent men of whom he had been the historian —Cowley and Denham, Dryden and Congreve, Gay, Prior and Addison. (M.)

Note.—The above is a reprint of Macaulay's article as revised for the 11th edn. of the *Encyclopædia Britannica* by T. Seccombe, who added the following note: "The splendid example of his style which Macaulay contributed in the article on Johnson to the 8th edition of this encyclopædia has become classic, and has therefore been retained above with a few trifling modifications in those places in which his invincible love of the picturesque has drawn him demonstrably aside from the dull line of veracity. Macaulay, it must be noted, exaggerated persistently the poverty of Johnson's pedigree, the squalor of his early married life, the grotesqueness of his entourage in Fleet Street, the decline and fall from complete virtue of Mrs. Thrale, the novelty and success of the *Dictionary*, the complete failure of the Shakespeare and the political tracts. Yet this contribution is far more mellow than the article contributed on Johnson twenty-five years before to the *Edinburgh Review* in correction of Croker. Matthew Arnold, who edited six selected *Lives* of the poets, regarded it as one of Macaulay's happiest and ripest efforts. It was written out of friendship for Adam Black, and 'payment was not so much as mentioned.' The big reviews, especially the quarterlies, have always been the natural home of Johnsonian study. Sir Walter Scott, Croker, Hayward, Macaulay, Thomas Carlyle (whose famous Fraser article was reprinted in 1853) and Whitwell Elwin have done as much as anybody perhaps to sustain the zest for Johnsonian studies. Macaulay's prediction that the interest in the man would supersede that in his 'works' seemed and seems likely enough to justify itself; but his theory that the man alone mattered and that a portrait painted by the hand of an inspired idiot was a true measure of the man has not worn better than the common run of literary propositions. Johnson's prose is not extensively read. But the same is true of nearly all the great prose masters of the 18th century. As in the case of all great men, Johnson has suffered a good deal at the hands of his imitators and admirers. His prose, though not nearly so uniformly monotonous or polysyllabic as the parodists would have us believe, was at one time greatly overpraised. From the 'Life of Savage' to the 'Life of Pope' it developed a great deal, and in the main improved. To the last he sacrificed expression rather too much to style, and he was perhaps over-conscious of the balanced epithet. But he contributed both dignity and dialectical force to the prose movement of his period."

BIBLIOGRAPHY.—Since Seccombe's comment was written there has been a steady output of Johnsonian literature. In the first place, Courtney and Nichol Smith's *Bibliography of Johnson* (1915) provides a sound basis for the study of the text of the whole of Johnson's works; an index of Johnson's literary criticism is contained in J. E. Brown's *Critical Opinions of Dr. Johnson* (1926) and P. H. Houston's *Doctor Johnson, A Study in XVIII. Century Humanism* (1923) discusses Johnson from the scholastic point of view. Such works are evidence of the greater attention now being paid to Johnson's own writings. Of the *Collected Works* it is still true to say that the best edition is the Oxford edition of 1825 in 9 volumes, with two supplementary volumes containing the *Debates*. Similarly the Birkbeck Hill editions of the *Lives of the Poets* (1905) and of the *Letters* (1892) remain the standard editions, though *Proposals* for a definitive edition of the *Letters* have been published by R. W. Chapman (Essays and Studies, Eng. Assoc. xii.). The latter editor has also produced editions of the *Journey to the Western Islands* (1924) and of *Rasselas* (1927); in both books the text is edited with scrupulous care. Though *Rasselas* was in Johnson's own day by far the most popular of his prose writings, later generations have preferred the *Lives of the Poets*, and it is significant that this work is now available in the World's Classics (ed. A. Waugh, 1906) and in Everyman's Library (ed. L. Archer-Hind, 1925). Enthusiasts for Johnson's prose have also endeavoured to popularize it by books of selections; *e.g.*, *Selections from The Rambler* (ed. W. Hale White, 1907), *Selections from The Idler* (ed. S. C. Roberts, 1921), *Johnson on Shakespeare* (ed. W. Raleigh, 1908), *Selected Letters* (ed. R. W. Chapman, 1925), *Samuel Johnson: Writer* (ed. S. C. Roberts, 1927). A handy reprint of Johnson's *Poems* is contained in *The Poems of Johnson, Goldsmith, Gray and Collins* (ed. T. Methuen Ward, 1905) and D. Nichol Smith's edition of the *Poems* is in preparation.

Recent editions of and selections from Boswell's *Life* are noted under BOSWELL (*q.v.*), but Sir Leslie Stephen's *Samuel Johnson* (1878) remains the best short biography; Col. F. Grant's *Life and Writings of Samuel Johnson*, planned on a similar scale, contains a useful bibliography; T. Seccombe's *The Age of Johnson* (1899) gives a concise account of the period, and S. C. Roberts' *Story of Dr. Johnson* (1919) provides an introduction for the beginner in Johnsoniana; the most intensive study of the byways of Johnson's career is that undertaken by Aleyn Lyell Reade, of whose *Johnsonian Gleanings* five parts have been published. A. M. Broadley's *Dr. Johnson and Mrs. Thrale* (1909), with an essay by T. Seccombe, contained much new material, and Mrs. Piozzi's *Anecdotes* have been freshly edited by S. C. Roberts (1925). The revival of general interest in Johnsoniana may perhaps be dated from the publication of Sir Walter Raleigh's *Six Essays on Johnson* (1910), a model of sane appreciation, and such small books as John Bailey's *Dr. Johnson and his Circle* (1913) and Robert Lynd's *Dr. Johnson and Company* (1927) are significant of the really popular interest in the subject. Many of the lesser lives, or parts of them, by Hawkins, Murphy, Tyers and others are included in the two volumes of Birkbeck Hill's *Johnsonian Miscellanies* (1897); in *Dr. Johnson and Fanny Burney* (1912) C. B. Tinker collects the passages from the diary and letters of Madame D'Arblay which relate to Johnson. Collectors (notably R. B. Adam and A. Edward Newton) facilitated research and editing; in particular, the former's *Catalogue*, containing many facsimiles of letters and manuscripts, is of great value. (S. C. R.)

JOHNSON, SIR THOMAS (1664–1729), English merchant, was born in Liverpool in Nov. 1664. He succeeded his father in 1689 as bailiff and in 1695 as mayor. From 1701 to 1723 he represented Liverpool in parliament, and he was knighted by Queen Anne in 1708. He effected the separation of Liverpool from the parish of Walton-on-the-Hill; from the crown he obtained the grant to the corporation of the site of the old castle where he planned the town market; the construction of the first floating dock (1708) and the building of St. Peter's and St. George's churches were due in great measure to his efforts. He was interested in the tobacco trade; in 1715 he conveyed 130 Jacobite prisoners to the American plantations. In 1723, having lost his fortune, he went himself to Virginia as a collector of customs. He died in Jamaica in 1729.

JOHNSON, WALTER PERRY (1887–1946), one of baseball's greatest pitchers, was born at Humboldt, Kan., on Nov. 6, 1887. He was one of the first of five baseball immortals voted into the Baseball Hall of Fame at Cooperstown, N.Y., in 1936. He was a right-handed thrower and batter for the Washington Senators, of the American league, from 1907 to 1927. During this period he won more games (414), struck out more batters (3,497), pitched more innings (5,923) and compiled more shutouts (113) than any major-league pitcher of the 20th century. He was considered by players, managers and umpires to have the fastest ball of all time. His blinding speed earned him the nickname of the "Big Train." High lights of his career included: an unparalleled feat of pitching three shutouts in four days, in 1908; 16 straight victories, in 1912; 56 consecutive scoreless innings (an all-time record), in 1913; and a no-hit, no-run game (v. Boston), in 1920. He won 32 games in 1912; 36 games in 1913. He was nonplaying manager for Washington (1929–32) and the Cleveland Indians (1933–35). He died in Washington, D.C., on Dec. 10, 1946. (D. SR.)

JOHNSON, SIR WILLIAM (1715–1774), British soldier and American pioneer, was born in Smithtown, County Meath, Ireland, the son of a country gentleman, Christopher Johnson. In 1737 he moved to America for the purpose of managing a tract of land in the Mohawk valley, N.Y., belonging to his uncle, Admiral Sir Peter Warren. He established himself on the south bank of the Mohawk, about 25 mi. W. of Schenectady, but before 1743 moved to the north bank where he had purchased a large tract of his own. His settlement prospered and a valuable trade was built up with the Indians. Fort Johnson with a store and mill was erected. His situation, together with his character, soon won for Johnson an immense influence over the Indians. He was adopted by the Mohawks and learned their language. In 1744 Gov. George Clinton of New York appointed him superintendent

of the affairs of the Six Nations (Iroquois). In 1746 he was made commissary of the province for Indian affairs and was influential in enlisting and equipping the Six Nations for participation in the conflict with French Canada. Two years later he was placed in command of a line of outposts on the New York frontier, but the peace of Aix-la-Chapelle interrupted the offensive operations he had planned. In May 1750, by royal appointment, he became a member for life of the governor's council. In 1754 he was one of the New York delegates to the Albany intercolonial congress, where plans of union were discussed and a council held with the Indians. In 1755 he was commissioned a major general, in which capacity he directed the expedition against Crown Point, and in September defeated the Indians and French at the battle of Lake George. For this success he received the thanks of parliament and was created a baronet. Also in 1756 he was appointed sole agent and superintendent of the Six Nations and all other Indians inhabiting British territory north of the Carolinas and the Ohio river, a position which he held until his death. Johnson took part in Abercrombie's disastrous campaign against Ticonderoga (1758), and in 1759 was second-in-command in General Prideaux's expedition against Ft. Niagara. succeeding to the chief command on that officer's death and capturing the fort. In 1760 he was with General Amherst at the capture of Montreal. As a reward for his services the king granted him 100,000 ac. of land north of the Mohawk river, on which he built Johnson Hall (on the site of the present Johnstown) and lived in baronial style after the war. It was Johnson's influence that kept the Iroquois loyal and made them effective in the French and Indian War. It was his influence which kept them from joining Pontiac in his conspiracy in 1763. Again, Johnson was instrumental in arranging the treaty of Stanwix in 1768. His services for a period of 30 years, through successive crises, as the outstanding Indian diplomat of the colonies, can hardly be overestimated.

His son, SIR JOHN JOHNSON, who also served through the French and Indian War. succeeded to the baronetcy upon his father's death; but during the Revolution he chose to remain on the British side and organized a loyalist regiment, whereupon the estates in the Mohawk valley were confiscated.

BIBLIOGRAPHY.—Five volumes of *The Papers of Sir William Johnson* were published at Albany (1921–27 *et seq.*). *See* also the collection in *Documentary History of the State of New York,* vol. ii., pp. 543–1009 (1849); W. L. Stone, *Life of Sir William Johnson* (1865); W. E. Griffis, *Sir William Johnson and the Six Wations* (1891); A. C. Buell, *Sir William Johnson* (1903); *Proceedings of the New York State Historical Association,* vol. i, iv, xi, xiii, xix.

JOHNSON, WILLIAM (1771–1834), U.S. jurist, associate justice of the United States supreme court. to whom, more perhaps than to any other, goes credit for establishing in the court the principle of dissent and the enduring practice for the rendering of opinions, was born in Charleston. S.C., on Dec. 27. 1771. He was graduated in 1790 from Princeton, read law with the Charleston Federalist Charles Cotesworth Pinckney and was admitted to the bar in 1793. Aligning himself with the new Jeffersonian Republican party, he was elected in 1794, 1796 and 1798 to the South Carolina legislature. In his third term he served as speaker, and in Dec. 1799 was elected to the state's highest court, to remain there until 1804.

During his 30 years on the supreme court of the United States, Johnson affected lastingly both the practices and the decisions of that body. On the eve of Thomas Jefferson's inauguration as president in 1801, the defeated Federalist leaders had secured the appointment of Secretary of State John Marshall as chief justice. There ensued a protracted tug-of-mar between the solidly Federalist court under Marshall and the Jefferson administration, which regarded the court, now asserting the power of judicial review, as a threat to its program. When at last a vacancy occurred on the court. Jefferson, in March 1804. appointed Johnson. who appeared to be firm in his Republican convictions. Johnson mas 32 when he shouldered the burden of counteracting Federalist decisions.

For a century after Marshall's death in 1835, the great chief justice was widely regarded as having totally dominated his court. In trying to make the court the acknowledged spokesman of the law and the constitution, Marshall not only wrote the opinions in most major cases, but sought, often with success, unanimous court support for them. After 1811 only two Federalists remained on a bench of seven, yet in such epochal decisions as *McCulloch* v. *Maryland* (1819) Marshall spoke for the xi-hole court. Jefferson himself probably contributed to the prevailing conception of Marshall's dominance, for he deplored the manner in which opinions were "huddled up in conclave" and "delivered as if unanimous, and with the silent acquiescence of lazy or timid associates, by a crafty chief judge. . . ."

Later researches disclosed, however, the occasional existence of a court minority. with Johnson as its principal spokesman. In 1822 Jefferson wrote Johnson. insisting that the justices were duty bound to record their opinions and votes on decisions and recommending resort to seriatim. or separate, opinions. In reply Johnson expressed partial agreement and related the difficulties he had encountered when he had first appeared on the court and attempted to file his own opinions. "I persevered," he wrote, "until I got them [the justices] to adopt the course they now pursue which is to appoint someone to deliver the opinion of the majority, and leave it to the discretion of the rest to record their opinions or not *ad libitum*." Johnson's own separate opinions were for that time numerous; while Marshall was writing nearly half the majority opinions. Johnson, in delivering 21 concurring and 34 dissenting opinions. wrote half the individual utterances. He spoke out alone most frequently and effectively during his last decade, after his correspondence with Jefferson.

Johnson, and indeed all the judges of the Marshall court. were generally agreed on the scope of power attributable to the national government. With rare exceptions, they all extended broad construction to the powers of congress over commerce and other matters and to the authority of the federal government to effectuate its policies through its own instrumentalities, free from state control. Here Johnson sided consistently with Marshall. yet the unique priority he assigned congress under the constitution had Jeffersonian overtones. Thus. in *Anderson* v. *Dunn* (1821), which upheld power in congress to punish for contempt, he based the implied powers of congress on a government's need of broad discretion in properly serving the people, and on elections as a check on arbitrary action.

By contrast. in seeking to narrow the range of the court's jurisdiction and likewise to widen the sphere of powers reserved to the states: Johnson differed from the majority. Said he, "State rights or United States rights are nothing, except as they contribute to the safety and happiness of the people." In concurring in *Gibbons* v. *Ogden* (1824), he defended broad regulative powers in congress; similarly, in *Ogden* v. *Saunders* (1827). over a rare dissent by Marshall, he supported power in the states to relieve economic distress. His emphasis on governmental power to regulate economic affairs. and on the advantages of co-operation between federal and state governments, anticipated developments of the 20th century.

Johnson exhibited his judicial independence most clearly while holding circuit court in his native Charleston. There. despite opposition, he declared illegal a ship clearance order of the Jefferson administration (1808), a state law severely regulating Negro seamen (1823) and an attempt by sponsors of state nullification of federal laws to refer the constitutionality of a protective tariff to a jury (1832). Learned and often prophetic. he was deeply concerned with legal justice for individuals and with the strengthening of the federal union; yet his restlessness, sensitiveness and irnpetuous manner of advocacy often enmeshed him in public controversy. Besides pamphlets and many articles in the press, he published *Sketches of the Life and Correspondence* of *Nathanael Greene* (2 vol., 1822). He died following surgery, in Brooklyn, N.Y., on Aug. 4, 1834.

BIBLIOGRAPHY.—For a full-length account of Johnson and a list of his writings, *see* Donald G. Morgan, *Justice William Johnson, the First Dissenter: the Career and Constitutional Philosophy of a Jeffersonian Judge* (1954). *See* also articles on Johnson: by D. G. Morgan in *Harvard Law Review,* vol. 57 (1944); by A. J. Levin, in *Michigan Law Review,* vol. 42, 43, 44, 46 and 47 (1944–49); and by Oliver Schroeder, Jr., in *University of Pennsylvania Law Review,* vol. 95

(1946–47). The role of the minority on the Marshall court is analyzed in D. G. Morgan's chapter in W. Melville Jones (ed.), *Chief Justice John Marshall: a Reappraisal* (1956). Johnson's own collection of private papers remains undiscovered. (D. G. MN.)

JOHNSON CITY, a city of Broome county, south-central New York, U.S., on the Susquehanna river, near the Pennsylvania border. It is situated between Binghamton (*q.v.*) and Endicott, the three comprising an industrial area known as the Triple cities. Johnson City is a leading centre for footwear and is significant also for felt goods, textile and wire spools, photoreproduction equipment and confectioneries. Surrounding agricultural lands are important chiefly for dairy products.

Formerly part of the Boston Ten townships, the site remained rural until the 1880s, when a shoe company constructed a new factory where Johnson City is located. The city was incorporated in 1892. For comparative population figures *see* table in NEW YORK: *Population*. (R. C. HE.)

JOHNSON CITY, a city of Washington county, Tenn., U.S., is located in the ridge and valley province of the northeastern part of the state, 21 mi. S.E. of Kingsport (*q.v.*) and 24 mi. S.W. of Bristol (*q.v.*). Early settlers moved into the area in the 1760s; soon thereafter farmers cultivated the land along the riverbanks, and ironmongers built forges and furnaces. The Washington county settlers' interest in politics and government was manifested by their participation in the formation of the Watauga association (1772) and the state of Franklin (1784–88) (see TENNESSEE: *History*). Johnson City started as a town in 1856 when a settler, Henry Johnson, for whom the city is named, built a warehouse at the junction of a stage road and a railroad. It was chartered as a city in 1869; this was revoked in 1879, and in 1885 a new charter was granted. The city has a council-manager form of government, in effect from 1939

A number of industries, including hardwood flooring, textiles, hardware, chemicals, plastics, foundries, bedding and brick tile, have been developed. The county has small, diversified farms which also provide a supply of labour for industry.

Educational facilities include East Tennessee State college, established in 1909. A large Veterans administration unit (Mountain home) serves a five-state area. Nearby mountains and Tennessee Valley authority (TVA) lakes provide recreational facilities. For comparative population figures *see* table in TENNESSEE: *Population*. (F. B. W.)

JOHNSTON, ALBERT SIDNEY (1803–1862), American Confederate general in the Civil War, was born at Washington, Ky., on Feb. 3, 1803. He graduated at West Point in 1826, and served for eight years in the U.S. infantry as a company officer, adjutant and staff officer. In 1834 he resigned his commission, emigrated in 1836 to Texas, then a republic, and joined its army as a private. His rise was very rapid, and before long he was serving as commander-in-chief in preference to Gen. Felix Huston, with whom he fought a duel. From 1838 to 1840 he was Texan secretary for war, and in 1839 he led a successful expedition against the Cherokee Indians. From 1840 to the outbreak of the Mexican War he lived in retirement on his farm, but in 1846 he led a regiment of Texan volunteers in the field, and at Monterey, as a staff officer, he had three horses shot under him. In 1849 he returned to the U.S. army as major, and in 1855 became colonel of the 2nd U.S. Cavalry (afterwards 5th), in which his lieut.-colonel was Robert E. Lee, and his majors were Hardee and Thomas. In 1857 he commanded the expedition sent against the Mormons, and performed his difficult and dangerous mission so successfully that the objects of the expedition were attained without bloodshed. He was rewarded with the brevet of brigadier-general. At the outbreak of the Civil War in 1861 Johnston, then in command of the Pacific department, resigned his commission and made his way to Richmond, where President Jefferson Davis, whom he had known at West Point, at once made him a full general in the Confederate army and assigned him to command the department of Kentucky. Here he had to guard a long and weak line from the Mississippi to the Alleghany mountains, which was dangerously advanced on account of the political necessity of covering friendly country. The first serious advance of the Federals forced him back at once, and he was freely criticized and denounced for what, in ignorance of the facts, the Southern press and people regarded as a weak and irresolute defence. Johnston himself, who had entered upon the Civil War with the reputation of being the foremost soldier on either side, bore with fortitude the reproaches of his countrymen, and Davis loyally supported his old friend. Johnston then marched to join Beauregard at Corinth, Miss., and with the united forces took the offensive against Grant's army at Pittsburg Landing. The battle of Shiloh (*q.v.*) took place on April 6 and 7, 1862. The Federals were completely surprised, and Johnston was in the full tide of success when he fell mortally wounded, dying a few minutes afterwards. President Davis said, in his message to the Confederate Congress, "Without doing injustice to the living, it may safely be said that our loss is irreparable," and the subsequent history of the war in the west went far to prove the truth of his eulogy.

His son, WILLIAM PRESTON JOHNSTON (1831–99), who served on the staff of Gen. Johnston and subsequently on that of President Davis, was a distinguished professor and president of Tulane university. His chief work is the *Life of General Albert Sidney Johnston* (1878), a most valuable and exhaustive biography.

See "The Death of General Albert Sidney Johnston on the Battlefield of Shiloh," in *Iowa Journal of History and Politics*, vol. xvi. p. 275–281 (1918); *see* also Amory Dwight Mayo, *William Preston Johnston's Work for a New South*, U.S. Educ. Bur. (1900).

JOHNSTON, ARTHUR (1587?–1641), Scottish writer of Latin verse, was the chief rival of George Buchanan (*q.v.*) in this art. He was born at Caskieben, Aberdeenshire; studied and practised medicine in Germany, Italy and France; and after his return to Scotland was made royal physician. He died at Oxford in 1641.

Johnston's Latin verse has a strong regional and Scottish flavour, and ranges from tragic to satirical and farcical themes.

See A. Johnston (ed.), *Delitiae poetarum Scotorum* (1637); W. Benson (ed.), *Psalmi Davidici* (1741); Sir W. D. Geddes (ed.), *Musa Latina Aberdonensis*, vol. i and ii (1892–95). (E. G. M.)

JOHNSTON, SIR HARRY HAMILTON (1858–1927), British administrator and explorer, was born on June 12, 1858, at Kennington, London. and educated at Stockwell grammar school and King's college, London. He was a student for four years in the painting schools of the Royal academy. At the age of 18 he began a series of travels in Europe and North Africa, chiefly as a student of painting, architecture and languages. In 1879–80 he visited the then little known interior of Tunisia. In 1882 he joined the earl of Mayo in an expedition to the southern part of Angola, a district then much traversed by Transvaal Boers. In 1883 Johnston visited H. M. Stanley on the Congo and explored the river above Stanley Pool at a time when it was scarcely known to Europeans other than Stanley and De Brazza. The British association, and the Royal society conferred on Johnston the leadership of the scientific expedition to Mt. Kilimanjaro which started from Zanzibar in April 1884.

While in the Kilimanjaro district Johnston concluded treaties with the chiefs of Moshi and Taveta (Taveita). These treaties or concessions were transferred to the merchants who founded the British East Africa company, and in the final agreement with Germany Taveta fell to Great Britain. In Oct. 1885 Johnston was appointed British vice-consul in Cameroon and in the Niger delta, and he became in 1887 acting consul for that region. A British protectorate over the Niger delta had been notified in June 1885, and between the date of his appointment and 1888, together with the consul E. H. Hewett, Johnston laid the foundations of the British administration in that part of the delta not reserved for the Royal Niger company. His action in removing the turbulent chief Ja-ja led to the complete pacification of a region long disturbed by trade disputes. During these three years of residence in the Gulf of Guinea Johnston ascended the Cameroon mountain and made large collections of the flora and fauna of Cameroon for the British Museum.

In the spring of 1889 he was sent to Lisbon, Port.. to negotiate the delimitation of the British and Portuguese spheres of influence in South-East Africa, but the scheme drawn up was not given

effect to at the time. On his return from Lisbon he was dispatched to Mozambique as consul for Portuguese East Africa and was charged with a mission to Lake Nyasa to pacify that region, then in a disturbed state as a result of the attacks of slave-trading Arabs on the stations of the African Lakes Trading company—an unofficial war. Because of the unexpected arrival on the scene of Maj. Serpa Pinto, Johnston was compelled to declare a British protectorate over the Nyasa region. A truce was arranged with the Arabs on Lake Nyasa, and within 12 months the British flag, by agreement with the natives, had been hoisted over a very large region which extended north from Lake Tanganyika to the vicinity of Uganda, to Katanga in the Congo Free State, the Shiré highlands and the central Zambezi. Johnston's scheme, in fact, was that known as the "Cape-to-Cairo," a phrase which he had brought into use in an article in the *Times* in Aug. 1888. According to his arrangement there would have been an all-British route from Alexandria to Cape Town. But by the Anglo-German agreement of July 1, 1890, the British sphere north of Tanganyika was abandoned to Germany, and the Cape-to-Cairo route broken by a wedge of German territory.

Johnston returned to British Central Africa as commissioner and consul general in 1891, and retained that post till 1896, in which year he was made a K.C.B. He was transferred to Tunis as consul general in 1897 because of his health. In the autumn of 1899 Sir Harry Johnston was dispatched to Uganda as special commissioner to reorganize the administration of that protectorate after the suppression of the mutiny of the Sudanese soldiers and the long war with Unyoro. His two years' work in Uganda and a portion of what became British East Africa were rewarded at the close of 1901 by a G.C.M.G. In the spring of the following year he retired from the consular service.

After 1904 he interested himself greatly in the affairs of the Liberian republic, and negotiated various arrangements with the Negro state by which order was brought into its finances. the frontier with French territory was delimited, and the development of the interior by roads was commenced. In 1903 he was defeated as Liberal candidate for parliament at a by-election at Rochester. He met with no better success at West Marylebone at the general election of 1906.

For his services to zoology he was awarded the gold medal of the Zoological society in 1902, and in the same year was made an honorary doctor of science at Cambridge. He received the gold medal of the Royal Geographical and the Royal Scottish Geographical societies and other medals for his artistic work from South Kensington and the Society of Arts. His pictures, chiefly dealing with African subjects, were frequently exhibited at the Royal academy. He was the author of numerous books on Africa, including *British Central Africa* (1897); *The Colonization of Africa* (1899); *The Uganda Protectorate* (1902); *Liberia* (1906); *George Grenfell and the Congo* (1908). During his travels in the northeastern part of the Congo Free State in 1900 he was instrumental in discovering and naming the okapi, a mammal nearly allied to the giraffe. His name has been connected with many other discoveries in the African fauna and flora.

In 1919 he wrote an amusing novel. *The Gay Dombeys,* the personages in which are descended from Charles Dickens' Dombeys. He died on July 31, 1927.

His later works include *The Opening up of Africa* (1911); *Pioneers in West Africa, etc.,* 6 vol. (1911–13); *The Story of My Life* (1923).

JOHNSTON, JOSEPH EGGLESTON (1807–1891), Confederate general in the U.S. Civil War, was born near Farmville, Va., on Feb. 3, 1807. His father, Peter Johnston (1763–1841), a Virginian of Scottish descent, served in the Revolutionary War. and afterward became a distinguished jurist; his mother was a niece of Patrick Henry. He graduated at West Point, in the'same class with Robert E. Lee. He served in the Black Hawk and Seminole wars, and left the army in 1837 to become a civil engineer, but a year later he was reappointed to the army as first lieutenant, Topographical Engineers. During the Mexican War he was twice severely wounded, was engaged in the siege of Vera Cruz, the battles of Contreras, Churubusco, and Molino del Rey, the storming of Chapultepec and the assault on the city of Mexico, and received three brevets for gallant and meritorious service. In April 1861 he resigned from the U.S. army and entered the Confederate service. He was commissioned major general of volunteers in the army of Virginia and assisted in organizing the volunteers. He was later appointed a general officer of the Confederacy and assigned to the command of the army of the Shenandoah. When I. McDowell advanced upon the Confederate forces under Beauregard at Manassas, Johnston moved from the Shenandoah valley with great rapidity to Beauregard's assistance. As senior officer he took command on the field, and at Bull Run (Manassas) (*q.v.*) won the first important Confederate victory. In Aug. 1861 he was made one of the five full generals of the Confederacy, remaining in command of the main army in Virginia. He commanded in the battle of Fair Oaks (May 31, 1862) and was severely wounded. In March 1863, still troubled by his wound, he was assigned to the command of the southwest and in May was ordered to take immediate command of all the Confederate forces in Mississippi, then threatened by Gen. U. S. Grant's movement on Vicksburg. When Gen. J. C. Pemberton's army was besieged in Vicksburg by Grant, Johnston made every effort to relieve it, but his force was inadequate. Later in 1863 he commanded the army of Tennessee at Dalton, and in the early days of May 1864 the combined armies of the north under Gen. W. T. Sherman advanced against his lines.

For the main outlines of the famous campaign between Sherman and Johnston *see* AMERICAN CIVIL WAR. When Johnston had been driven back to Atlanta, he was superseded by Gen. J. B. Hood with orders to fight a battle. The wisdom of Johnston's course was soon abundantly clear, and the Confederate cause was already lost when Lee reinstated him on Feb. 23, 1865. He opposed Sherman's march through the Carolinas, and at Bentonville, N.C., fought a most gallant and skilful battle against heavy odds. But the Union troops steadily advanced, and a few days after Lee's surrender Johnston advised Pres. Jefferson Davis that it was in his opinion useless to continue the conflict, and he was authorized to make terms with Sherman.

After the close of the war Johnston engaged in civil pursuits. In 1874 he published a *Narrative of Military Operations During the Civzl War;* in 1877 he was elected to represent the Richmond district of Virginia in congress; and in 1887 he was appointed by Pres. Grover Cleveland U.S. commissioner of railroads. He died at Washington, D.C., on March 21, 1891.

It was not the good fortune of Johnston to acquire the prestige which so much assisted Lee and Jackson, nor indeed did he possess the power of enforcing his will on others in the same degree; but his methods were exact, his strategy calm and balanced, and, if he showed himself less daring than his comrades, he was unsurpassed in steadiness.

See Hughes, *General Johnston,* in "Great Commanders Series" (1893); Gamaliel Bradford, *Confederate Portraits* (1914); Sir Frederick Barton Maurice, *Statesmen and Soldiers of the Civil War* **(1926).**

JOHNSTON, RICHARD MALCOLM (1822–1898), U.S. educator and author of local-colour fiction, was born near Powelton. Ga., on March 8. 1822, the son of a plantation owner. He graduated from Mercer university at Penfield (later at Macon), Ga.. in 1841, read law in Augusta, Ga., and was admitted to the bar in 1844. Professor of rhetoric and belles-lettres at the University of Georgia at Athens, 1857–61, Johnston established a boys' school near Sparta, Ga., in 1862. It became known particularly for its disciplinary system, which incorporated features of the honour system. After the Civil War he moved his school to Chestnut Hill, near Baltimore, Md., where he conducted it under the name Pen Lucy school for a number of years.

From 1896 a clerk in the bureau of education, Washington. D.C., he prepared a study on early education in middle Georgia.

In his humorous stories Johnston vividly portrayed the people and country of his native state of Georgia, but at times he virtually ignored action and plot. *Dukesborough Tales,* four of which had been previously published as *Georgia Sketches* in 1864, mas first published in 1871 and revised in a number of later editions. Other works included *Old Mark Langston, a Tale of Duke's Creek* (1884), a novel; *Mr. Billy* Downs *and His Likes* (1892), six sto-

ries; and *Autobiography of Col. Richard Malcolm Johnston* (1900) (he had received the courtesy title of colonelfduring the Civil War). Johnston died on Sept. 23, 1898.

JOHNSTONE, a small burgh of Renfrewshire, Scot., 9 mi. W. of Glasgow. Pop. (1961) 18,369. The town, though well planned on land at Easter Cochran, by the Black Cart river, in about 1781 by George Houstoun, the local laird. soon became a product of the Industrial Revolution as the cotton industry, suited to the moist air, made raids into the scenery. It became a burgh in 1857 and after World War I was much improved. Industries include engineering and the making of textiles, paper, nylon fishing lines, bootlaces and vermin traps. In the village of Elderslie (1 mi. E.), Sir William Wallace (*q.v.*), a Scottish national hero, is said to have been born.

JOHNSTOWN, a city of Pennsylvania. U.S., 70 mi. E. of Pittsburgh. at the headwaters of the Conemaugh river. The business-industrial district lies within the narrow river valley, but much of the residential section is located several hundred feet above the central city. Located in a steelmaking and coal-mining area, Johnstown is the centre of a standard metropolitan statistical area comprising Cambria and Somerset counties. Pop. (1960) city 53.949; metropolitan area 280.733. The population of the city decreased slightly between 1920 and 1940 and at an accelerated rate thereafter, largely as a result of the mechanization of coal mining and the reduced market for coal; for comparative population figures *see* table in PENNSYLVANIA: *Population.* Approximately 6% of the population is foreign-born and slightly more than 3% is Negro. Although Johnstown was founded in 1800, it first became important as the western terminus of the Portage railroad, a series of inclined planes whereby canal barges on the state-owned Pennsylvania canal were transported piggyback on railway cars for 36 mi. over the summit of the Allegheny mountains. In 1861 the modern steel industry was born at Johnstown with the use of the Kelly converter *(see* CONVERTER STEEL) Other steel firsts developed at Johnstown include the first blooming mill for the breaking donn of steel ingots and the first steel rails to be produced commercially. By 1873 Johnstown nas the leading steelmaking centre in America The city suffered a crushing blow on May 31, 1889, when a major upstream reservoir burst and sent a great wall of water crashing down the narrow river valley. Over 2.300 persons were drowned; 777 unidentified victims are buried in a single plot in Grandview cemetery. Flood property damage exceeded $10,000,000. Following another disastrous flood in 1936, the Conemaugh river was tamed by a multimillion dollar flood-control program.

Johnstown is no longer pre-eminent in steel production. but within this industrial complex coal is mined, coke is produced. open-hearth and blast furnaces operate and such finished products as steel plate. wheels. axles, freight cars and wire are fabricated. Inside the Johnstown market area a significant portion of the U.S. production of soft coal is mined yearly.

Johnstown college, a junior college branch of the University of Pittsburgh was opened in 1927. A municipal stadium seats 17,000, while the Cambria County War Memorial building has a seating capacity of 5,500.

The Johnstown area has several parks. Many visitors join citizens in riding the inclined-plane passenger car that rises 500 ft. at a 71% grade from the business to the residential district.

(R. L. LE.)

JOIGNY, a town of central France in the *département* of Yonne. 18 mi. N.N.W. of Auxerre. Pop. (1954) 6.439. Joigny (Joviniacum) was probably of Roman origin. In the 10th century it became the seat of a countship dependent on that of Champagne. Joigny is on the flank of Côte St. Jacques on the bank of the Yonne. The Porte du Bois, a gateway with two massive flanking towers, is a relic of the 10th-century castle; there is also a castle of the 16th and 17th centuries, partly demolished. Joigny developed trade in wines, coal, wood, wooden shoes and hosiery.

JOINERY, one of the useful constructive arts which contribute to the comfort and convenience of man. As the arts of joinery and carpentry are often followed by the same individual, it may appear that the same principles are common to both, but a close examination Ieads to a different conclusion. The art of carpentry is directed almost wholly to the support of load and its principles must be sought in the mechanical sciences. In a building it includes all the timberwork necessary for support, division or connection, and its object is to give firmness and stability to the structure. The art of joinery has for its object the addition in a building of all the fixed woodwork necessary for comfort, convenience or ornament. The work of the joiner is in many cases of a complicated nature and often must be executed in an expensive material, therefore joinery requires much skill in that part of geometrical science which treats of the projection and relation of lines, surfaces and solids, as well as an intimate knowledge of the structure and nature of wood. A good carpenter may not be a joiner, but a good joiner is competent, at least, to supervise all the operations required in carpentry. The heavy labour of the carpenter does not fit him to produce that accurate workmanship expected from a joiner. In carpentry, strength is mainly the result of the form and position of its parts; in joinery, strength depends to a larger extent upon the rigidity of the joints. It is important that a joiner's work shall be constructed of sound and dry materials, and on such principles as to allow of movement caused by changes of temperature and humidity.

In early times, woodwork was crude and jointing was difficult and roughly done. The first dawnings of the art of modern joinery appear in the thrones, stalls, pulpits and screens of early Gothic cathedrals and churches, but even in these the art is indebted to the carver for everything that is worthy of regard. With the revival of classic art, however, great changes took place in every kind of construction. Forms were introduced in architecture which demanded new principles for their satisfactory execution, and these principles were discovered and published by craftsmen. These men had scanty geometrical knowledge and confused notions and definitions of principles and their descriptions were often obscure and sometimes erroneous. During this period the framed wainscot of small panels gave way to the large bolection moulded panelling; doors which were formerly heavily framed and hung on massive posts or in jambs of cut stone were now framed in light panels and hung in moulded dressings of wood. Oak timber was generally used but the scarcity of oak and the expense of working it subsequently led to the importation of fir timber from northern Europe, and this gradually superseded all other material save for special work. In recent years, as a result of the development of more ample, quicker and less costly means of transport, a great variety of hardwoods and softwoods have been imported and are now extensively used in all types of building.

MODERN TECHNIQUE

The Joiner's Tools.—The joiner operates with a large variety of tools, the names and uses of the principal ones being:

Saws: the handsaw for cutting large material across the grain; the ripsaw for cutting large material with the grain; the tenon saw for smaller material and more accurate cutting than either of the foregoing; the dovetail saw for still finer cutting; the bow saw, the keyhole saw, the pad saw and the table saw, for cutting along curves and for pierced work.

Planes: the jack plane for removing rough surfaces and reducing material to size; the trying plane for forming straight and true surfaces; the smoothing plane for finishing surfaces; the rebate plane for working internal angles; the shoulder plane for truing up hardwood shoulders and similar work; the bullnose plane for working close up to stops and for similar uses; the plough for grooving with the grain; the side fillister and sash fillister for forming rebates; the grooving plane for grooving across the grain; the compass plane for curved surfaces; the side rebate plane for planing the sides of grooves; the chamfer plane; various moulding planes.

Chisels: the firmer chisel for removing waste; the paring chisel for finishing surfaces that are inaccessible or unsuited to the plane; the mortise chisel for large mortises; the sash chisel for small mortises.

Gouges: the firmer gouge for heavy circular cutting; the paring

gouge for finishing concave curved surfaces; the scribing gouge for scribing mouldings.

Boring bits: the twist or augur bit; the centre bit; the centerless bit; the expanding bit; the shell bit; the nose bit; the gimlet bit; twist drills; countersinks for wood and metal.

Brace or stock: for holding every form of boring bit.

Try squares: for testing the right angle between adjacent surfaces and for squaring lines across material.

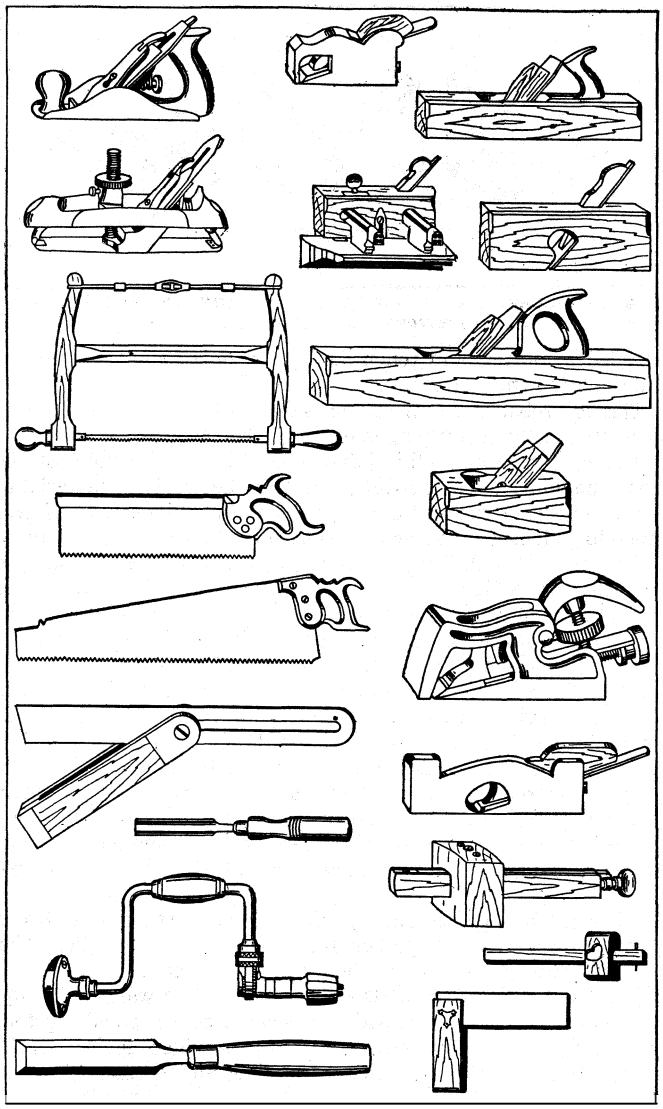


FIG. 1.— IMPLEMENTS USED IN VARIOUS PROCESSES OF JOINERY

Bevel: for testing angles other than right angles and for marking lines inclined to the surfaces of the material.

Gauges: the marking gauge for marking lines parallel to the surfaces of the material; the mortise gauge for marking mortise lines on the material; the spider gauge for marking and testing curved and twisted material.

Spokeshaves: for cleaning up and shaping curved surfaces.

Mitre block and mitre box: used in sawing mitred intersections.

Mitre shoot: used in planing mitred surfaces.

Cramp: for forcing and holding surfaces into close contact.

Hand screw: a form of wooden cramp.

Routers: for forming grooves in curved and twisted material and for finishing sunk surfaces.

Hammer, Mallet, Screwdriver, Bradawl, Gimlet, Pincers, Sharpening stone and Slips: and a variety of minor tools. *(See* fig. 1.)

In making a typical example of joinery, such as a panelled door and door linings, and assuming the whole of the work to be done by hand, the chief operations and their order of procedure would be as follows:—the measurements are taken from the architect's scale and detail drawings and full size sections and special details are set out on a thin board called a setting out rod, or on paper. A quantity sheet, containing the sawn and finished sizes and the names of the various members, together with a list of the ironmongery required, is prepared. The material is then cut and planed to the required sizes, skill and great care being exercised to produce true surfaces and the required angles between the surfaces. If the width of the panels necessitates glue jointing this operation is performed at this stage to give time for the glue to harden before the panel is required for fitting.

The shoulder mortise and other cutting lines are then transferred from the rod to the material; the important lines being marked with a scribing knife or gauge.

The mortising is then done and the tenons that are parallel *to* the grain (fibres) are cut by the saw.

The rebating, grooving and moulding are the next operations, after which the cheeks of the tenons are cut, the tenons haunched and the stuck mouldings (if any) scribed or mitred. The panels are then fitted and cleaned up, and all the surfaces of the framing that will be inaccessible when the work is put together are lightly planed and glass-papered. The work is next assembled and lightly cramped up for inspection. If everything is found to be satisfactory the work is partially knocked apart, the glue or other adhesive is applied and the final cramping and wedging up is completed. Finally, the surfaces are finished with the plane and in the case of hardwoods, the scraper and glass-paper.

The preparation of joinery entirely by hand is now the exception—a fact due to the ever-increasing use of machines, which have remarkably shortened the time required to execute ordinary operations. Various machines rapidly and perfectly execute planing and surfacing, mortising and moulding, leaving the craftsman merely to assemble, glue and wedge. Large quantities of machine-made flooring, window-frames and doors are now imported into England from abroad.

Joinery Woods.—The structure and properties of wood should be thoroughly understood by every joiner. Timber shrinks considerably in the width, but not appreciably in the length; its size and sectional shape alters with changes of temperature and humidity. Owing to these changes certain joints and details, hereinafter described and illustrated, are in common use for the purpose of counteracting the bad effect of movements which would otherwise injure the joinery work.

The kinds of wood commonly employed in joinery are the different species of North European and North American pine, oak, teak and mahogany *(see* TIMBER). The greater part of English joiners' work is executed in the northern pine exported from the Baltic countries. Hence the joiner obtains the planks, deals, battens and strips from which he shapes his work. The timber reaches the workman from the sawmills in a size convenient for the use he intends, considerable time and labour being saved in this way.

A log of timber sawn to a square section is termed a *balk.* In section it may range from 1 to $1\frac{1}{2}$ ft. square. *Planks* are formed by sawing the balk into sections from 11 to 18 in. wide and 3 to 6 in. thick, and the term *deal* is applied to sawn stuff 9 in. wide and 2 to $4\frac{1}{2}$ in. thick. *Battens* are boards running not more than 3 in. thick and 4 to 7 in. wide. A *strip* is not thicker than $1\frac{1}{2}$ in., the width being about 4 in.

Joints.— (See figs. 2, 3 and 4.) The simplest type of joint used to obtain an increased width of material is the square or smooth joint, in which the edges of the boards to be jointed are planed straight and square to the faces, after which the edges are glued and rubbed into close contact; to hold the edges together until the glue is hard, iron dogs are driven lightly into the ends of the boards across the joint.

A joint in general use for joining up boards for fascias, panels, linings, window-boards, and other work of a like nature is formed in a similar manner to the above, but with a cross-grained tongue inserted, thereby greatly strengthening the work at an otherwise naturally weak point. This is termed a *cross-tongued and glued* joint. The *dowelled* joint is a square glued joint strengthened with hard wood or iron dowels inserted in the edge of each board to a

depth of about ¾ in. and placed about 18 in. apart. The matched joint is shown in two forms, beaded and V jointed. Matched boarding is frequently used as a less expensive substitute for panelled framing. Although of course in appearance it cannot compare with the latter, it has a somewhat ornamental appearance, and the moulded joints allow shrinkage to take place without detriment to the appearance of the work. The rebated joint is used in the meeting styles of casements and folding doors, and it is useful in excluding draughts and preventing observation through the joint.

Angle Joints.—For joining the edges of boards and framing together so as to form an angle between the faces of the material the following are the principal joints used: the plain mitre joint, the tongued mitre joint, the rebated and mitred joint, the tongued grooved and moulded joint, and the rebated grooved and moulded joint. Their chief uses are at the external angles between dado and other vertical framing, and at the angles between beam and pipe casings.

The dovetail is a most important joint; its most usual forms are illustrated in fig. 3. The *mitre dovetail* is used only in the best

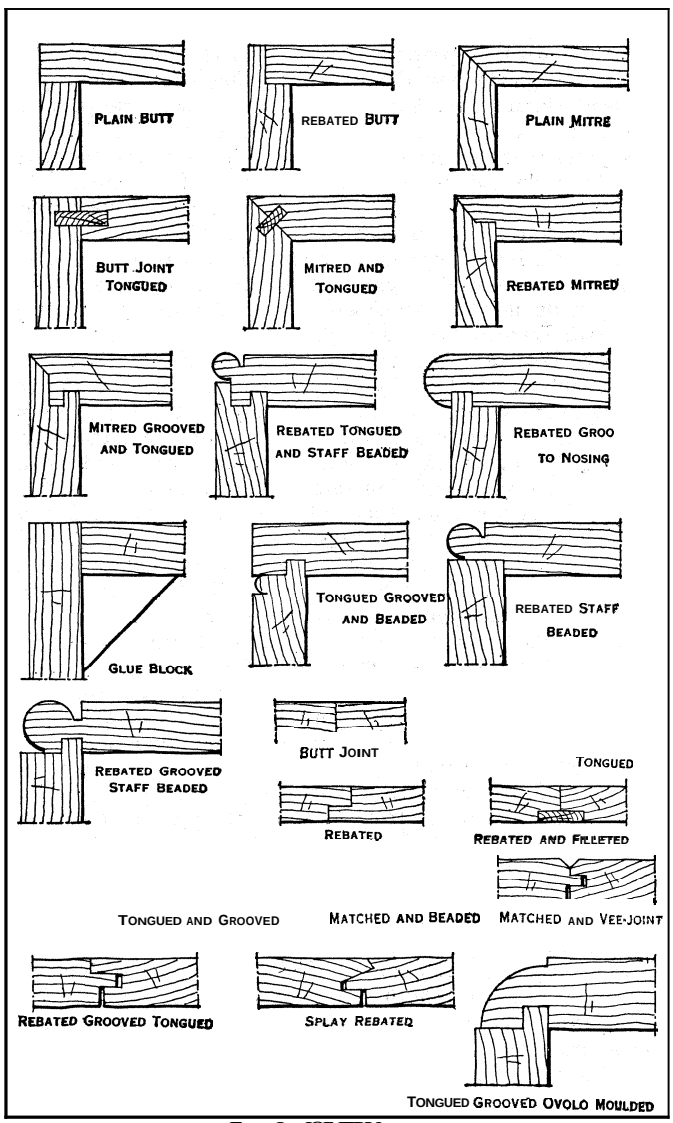


FIG. 2.—JOINERY JOINTS

work. It will be seen that the dovetail is a tenon, shaped as a wedge, and it is this distinguishing feature which, if closely fitted, gives it great strength irrespective of glue or screws. It is invaluable in framing together joiners' fittings; its use in drawers especially provides a good example of its purpose and structure.

Housed *Joints.*—This term is applied when the face of a board is grooved or trenched to receive the end of a second board; when the sides of the groove are square it is a plain housing, when the sides are bevelled it is a dovetailed housing. When the groove is stopped a short distance from the edge of the material it is called a stopped housing. The housed joint is used in fixing shelves, at the head and sill of a cased window frame, between the steps and strings of stairs, and for many other similar purposes.

Mortise and Tenon Joints.—When the end of a wooden member is cut to fit into a rectangular hole in a second member, the joint

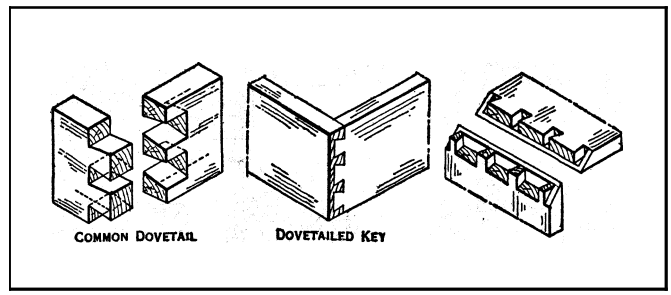


FIG. 3.—JOINERY JOINTS—DOVETAILS: (A) COMMON DOVETAIL, (B) LAPPED DOVETAIL. (C) MITRE OR SECRET DOVETAIL

is called a mortise and tenon joint; the hole being the mortise and the fitted end, the tenon.

This is probably the most generally used of all joinery joints since practically all framing is held together by this method.

The rules relating to this joint are:—(i.) the thickness of the tenon should be about one-third of the thickness of the material to be jointed; (ii.) the width of the tenon should not exceed five times its thickness. When the width of a tenon is cut away to make it accord with "rule ii." it is called a haunched tenon; the position from which the part of the tenon has been removed is called the haunch. A third rule is:—the sum of the widths of the haunches should not exceed the sum of the widths of the tenons.

The second and third rules are of importance only when the tenon is fixed by wedges; when the tenon is pinned its width is not so important since undue shrinkage would not affect the pin whereas it would tend to loosen the wedges.

The number and positions of tenons on the same end of one piece of material are referred to as follows:—one tenon is a single tenon; two tenons in the same plane are called "a pair of single tenons"; two tenons side by side are called a "double tenon"; four tenons, two in each of two planes are called a "pair of double tenons."

When a tenon passes only partially through the material it is called a "stub tenon." Other forms of tenon are called "fox wedged," "tusk," and '(dovetailed and keyed tenon."

Warping in Wide Boards.—The tendency to warp, twist and split, which boards of great width, or several boards glued together edge to edge, naturally possess, must be provided against in the construction. On the other hand, swelling and shrinking due to changes in the humidity of the atmosphere must not be checked, or the result will be disastrous. To effect this end various simple devices are available. The direction of the annular rings in alternate boards may be reversed, and when the boards have been carefully jointed with tongues or dowels and glued up, a hard-wood tapering key, dovetail in section, may be sunk into a wide dovetail at the back (fig. 4). It must be accurately fitted and driven tightly home, but not glued. Battens of hard wood may be used for the same purpose, fixed either with hard wood buttons or by means of brass slots and screws, the slots allowing for any slight movement that may take place. With boards of a substantial thickness light iron rods may be used, holes being bored through the boards edgewise, the edges glued up and the rods passed through. This method is very effective and neat in appearance, and is specially suitable when a smooth surface is desired on both sides of the work.

MOULDINGS, SKIRTINGS AND DADOS

Mouldings.—These are used in joinery to relieve plain surfaces by the contrasts of light and shade formed by their members, and to ornament or accentuate those particular portions which the designer may wish to bring into prominence. Skill and discrimination are required in designing and applying mouldings, but the crafts-

man must be able to appreciate the beauty and refinement of a moulding in order to interpret the ideas of the designer and draftsman. The character of a moulding is greatly affected by the nature and appearance of the wood in which it is worked. A section suitable for a hard regularly grained wood, such as mahogany, would probably look insignificant if worked in a softer wood with pronounced markings. Mouldings worked on woods of the former type may consist of small and delicate members; woods of the latter class require bold treatment.

The mouldings of joinery, as well as of all other moulded work used in connection with a building, are usually worked in accordance with full-sized detail drawings prepared by the architect, and are designed by him to conform with the style and class of building. There are, however, a number of moulded forms in common use which have particular names; sections are shown of many of these in fig. 5. Most of them occur in the classic architecture of both Greeks and Romans. A striking distinction, however, existed

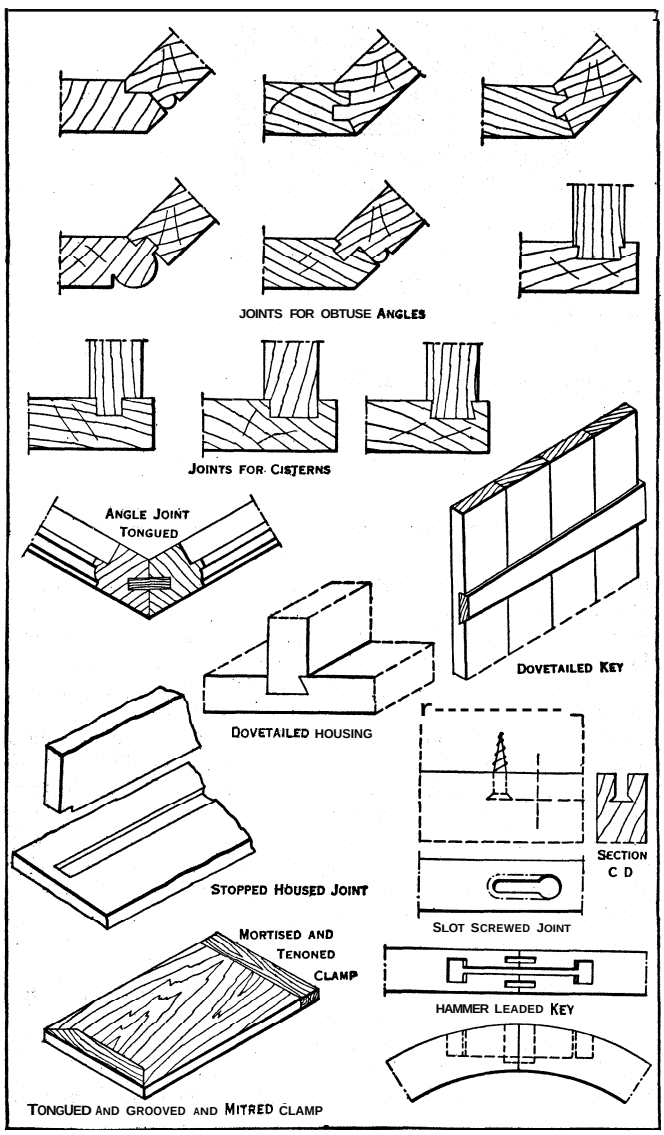


FIG. 4.— JOINERY JOINTS USED FOR SPECIAL PURPOSES

in the mouldings of these two peoples; the curves of the Greek mouldings were either derived from conic sections or drawn in freehand, while in typical Roman work the curved components were segments of a circle. Numerous examples of the use of these forms occur in ordinary joinery work, and may be recognized on reference to the illustrations.

Mouldings may be either stuck or planted on. A stuck moulding is worked directly on the solid framing; a *planted* moulding is separately worked and fixed in position with nails or screws. Beads and other small mouldings should always be stuck; larger ones are usually planted on. In the case of mouldings planted on panelled work, the nails should be driven through the moulding into the style or rail of the framing, and not into the panel. By adopting the former method the panel is free to expand and contract without altering the good appearance of the work, but if the moulding be fixed to the panel it will, when the latter shrinks, be pulled out of place, leaving an unsightly gap between the moulding and the

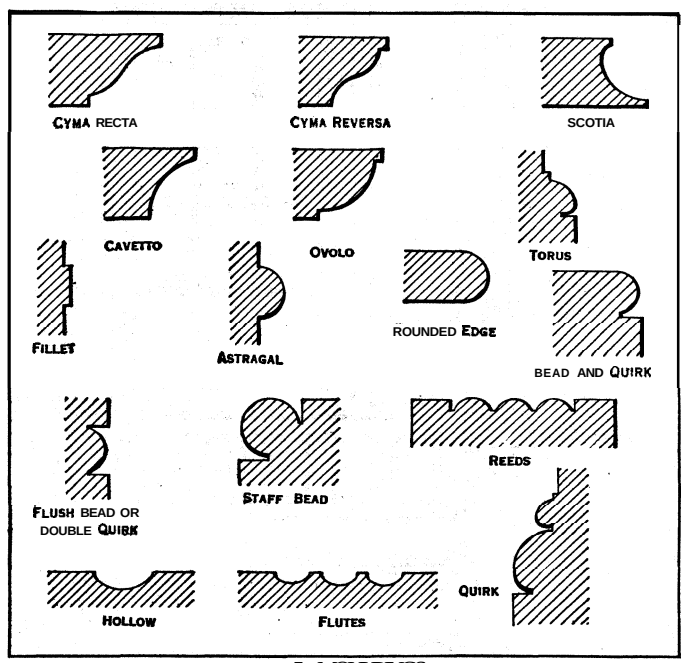


FIG. 5.—MOULDINGS

framing; or if sturdy mouldings be used, the panel may split under the strain.

Planted mouldings are cut to intersect on plain mitres, but mouldings stuck on the solid are scribed whenever the section of the moulding will permit. Scribing consists of cutting away the end of one moulding to form an exact reverse of the moulding profile so as to allow the cut surfaces to fit closely down on to the adjacent moulding. The advantage of scribing is that the appearance of the joint is less affected by shrinkage. In machine made joinery the scribing and tenoning are effected in one operation by the tenoning machine, while mitreing is done by hand.

Skirtings.— In joinery, a skirting is a board fixed around the base of an internal wall to form an ornamental base for the wall (*see* fig. 7). It also covers the joint between the flooring and the wall, and protects the base of the wall from injury. Skirtings may be placed in two classes—those formed from a plain board with its upper edge either left square or moulded, and those formed of two or more separate members and termed a *built-up* skirting (fig. *6*). Small angle fillets or mouldings are often used as skirtings The skirting should be worked so as to allow it to be fixed with the heart side of the wood outwards; any tendency to warp will then only serve to press the top edge more closely to the wall. In good work a groove should be formed in the floor and the skirting tongued into it so that an open joint is avoided should shrinkage occur The skirting should be nailed only near the top to wood grounds secured to breeze fixing blocks in the brickwork These grounds are about $\frac{3}{4}$ to 1 in. thick, *i.e.*, the same thickness as the plaster, and are generally splayed or grooved on the edge to form a key for the plaster. A rough coat of plaster should always be laid on the wall behind the skirting to keep out vermin.

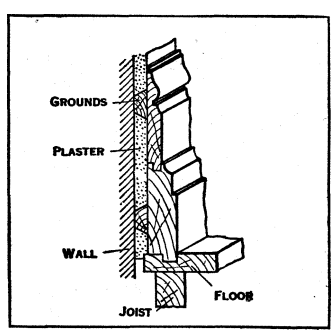


FIG 6.—BUILT-UP SKIRTING

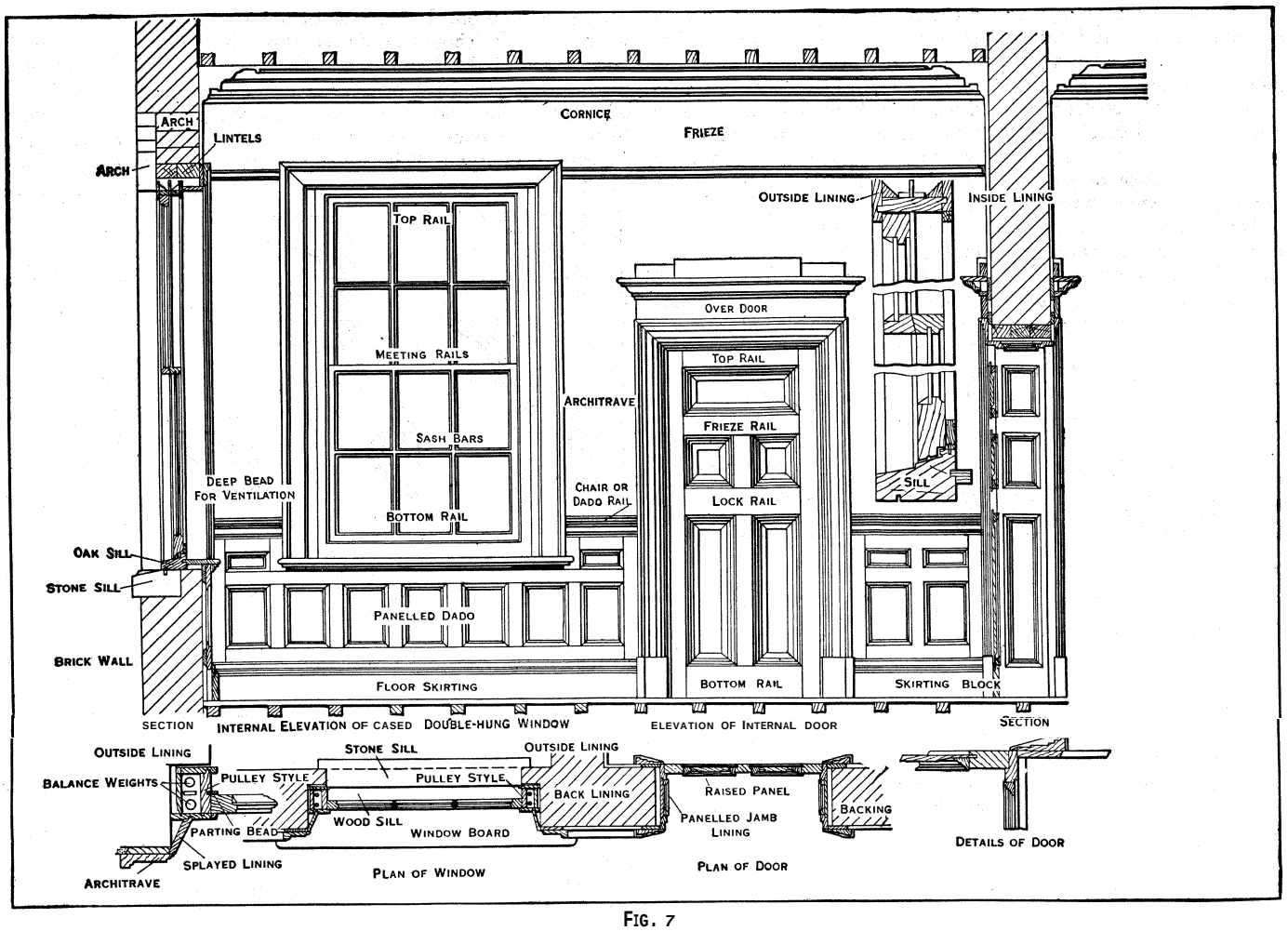


FIG. 7

Dados.—A dado, like a skirting, is useful both in a decorative and a protective sense. It is filled in to ornament and protect that portion of the wall between the *chair* or *dado rail* and the skirting. It may be of horizontal boards battened at the back and with cross tongued and glued joints, presenting a perfectly smooth surface, or of matched boarding fixed vertically, or of panelled framing. The last method is of course the most ornate and admits of great variety of design. The work is fixed to rough framed wood grounds which are nailed to fixing blocks built into the brickwork. Fig. 7 shows an example of a panelled dado with capping moulding and skirting. A *picture rail* also is shown; it is a small moulding with the top edge grooved to take the metal hooks from which pictures are hung.

WINDOWS AND DOORS

Windows.— The parts of a window sash are distinguished by the same terms as are applied to similar portions of ordinary framing, and are formed of rails and styles, with sash bars rebated for glazing. The upright sides are *styles;* the horizontal ones, which are tenoned into the styles, are *rails* (fig. 7).

Sashes hung by one of their vertical edges are called *casements.* They are really a kind of glazed door and sometimes indeed are used as such, as for example *French casements* (fig. 8). They may be made to open either outwards or inwards. It is very difficult with the latter to form perfectly water-tight joints; with those opening outwards the trouble does not exist to so great an extent. *Yorkshire sliding sashes* move in a horizontal direction upon grooved runners with the meeting styles vertical. They are little used, and are apt to admit draughts and wet unless efficient checks are worked upon the sashes and frames.

Lights in a position difficult of access are often hung on *centre pivots;* metal pivots are fixed to the frame and the sockets in which these pivots work are screwed to the sash. Movement is effected by means of a cord fixed so that a slight pull opens or closes the window to the desired extent, and the cord is then held by being tied to, or twisted round, a small metal button or clip, or a geared fanlight opener may be used. For the side sashes of lantern lights and for stables and factories this form of window is in general use.

In the British Isles and in America a common form of window is the *cased frame with double hung sliding sashes.* This style has many advantages. It is efficient in excluding wet and draughts, ventilation may be easily regulated and the sashes can be lowered and raised with ease without interference with any blinds, curtains or other fittings, that may be applied to the windows. In the ordinary window of this style, however, difficulty is experienced in cleaning the external glass without assuming a dangerous position on the sill, but there are many excellent inventions now on the market which obviate this difficulty by allowing—usually on the removal of a small thumb-screw—the reversal of the sash on a pivot or hinge. For a small extra cost these arrangements may be provided; they will be greatly appreciated by those who clean the windows. The cased frames are in the form of boxes to enclose the iron or lead weights which balance the sashes (fig. 7), and consist of a pulley style—which takes the wear of the sashes and is often of hard wood on this account—an inside lining, and an outside lining; these three members are continued to form the head of the frame. The sashes are connected with the weights by flax lines or chains of special make working over metal pulleys fixed in the pulley styles. Access to the weights for the purpose of fitting new cords is obtained by removing the pocket piece. A thin back lining is provided to the sides only and is not required in the head. The sill is of oak weathered to throw off the water. A parting bead separates the sashes, and the inside bead keeps them in position. A parting slip hung from the head inside the cased frame separates the balancing weights and ensures their smooth working.

The inside lining is usually grooved to take the elbow and soffit linings, and the window board is fitted into a groove formed in the sill. The example shown in fig. 7 has an extra deep bottom rail and bead; this enables the lower sash to be raised so as to permit of ventilation between the meeting rails without causing a draught at the bottom of the sash. This is a considerable improvement upon the ordinary form, and the cost of constructing the sashes in this manner is scarcely greater.

Bay windows with cased frames and double hung sashes often require the exercise of considerable ingenuity in their construction

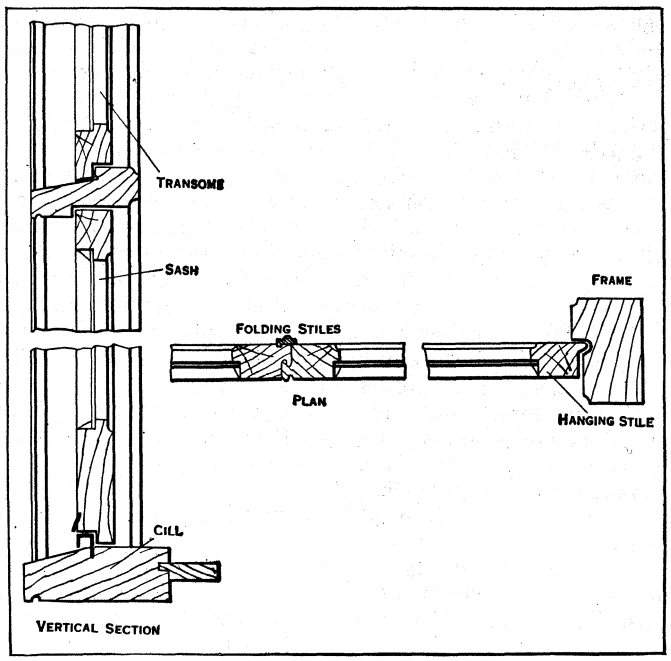


FIG. 8.— FRENCH CASEMENTS, TO OPEN INWARD

in order that the mullions shall be so small as not to intercept more light than necessary; at the same time the sashes must work easily and the whole framing be stable and strong. The sills should be mitred and tongued at the angles and secured by a hand-rail bolt. Frequently it is not desired to hang all the sashes of a bay window, the side lights being fixed. To enable smaller angle mullions to be obtained, the cords of the front windows may be taken by means of pulleys over the heads of the side lights and attached to counter-balance weights working in casings at the junction of the window with the wall. This enables solid angle mullions to be employed. If all the lights are required to be hung the difficulty may be surmounted by hanging two sashes to one weight. Lead weights take up less space than iron, and are used for heavy sashes.

In framing and fixing *skylights* and *lantern lights* also great care is necessary to ensure the result being capable of resisting rough weather and standing firm in high winds. Glue should not be used in any of the joints, as it would attract moisture from the atmosphere and set up decay. Provision must be made for the escape of the water which condenses on and runs down the inner side of the glass, by means of a lead-lined channelled moulding, provided with zinc or copper pipe outlets. The skylight stands on a curb raised at least 6 in. to allow of the exclusion of rain by proper flashing. The sashes of the lantern usually take the form of fixed or hung casements fitted to solid mullions and angle posts which are framed into and support a solid head. The glazed framing of the roof is made up of moulded sash bars framed to hips and ridges of stronger section; these rest on the head, projecting well beyond it in order to throw off the water.

Shutters for domestic windows have largely fallen into disuse, but a reference to the different forms they may take is perhaps necessary. They may be divided into two classes—those fixed to the outside of the window and those fixed inside. They may be battened, panelled or formed with louvres, the latter form admitting air and a little light. *External* shutters are generally hung by means of hinges to the frame of the window: when the window is set in a reveal these hinges are necessarily of special shape, being of large projection to enable the shutters to fold back against the face of the wall. *Internal* shutters may be hinged or may slide either vertically or horizontally. Hinged folding boxed shutters may be fitted into square or splayed recesses on the inside of a sliding sash or casement window, a number of panelled units being hinged together in order to fold neatly within the recess; they are usually held in position by means of a hinged iron bar secured with a special catch. Lifting shutters are usually fitted in a casing formed in the window back, and the window board is hinged to lift up, to allow the shutters to be raised by means of rings fixed in their upper edges. The shutters are balanced by weights enclosed with casings in the manner described for double hung sashes. The panels are of course filled in with wood and not glazed. The shutters are fixed by means of a thumb-screw through the meeting rails, the lower sash being supported on the window board which is closed down when the sashes have been lifted out. Shutters sliding horizontally are also used, but they are not so convenient as the forms described above.

Doors.— External doors are usually hung to solid frames placed in the reveals of the brick or stone wall. The frames are rebated for the door and ornamented by mouldings either stuck or planted on. The *jambs* or *posts* are tenoned, wedged and glued to the head, and the feet secured to the sill by stub tenons or dowels of iron. Solid window frames are of similar construction and are used chiefly for casements and sashes hung on centres as already described. Internal doors are hung to jamb linings (fig. 7). They are usually about 1½ in. thick and rebated for the door. When the width of jamb allows it, panelling may be introduced as in the example shown. The linings are nailed or screwed to rough framed grounds 1 in. in thickness plugged or nailed to the wall or partition. *Architraves* are the borders or finishing mouldings fixed around a window or door opening, and screwed or nailed to wood grounds (fig. 7). Polished hard wood architraves may be secretly fixed, *i.e.*, without the heads of nails or screws showing on the face, by putting screws into the grounds with their heads slightly projecting, and hanging the moulding on them by means of keyhole slots formed in the back.

Doors may be made in a variety of ways. The simplest form, the *common ledged* door, consists of vertical boards with plain or matched joints nailed to horizontal battens which correspond to the rails in framed doors. For openings over 2 ft. 3 in. wide, the doors should be furnished with braces. *Ledged and braced* doors are similar, but have, in addition to the ledges at the back, oblique braces which prevent any tendency of the door to drop. The upper end of the brace is birdsmouthed into the under side of the rail near the lock edge of the door and crosses the door in an oblique direction to be birdsmouthed into the upper edge of the rail below, near the hanging edge of the door. This is done between each pair of rails.

Framed ledged and braced doors are a further development of this form of door. The framing consists of lock and hanging styles, top, middle and bottom rails, with oblique braces between the rails. These members are tenoned together and the door sheathed with boarding. The top rail and styles are the full thickness of the door, the braces and middle and bottom rails being less by the thickness of the sheathing boards, which are tongued into the top rail and styles and carried down over the other members to the bottom of the door. The three forms of door described above are used mainly for temporary purposes, and stables, farm buildings and outhouses of all descriptions.

The doors in dwelling-houses and other buildings of a like character are commonly *framed and panelled* in one of the many ways possible. The framing consists of styles, rails and muntins or mountings, and these members are grooved to receive and hold the panels, which are inserted previously to the door being glued and wedged up. The common forms are doors in four or six rectangular panels, and although they may be made with any form and number of panels, the principles of construction remain the same. The example shown in fig. 7 is of a five-panel door, with bolection moulded raised panels on one side, and moulded and flat

panels on the other (fig. g).

A clear idea of the method of jointing the various members may be obtained from fig. 10. The tongues of raised panels should be of parallel thickness, the bevels being stopped at the moulding. The projecting ends or horns of the styles are kept on until commencement of the process of hanging, as they prevent the ends of the styles being damaged.

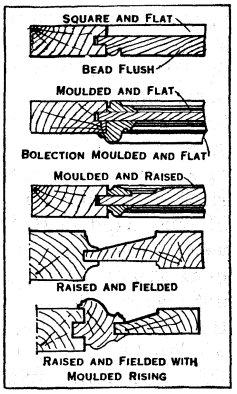


FIG. 9.— FORMSOF PANELLING

Where there is a great deal of traffic in both directions *swing* doors, either single or double, are used. To open them it is necessary simply to push, the inconvenience of turning a handle and shutting the door after passing through being avoided, as a spring causes the door to return to its original position without noise. They are usually glazed and should be of substantial construction. The door is hinged at the top on a steel pivot; the bottom part fits into a metal shoe connected with the spring, which is placed in a box fixed below the floor.

For large entrances, notably for hotels and banks. a form of door working on the *turnstile* principle is frequently adopted. It is formed of four leaves fixed in the shape of a cross and working on top and bottom central ball-bearing steel pivots, in a circular framing which forms a kind of vestibule. The leaves of the door are sometimes fitted with slips of india-rubber at their edges which, fitting close to the circular framing, prevent draughts.

When an elegant appearance is desired, and it is at the same time necessary to keep the cost of production as low as possible, doors of pine or other soft wood are sometimes covered with a veneer or thin layer of hard wood, such as oak, mahogany or teak, giving the appearance of a solid door of the better material. Made in the ordinary way, however, the shrinkage or warping of the soft wood is very liable to cause the veneer to buckle and peel off. Veneered doors made on an improved method obviating this difficulty have been placed on the market by a Canadian company. The core is made up of strips of pine with the grain reversed, dried at a temperature of 200° F., and glued up under pressure. Both the core and the hard wood veneer are grooved over their surfaces, and a special damp-resisting glue is applied; the two portions are then forced together under hydraulic pressure. By reason of their construction these doors possess the advantages of freedom from shrinking, warping and splitting, defects which are all too common in the ordinary veneered.

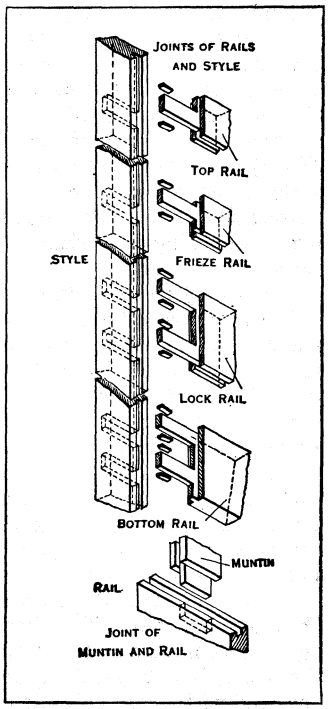


FIG. 10.— JOINTS IN DOOR FRAMING

Ordinary animal glue should not be used in work exposed to the weather as it absorbs damp and thus hastens decay; in its place a compound termed *beaumontique,* made of white lead, linseed oil and litharge, should be used.

JOINT ACCOUNT, a financial and business term having three applications: (1) A temporary business association of two or more persons acting as partners, often known as a joint venture or joint adventure. The legal rights and responsibilities of such partners are similar to those of members of a general partnership although there are several points of difference established by law. (2) A bank account in which two or more persons have joint interests or rights, often known as a joint deposit. The account is made and carried under the names of the several owners, connected by the word "and." It is the joint property of all of them and is generally subject to withdrawals by check, although the method of signature is a matter of agreement between the joint depositors and the bank. This form of deposit is used very commonly by husband and wife as a matter of convenience. In case of the death of one of the joint depositors the account becomes the property of the survivor without administratorship. (3) Several banking or security houses associated as a syndicate in the marketing of a large block of securities to the public.

(J. H. B.)

JOINT CHIEFS OF STAFF, the principal military advisers to the president of the United States, the secretary of defense, and the national security council. The joint chiefs of staff (JCS) was created in 1942 to assist the president in directing the U.S. forces in World War II. After the war the JCS was given statutory recognition and a full-time staff. The JCS consisted of four members —the army chief of staff, air force chief of staff, chief of naval operations and a chairman. The commandant of the marine corps was authorized to sit as a member of the JCS when matters of direct concern to his corps were discussed. See STAFF. MILITARY.

JOINT FIRS (Eplzedm), a genus of peculiar shrubs of the family Gnetaceae. comprising 2 j species native to warm temperate regions. Six species, commonly known as Mexican tea or joint pine, occur in the western U.S., widely distributed in arid districts from Wyoming to California and southward to western Texas and Mexico. A Chinese species, *Ephedra* sinica, yields the important drug ephedrine. See DECONGESTANT DRUGS; GYMNOSPERMS.

JOINTS, in engineering, may be classed: (1) according to their material, as in stone or brick, wood or metal; (2) according to their object, *e.g.,* to prevent leakage of air, steam or water, or to transmit force, which may be compression, tension or shear; or (3) according as they are stationary or moving ("working" in technical language). Many joints, like those of ship plates and boiler plates, or the cylinder head joint in an internal-combustion engine, have simultaneously to fulfil both objects mentioned under (2).

Wood joints are nearly all stationary. They are made partly fluid tight by grooving and tenoning and by caulking with oakum or similar material. The wood swells when it is saturated with water, the edges of the joints press closer together and the joints become tighter. Where timber is used structurally to transmit loads, compression joints can be simply formed. The contact surfaces should be accurately fitted and should be normal or nearly normal to the direction of the force transmitted. Owing to its weak shearing strength parallel to the grain, tension joints will be satisfactory only if made using suitable metal connectors. These are of the following types: shear plate (fig. 1), split ring (fig. 2), bulldog (fig. 3) and spiked grid (fig. 4). The bolts, where used, do not bear on the timber but serve only to hold the joint assembled. In the case of the shear-plate connection the load is transmitted in shear by the bolt, but the bolt bears only on the metal shear plate to transmit this force. If the timber pieces, in tension, which are to be jointed are simply bolted together with steel bolts, the stresses become extremely localized in the immediate neighbourhood of the bolts. This will tend to cause both bearing and shear failures in the timber.

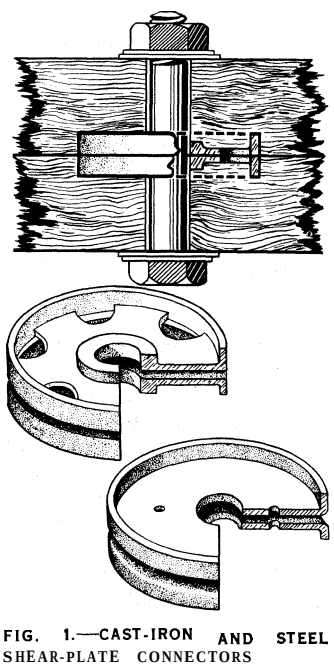


FIG. 1.—CAST-IRON AND STEEL SHEAR-PLATE CONNECTORS

Steel and the other commonly used metals possess in variously high degrees the qualities desirable in jointing materials. The joint ends of metal pieces can be fashioned to any desired form or size. Rletallic surfaces can be machined evenly to ensure the closest fit over their whole areas of contact. This is of the highest importance, especially in joints designed to transmit a force or an electric current.

Mild steel is especially suitable for joints when there is not continuous rapid motion. Where such motion occurs. a bushing or layer of brass. bronze. or either of these metals coated with a low friction alloy, such as white metal. is inserted (fig. 5). The joint then possesses the good frictional qualities of the bush surface. Leakage past moving metal joints can be prevented by cutting the surfaces accurately to fit each other. Steam-engine slide valves and their seats! and piston packing rings and the cylinders in which they work may be cited as examples, A subsidiary compressible packing is sometimes employed in the stuffing boxes. which prevent the escape of steam from cylinders through the piston-rod hole of steam engines. Fixed metal joints are made fluid tight by: (1) caulking a riveted joint, *i.e*, by hammering in the edge of the metal with a square-edged chisel; (2) the insertion

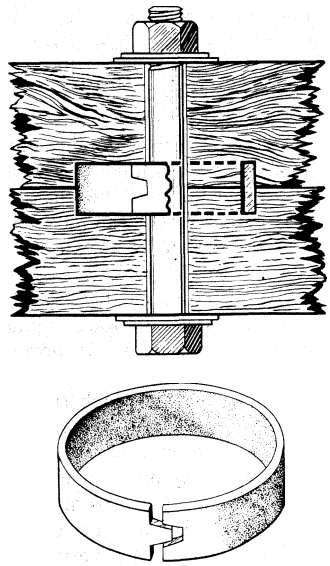


FIG 2.—SPLIT-RING CONNECTOR

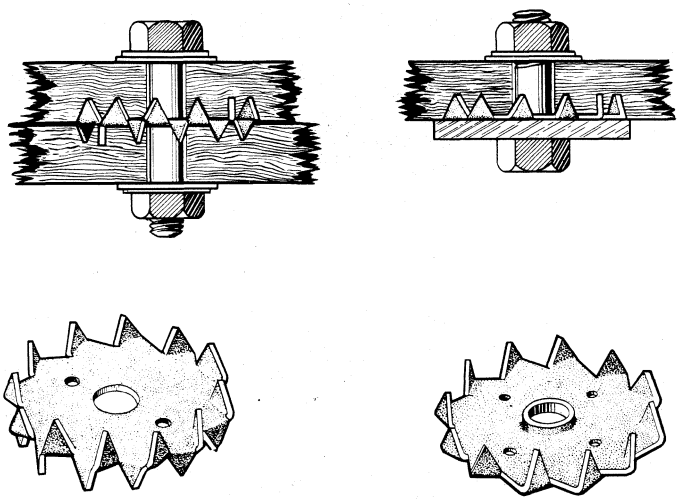


FIG. 3.— DOUBLE-SIDED AND SINGLE-SIDED BULLDOG CONNECTORS

between the surfaces of a layer of various jointing compounds: (3) the insertion of a layer of soft solid substance called packing, insertion or gasket. Metal parts may also be joined by soldering. brazing or welding. Soldered joints are used mainly for electrical connections and are made by heating the parts to be joined and adding molten solder, which, on cooling. solidifies and adheres to both metal surfaces thus jointing them together. The metal faces to be joined must be first cleaned and smeared with a suitable flux.

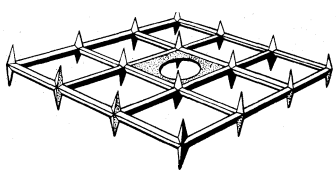


FIG. 4.— FLAT SPIKED GRID CONNECTOR

The solder is an eutectic alloy of tin and lead. Most metals can be joined by soldering, the main exception being aluminum and its alloys. The brazing process is similar to the soldering process. but brass or bronze is used as the added molten material instead of solder. Welding may also be carried out in a similar manner. but the added metal in this case will be identical with that of the parts joined. usually steel. Lead in plumbing can be satisfactorily welded in the same way (lead-burning). The nececsary heat is provided by a torch supplied with oxygen and acetylene, hydrogen or other inflammable gases under pressure (gas welding), and the added metal melted from a filler rod or wire. Alternatively the heat may be suppiied by an electric arc. The arc may be struck between the nork piece on one hand and either the filler wire or a separate electrode (usually of tungsten) on the other. The arc and the pool of molten metal must be protected from the atmosphere. This is achieved either by means of a flux coating of the filler rod nhen this is used as an electrode or by means of an envelope of inert gas, such as argon or helium. when a separate electrode is used. A third type of weld is termed a pressure meld. in nhich no metal is added. The parts to be joined, which must be of similar metal. are heated to a welding temperature (almost the melting temperature of the metals joined) and are pressed together. The heating may be by flame or by passing a heavy electric current through the parts. Local spot welds are made using round pointed copper electrodes. continuous seam welding by using copper wheels as electrodes. Pressure nelds may be made in aluminum at room temperature.

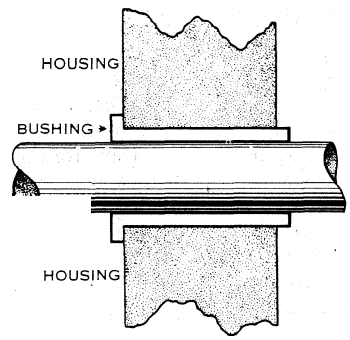


FIG. 5.— BUSHING

Apart from the above joints and glued or cemented joints, most joints are formed by cutting one or more holes in the ends of the pieces to be joined and inserting pins in these holes. The word "pin" is technically restricted to mean a cylindrical pin in a movable joint. The word "bolt" is used when the cylindrical pin is screwed up tight with a nut so as to be immovable. The word "stud" is used when the pin is screwed into or welded to one part, and a second part is held by a nut screwed on to the other end of the pin. When the pin is not screwed, but is fastened by being beaten down on either end, it is called a rivet (fig. 6). The pin is sometimes rectangular in section and tapered or parallel lengthwise (*e.g.*, gibs and cotters'). Fixed joints are seldom subject to simple compression in the direction of their length, though frequently to simple tension in that direction (*e.g.*, joint between a cylinder and cylinder head, where the bolts or studs must resist the n-hole of the thrust of the steam or combustion gases and at the same time keep the joint steamtight or gastight). (A. RD.)

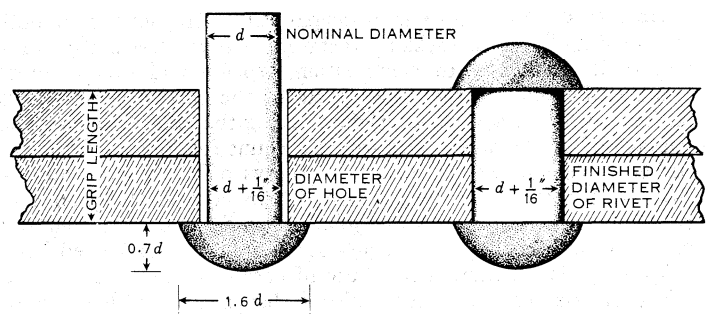


FIG. 6.— SNAPHEADED RIVET

JOINTS, in geology. are the dividing planes by which 'nearly all rocks are traversed more or less completely and which extend in various directions and at various inclinations. generally at a high angle, to the horizontal. Unlike faults. joints are fissures where little or no movement between the blocks has taken place. though the presence of slickensides — striae on the smooth faces — show that in some cases there has been some rubbing movement. Jointing cannot extend to a very great depth: for toward the base of the zone of fracture, estimated by Van Hise at about 12 km. in rigid rocks, joints and faults cannot form since the rocks tend to flow in relief of strain.

In unweathered rocks. joints, though present: are inconspicuous. but on weathering become marked. especially in a soluble rock. such as limestone. Sedimentary rocks usually show two sets of joints perpendicular to the bedding and to one another, one set in the direction of dip. the other of strike. The more prominent set. if well developed and running for long distances, forms a set of

master *joints.* Individual fissures cannot be traced very far, since joints run into one another, though their approximate general parallelism is evident. The distance between joints varies from an inch or so to several yards: in alternating strata the degree of jomting may vary from bed to bed. In igneous rocks jointing is generally quite irregular, but in granite two vertical sets at right angles to one another, with another set of cross joints approximately horizontal, are frequently found. These cross joints are of a different origin: they are the effect of weathering since they conform to the surface of the ground and die out with depth. Intrusive sills and dikes in many places show a columnar structure perpendicular to the cooling surfaces, where jointing has been so symmetrical that the sheets weather out into polygonal prismatic columns. In the well-known Giant's Causeway the columns are hexagonal, implying three equally developed sets of joints.

Near the surface joints are more or less open, especially in limestones. Solution by percolating water controlled by joints has led to the formation of large caves and underground rivers several miles in length. Highly jointed rocks are objectionable as a source of potable water; since such water is likely to be contaminated by surface impurities. Quarrying operations are much helped by the presence of a well developed joint system combined with the bedding planes of weakness. Large monoliths are obtainable from granite where the vertical jointing, widely spaced, is not interrupted by cross jointing.

Origin of Joints. — The principal cause of jointing in both stratified and igneous rocks is crustal movement. Certainly stratified rocks subjected to compression, tension and torsion must crack and fissure in the upper parts of the earth's crust. Thus strike and dip joints would originate along the axes of folds. The passage of earthquake waves would account for jointing in undisturbed horizontal strata, which is otherwise hardly explicable if folding is absent. Contraction on drying or crystallization also contributes to minor irregular jointing, as do also expansion and contraction due to epigene agents or the intrusion of heated igneous rocks. The columnar structure of basalt is due to the cooling effect of the walls between which it has been intruded and to which the structure is always at right angles. C. B. B)

JOINTS AND LIGAMENTS. A joint, or articulation, is the junction of two or more parts of the skeleton that are so fixed together as to allow more or less motion between these parts against each other in one or more directions. Ligaments are tough. fibrous strands that secure the relationships of the bones of the joints, ligaments also support the internal organs.

Most of the joints of the body are freely movable; these are called diarthroses. But there are other joints that are capable of only a little motion. Among these is the type called syndesmosis. in which the bones are joined by fibrous tissue. Another is that called synchondrosis, in which two bones are fitted together by cartilage; an example is the symphysis between the pubic bones. Only a slight degree of springy motion (which varies nith age) is possible in a synchondrosis. This article is confined largely to a discussion of the diarthroses — the movable joints — and to the ligamentous structures that join and support them.

JOINTS

Anatomy. — The opposing surfaces of the bones constituting a joint are molded to each other and are covered by a cartilage layer that in the adult becomes the remainder of the preformed cartilaginous bone end. The molding of the bone occurs in various degrees, some fitting closely, as in the elbow joint (ulna and humerus), and some fitting loosely, as in the shoulder joint (humerus and scapula), depending upon the range and the freedom of motion of the particular joint.

The space between bones in the joint is the joint space, or the joint cavity, and it is enclosed by the capsular sac, a tough fibrous tissue fastened to the ends of the bones that form the joint. This membrane is lined with a very sensitive and vascular lining, the synovial membrane, which is fastened to the bones, usually at the margin of their cartilaginous covering. The synovial lining secretes a fluid, the synovia, a lubricating substance which also furnishes the nourishment for the joint cartilage. Sometimes these joint cavities extend into pouches or recesses or communicating bursae, and the shape of the joint sac changes much with motion. as in the knee joint. The capsular sac is heavily strengthened by capsular ligaments woven into it.

Function. — The prime function of the joint is to provide free movement. Joints moving in one direction or plane only are called ginglymus; examples of these are the interphalangeal joints between the links of the fingers. A joint that combines motion in one plane (flection and extension) with rotation about the length axis is called a trochoginglymus. An enarthrosis, also called a ball-and-socket joint, is a joint that is capable of moving in all directions, such as the shoulder and hip joints.

Rotation along a longitudinal axis alone is carried out in a pivot joint, or trochoides. In order to control strictly this motion, the arrangement is in the form of a double joint, which has a common axis around which the motion occurs. This is seen, for instance. in the radio-ulnar articulation, which is a double joint, one at the upper and one at the lower end of the forearm. It permits a rotatory movement of the forearm and hand (pronation and supination). The ribs are likewise fastened to the spinal column by double joints (the costovertebral and the costotransverse articulations), which permit the upward and downaard motion of

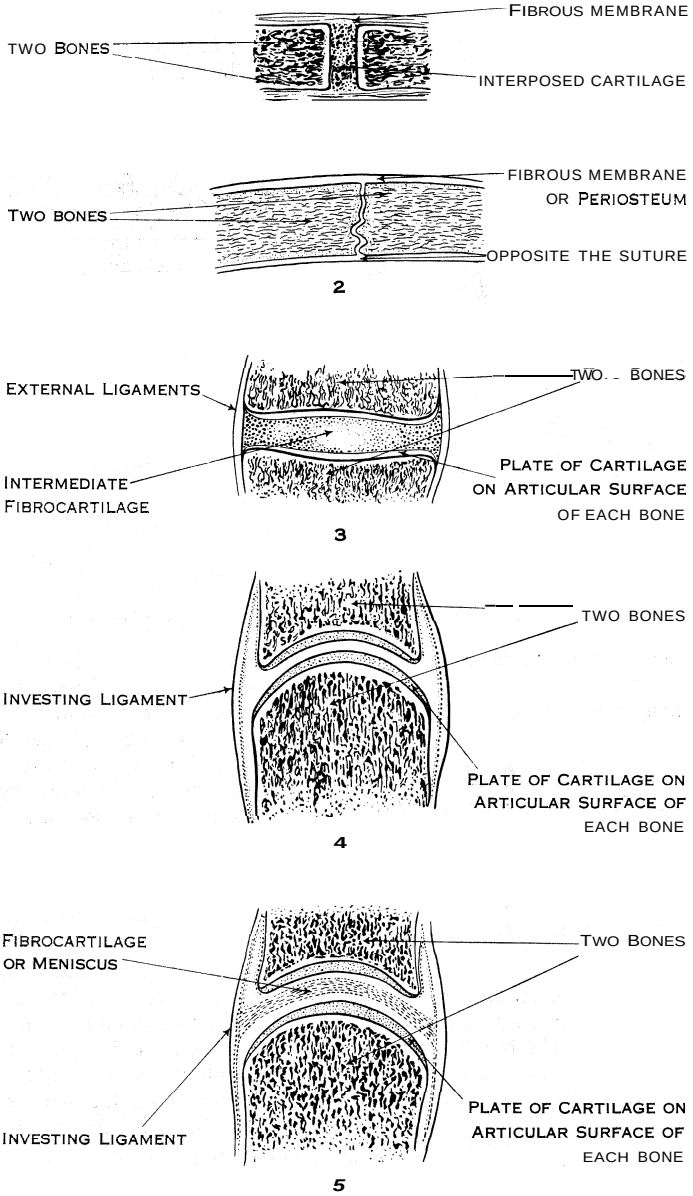


FIG. 1–5. — JOINTS

Vertical sections through (1) synchondrosis, (2) cranial suture, (3) amphiarthrodial joint, (4) diarthrodial joint, (5) diarthrodial joint with Interposed fibrocartilage or meniscus

the rib cage during respiration.

A saddle joint is a joint in which one of the bones is fitted to the other by a sort of saddle-shaped concavity. This also permits motion in all directions. but the movements are less free than they are in the enarthrosis or ball-and-socket joint. An example of this is the joint that unites the thumb with the wrist.

Embryologic Development. — The joints develop during the mesenchymatous period of the embryo's life. This is the stage of preformation of the skeleton and is represented by a condensation of young connective tissue, the so-called mesenchyme. This mesenchyme forms the axial or vertebral skeleton as well as that of the extremities.

In this primordial formation there takes place what is called a chondrification, which means the substitution of this tissue by cartilage cells which again are the forerunners of the later ossification. Only the site of the joint remains as a mesenchymatous plate, and this plate later becomes absorbed and thereby leaves a cavity, the joint. The menisci or intra-articular cartilages represent an incomplete chondrification of the intermediate mesenchymatous plate so that really a double joint is formed, more or less incompletely separated by the cartilages. The ligaments likewise develop from condensed mesenchymatous strands. but they remain as connective tissue whereas the central rods which represent the bone undergo chondrification and later ossification.

Joints of the Body. — Vertebral *Column.*—The bodies of the 24 vertebrae resting upon the sacrum are joined by intervertebral discs. The intervertebral disc is a joint of peculiar construction. inasmuch as it consists of a tough fibrous ring containing in its centre a round-cellular, gelatinous, semielastic body, the nucleus pulposus. Because of its ability to change its shape and its position within the fibrous ring, tilting movements are possible between vertebrae in all directions, the discs functioning as a sort of universal joint.

The arches of the vertebrae carry the articular processes which, with the adjacent ones of the vertebrae above and below, form the intervertebral articulation. The anterior column (*i.e.*, that of the bodies) carries the weight. The articular facets of the arches glide over each other, while the movement occurs about or in the neighbourhood of the discs as centres.

The ligaments are fitted into the spine under tension. running along the bodies and along the arches. The anterior longitudinal ligament runs the entire length from the occiput to the sacrum along the anterior surface of the bodies of the vertebrae; the posterior runs along the posterior surface of the bodies of the vertebrae. At the posterior column the long ligaments are the supraspinous ligaments, and the short ligaments are spanned between arches and processes, and all are fitted in under considerable tension. The discs, on the other hand, are fitted in between the vertebral bodies under considerable pressure, amounting to an average of about 66 lb.

All this gives the spine a great deal of stability in spite of its consisting of so many articulating segments. As a result it requires only a comparatively small amount of muscle force to hold the spine in erect position.

The ribs are articulated aith the spinal column by means of the costovertebral articulations between the heads of the ribs and the side of the vertebral body, and the costotransverse articulations between the ribs and transverse processes. This double articulation restrains the rib movement to one about the common axis of both articulations. This permits the ribs to flare outward and upward during respiration.

At the junction of the cervical spine to the skull there are great modifications in the usual vertebral pattern. The axis of the second cervical vertebra represents really the body of the first cervical fused with that of the second. It articulates nith the first cervical vertebra, the atlas. in the atlantoaxial joint. which is secured by ligaments between the atlas, the odontoid and the ecciput. The first cervical vertebra (atlas) articulates with the occiput, the bone occupying the posterior portion of the skull. Nodding and shaking of the head are carried out in these two articulations, but the side bending of the head occurs in the rest of the cervical spine.

Shoulder. — The shoulder girdle complex is composed of the collarbone or clavicle, the shoulder blade or scapula and the upper arm bone or humerus. This complex has three articulations:

1. The sternoclavicular articulation between the coliarbone and the sternum or breastbone is one of the four articulations of the human body endowed with an intra-articular cartilage or meniscus. It permits the clavicle to move up and down, forward and backward as well as to rotate about a length axis.

2. The acromioclavicular joint is between the outer end of the collarbone and the acromion or shoulder-height process of the shoulder blade. This joint also permits the clavicle to move in the same manner as does the sternoclavicular articulation. upuard and downward, backward and forward. The centre of motion for both articulations lies between them at the costoclavicular ligament, which is much nearer to the inner end of the clavicle than to the outer. Consequently both ends of the clavicle move simultaneously but in opposite directions like the arms of a scale.

3. The third joint of the shoulder girdle complex is the shoulder joint, which is the joint between the shoulder blade or scapula and the upper arm bone or humerus. This is a ball-and-socket joint that can move in all directions. Its range of motion is augmented by the t o other articulations already mentioned.

All joints are reinforced by ligaments. Special ligaments are the costoclavicular ligament between clavicle and first rib which serves as fulcrum for the movement of the clavicle; the coracoclavicular ligament between the clavicle and the coracoid or duckbill process of the scapula, which restrains the upward movement of the outer end of the clavicle; and the coracoacromial ligament between the coracoid process and the acromial process of the shoulder blade. which acts as an overhanging roof to the shoulder joint and protects the humerus from upward displacement.

The tendon of the long head of the biceps muscle is covered by synovial lining as it passes through the joint from the upper edge of the articulating area of the scapula, the so-called glenoid cavity, leaving the joint to lie between the two tubercles or excrescences of the humerus. The development of the clavicle is closely connected m-ith the prehensile function of the upper extremity. Among the mammals the bone is present only in the primates.

Elbow. — This is a hinge joint in which the forearm moves against the upper arm or vice versa. The part of the humerus articulating m-ith the ulna, the trochlea, fits snugly into the semilunar notch or greater sigmoid cavity of the upper end of the ulna. On the outer side of the joint, however, the head of the radius plays loosely about the corresponding end of the humerus, the capitellum. It is in this latter joint that the length rotation of the forearm, that is the pronation (thumb turned to the inner side) and the supination (thumb turned out to the outer side), takes place. This movement is further safeguarded by the two radioulnar articulations, the one situated at the upper and the other at the lower end of the forearm bone. In the upper of these two articulations the disc-shaped head of the radius rotates in the lesser sigmoid cavity of the ulna; in the lower, the disc-shaped lower end of the ulna fits into a slightly concave sigmoid cavity of the radius.

The forearm and upper arm do not form a complete straight line when the joint is in full extension, but the forearm is deflected outmard about 10° to 15° in men and 20° to 25° in women. This is called the carrying angle. When the forearm is fully flexed, homever, the hand points strictly to the shoulder joint and not to the chest; for the axis of the elbow joint exactly bisects this angle between the axis of the humerus and the forearm.

Between the radius and the ulna the interosseous ligament is spanned, its fibres ascending from the ulna to the radius so as to protect the latter from being pushed upward. At the lower end of this ligament there is the so-called chorda obliqua, a portion of the ligament, but with fibres which run in the opposite direction; these protect the radius from being pulled downward.

Wrist.—The wrist joint is between the radius and the first row of bones of the carpus or wrist, namely the scaphoid, the semilunar, the triquetrum or triangular bone and the pisiform bone. There is an oblong articulation between the radius and the first three of these bones which is called the proximal carpal joint. This joint

permits motion in the direction of backward and forward flection of the hahd as well as side motion. Its upper articular surface is completed by a triangular cartilage that extends between the edge of the radius and the very end of the ulna.

The midcarpal joint is the joint between the proximal row of the carpal bones, mentioned above, and the distal or peripheral row, which consists also of four bones. namely the greater and lesser multangulum, the capitate bone and the uncinate or hooked bone. This is an S-shaped, gliding articulation that augments the motions of the radiocarpal joint.

The joints between the bases of the fingers and the metacarpal bones of the palm permit flection and extension of the fingers on the palm. side motion of the fingers, and a slight degree of length rotation. When the fingers are extended, they spread apart; when they are flexed, they crowd together. In this movement they rotate about their length axis in such a fashion that the hollow of the hand becomes cupped, for which purpose a certain length rotation is necessary, although it is insignificant in degree.

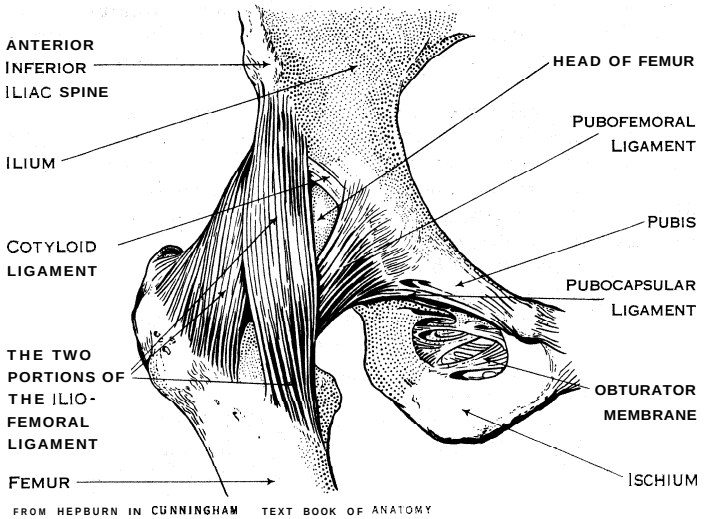
The joints between the fingers are the interphalangeal joints, uniting the different finger links or phalanges. These are purely hinge joints and move only in one plane.

All joints of wrist and fingers are heavily reinforced and secured by capsular and interosseous ligaments.

Sacroiliac.—The sacroiliac articulation is placed between the sacrum and the iliac bone or ilium, the uppermost of the three bones composing the pelvis. This joint is a combination of a diarthrosis with a syndesmosis, since the remaining large space between the sacrum and the ilium is filled out by strong and tough connective tissue. Very little motion is possible in this articulation; it is only during pregnancy or menstruation that some slight relaxation occurs. This massive connective tissue formation is called the sacroiliac ligamentous mass. The fifth lumbar vertebra is further secured to the ilium by the iliolumbar ligaments. which run from the transverse process of the fourth and fifth lumbar vertebrae to the posterior rim of the ilium, preventing the fifth lumbar vertebra from sliding forward.

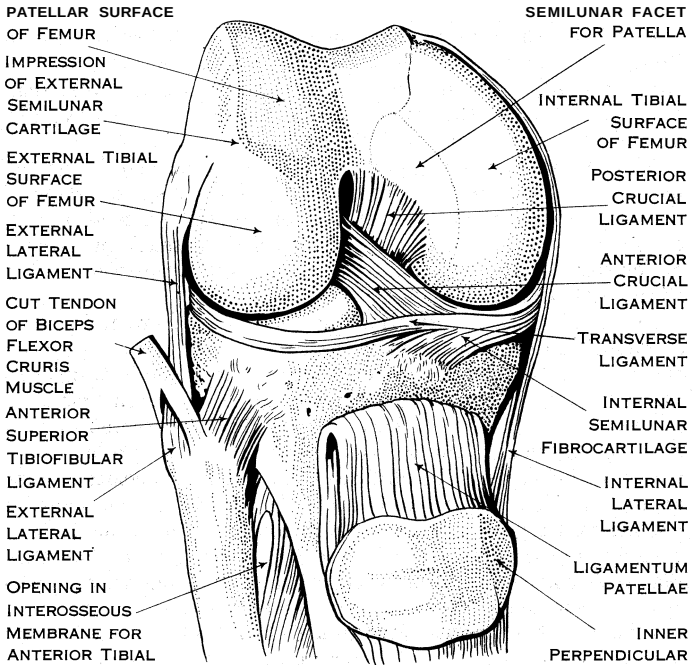
Other auxiliary ligaments of the pelvis are the ligamentum sacrospinosum and the sacrotuberosum which run from the sacrum to the spine and the tuber of the ischium, or seat bone. The role of this ligament is to prevent the sacrum from tipping backward under the weight of the body.

Hip.—The hip joint is the articulation of the upper end of the thighbone with the socket or acetabulum at the junction of the three bones (ilium. pubis and ischium) forming the pelvis. This joint is a ball-and-socket joint and therefore permits motion in all directions. The capsular apparatus of this joint is likewise heavily enforced by strong ligaments) of which the most powerful and strongest is the iliofemoral ligament, which reinforces the capsular apparatus in its anterior aspect.



FROM HEPBURN IN CUNNINGHAM TEXT BOOK OF ANATOMY

FIG 6 — DISSECTION OF HIP JOINT ANTERIOR VIEW, SHOWING ATTACHMENT OF LIGAMENTS TO FEMUR, ILIUM, ISCHIUM AND PUBIS



FROM HEPBURN IN CUNNINGHAM TEXT BOOK OF ANATOMY

FIG 7 — DISSECTION OF KNEE JOINT FROM THE FRONT THE PATELLA IS SEEN THROWN DOWN TO SHOW THE INTERNAL SEMILUNAR CARTILAGE AND TRANSVERSE LIGAMENT

This joint has wide excursion ranges which differ, however, in the different planes. The range of flexion and extension is about 140°, while that of abduction—that is, of outward and inward carrying of the limb—amounts to about 80°. The circling of length rotatory movement in both inward and outward rotation has a range from 60° to go°, according to the position of flection in which the limb is held.

Knee.—This is the largest joint of the body, and it also has to sustain the greatest stresses since it is located between the hip joint and the ankle joint, supporting the entire weight of the body and of the upper part of the limb. Consequently, the articular ends are very massive. At the same time great freedom of motion of the joint is necessary for the mechanics of the gait. The massive condyles (rounded ends) of the lower end of the femur (thighbone) articulate with the corresponding condyles of the tibia (leghone) by means of the already mentioned intra-articular cartilages. The whole joint is enveloped in a rather redundant capsular apparatus that contains the patella, or kneecap. The recess in the capsular apparatus is wide enough to follow the movement of the joint. and it allows the kneecap to sweep freely up and down at the anterior surface of the femur.

In the interior of the joint there are the crucial ligaments, which run crosswise from the inner and outer condyles of the femur respectively to the space between the condyles of the tibia. The principal function of this joint is flexion and extension, but a certain amount of length rotatory motion is necessary for the gait. For this purpose the reinforcing ligaments of the knee joint—that is, the collateral ligaments—relax when the knee is in flexion to permit a certain amount of length rotation in the joint.

Foot and Ankle.—The ankle joint proper is the joint between the lower end of tibia and fibula (calfbone), the so-called malleolus, which forms a mortise into which fits the body of the astragalus or anklebone. In this joint only backward and forward or extension and flexion movement is possible. Another joint is situated between the anklebone and the underlying os calcis, or heelbone. In this articulation the movement is a side tipping whereby the inner border of the foot can be lowered or raised, the so-called pronation and supination of the foot.

The third articulation of the foot is situated between the anterior end of the heelbone and that of the anklebone respectively

on one side and the cuboid, which is the outermost of the distal row of the tarsal bones, and the scaphoid or boat-shaped bone. The cuboid articulates with the anterior end of the heelbone, and the scaphoid or boat-shaped bone articulates with the anterior end or head of the anklebone. In this articulation there are really three types of motion possible: the forefoot can be bent up against the back part of the foot. turned inward and outward or tilted upward or downward. All the joints of the foot are heavily reinforced by ligaments, of which the most important are the internal and external deltoid ligaments.

The so-called inner arch of the foot is formed by the heelbone supporting the anklebone upon which again rests the weight of the body. It continues forward through the boat-shaped bone and the three wedge-shaped bones or cuneiforms which articulate with the metatarsals of the three inner toes.

The outer arch of the foot is formed by the heelbone, the cuboid and the metatarsals of the two outer toes. The weight of the body rests upon the inner arch, and the latter is borne by the outer arch by means of a prolongation of the heelbone. the so-called sustentaculuni.

Jawbone.—The temporomaxillary articulation of the mandible or the joint of the jawbone is situated between the sigmoid cavity of the temporal bone and the so-called condyle of the mandible or jawbone. It is also endowed with an intra-articular cartilage or meniscus by which the range of motion in this joint is greatly increased. This articulation is heavily reinforced by capsular ligaments.

The motion in this joint is a combination mechanism. On opening the mouth the motion starts with a hinge movement and then goes into a gliding, taking the meniscus with it. This joint between the temporal bone and the mandible is found only in mammals. It is a perfect hinge joint in the Carnivora. In some, the antero-posterior gliding movement is favoured: as in the rodent, and in others the lateral movements predominate, as in the ruminants.

LIGAMENTS

Ligaments are structures consisting of tough fibrous strands, the direction of which is so arranged as to offer the greatest resistance to stresses. In some ligaments the fibres are arranged parallel, as the interosseous radio-ulnar ligament; in some they are fan-shaped, as the internal collateral ligament of the knee; and in some the fibres are arranged in layers crossing in different directions, as in the sacroiliac, according to the stresses they are expected to resist.

The so-called white ligament consists of connective tissue fibres with few elastic elements; the so-called yellow ligament (for instance, the ligamentum flavum between the vertebral arches) is rich in elastic fibres. Some ligaments (articular ligaments) serve directly as capsular reinforcement. They are either closely attached to the outer layer of the capsular sac (for instance, the glenohumeral ligament reinforcing the shoulder joint capsule) so that they can be isolated from the capsule only with difficulty; or they appear as separate and distinct anatomic structures (for instance, the external collateral ligament of the knee joint); or they are partly enclosed attachments and partly free and easily separable from the joint capsule (for example. the internal collateral ligament of the knee).

There are other ligaments not directly in the vicinity of joints securing the relationship of bones to each other. They also restrict motion by acting as tie piece between bones. Here belong, for instance. the interosseous ligaments! such as those that unite the forearm bones (radius and ulna), or the interosseous ligaments of the leg between tibia and fibula, or the ligaments spanned between the ribs (intercostals) and the long and short ligaments between the bodies of the vertebrae (the so-called anterior column), as well as those that are spanned between the segments of the so-called posterior column of the spine formed by the vertebral arches.

Intra-articular ligaments exist in the knee (the cruciate ligaments, anterior and posterior). They are covered by synovial membrane so that they are, strictly speaking, extra-articular; however, they protrude into the joint.

The intra-articular cartilage is a formation that is found in four joints of the human body: the temporomaxillary joint (the joint between the loner jaw and the temporal bone); the sterno-clavicular joint between sternum and clavicle; the wrist joint (triangular cartilage); and the knee joint, where these cartilages are knonn as menisci or semilunar cartilages. These cartilages are interposed between the bones so that their gliding will increase the range of motion of the joint. See also BONE; CONNECTIVE AND SUPPORTING TISSUES; MUSCLE AND MUSCULAR SYSTEM; SKELETON VERTEBRATE. (A. SR.; X.)

JOINTS AND LIGAMENTS, DISEASES AND DISABILITIES OF. Diseases and disabilities of the joints and ligaments arise from a variety of causes, including congenital defects, trauma, infection and arthritis. This article first discusses diseases and disabilities of the joints and then those of ligaments. For information about the anatomy of these structures. see JOINTS AND LIGAMENTS.

Congenital Absence or Dislocation of Joints.—A joint may be absent at birth because of some error that occurred in prenatal differentiation of the mesoderm. The result is congenital synosteosis, or fusion, of the two bones forming the joint; for instance. between humerus and ulna, between the bodies of several vertebrae where the intervertebral disc betneen them disappears, or between the phalanges of the fingers (symphalangism).

Many joints may be dislocated during the birth process. The most common congenital dislocation—that of the hip joint—occurs more often in females than in males. It causes a characteristic waddle and considerable difficulty in walking and in later years may produce pain, fatigue and secondary disturbances of the back due to the exaggerated sway-backed deformity it produces. Since the late 1880s it has been known that this dislocation can be successfully reduced up to a certain age. Great progress has been made in establishing early diagnoses, with the result that the patient can be treated in the first month of life with good results. After the fifth or sixth year and sometimes much sooner the dislocation can no longer be reduced by bloodless manipulation. Surgery, however, is often successful beyond that age Old congenita! dislocations may produce pain and fatigue and may require palliative operations that relieve the symptoms by aligning the limb so that it can withstand the stresses of weight bearing.

Congenital dislocation of joints other than the hip is comparatively rare. Those occurring most frequently are dislocations of the upper end of the radius and of the shoulder. Congenital dislocation of the knee occurs usually in connection with congenital contractures that force the knee into either extended or hyperextended position so that it appears to be bent forward, sometimes to a very remarkable degree. Like the congenital dislocations of the hip, those of the other joints require reduction at the earliest possible age.

Joint Injuries and Infection.—All wounds that penetrate into a joint are serious because of the great susceptibility of the synovial membrane to infection. Whether these wounds are contaminated by tools or instruments or by gunshot or shrapnel. they must be carefully dissected and cleaned. This is called the *débridement*. The object is to remove all dead or severely damaged tissue that could facilitate the spread of infection. Only after the first few hours can these wounds be considered as sufficiently clean, so that. after being débrided and after they have been treated nith antibiotics such as the sulfonamides or penicillin, they may be sewed up. When more than a few hours have elapsed, the joint, even if properly cleaned or débrided, must be considered as infected and. according to the type of infecting agent. the joint must be drained freely. Such joints also must be immobilized because motion favours the spread of infection throughout the body.

Most joints are extremely susceptible to acute pyogenic infection that is caused mainly by the staphylococcus and the streptococcus, although many other bacteria. such as the pneumococcus, meningococcus and the typhoid bacillus, also can cause it. Knee-joint infections especially are likely to produce general septic symptoms because of the great extent of the synovial membrane.

Besides being caused by penetrating wounds, joint infections also arise from diseased neighbouring bones or by way of the blood stream from a remote site of infection.

Acutely inflamed joints are usually treated with rest and evacuation of the inflammatory contents, especially since some of these bacteria elaborate enzymes that destroy the cartilage and obliterate the joint.

Chronic Joint Disease.—This category comprises chronic inflammatory conditions of different types, some identified by the causative bacterial agents such as tuberculosis and syphilis and others not so identified, such as chronic arthritis. Any acute form of joint inflammation may enter into a chronic stage when the infectious agent has become attenuated.

The *Tuberculous* Joint.—Not until the tubercle bacillus was discovered by Robert Koch in 1882 was the identity of this infection definitely established, although tuberculous disease of the joint was known clinically long before as tumour albus, or white swelling The majority of cases develop in childhood from a primary pulmonary tuberculosis acquired in early infancy. However, it is by no means rare for joint tuberculosis to develop in adults.

In the young, conservative treatment of the joints by immobilization in plaster casts or splints commonly succeeds in bringing the process to a halt, but such treatment must be continued, sometimes for years, until all signs of activity have disappeared. In the adult, however, most of these joints will not heal under rest and immobilization and require operative resection to eliminate the joint entirely. The time for such an operation must be chosen carefully since satisfactory general as well as local conditions are necessary for success.

If tuberculous joint disease spreads into the surrounding soft tissue, abscesses develop that perforate through the skin and establish sinuses, or running tuberculous sores. A tuberculous sinus is a severe complication since it permits other more virulent infectious agents, such as the staphylococcus or streptococcus, to penetrate into the tuberculous focus and thereby change the tuberculous joint into one of so-called mixed infection that is much more difficult to control. (See TUBERCULOSIS: *Nonpulmonary* Tuberculosis.)

The Arthritic Joint.—Arthritis is by far the most frequently occurring joint disease. There are two types of arthritis: rheumatoid arthritis and osteoarthritis, or degeneration joint disease. The former is commonly a disease of younger people, the latter of persons at or past middle age.

Rheumatoid arthritis is more destructive and more crippling than osteoarthritis. It involves many joints, mostly symmetrically, and frequently leads to the stiffening of the joints in various kinds of distorted positions unless proper measures are taken early to prevent both stiffness and deformity. This type starts in the synovial membrane and it leads to extensive destruction of the articular cartilage and to the formation of intra-articular joint adhesions.

Osteoarthritis does not produce intra-articular adhesions, but the joint becomes just as painful and stiff as in rheumatoid arthritis because the joint surfaces become rough and uneven; they form spurs and spicules that interlock and may abolish joint motion completely. This arthritis involves the large joints of the body as well as the end joints of the fingers, whereas rheumatoid arthritis involves as a rule large joints and the middle joints of the fingers. The hip joint especially is a frequent site of osteoarthritis in older people. (See ARTHRITIS.)

Joint Stiffness.—Stiffness of the joint is so frequent that it must be anticipated in almost all chronic joint diseases. It is due either to the destruction of the joint itself and to the formation of intra-articular adhesions or to the shrinkage of the soft structures surrounding the joint or, as is more often the case, to a combination of these. It is during the acute stage, before the pathological changes of the joint have reached their full extent, that the treatment must be such as to minimize the stiffening effect of the joint disease. A joint that is kept at rest and is protected from any irritation is likely to suffer less restriction of motion after recovery than one that is needlessly manipulated at the acute stage. When an inflamed joint is manipulated it will lose some of its range of motion because of the inflammatory reaction. In some joints, for instance in tuberculosis, it is difficult to determine when the inflammatory process has subsided; in others, for instance in the arthritic joint, there comes a time when it may be considered as quiescent. On the other hand, the muscles and ligaments of the joint require motion in order to prevent atrophy. It follows, therefore, that in chronic joint disease there is a time for absolute rest and a time for carefully instituted motion.

Manipulation of a tuberculous joint is always a doubtful and dangerous procedure, but there is a proper time for active and passive motion of the arthritic joint.

The Deformed Joint.—It must also be anticipated at the beginning of the treatment that the joint disease may end not only in stiffness but also in deformity in spite of rest and other treatment. Inflamed joints naturally assume the position in which the volume capacity of the joint is greatest and the tension on the very sensitive synovial lining therefore minimal. In this position the joint may become stiffened, and a very disabling contracture may result. In the earlier stages the deformities are produced when muscles contract as a reflex reaction and hold the joint in this faulty position. The surgeon, foreseeing this, must take care to keep the joint from contracting or must correct already existing contractures by the application of splints or by traction that regains the straight position of the joint. The real art of the treatment is to plan the correction gradually and carefully so as to avoid a reaction of the joint. This must be done, of course, before the joint has stiffened irrevocably by virtue of destruction and adhesion.

When the joints no longer respond to conservative devices such as traction, operative measures must be undertaken to overcome the obstacles furnished by the muscles and joint capsule. If the joint itself has been destroyed and the bones have become bound together by fibrous adhesions or by bony bridges, then a new joint must be fashioned by plastic surgery after the ankylosing tissues have been separated. Under favourable circumstances joint motion can be restored to a practical extent. A piece of soft tissue, usually taken from the thigh, is interposed or a cup made of Vitallium or of plastic is placed between the two bones that form the joint.

These operations are difficult and must be undertaken only on strict indication. For instance, if several joints are involved so that locomotion becomes very difficult, such an operation on one of the joints may be unavoidable. The joints that lend themselves to this difficult operation are the elbow, hip and knee joints and some of the finger joints.

Neurogenic Arthropathy.—The so-called neuropathic joints caused by neurogenic arthropathy are also called Charcot's joints after Jean Martin Charcot (*q.v.*), the great French clinician who contributed a great deal to the knowledge of this condition. These joints, since they are deprived of their nerve supply, degenerate and decay. It is a peculiar and grotesque mixture of melting down of bone with the production of a great deal of irregular bony mass in and around the joint. Such joints are seen, for instance, in *tabes dorsalis* (locomotor ataxia) and in syringomyelia, both diseases of the cord, or after severe injuries of the spinal cord.

Tumours of the Joint.—Tumours may develop in the joint lining or capsular apparatus as well as in the bone ends of the joints. Synovial tumours (synovioma) that are malignant are frequently seen, especially about the knee joint. Another tumour is the so-called xanthoma (yellow tumour), a variant of fibrous tumour. It has peculiar foamlike cells that give it a slightly yellowish appearance, hence the name.

A number of tumours in the bone may be located in the articular ends; for instance, cystic tumours such as giant cell tumour, a peculiar tumour formation that prefers the epiphyseal or joint ends of the bone. Other tumours of this type are chondroma (cartilage tumours) and its malignant counterpart, chondrosarcoma.

Malignant tumours of the joints are characterized by their rapid growth and by the appearance of pain. A benign tumour that has been present for a considerable time may become malignant, and in this case the rapid increase in growth and the appearance of con-

siderable and continuous deep-seated pain is very suggestive of malignancy. Consequently, it often becomes necessary in case of doubt to perform a small operation in which a portion of the tumour is removed for pathological examination.

Injuries to Ligaments (Sprains).—Mechanical stresses produce abnormal stretching or tearing of the supporting ligaments of the joints. A tear may penetrate into the capsular apparatus and involve the synovial lining. In this case bleeding into the joint (hemarthros) and swelling occur soon after the injury; *i.e.*, perhaps in a few minutes. Even if the synovial lining is not torn. the strain on it will cause a reactive hyperemia of the synovia that results in effusion of synovial fluid into the joint. In this case the swelling appears more slowly, sometimes after 24 hours or even later. Joint sprains usually mend completely in otherwise healthy individuals provided the joint is properly immobilized so that no additional tears are superimposed upon the original injury and the process of repair can go on undisturbed. For this purpose the joint is placed in a retentive dressing. *i.e.*, a cast or a splint or sometimes only a properly applied adhesive dressing, the object being to avoid straining the articulation by movement or weight bearing.

In joints previously diseased, for instance in arthritis, these ligamentous and capsular sprains occur much more easily because of the loss of elasticity of these structures, and the same applies to the natural inelasticity of senescence. In this case the process of repair is much slower, and protective immobilization of the joint must be prolonged. Since all joint injuries including those to capsule and ligaments are followed by acute atrophy of the musculature about the joint, the joint may thereby lose an important element of stabilization and may in time become insecure. This again invites further sprain, and a vicious circle is thereby established. Therefore the treatment must be guided by a consideration of how long and to what extent immobilization is indispensable for the repair of the ligaments and, on the other hand. when exercises are to be instituted in order to redevelop the atrophic musculature. No two patients and no two joints are alike in this respect and no sweeping general rules can be established.

Injuries to the Intra-articular Cartilage.—Of the four joints in the body that include intra-articular cartilage, the most commonly injured is the knee joint. Injuries to these menisci (semilunar cartilages) occur frequently in the knees of football. cricket or baseball players. They are produced by twisting, or wrenching the knee inward while the foot and leg are fixed upon the ground. When the cartilage tears, it usually causes what is called a lockage of the knee, which means inability to straighten it. These tears appear in the form of tabs or splits in the cartilage, and by becoming dislodged into the joint they cause a mechanical obstacle to extension. A fresh displacement can be reduced by manipulative methods, but recurrent attacks make the removal of the injured cartilage necessary.

See also BOKE. DISEASES AND INJURIES OF: *Fractures;* FRACTURES AND DISLOCATIONS; GOUT; ORTHOPEDIC SURGERY; SPINE. DISEASES AND DISABILITIES OF; STEROIDS; TEKDINITIS.

(A. Sr.; X.)

JOINT TENANCY, the tenancy of an estate by two or more persons wherein those participating are subject to the same conditions of interest and possession and are individually responsible in respect of the tenure and survivorship of the property; such joint tenancy being only dissolved by partition. The purchaser of the share of a joint tenant is not entitled to resell and must accept the terms of the tenancy in common with the surviving partners. A joint tenancy is regarded by law as a single person and those concerned are jointly responsible for any legal proceedings in connection with the estate. Lloreover, when one of the joint tenants dies, his share, instead of going to his own heirs, lapses to his co-tenant's by survivorship. This tenancy is distinguished from *tenancy* in *common* under which the property of each co-tenant passes to the heirs and not to the surviving tenants. (See PARTITION.)

In the United States joint tenancies have been looked upon with disfavour. Statutes have reversed the common law rule whereby a grant to two or more was supposed to create a joint tenancy, substituting the presumption that a tenancy in common is created unless a contrary intention appear upon the face of the grant. Some States have abolished the right of survivorship in the case of joint tenants, prescribing that no such right shall exist unless specifically contained in the grant. A few States have abolished joint tenancy completely, transforming such estates into tenancies in common.

JOINTURE, in law, a provision for a wife after the death of her husband. As defined by Sir E. Coke, it is "a competent livelihood of freehold for the wife, of lands or tenements, to take effect presently in possession or profit after the death of her husband, for the life of the wife at least, if she herself be not the cause of determination ,or'forfeiture of it." (Co. Litt. 36b.) It must have been made before marriage and be expressed to her in lieu of dower (*q.v.*).

JOINTWORM, the name applied in the United States to the larvae of hymenopterous gall-forming insects of the genus *Harmolita,* two of which. *H. triciti* and *H. hordei,* are important parasites of wheat and barley respectively, causing swellings in the stems near or on the joints (whence the name). The adult insects are small wasps, about $ in. long and black in colour. (See HYMENOPTERA.)

JOINVILLE, the name of a French noble family of Champagne, which traced its descent from Étienne de Vaux, who lived at the beginning of the 11th century. Geoffroi III. (d. 1184), sire de Joinville, who accompanied Henry the Liberal, count of Champagne, to the Holy Land in 1147, received from him the office of seneschal, and this office became hereditary in the house of Joinville. In 1203 Geoffroi V., sire de Joinville, died while on a crusade, leaving no children. He was succeeded by his brother Simon, who married Beatrice of Burgundy, daughter of the count of Auxonne, and had as his son Jean (*q.v.*), the historian and friend of St. Louis. Henri (d. 1374), sire de Joinville, the grandson of Jean, became count of Vaudémont, through his mother, Marguerite de Vaudémont. His daughter, Marguerite de Joinville, married in 1393 Ferry of Lorraine (d. 1415), to whom she brought the lands of Joinville. In 1552, Joinville was made into a principality for the house of Lorraine. Mlle. de Montpensier, the heiress of Mlle. de Guise, bequeathed the principality of Joinville to Philip, duke of Orleans (1693). The castle. which overhung the Marne, was sold in 1791 to be demolished. The title of prince de Joinville (*q.v.*) was given later to the third son of King Louis Philippe. Two branches of the house of Joinville have settled in other countries: one in England, descended from Geoffroi de Joinville, sire de Vaucouleurs, and brother of the historian, who served under Henry III. and Edward I.; the other, descended from Geoffroi de Joinville, sire de Briquenay, and son of Jean. settled in the kingdom of Naples.

See J. Simonnet, *Essai sur l'histoire et la généalogie des seigneurs de Joinville* (1875); *H. F.* Delaborde, *Jean de Joinville et les seigneurs de Joinville* (1894). (M. P.; X.)

JOINVILLE, FRANÇOIS FERDINAND PHILIPPE LOUIS MARIE, PRINCE DE (1818–1900), third son of Louis Philippe. duc d'Orléans, afterwards king of the French, was born at Neuilly on Aug. 14, 1818. He was educated for the navy, and became lieutenant in 1836. In 1840 he was entrusted with the removal of the remains of Napoleon from St. Helena to France. In 1844 he conducted naval operations on the coast of Morocco, bombarding Tangier and occupying Mogador, and was recompensed with the grade of vice-admiral. In the following year he published in the *Revue des deux mondes* an article on the deficiencies of the French navy which attracted attention. By his hostility to the Guizot ministry, by an affectation of ill-will towards Great Britain, he gained considerable popularity. The revolution of 1848 nevertheless swept him away with the other Orleans princes. He hastened to quit Algeria, where he was then serving, and took refuge at Claremont, in Surrey, with the rest of his family. In 1861, upon the breaking out of the American Civil War, he proceeded to Washington, and placed the services of his son and two of his nephews at the disposal of the United States government. Otherwise: he was little heard of until the overthrow of the Empire in 1870, when he re-entered France, only to be

promptly expelled by the government of national defence. Returning incognito, he joined the army of General d'Aurelle de Paladines, under the assumed name of Colonel Lutherod, fought bravely before Orleans, and afterwards, divulging his identity, formally sought permission to serve. Gambetta, however, arrested him and sent him back to England. In the Kational Assembly, elected in February 1871, the prince was returned by two departments and elected to sit for the Haute Marne, but, by an arrangement with Thiers, did not take his seat until the latter had been chosen president of the provincial republic. He resigned his seat in 1876. In 1886 the provisions of the law against pretenders to the throne deprived him of his rank as vice-admiral, but he continued to live in France; he died in Paris on the 16th of June 1900. He had married in 1843 the princess Francisca, sister of Pedro II., emperor of Brazil, and had a son, the duc de Penthièvre, also brought up to the navy, and a daughter Françoise, who married the duc de Chartres.

The prince de Joinville wrote *Essais sur* la *marine française* (1853); *Études sur la marine* (1859 and 1870); La *Guerre d'Amerique, campagne du Potomac* (1862 and 1872); *Encore un mot sur Sadowa* (Brussels, 1868); and *Vieux souvenirs* (1894).

JOINVILLE, JEAN, SIRE DE (1224–1317), was the second great writer of history in Old French, and occupies the interval between Villehardouin and Froissart. He was the head of a noble family of the province of Champagne *(see* JOINVILLE). His first appearance at the king's court was in 1241, on the occasion of the knighting of Louis IX.'s younger brother Alphonse. Seven years afterwards he took the cross. The crusade, in which he distinguished himself equally by wisdom and prowess, taught his practical spirit several lessons. He returned with the king in 1254. He was in the intervals of residence on his own fief a constant attendant on the court, but he declined to accompany the king on his last and fatal expedition. In 1282 he was one of the witnesses whose testimony was formally given at St. Denis in the matter of the canonization of Louis, and in 1298 he was present at the exhumation of the saint's body.

It was not till even later that he began his history, the occasion being a request from Jeanne of Kavarre, the wife of Philippe le Bel. The great interval between his experiences and the period of the composition of his history is important for the due comprehension of the latter. Some years passed before the task was completed in Oct. 1309. Jeanne was by this time dead, and Joinville presented his book to her son Louis. This original ms. is now lost. Great as was his age, Joinville had not ceased to be actively loyal, and in 1315 he complied with the royal summons to bear arms against the Flemings. He was at Joinville again in 1317, and on July 11 he died, leaving his possessions and his position as seneschal of Champagne to his second son Anselm. He was buried in the neighbouring church of St. Laurent.

The **Writer.**—Joinville's *Histoire de Saint Lozris* bears the vivid impress of the writer's personality. It does not, like Villehardouin's account, give us a picture of the temper and habits of a whole order or cast of men during an heroic period of human history; it falls far short of Froissart in vivid portrayal of the picturesque and external aspects of social life; but it is a more personal book than either. The writer was a very old man telling of circumstances which occurred in his youth. He evidently thinks that the times have not changed for the better—what with the frequency with which the devil is invoked in modern France, and the sinful expenditure common in the matter of embroidered silk coats. But this laudation of times past concentrates itself almost wholly on the person of the sainted king whom, while with feudal independence he had declined to swear fealty to him, "because I was not his man," he evidently regarded with an unlimited reverence. His age, too, while garrulous to a degree, seems to have been free from the slightest taint of boasting. No one perhaps ever took less trouble to make himself out a hero than Joinville. He is constantly admitting that on such and such an occasion he was terribly afraid; he confesses without the least shame that, when one of his followers suggested defiance of the Saracens and voluntary death, he (Joinville) paid not the least attention to him; nor does he attempt to gloss in any way his refusal to accompany St. Louis on his unlucky second crusade, or his invincible conviction that it was better to be in mortal sin than to have the leprosy, or his decided preference for wine as little watered as might be, or any other weakness. Yet he was a sincerely religious man, as the curious *Credo*, written at Acre and forming a kind of anticipatory appendix to the history, sufficiently shows.

His History.—Joinville's history is divided into three parts, dealing with the character and conduct of the hero, Saint Louis; the second with his acts and deeds in Egypt, Palestine, etc., as Joinville knew them; and his subsequent life and death. Of these the last is very brief, the first not long; the middle constitutes the bulk of the work. The contents of the first part are chiefly stories showing the valour of Louis, his piety, his justice, his personal temperance, and so forth.

The second part enters upon the history of the crusade itself, and tells how Joinville pledged all his land save so much as would bring in a thousand livres a year, and started with a brave retinue of nine knights (two of whom besides himself wore bannerets), and shared a ship with the sire d'Aspremont, leaving Joinville without raising his eyes, "pour ce que le cuer ne me attendrisist du biau chastel que je lessoie et de mes deux enfans"; how they could not get out of sight of a high mountainous island (Lampedusa or Pantellaria) till they had made a procession round the masts in honour of the Virgin; how they reached first Cyprus and then Egypt; how they took Damietta, and then entangled themselves in the Delta. Bad generalship, which is sufficiently obvious, unwholesome food—it was Lent, and they ate the Nile fish which had been feasting on the carcases of the slain—and Greek fire did the rest, and personal valour was of little avail, not merely against superior numbers and better generals, but against dysentery and a certain "mal de l'ost" which attacked the mouth and the legs, a curious human version of a well-known bestial malady. After ransom Acre was the chief scene of Louis's stay in the East, and here Joinville lived in some state, and saw not a few interesting things, hearing besides much gossip as to the affairs of Asia from ambassadors, merchants and others. At last they journeyed back again to France, not without considerable experiences of the perils of the deep, which Joinville tells with a good deal of spirit. The remainder of the book is very brief. Some anecdotes of the king's "justice," his favourite and distinguishing attribute during the 16 years which intervened between the two crusades. are given; then comes the story of Joinville's own refusal to join the second expedition, a refusal which bluntly alleged the harm done by the king's men who stayed at home to the vassals of those who went abroad as the reason of Joinville's resolution to remain behind. The death of the king at Tunis, his *ensezgnement* to his son, and the story of his canonization complete the work.

The book in which this interesting story is told has had a literary history It seems to have undergone very much the same fate as that which befell the originals of the first two volumes of the *Paston Letters* which Sir John Fenn presented to George III. Several royal library catalogues of the 14th century are known, but in none of these does the *Histoire* de *St. Louis* appear. It does appear in that of Charles V. (1411), but apparently no copy even of this survives. A copy at first or second hand which belonged to the fiddler king René of Provence in the 15th century was used for the first printed edition in 1547. Other editions were printed irom other versions, all evidently posterior to the original. But in 1741 the well-known mediaevalist, La Curne de St. Palaye, found at Lucca a manuscript of the 16th century, evidently representing an older text than any yet printed. Three years later a 14th century copy was found at Brussels; this is the standard manuscript authority for the text of Joinville, and appears in the well-known collection of Michaud and Poujoulat as well as in that of Buchon, and in a careful and useful separate edition by Francisque Michel. The modern science oi critical editing, however, which applies to mediaeval texts the principles long recognized in editing the classics, has discovered in the 16th century ms. and still more in the original miscellaneous works of Joinville, the letters, deeds, etc., already alluded to, the materials for what we have already called a conjectural restoration. which is not without its interest, though perhaps it is possible for that interest to be exaggerated.

For general readers Buchon's or Michaud's editions of *Joinville* will suffice amply. Both include translations into modern French, which are hardly necessary, ior the language is easy. Natalis de Wailly's editions of 1868 and, particularly, 1874 are critical editions, embodying the modern research connected with the text, the value of which is considerable, hut contestable. Much valuable information appeared for

the first time in the edition of F. Michel (1859). To these may be added A. F. Didot's *Études sur Joinville* (1870) and H. F. Delaborde's *Jean de Joinville* (1894). A good sketch of the whole subject mill be found in Auhertin's *Histoire de la langue et de la littérature françaises au moyen âge,* ii. There are English translations by T. Johnes (1807), J. Hutton (1868), Ethel Wedgwood (1906), and (more literally) Sir F. T. Marzials ("Everyman's Library," 1908).

JÓKAI, MÓR (1825–1904), Hungarian novelist who is perhaps the most widely read Hungarian author, was born at Komárom on Feb. 18, 1825. He studied law and became a clerk in a solicitor's office: but soon abandoned the profession to devote himself entirely to literature. He was an intimate friend of Sándor Petofi. In 1848 he married a famous actress, Róza Laborfalvi. Jokai played an active part in the events leading to the outbreak of the Hungarian revolution in 1848, but his gentle nature disapproved of extremists and his role remained insignificant. During the period of repression which followed, Jokai, like many other writers, had to hide. and only his wife's cleverness enabled him to escape arrest.

Jókai was a prolific writer. His collected works (published 1894–98) filled 100 volumes. which did not include his considerable journalistic output. In 1861 he was elected to the national assembly and kept his seat until 1896, when he was made a member of the upper house. His first wife died in 1886 and, although a septuagenarian, he then married a young actress. At his death in Budapest on May 5, 1904, the whole nation went into mourning. No Hungarian writer has been as popular as Jókai, or translated into so many languages. Though the quality of his work is uneven, there can be no doubt that he deserves the high esteem in which Hungary holds him.

Jókai's early work shows the strong influence of French romanticism mixed with a Petofi-like popular realism. His first novel, *Hdtkoznapok* ("Weekdays!" 1845), is a curious blend of these apparently incompatible trends. In the years following the revolution Jókai made closer acquaintance with reality and learned to draw increasingly on personal experience. Nevertheless, he still did not picture things, persons and events as they actually were, but as he saw them; his kindness, his gentle humour, his optimism made him draw a rosier picture of both past and present than an impartial observer would have done. Jókai's life is dominated by illusions which he imparts to his readers. His historical novels, *e.g., Erdély aranykora* ("The Golden Age of Transylvania," 1852) and *Török világ Magyarországon* ("Turkish World in Hungary," 1853), have little claim to historical accuracy, but his evocation of the past is so compelling that it gains ascendancy over truth. Even in his novels dealing with contemporary Hungarian society or with the "reform era" of the first half of the century, Jókai managed to gloss over harsh reality. His novels *Egy magyar nábob* ("A Hungarian Nabob." 1853–54), *Kárpáthy Zoltán* (1854) and *Az új földesúr* ("The New Squire;" 1863) are immensely entertaining, and in spite of weaknesses in characterization and a looseness in construction, are considered masterpieces.

Among his novels written in the less bracing atmosphere of the era following the compromise with the Habsburgs (1867), *Fekete gyémántok* ("Black Diamonds," 1870) and *Az aranyember* ("A Man of Gold." 1873) are outstanding. In a manner reminiscent of Balzac, Jókai tackles here some of the problems of a mercantile society through the lives of his heroes. But here, as elsewhere! he does not let either facts or theories hamper the flow of his imagination. His tales develop in a world of his own. enchanted and enchanting. the world of one of the greatest of storytellers.

See Mikszáth Kálmán, *Jdkai Mór élete és kora* (1907); Sötér István, *Jdkai Mór* (1941). (Ds. Sr.)

JOKL, NORBERT (1877–1942), Czech linguist, who was a leading authority on the Albanian language, was born on Feb. 2 j, 1877, at Bzenec, Czech. Having taken his advanced degree in Slavonic studies at the University of Vienna in 1908, he entered the University library. where he spent his entire career and rose to the highest post. Beginning in 1913, he concurrently lectured at the University of Vienna, where he received a professorial appointment in 1923. His entire scholarly life and publication were devoted to the study of Albanian, a field to which he became a capital contributor. Jokl significantly extended knowledge of the inherited Indo-European vocabulary of Albanian and of the complex linguistic prehistory of the Balkans. his best known work being *Linguistisch-kulturhistorische Untersuchungen aus dem Bereiche des Albanischen* (1923). Jokl's complete and detailed annual critical bibliographies of Albanian linguistics from 1916 to 1939 are a tribute to his meticulous learning. He died in a concentration camp at Vienna about May 8. 1942.

See the obituary *by* C Tagliavini, *Indogermanisches Jahrbuch,* 28 296–301 (1949). (E P. H)

JOLIET, a city of Illinois, U S, on the Des Plaines river, 3i mi. S.W. of Chicago, and seat of Will county, has been called "Stone city" for its excellent limestone, used throughout the middle nest (*e.g.,* in the Rock Island arsenal. state capitol and Lincoln monument, Springfield). Pop. (1960) 66,780. (For comparative population figures, *see* ILLINOIS: *Population.)* It is the centre of a rich farming and industrial area, served by railways, national highways and the Great Lakes-Gulf waterway. The first settlers (1831) left because of the Black Hawk War. Charles Reed was the first permanent settler (1833) The town was incorporated in 1852 and adopted a commission form of government in 1918. Originally named Juliet in honour of Juliet Campbell, daughter of a settler, it was renamed (1845) for Louis Jolliet, French-Canadian explorer who visited the site (1673). Settlers from the northeast predominated and gave a definitive stamp to the city. In the 1840s and 1850s, British, Irish and German settlers came. Opening of the Illinois-Michigan canal (1848) and entry of a railway, the Rock Island, in 1852, gave a wider market to its farm products, coal and limestone. The industrial era began in the 1870s, expanding after 1890. Industries and products include oil refining, railroad shops, machinery, wire, chemicals, paper and printing.

Joliet claims the oldest public junior college (1902) and has a nationally famous high school band. Pilcher Park arboretum is a preserve for native and imported trees and shrubs, and the 75-ac. Bird Haven gives sanctuary to about 200 kinds of birds.

(M. Ws.)

Penal Institutions.—In the Joliet area are two Illinois state prisons. both administered by one warden, and related penological facilities. On the edge of the city is the old prison, built in the mid-19th century from rock quarried in the vicinity. It is used to house occasional offenders and those who have committed less serious felonies and are not considered to be in need of maximum surveillance. Across the street is the diagnostic depot where new prisoners sentenced from northern Illinois are classified and transferred to a prison or other institution.

Stateville penitentiary (new prison), architecturally one of the world's most unusual penal institutions, is a maximum security prison about 5 mi. N. of Joliet. Begun in 1916. its 64 ac. are surrounded by a wall more than 30 ft. high. Within the wall are located the cell houses, dining hall, workshops, dormitories. hospital, storehouses and other structures necessary for the upkeep of the prison and the welfare and security of the prisoners. The dining hall, near the middle of the enclosure. is a circular building with narrow tables arranged so that all inmates must sit facing the centre of the hall where a guard post is located. Radiating from the dining hall are covered walks and corridors leading to the cell houses, most of which are circular with cells arranged in four tiers around the outer edge. A guard tower in the centre of each cell house provides a view of each cell. The dining hall and cell houses, similar to the panopticon designed by the English philosopher Jeremy Bentham but never built. are outstanding features of Stateville and are not duplicated elsewhere. A 2.200-ac. honour farm. worked by trusted prisoners, is situated outside the wall.

(X.)

JOLIOT, (JEAN) FRÉDÉRIC (1900–1958), French physicist also knonn as JOLIOT-CURIE after his marriage in 1926 with Irène Curie (see JOLIOT-CURIE, IRENE), was awarded in 1935, jointly nith his wife, the Nobel prize for chemistry for the discovery of new radioactive elements prepared artificially. He was born at Paris on March 19, 1900, and first studied engineering and then chemistry In 1925 he was appointed to the staff of the Radium institute, Paris, where he later became professor. In his

striking experiments on artificial radioactivity, there were obtained three new radioactive elements that did not occur naturally; they were isotopes of nitrogen, phosphorus and aluminum, and accordingly were named radionitrogen, radiophosphorus and radioaluminum. The method consisted in bombarding boron, aluminum and magnesium, respectively, with alpha rays. In effect, this was the discovery of how to produce radioactivity in elements that did not normally exhibit radioactive properties, and it gave a means of studying the breakdown of atoms by observations on these unstable nuclei. Many other radioisotopes have since been produced by different methods; and they have been successfully used to follow, by means of their radioactivity, the course of various elements in living organisms. The assimilation of carbon by the green leaves of plants in sunlight has been followed by the use of carbon dioxide prepared from radiocarbon, the isotope of carbon with an atomic weight of 14 (instead of the normal isotope of atomic weight 12, which is not radioactive). Joliot in 1939 detected also the emission of neutrons in nuclear fission. In 1944 he was appointed director of the French Centre *nationale* des Recherches *scientifiques,* Paris, and in 1946 was made high commissioner for atomic energy; but he was removed by the government in 1950 because of his Communist views.

Joliot died in Paris on Aug. 14, 1958. (D. McK.)

JOLIOT-CURIE, IRÈNE (1897–1956), French physicist, daughter of Pierre and Marie Curie (*q.v.*), was awarded the Nobel prize for chemistry in 1935 jointly with her husband, Frédéric Joliot (q *v.*), for their discovery of new radioactive elements prepared artificially. She was born in Paris on Sept. 12, 1897, and educated at the Sorbonne. In 1918 she became her mother's assistant at the Radium institute. Paris, where she acquired her remarkable knowledge of the radioactive elements and where she met Joliot. whom she married in 1926. In their researches they had bombarded boron, aluminum and magnesium, respectively, with alpha particles; and they had obtained radioactive isotopes of elements not ordinarily radioactive, namely, nitrogen, phosphorus and aluminum. These discoveries revealed the possibility of using artificially produced radioactive elements to follow chemical changes and physiological processes, and such applications were soon successful; the absorption of radioiodine by the thyroid gland was detected, and the course of radiophosphorus (in the form of phosphates) was traced in the metabolism of the organism. The production of these unstable atomic nuclei afforded further means for the observation of changes in the atom as these nuclei broke down. The Joliot-Curies observed also the production of neutrons and positive electrons in the changes that they studied; and their discovery of artificial radioactive elements was an important step toward the solution of the problem of releasing the energy of the atom, since the method of Enrico Fermi (q *v.*), using neutrons instead of alpha particles for the bombardments which led to the fission of uranium, was an extension of the method of the Joliot-Curies for producing radioelements artificially. Mme. Joliot-Curie was dismissed by the French government in 1951 from her post in the French Atomic Energy commission because of her Communist views. She died in Paris on March 17, 1956. (D. McK.)

JOLLIET, LOUIS (1645–1700), explorer of the Mississippi river, nas baptized at Quebec, Can., Sept. 21, 1645. Selected by the French intendant Jean Talon to ascertain the direction and mouth of the Mississippi, he embarked at Sault Ste. Marie in the spring of 1673 and went to Michilimackinac (St. Ignace, Mich.), where he was joined by Father Jacques Marquette; for the extent of their explorations, which established that the Mississippi did not flow into the Pacific ocean, see MARQUETTE. JACQUES.

On the return journey Jolliet's canoe was overturned and his journal and papers lost, but he made a map from memory which agrees nith the autographed map of Marquette. Jolliet later travelled to Hudson bay and to the Labrador coast in the interest of the fur trade and fisheries. He died in 1700.

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JOLLY, GEORGE (fl. 1640–1673?), English actor-manager who, after obscure beginnings at London, emerged in 1648 as the leader of a troupe of English strolling players in Germany. Having gained a foothold at Cologne, he moved on to other German cities, notably Frankfurt-on-Main, where he played regularly at the time of the fair. It is likely that Jolly's company performed—with Italianate scenery, actresses and music—before the future Charles II when he visited Frankfurt in 1655. At the Restoration Jolly received a royal grant permitting him to manage a theatre in London. In 1663, while Jolly was touring the provinces, Sir William Davenant and Thomas Killigrew, the two patentees holding the theatrical monopoly, conspired against Jolly and persuaded the king to revoke Jolly's grant. Jolly fought back but in the end had to accept the terms of the patentees; he agreed to serve as their "deputy" as manager of the "Nursery," a training school for young actors. After 1673 Jolly's name disappears from the records. (A. M. N.)

JOLLY BALANCE is a device for determining the specific gravity (relative density) of solids and liquids. Its operation is based on (1) Archimedes' principle; *i.e.,* that a body immersed in a fluid is buoyed up by a force equal to the weight of the fluid displaced, and (2) on Hooke's law; *i.e.,* that in elastic bodies and within certain limits the strain is proportional to stress, or that displacement is proportional to displacing force. In its usual form the Jolly balance consists of a long, delicate, helical spring suspended by one end in front of a uniformly graduated scale. To the lower end of the spring is attached a weight pan, and immediately below that a small wire basket. At some convenient point, usually just above the weight pan, an index is provided which can be read with reference to the scale, which is usually graduated on the surface of a mirror to avoid parallax in reading the position of the index. A movable platform for supporting a small vessel of water is provided; this can be clamped at any desired height along the vertical scale and immediately below the wire basket attached to the lower end of the spring. The point of suspension of the upper end of the spring is also usually movable vertically, as a means of increasing the range of the balance and as an aid in adjusting the index to a convenient zero setting.

In determining the specific gravity of a solid, a zero reading of the position of the index is taken with the wire basket immersed in water up to a definite point on its suspension wire, care being taken to see that the point of suspension of the helical spring is such as to permit the necessary extension of the spring during subsequent steps of the determination. Let this reading be W_1. Next, place in the weight pan the specimen of which the specific gravity is to be determined; lower the movable platform carrying the vessel of water until the water surface reaches the same point on the suspension wire as before; and again read the index. Let W_2 represent this reading. $W_2 - W_1$, which represents the extension of the spring. may be taken as the weight of the specimen in air. Then place the specimen in the wire basket, immersed in water, and again adjust the height of the movable platform until the water surface is at the original height on the suspension wire above the basket, and again read the position of the index. Let this reading be W_3. $W_2 - W_3$, which represents the difference in the extension of the spring when the specimen is immersed in air and in water, respectively. may be taken as the loss of weight in water. Then specific gravity

$$= \frac{\text{weight in air}}{\text{loss of weight in water}} = \frac{W_2 - W_1}{W_2 - W_3}$$

The specific gravity so obtained is the apparent specific gravity in air, in terms of water at the temperature of the determination. In order to determine the specific gravity of a liquid, the same procedure is followed except that the loss of weight in water and the loss of weight in the unknown liquid are determined with any convenient specimen of a solid not affected by either liquid. The specific gravity of the unknown liquid is the ratio of the loss of weight in the unknown liquid to the loss of weight in water. See also BALANCE; ELASTICITY. (H. W. BEA.)

JOLO ISLAND, main island, Sulu archipelago, Philippines, 590 mi. S. of Manila. It is irregular in shape, measuring **35** mi. east-west and averaging **9** mi. north-south. In **1958** an estimated 137,471 people, largely Moro farmers, occupied the **345** sq.mi. of area. Lush tropical vegetation and several extinct volcanoes, culminating in Mt. Tumatangas at **2,660** ft., characterize Jolo. The municipality (pop. 1959 est. 22,396), port and capital of Sulu (*q.v.*) province, lies at the northwestern end of the island. The main pier provides accommodations for interisland vessels, occasional ocean-going freighters and craft of the Philippine navy. Numerous small piers accommodate a fleet of fishing, pearling, and native trading craft. Jolo serves as a focus for considerable trade, much of it illegal, between the Sulu Islands and Borneo. It was formerly the centre of Moro military activity against the Spanish and the U.S. regimes. Settlement at this site antedated the introduction of Islam in the 14th century. (R. E. HE.)

JOLSON, AL (ASA YOELSON) (1886–1950), U.S. film and musical comedy entertainer who performed most often in blackface, was born in Srednick, Russia, on May **26, 1886.** Brought to the United States when he was seven years old, Jolson was reared in Washington, D.C., and made his first stage appearance there. In 1909 he joined Lew Dockstader's minstrel troupe. He soon became a leading musical comedy entertainer and singer, appearing in *La Belle Paree* (1911), *Honeymoon Express* (1913), *Bombo* **(1921)** and *Big Boy* (1925). Some of his biggest successes were achieved under Lee Shubert at the New York Winter Garden. Jolson appeared in the first important talking motion picture, the Warner Brothers film *The Jazz Singer* (1927), and in other well-known films, including *The Singing Fool* **(1928)** and *Sonny Boy* (1929). He also collaborated in the writing of many popular songs. The story of his life was filmed in *The Jolson Story* **(1946).** He died Oct. **23,** 1950, in San Francisco, Calif. Jolson's singing style was unique; his ability to gain the affection of audiences has seldom been equaled. (M. S. BY.)

JOLY DE LOTBINIÈRE, SIR HENRI GUSTAVE (1829–1908), Canadian politician, was born at Epernay in France on Dec. 5, 1829. He was educated in Paris and called to the bar of lower Canada in 1858. In 1861 he was elected to the house of assembly of the province of Canada as Liberal member for the county of Lotbinière, which he represented (1867–74) in the house of commons. Ottawa, and the legislative assembly, Quebec. Joly was opposed to confederation. In 1878 he was called by Luc Letellier de St. Just, lieutenant governor of Quebec, to form an administration, which was defeated in 1879; until 1883 he was leader of the opposition. During his administration he adopted a policy of retrenchment and endeavoured to abolish the legislative council. In 1885, as a protest against the attitude of his party toward Louis Riel, who was executed for treason, he retired. But in **1896** he was returned as member for the county of Portneuf. He had already been created knight commander of St. Michael and St. George (1895). On the formation of Sir Wilfrid Laurier's administration he accepted the office of controller of inland revenue; a year later he became a privy councilor as minister of inland revenue. In 1900–06 he was lieutenant governor of British Columbia. He died on Nov. **17,** 1908.

JOMINI, ANTOINE HENRI, BARON (1779–1869), general, was born on March **6,** 1779, at Payerne in the canton of Vaud, Switzerland. He wished for a military life; for some time he was a clerk in a Paris banking-house, until the outbreak of the Swiss revolution. At the age of nineteen he was appointed to a post on the Swiss headquarters staff, and when twenty-one commanded a battalion. At the peace of Lunéville in 1801 he returned to business life in Paris, where he devoted himself to the *Traité des grandes opérations militaires,* which was published in 1804–1805. Introduced to Marshal Ney, he served in the campaign of Austerlitz as a volunteer aide-de-camp on Ney's personal staff. In December 1805 Napoleon made him a colonel in the French service. Ney thereupon made him his principal aide-de-camp. In 1806 Jomini published his views on the impending war with Prussia, and this, along with his knowledge of Frederick the Great's campaigns, led Napoleon to attach him to his own headquarters. He was present with Napoleon at the battle of Jena, and at Eylau won the cross of the Legion of Honour. After the peace of Tilsit he was made chief of the staff to Ney, and created a baron In the Spanish campaign of **1808** he gave the marshal much good advice, but Jomini quarrelled with his chief, and was left at the mercy of Berthier, the emperor's chief of staff. He had already been invited to enter the Russian service, but Napoleon compelled him to remain in the service as general of brigade. For some years thereafter Jomini held both a French and Russian commission, with the consent of both sovereigns. When war between France and Russia broke out, he escaped from his dilemma by taking a command on the line of communication. He was thus engaged when the seat of war shifted to central Germany. He rejoined Ney, took part in the battle of Lutzen and, as chief of the staff of Ney's group of corps, distinguished himself at the battle of Bautzen, and was recommended for the rank of general of division. Berthier, however, had him arrested for failing to supply certain returns that had be-n called for.

How far Jomini was held responsible for certain misunderstandings which frustrated Ney's hopes *(see* BAUTZEN) there is no means of knowing. But the pretext for censure was trivial and baseless, and during the armistice Jomini entered the Russian service. This was regarded by Napoleon as going over to the enemy. Jomini had indeed for years held a dormant commission in the Russian army, had declined to take part in the invasion of Russia in **1812,** and was a Swiss and not a Frenchman. He withdrew from the Allied Army in **1814** when the violation of Swiss neutrality was inevitable. Apart from love of his own country, the desire to study, to teach and to practise the art of war was his ruling motive. At the critical moment of the battle of Eylau he exclaimed, "If I were the Russian commander for two hours!" On joining the allies he became lieutenant-general and aide-de-camp to the tsar, and rendered important assistance during the German campaign. He declined as a Swiss patriot and as a French officer to take part in the passage of the Rhine at Basel and the subsequent invasion of France.

In 1815 he was with the emperor Alexander in Paris, and attempted in vain to save the life of his old commander Ney. This almost cost him his position in the Russian service, but he succeeded in making head against his enemies, and took part in the congress of Vienna. Resuming his post in the Russian army, he was about 1823 made a full general, and until his retirement in 1829 he was principally employed in the military education of the tsarevich Nicholas (afterwards emperor) and in the organization of the Russian staff college, which was opened in 1832. In 1828 he was employed in the field in the Russo-Turkish War, and at the siege of Varna he was given the grand cordon of the Alexander order. This was his last active service. In 1829 he settled at Brussels where he chiefly lived for the next thirty years.

In 1853, after trying without success to bring about a political understanding between France and Russia, Jomini was called to St. Petersburg to act as a military adviser to the tsar during the Crimean War. He returned to Brussels on the conclusion of peace in 1856 and some years afterwards settled at Passy near Paris. He was busily employed up to the end of his life in writing treatises, pamphlets and open letters on subjects of military art and history, and in 1859 he was asked by Napoleon III. to furnish a plan of campaign in the Italian War. One of his last essays dealt with the war of **1866** and the influence of the breech-loading rifle, and he died at Passy on March **24, 1869,** only a year before the Franco-German War. Thus one of the earliest of the great military theorists lived to speculate on the tactics of the present day.

Amongst his numerous works the principal, besides the *Traité,* are: *Histoire critique et militaire des campagnes de la Révolution* **(1806;** new ed. 1819–24); *Vie politique et militaire de Napoléon racontée* **par** *lui-même* (1827) and, perhaps the best known of all his publications, the theoretical *Précis de l'art de la guerre* (1836).

See Ferdinand Lecomte, *Le Général Jomini, sa vie et ses écrits* **(1861;** new ed **1888);** C. **A.** Saint-Beuve, *Le Général Jomini* **(1869);** *A.* Pascal, *Observations historiques sur la vie, &c., du général Jomini* **(1842).**

JOMMELLI, NICCOLO (1714–1774), Italian composer, was born at Aversa near Naples on Sept. 10, 1714. His first opera,

L'Errore amoroso, was successfully produced at Naples (under a pseudonym) when he was only twenty-three. Three years afterwards he went to Rome to bring out two new operas, and thence to Bologna, where he profited by the advice of Padre Martini, one of the greatest contrapuntists of his age In 1748 he went to Vienna, where one of his finest operas, *Didone,* was produced. Three years later he returned to Italy, and in 1753 he obtained the post of *Kapellmeister* to the duke of Württemberg at Stuttgart. Here he wrote many more operas and adjusted his style so completely to German taste that when, after an absence of fifteen years, he returned to Naples, his countrymen hissed two of his operas off the stage, and he retired in consequence to his native village. He died at Naples on Aug 2j, 1774, his last composition being the celebrated *Miserere,* a setting for two female voices of Saverio Mattei's Italian paraphrase of Psalm li. Jommelli is one of the most representative composers of the generation following Leo and Durante.

See Hermann Abert, *Jommelli als Opernkomponist* (I-Ialle, 1908).

JONAH, in the Bible, a prophet who foretold the deliverance of Israel from the Aramaeans (2 Ki. xiv. 25). He may also be the hero of the much later book of Jonah, but how different a man is he! New problems have arisen out of that book, but here we can only attempt to consider what, in a certain sense, may be called the surface meaning of the text.

The prophet Jonah is summoned to go and prophesy against Nineveh, a great and wicked city (cf. 4 Esdras ii. 8, 9). He fears (iv. 2) that the Ninevites may repent, so he proceeds to Joppa, and takes his passage for Tarshish. But soon a storm arises of which he proves to be the cause. He is, at his own request, thrown into the sea, which at once becomes calm. Meantime God has "appointed a great fish" which swallows up Jonah till, at a word from Yahweh, three days later, it vomits him on to the dry ground. Again Jonah receives the divine call. This time he obeys. After delivering his message to Nineveh he waits in vain for the destruction of the city (probably iv. 5 is misplaced and should stand after iii. 4). Thereupon he beseeches Yahweh to take away his worthless life. As an answer Yahweh "appoints" a small quickly-growing tree with large leaves (the castor-oil plant) to shelter the angry prophet from the sun. But the next day the tree perishes by God's "appointment" from a wormbite. Then God "appoints" the east wind whose fierce heat brings Jonah again to desperation. The fine close reminds us of Job. God himself gives short-sighted man a lesson. Jonah has pitied the tree, and should not God have pity on so great a city?

It is generally agreed that the psalm in ch. ii. has been transferred from some other place; it is an anticipatory thanksgiving for the deliverance of Israel, mostly composed of phrases from other psalms. Further, the narrative is an imaginative story, a Midrash (*q.v.*), based upon Biblical data and tending to edification. The narrator considered that Israel had to be a prophet to the "nations" at large, that Israel had, like Jonah, neglected its duty and for its punishment was "swallowed up" in foreign lands. God had watched over His people and prepared its choicer members to fulfil His purpose. This company of faithful but not always sufficiently charitable men represented their people, so that it might be said that Israel itself (the "Servant of Yahweh"; *see* ISAIAH) had taken up its duty, but in an ungenial spirit which grieved the All-merciful One. The book, which is post-exilic, may therefore be grouped with another Midrash, the Book of Ruth, which also appears to represent a current of thought opposed to the exclusive spirit of Jewish legalism.

Besides symbolism there may be myth. The "great fish" has a mythological appearance. The Babylonian dragon myth *(see* CREATION, MYTHS OF) is often alluded to in the old Testament; *e.g.,* in Jer. li. 44, which, as Cheyne long since pointed out, may supply the missing link between Jonahi. 17 and the original myth. For the "great fish" is ultimately Tiãmat, the dragon of chaos, represented historically by Nebuchadrezzar, by whom for a time God permitted or "appointed" Israel to be swallowed up.

BIBLIOGRAPHY.—Cheyne, *Ency. Bib.,* "Jonah"; and his article "Jonah, a Study in Jewish Folklore and Religion," *Theological Review* (1877), pp. 211–219; Ronig, Hastings' *Dict. Bible,* "Jonah"; C. H. H. Wright, *Biblical Studies* (1886) argues ably for the symbolic theory. Against Cheyne, *see* Marti's *Commentary* (1894); the "great fish" and the "three days and three nights" remain unexplained by this writer.

(T. K. C.)

JONAH, RABBI (ABUL WALID MERWAN IBN JANAH; also R. MARINUS) (*c.* 990–*c.* 1050), the greatest Hebrew grammarian and lexicographer of the middle ages. He was born in Córdoba, Spain, studied in Lucena and, after somewhat protracted wanderings settled in Saragossa, where he died. Though a physician. Rabbi Jonah devoted himself to the scientific investigation of the Hebrew language and to a rational biblical exegesis based upon sound linguistic knowledge. His first work—composed, like all the rest, in Arabic—bears the title *Almustalha* and forms, as is indicated by the word, a criticism and at the same time a supplement to the two norks of Yehuda 'Hayyuj on the verbs with weak-sounding and double-sounding roots. These two treatises, with which 'Hayyuj had laid the foundations of scientific Hebrew grammar. were recognized by Xbul Walid as the basis of his own grammatical investigations. Rabbi Jonah's principal work, the *Kztab al Tankih* ("Book of Exact Investigation"). includes the *Kztab al-Luma* ("Book of Many-Coloured Flower Beds") and the *Kitab al-usul* ("Book of Roots"). The former (edited by J. Derenbourg. 1886) contains the grammar; the latter (edited by A. Neubauer, 187j) the lexicon of the Hebrew language. Both norks mere published in the Hebrew translation of Yehuda Ibn Tibbon (*Sefer Ha-Rikmah,* edited by B Goldberg, 1855; *Sefer Ha-Schoraschim,* edited by W Bacher, 1897). The other writings were edited in Arabic nith French translation by Joseph and Hartnig Derenbourg (1880) A few fragments and numerous quotations in his principal book form our only knonledge of the *Kitab al-Tashwir* ("Book of Refutation"), a controversial nork in which he successfully answered the opponents of his first treatise The grammatical work of Rabbi Jonah extended to the domain of rhetoric and biblical interpretation. His lexicon is of importance by reason of its ample contribution to the comparative philology of the Semitic languages—Hebrew and Arabic in particular Abul Walid's norks had the greatest influence on Jewish exegesis.

JONAS, JUSTUS (1493–1555), German Protestant reformer, who translated into German the nritings of Martin Luther and Philipp Melanchthon, was born at Nordhausen, Thuringia, on June j, 1493 His real name was JODOCUS (JOBST) KOCH. He studied law and the humanities at the University of Erfurt and at Wittenberg His great admiration for Erasmus first led him to Greek and biblical studies, and his election in 1519 as rector of the University of Erfurt was regarded as a triumph for the partisans of the "new learning." After the Leipzig disputation nith Johann Eck (*see* LUTHER. MARTIN) Luther won his allegiance. He accompanied Luther to Worms in 1521, and mas appointed professor of canon law at Wittenberg. During Luther's stay in the Wartburg Jonas nas one of the most active of the Wittenberg reformers. In 1546 he was at Luther's deathbed at Eisleben, and he preached the funeral sermon for Luther before the cortege left Eisleben. In the same year, however, he was banished from the duchy. He died at Eisfeld on Oct. 9, 1555.

Jonas' correspondence was edited by G. Kawerau in 2 volumes (1884–85).

JONATHAN. Of the many Jewish bearers of this name. three are well known: (1) The grandson of Moses. who nas priest at Dan (Judg xviii. 30). (2) The eldest son of Saul, who. together nith his father. freed Israel from the Philistines (I Sam. xiii). Both are lauded in an elegy quoted from the Book of Jashar (II Sam, i, 17 *et seq.)* for their warm mutual love. their heroism and their labours on behalf of the people. Jonathan's name is most familiar for the firm friendship which subsisted between him and David *(see* DAVID; SAUL). (3) Jonathan hfaccabaeus *(see* JEWS: MACCABEES).

JONES, ALFRED GILPIN (1824–1906), Canadian politician. was born at Weymouth, Nova Scotia, in Sept. 1824. In 1865 he opposed the federation of the British American provinces, and, in his anger at the refusal of the British Government to repeal such portions of the British North America act as referred to Nova Scotia. made a speech which won for him the name of "Haul-down-the-flag" Jones. He was for many years a member of

the Federal parliament, and for a few months in 1878 was minister of militia under the Liberal Government. Largely owing to his influence the Liberal party refused in 1878 to abandon its Free Trade policy, an obstinacy which led to its defeat in that year. In 1900 he was appointed lieutenant-governor of his native province, and held this position till his death on March 15, 1906.

JONES, SIR ALFRED LEWIS (1845–1909), British shipowner, was born in Carmarthenshire, in 1845. At the age of 12 he was apprenticed to the managers of the African Steamship company at Liverpool, making several voyages to the west coast of Africa. About 1891 he entered the firm of Messrs. Elder, Dempster & Co., with a share in the undertaking. In 1901 he was knighted. Sir Alfred Jones took a keen interest in imperial affairs, and was one of the founders of the Liverpool School of Tropical Medicine. He acquired considerable territorial interests in west Africa, and financial interests in many of the companies engaged in opening up and developing that part of the world. He opened up a new line of communication with the West Indies, and stimulating the Jamaica fruit trade and tourist traffic. He died on Dec. 13, 1909, leaving large charitable bequests.

JONES, EBENEZER (1820–1860), British poet, was born in Islington, London, on Jan. 20, 1820. His father, who was of Welsh extraction, was a strict Calvinist, and Ebenezer was educated at a dull, middle-class school. The death of his father obliged him to become a clerk in the office of a tea merchant, where he worked for 72 hours a week. Shelley and Carlyle were his spiritual masters, and he spent his meagre spare time in reading and writing. The unkind reception of his *Studies of Sensation and Event* (1843) seemed to be the last drop in his bitter cup of life. Baffled and disheartened, he destroyed his manuscripts. In 1849 he wrote a pamphlet, *The Land Monopoly,* in which he anticipated Henry George in proposing land nationalization. He was rapidly dying of consumption when he wrote his three remarkable poems, "Winter Hymn to the Snow," "When the World is Burning" and "To Death." The fame that these and some of the pieces in the early volume brought to their author came too late. He died at Brentwood on Sept. 14, 1860.

It was not till 1870 that Dante Gabriel Rossetti praised his work in *Notes and Querzes.* Rossetti's example was followed by W. B. Scott, Theodore Watts-Dunton, who contributed some papers on the subject to the *Athenaeum* (Sept. and Oct. 1878), and R. H. Sheppard, who edited *Studies of Sensation and Event* in 1879.

JONES, EMILY ELISABETH CONSTANCE (1848–1922), English educator, was born at Langstone Court, Hereford, in 1848. She was educated in Cheltenham, and at Girton college, Cambridge, where she took a first-class in the moral sciences tripos in 1880. In 1884 she was appointed resident lecturer at Girton, vice-mistress in 1896, and mistress in 1903. She retired in 1916. She died on April 18, 1922, at Weston-Super-Mare.

Her works include *Elements of Logic as a Science of Propositions* (1890); *Primer* of *Logic* (1905); and *A New Law of Thought and its Logical Bearzngs* (1911). She also, with Miss E. Hamilton, translated Lotze's *Mikrokosmus* (1885), and has edited (1902) Henry Sidgwick's *Lectures on* T. *H. Green, Herbert Spencer and J. Martzneau.*

JONES, ERNEST CHARLES (1819–1869), English Chartist, was born in Berlin on Jan. 26, 1819, and educated in Germany. His father, a British army officer, was then equerry to the duke of Cumberland, afterwards king of Hanover. In 1838 Jones came to England and in 1841 published anonymously *The Wood Spirit,* a romantic novel. In 1844 he was called to the bar at the Middle Temple, but from 1845 to 1854 he devoted time and energy to the Chartist movement, quickly becoming a leader much respected for his single-mindcdness and steadfastness. In 1847 he wrote for the *Northern Star* and became joint editor with Feargus O'Connor of *The Labourer.* He advocated the formation of national guards, and in 1848, while trying to rally the breaking ranks of the Chartist movement, he was arrested for sedition and sent to prison for two years, where he was treated as a common felon until, after a protest in parliament. he was allowed to purchase exemption from prison tasks. While in prison he wrote *The Revolt of Hindostan,* an epic poem. In 1852 he started the *People's Paper* and later accepted the programme of Karl Marx. When the movement died he joined the advanced Radical party and devoted much time to the writing of novels and political songs, the most famous of which are *The Song of the Lower Classes* and *Songs of Democracy.* He died at Manchester on Jan. 26, 1869.

JONES, SIR HAROLD SPENCER (1890–1960), British astronomer and tenth astronomer royal, who had the Royal observatory transferred from Greenwich to Herstmonceux in Sussex, was born in London on March 29, 1890. After a distinguished career at Cambridge, he was appointed chief assistant at the Royal observatory. Greenwich, in 1913. In 1923 he went as his majesty's astronomer to the observatory at the Cape of Good Hope, and in 1933 returned to Greenwich as astronomer royal. Smoke and artificial illuminations made Greennich no longer suitable for the highest class of astronomical observations and Spencer Jones took steps to have the observatory moved, but World War II intervened. After the war, a new site was procured at Herstmonceux in Sussex, but the new observatory was not yet completed when he retired in 1955.

Spencer Jones's scientific work largely concerned the determination of the fundamental constants of astronomy, and in particular of the solar parallax, which shows the mean distance between earth and sun to be approximately 93,000,000 mi. He had also a keen interest in geophysics, particularly in problems concerned with the rotation of the earth and with magnetism, and in international astronomical co-operation. Knighted in 1943, he was created a knight of the British empire in 1955. He died in London on Nov. 3, 1960. (J. JN.)

JONES, HENRY (1831–1899), English author, well known as "Cavendish." his pseudonym as a writer on whist, was born in London on Nov. 2, 1831 being the eldest son of Henry D. Jones, a medical practitioner. He adopted his father's profession, established himself in 1852 and continued for 16 years in practice in London. He was a member of several whist clubs, among them the "Cavendish." and in 1862 appeared his *Principles of Whist, Stated and Explained by "Cavendish,"* which became the leading authority as to the practice of the game. This work was followed by treatises on the laws of piquet and écarté. "Cavendish" also wrote on billiards, lawn tennis and croquet, and contributed articles on whist and other games to the ninth edition of the *Encyclopædia Britannica.* "'Cavendish' was not a law-maker, but he codified and commented upon the laws which had been made during many generations of card-playing." He died on Feb. 10, 1899.

JONES, HENRY ARTHUR (1851–1929), English dramatist, was born at Grandborough. Buckinghamshire, on Sept. 28. 1851, the son of Silvanus Jones, a farmer. His first piece, *Only Round the Corner,* was produced at the Exeter theatre, and within four years of his debut as a dramatist he scored a great success by *The Silver King* (November 1882), written with Henry Herman, a melodrama produced by Wilson Barrett at the Princess's theatre. Its financial success enabled the author to write a play "to please himself." *Saints and Sinners* (1884), which ran for 200 nights, placed on the stage a picture of middle-class life and religion in a country town. His next serious piece was *The Middleman* (1889), followed by *Judah* (1890), both powerful plays, uhich established his reputation. Arnong his later plays were *The Dancing Girl* (1891), *The Crusaders* (1891), *The Bauble Shop* (1893), *The Tempter* (1893), *The Masqueraders* (1894), *The Case of Rebellious Susan* (1894), *The Liars* (1897), *Carnac Sahib* (1899). *The Manoeuvres of Jane* (1899), *Mrs. Dane's Defence* (1900), *The Princess's Nose* (1902), *Chance the Idol* (1902), *Whitewashing Julia* (1903), *Joseph Entangled* (1904), *The Chevalier* (1904), *Mary Goes First* (1913), *The Lie* (1914), *Cock o' the Walk* (1915). A uniform edition of his plays began to be issued in 1891. His own views of dramatic art have been expressed from time to time in *The Renascence of the English Drama* (1895), *Foundations of a National Drama* (1913), *Theatre of Ideas* (1915) and other works. He died at Hampstead, on Jan. 7, 1929.

JONES, HILARY POLLARD (1863–1938), U.S. naval officer, was born in Hanover county, Va., on Nov. 14, 1863, and graduated from the United States Naval academy in 1884. Promoted to the rank of admiral in 1921, he served as commander in chief of the U S. fleet during 1921–22 and was a member of the

U.S. delegation to the arms limitation meetings at Geneva in 1926 and 1927. He died Jan. 1, 1938. Jones's character won the universal respect and esteem of his fellow officers. (J. B. HN.)

JONES, INIGO (1573–1652), one of the greatest of English architects and the first to be guided by the principles of the Italian Renaissance, was born in London on July 1j, 1573, the son of a clothworker. At an undetermined date before 1603, when he figured in the earl of Rutland's household accounts as "a picture maker," he visited Italy. There he studied painting and, evidently, the theatre, thus fitting himself for the role in which he first appeared at the court of James I in 1605—that of designer of costumes and scenery for court masques. Theatrical design mas his main work until 1611, when he was appointed surveyor to Henry, prince of Wales. In 1613. after the death of the prince, he was granted the reversion of the office of surveyor of the king's works and proceeded to enlarge his knowledge of architecture on a 19-month continental tour with the earl of Arundel. In Italy this tour took him to Rome, Naples, Venice and Vicenza. His study of the works of Andrea Palladio (*q.v.*) in and near the last city was as important for the future of English architecture in general as for the development of his own style (see PALLADIANISM).

In 1615 Jones became surveyor under James I. He continued in this position under Charles I. The first original work designed by him in this capacity was the Queen's house at Greenwich, Kent, completed in 1635; his first major executed design was the Whitehall banqueting house, London (1619–21), generally considered his masterpiece. As a conspicuous public building of purely classical design, this was at that time unique in England, and indeed in northern Europe. His later works included the Queen's chapel at St. James's (now Marlborough house chapel), St. Paul's, Covent Garden, London (1630–31), the restoration of St. Paul's cathedral in 1634, and unexecuted designs for a new Whitehall palace. In 18th-century England his designs were admired and imitated equally with Palladio's. He died on June 21, 1652, at Somerset house, London.

See J. A. Gotch, *Inigo Jones* (1928); *M*. Whinney, *Renaissance Architecture in England* (1952); John Summerson, *Architecture in Britain 1530–1830* (1953), with a bibliography. (Ms. W.)

JONES, JACOB (1768–1850), U.S. naval officer, was born near Smyrna, Del., in March 1768. and studied medicine at the University of Pennsylvania. When his practice in Kent county, Delaware, proved none too lucrative, he turned to politics and became clerk of the Delaware supreme court. In 1799, at the age of 31, carried away by enthusiasm over the naval war against France, he entered the United States navy as a midshipman on the frigate "United States," captain, John Barry. At the close of the quasi war with France, Jones was retained in the navy and promoted to a lieutenancy. As second lieutenant of the "Philadelphia," he was taken prisoner with the rest of the officers and crew when the frigate ran on the rocks off the harbour of Tripoli (1803). Jones mas a prisoner for 19 months until the Barbary powers were subdued in 1805. In the War of 1812 he mas commander of the first sloop of war. "Wasp," which, on Oct. 18, 1812, off Cape Hatteras, took the British sloop of war "Frolic." Of equal armament, the two vessels engaged in a 40-minute gun duel, but Jones's gunners were so superior that when the "Wasp's" crew boarded the enemy vessel there was no further resistance, the British having been literally swept from their own decks. Unfortunately for Jones, a British 74-gun ship happened upon the "Wasp" and "Frolic" as the battle ended, took the former and retook the latter. When exchanged a year later, Jones received a gold medal from congress, which also presented $25,000 to the officers and men. After the war, in command of the ex-British frigate "Macedonian." Jones was in Decatur's squadron which overawed the Barbary powers at Algiers in 181j. He commanded the Mediterranean squadron from 1821 to 1823, and the Pacific squadron from 1826 to 1829. After his retirement, he was appointed commander of the Philadelphia Naval asylum, where he died on Aug. 3, 1850.

See *Commodore Jacob Jones,* Papers of the Historical Society of Delaware, xliv (1906); and Quasi *War with France and Barbary War* documents, 11 vol. (1935–43). (W. B. CK.)

JONES, JOHN PAUL (1747–1792), naval officer of the American Revolutionary War, was born John Paul in the parish of Kirkbean, county of Kirkcudbright, on Solway firth. Scotland, on July 6, 1747, the son of John Paul, a landscape gardener. Apprenticed to John Younger, a Kirkcudbright merchant shipper, he sailed at the age of 12 as cabin boy on a ship to Virginia, there visiting his older brother William, a tailor at Fredericksburg. When Younger failed in 1766. the apprenticeship ended, and Jones received a warrant as acting midshipman in the British navy. That he ever served seems doubtful, as that same year found him chief mate of a Jamaica-owned slaver brigantine. After two years he quit the slave trade and took passage at Jamaica on a brigantine for Scotland. Master and chief mate died of fever on the passage, and he brought the ship safely home, to be appointed master. In April 1770, at Tobago. the ship's carpenter, whom he had had flogged for laziness, deserted, shipped on another vessel, and died a few months later. When John Paul reached Scotland in Nov. 1770, he was arrested on a charge of murdering the carpenter, but was released on bail. He sailed for the West Indies, hunting evidence to disprove the murder charge. He purchased a vessel in Sept. 1772 and made several voyages to Tobago. the final one culminating in "the great misfortune" of his life when, in Dec. 1773, he killed the ringleader of a mutinous crew. Upon advice of friends, he fled the island rather than await a future sitting of the admiralty court, and changed his name to John Paul Jones. While his movements are obscure for the next two years, it is apparent that he sought his brother in Fredericksburg and, when the latter died in 1774, participated in his estate. Meanwhile he had met some of the southern leaders of the revolutionary movement, one of whom, Joseph Hewes. of North Carolina, a member of the Continental Congress, induced him to go to Philadelphia. There, in the fall of 1775, he received a commission as senior lieutenant in the new Continental navy.

To Jones, on Dec. 3, 1775, fell the honour of first raising the Grand Union flag on the ship "Alfred," of twenty 9-pounders, flagship of the little fleet commanded by Esek Hopkins. When that fleet reached the Bahamas. in March 1776. Jones's knowledge of the topography of the islands contributed to the bloodless capture of New Providence with a great quantity of ordnance. Upon the return cruise, in command of the "Alfred's" main battery, he distinguished himself in the inconclusive engagement in which the British ship "Glasgow" escaped from the whole Continental fleet. As the captain of the sloop "Providznce" was court-martialed for co ardice during that engagement, Hopkins gave Jones command of the "Providence," a vessel of twelve 4-pounders and 70 men, with a temporary Commission dated May 10, 1776. Convoying a coal ship from Boston to Philadelphia, Jones arrived in August at a time when the marine committee was investigating Commodore Hopkins' conduct. It approved Jones's appointment to a captaincy, but issued him a new commission dated Aug. 8. He sailed from the Delaware capes on Aug. 21, under orders to cruise as long as his provisions and water lasted. The cruise consumed six weeks and five days and ranged from Bermuda to Nova Scotia. The "Providence" twice outwitted British frigates. the "Solebay" and "Milford"; manned and sent in eight prizes—six brigantines, a ship and a sloop; and sank or burned eight more—six schooners, a ship and a brigantine—some of which were cut out of Nova Scotian harbours. Jones brought the "Providence" safely into Rhode Island on Oct. 7, 1776. Transferred to the "Alfred" with his entire crew, Jones sailed in Nov. 1776 for a cruise off Nova Scotia in company with the "Providence" under Hoysteed Hacker. Off Louisburg they took a merchant ship and the valuable transport "Mellish," but on Nov. 18 the "Providence" parted in a light gale, which Hacker used as a pretext to return to port. Proceeding alone, Jones burned a large ship off Canso as well as the oil warehouses ashore, cut three ships out from under the nose of the British frigate "Flora" off Cape Breton and, on his return, cleverly fooled the "Milford" for a second time; he and his prizes reached Boston unmolested on Dec. 15. Meanwhile. congress had placed him 18th on the seniority list, preceded by a number of captains who had entered the service after he had, an injustice that rankled in his mind for many years. Efforts to atone for the discrimination

against him were attempted in congress, but most of them proved abortive.

On June 14, 1777, the same day the Stars and Stripes was selected as the national emblem. congress appointed Jones to the newly built ship "Ranger." of eighteen 6-pounders, at Portsmouth, N.H. Delays in outfitting and manning held him in port until Nov. 1. when he sailed for France with official word of Gen. Burgoyne's surrender and the promise of a large frigate being built at Amsterdam. But the news of Burgoyne's capitulation had preceded him, and the frigate, to prevent British seizure, had to be sold to France. Disappointed on both counts, Jones secured permission from the U.S. commissioners at Paris for a cruise in European waters. Before sailing, he had the honour of receiving the first salute to the new U.S. flag from a French fleet in Quiberon bay, on Feb. 14, 1778. The subsequent cruise mas a spectacular one through St. George's channel and the Irish sea, where a number of prizes were taken. Before dawn, on April 23. 1778, with 31 volunteers, Jones went ashore at Whitehaven, spiked the cannon in two forts, but was disappointed in efforts to burn the shipping. At noon the same day, he landed on St. Mary's Island, in Solway firth, intending to seize Lord Selkirk as a hostage. In the latter's absence from home, the "Ranger's" men insisted upon taking the Selkirk silver plate, which Jones later redeemed out of his own pocket and restored to the owners, with profuse apologies to Lady Selkirk. Off Carrickfergus, Ire, the next day, he climaxed the cruise by taking the British ship of war "Drake," of twenty 4-pounders, in an hour's encounter in which Jones lost 8 killed and wounded and the "Drake" lost 42. When he returned to Brest on May 8 he was hailed as a hero, and the French minister of marine asked that he be held in France to head a future naval expedition. Jones turned command of the "Ranger" over to an ungrateful and insubordinate lieutenant and cooled his heels, wild with frustration, for six months in French ports before the ministry acted.

When the expedition finally sailed from L'Orient, on Aug. 14, 1779, it consisted of the "Bon Homme Richard," an old French East Indiaman armed with forty-two 18-, 12- and 9-pounders, named by Jones in honour of Benjamin Franklin and his *Poor Richard's Almanack;* the "Alliance," of 36 guns, a new U.S. frigate recently arrived in France; two small French ships, the "Pallas." of 32 guns, and the "Vengeance," of 12; and three privateers which soon abandoned the fleet. Proceeding around Ireland and Scotland. Jones had constant trouble with Peter Landais, the French captain of the "Alliance." A number of prizes were taken, but an attempt to attack the Scotch port of Leith was prevented by contrary winds On Sept. 23, off Scarborough, Eng.. on the return leg of the cruise, Jones won enduring fame in one of the most famous naval engagements of history. The little squadron intercepted the Baltic merchant fleet under convoy of the British ships "Serapis," of fifty-four 18-, 9- and 6-pounders, and "Countess of Scarborough." of 20 guns. Jones engaged the "Serapis" by moonlight. and for $3\frac{1}{2}$ hours the vessels lay yardarm to yardarm, with the "Alliance" twice circling them and firing indiscriminately into both. When the "Serapis" struck, she was on fire, and the "Bon Homme Richard" was in a sinking condition. "No action before was ever, in all respects," wrote Jones afterward. "so bloody, so severe and so lasting." The carnage had been so great that neither Jones nor his opponent, Richard Pearson of the "Serapis," whether through inability or reluctance, ever issued a complete casualty list. One of Jones's junior officers estimated the killed and wounded on the "Bon Homme Richard" at 302.

Jones transferred his crew to the "Serapis" and, after his own ship had foundered. the squadron, with the "Countess of Scarborough" taken by the "Pallas," sailed for the Texel. There Jones preferred charges against Landais and took command of the "Alliance." Disdaining the subterfuge of a French commission, he escaped a British blockading squadron in Dec. 1779, and cruised in the "Alliance" without much success for several months. For his great victory Louis XVI gave him a gold-hilted sword and made him a chevalier of France. Meanwhile, Landais seized the "Alliance" at L'Orient in June 1780, while Jones was ashore, and sailed off in her. Finally, in 1781, Jones returned to the U.S. in the borrowed French ship "Ariel," to receive the grateful thanks of congress on April 14, and be assigned to the 74-gun ship "America," being built at Portsmouth, N.H. But the "America" was shortly after given to France to replace a ship lost in Boston bay, and Jones's final service in the Revolution was as a volunteer on Vaudreuil's French fleet, which sailed to the West Indies but accomplished nothing before peace was declared.

Sent to France as prize agent in Nov. 1783, Jones effected a partial settlement by 1786, and returned to the U.S. in 1787 to be awarded a gold medal by congress and again dispatched abroad to seek restitution from Denmark for two prizes that government had turned back to England. While in Copenhagen in 1788, and on advice of Thomas Jefferson, then ambassador to France, he accepted an offer from Catherine the Great and entered the Russian navy as a rear admiral. Sent to the Black sea and promised supreme command in the campaign against the Turks, Jones was soon disillusioned. His victories were credited to others. His subordinates were encouraged to dispute his authority. As a finale, in St. Petersburg in March 1789, he was falsely accused of criminal assault upon a young girl. Catherine had tired of him and, in lieu of dismissal, granted him leave of absence. He returned to France embittered and broken physically, and rapidly went into a decline. When he died, on July 18. 1792, he was buried in an unmarked grave in St. Louis cemetery for Protestants. More than a century later, the body having been found and identified through the efforts of Ambassador Horace Porter, an escort of U.S. warships brought Jones's remains back to the land of his adoption, where a crypt had been prepared in the naval chapel at Annapolis. His grave is a national shrine.

BIBLIOGRAPHY.—Countless volumes have been written about Jones, many of them highly imaginary. A definitive biography is that of Lincoln Lorenz, *John Paul Jones, Fighter for Freedom and Glory* (1943). Second in importance is one of the earliest biographies, R. C. Sands, *The Life and Correspondence of John Paul Jones* (1930). A purported biography by A. C Buell, *Paul Jones, Founder of the American Navy* (1905) is spurious. A bibliography of Jones literature was compiled by Don C. Seitz, *Paul Jones; His Exploits in English Seas* (1917) Jones's letters are largely in the Peter Force collection and the Continental congress papers, vol. 54, 58, 132, 147, 168, 193 and 639, in the Library of Congress. (W. B. CK)

JONES, JOSEPH STEVENS (1809–1877), U.S. physician, actor, theatrical manager and author of over 150 plays, was born in Boston. Mass.. on Sept. 28, 1809. He is remembered for his Yankee characters, the most popular of which. Solon Shingle in *The People's Lawyer* (1839), was acted with great success by George H. Hill, Charles Burke, Joshua Silsbee and John E Owens. Early in his career Jones acted in the Warren. National and Tremont theatres in Boston and managed the Tremont during its last two seasons. His first successful play, *The Liberty Tree, or Boston Boys in '76* (1832), was produced at the Warren. His last published play, *The Silver Spoon,* was first produced at the Boston Museum (1852) with William Warren as Jefferson S. Batkins. Though he continued to write plays. Jones left the stage in 1841, obtained his M.D. degree from the Harvard medical school (1843) and was a successful physician until his death on Dec. 29, 1877.

See John Bouvé Clapp, *Boston Evening Transcript* (Dec. 30, 1910). (B. HT.)

JONES, LEWIS RALPH (1864–194j), U.S. botanist, was born at Brandon, Wis., Dec. 5, 1864. Besides valuable research in plant pathology, Jones had a constructive influence on early institutions and programs of higher education and research in North America. After receiving his bachelor's degree from the University of Michigan, he became botanist of the Vermont agricultural experiment station in 1889 and professor of botany of the University of Vermont in 1893. Twenty years at Vermont, interspersed with travel and advanced study (Ph.D., University of Michigan, 1904), established him as a leader in U.S. botany and plant pathology. In 1910 he went to the University of Wisconsin to found its department of plant pathology; he came to be recognized as dean of the plant pathologists of his generation and as a leader in biology and agriculture.

For a biographical memoir, *see* G. W. Keitt, and F. V. Rand, "Lewis Ralph Jones 1864–1945," *Phytopathology* 36:1–17 (1946).

(*G*. W. KT.)

JONES, OWEN (1809–1874), English designer, writer and architect, was born in London on Feb. 15, 1809. He studied at the Royal Academy. From 1833 to 1834 he traveled in the near east and in Spain. His *Plans, Elevation, Sections and Details of the Alhambra* (1842–45) drew attention to Islamic design. He soon became influential and pioneered prefabricated metal building for the tropics. He also worked as an interior decorator and book illustrator. In 1851 he was appointed a superintendent of works for the Great exhibition and in 1852, supervised the decorations of the re-erected Crystal palace. His main, and still standard, work, *The Grammar* of *Ornament* (first edition 1856), is a systematic pictorial collection of eastern and western design motifs, emphasizing colour and the application of logical principles to the design of everyday objects.

He died in London on April 19, 1874. (A. K. P.)

JONES, ROBERT EDMOND (1887–1954), **U.S.** theatrical and motion-picture designer, was born at Milton, N.H., Dec. 12, 1887. He graduated from Harvard university in 1910 and began designing scenery for the theatre in New York city in 1911. He attracted attention by the boldness of his conceptions and in 1933 began designing for colour motion pictures. He died in Milton, Nov. 26, 1954.

Among the plays for which he designed the stage settings were *The Man Who Married a Dumb Wife,* for Granville Barker (1915); *The Jest* (1919); *Rzchard III* (1920), and *Macbeth* (1921), tor Arthur Hopkins; *Beyond* and *Desire Under the Elms* for the Provincetown Playhouse (1924); *Green Pastures* (1930); *The Philadelphia Story* (1939); *Lute Song* and *The Iceman Cometh* (1946); and *7he Enchanted* (1950). He published, with K MacGowan, *Continental Stagecraft* (1922) and *The Dramatic Imagination* (1941)

JONES, ROBERT TYRE, JR. (BOBBY JONES) (1902–), only golfer in history to win the "Grand Slam"—the four major tournaments of the golf world, the amateur and open championships of Great Britain and the United States—a feat accomplished by the U.S. star in 1930. Born in Atlanta. Ga., on March 17, 1902, Jones was only 14 when he entered his first national championship. Before retiring after that triumph, Jones had played in 13 U.S. amateur championships, winning j and finishing second twice. Competing as an amateur against the best golf professionals in the world, he won four U.S. open championships and four times finished second out of 11 trials. He captured three out of the four British open championships in which he competed, and the British amateur once. He won 13 national championships from 1923 through 1930. Jones's excellence was in his putting. and his putter was known as "Calamity Jane."

After quitting golf competition, Jones established a law practice in Atlanta. In 19j8 Jones was presented with the freedom of the burgh of St. Andrews, Scot., home of the premier golf club of the world. He was the first American to be so honoured since Benjamin Franklin won the freedom of the burgh in 1759.

(J. D. McC.)

JONES, RUFUS MATTHEW (1863–1948), U.S. Quaker, teacher. writer and humanitarian. was born in South China. Me., on Jan. 25, 1863. After attending the Friends Boarding school in Providence. R.I., and Haverford (Pa.) college. he studied at the university of Heidelberg (Ger.). and several years later at the universities of Pennsylvania and Harvard, his attention focusing more and more on "man's inner life and the spiritual ground and foundation of the universe." In 1893 he became editor of *The Friends Review* (later *The American Friend*) and joined the faculty of Haverford college as a teacher of philosophy.

A meeting in 1897 with John Wilhelm Rowntree, a brilliant and like-minded English Friend, resulted in an ambitious plan for a collaborative history of mysticism and Quakerism. Rowntree's untimely death did not prevent the iruition of the scheme. Jones published *Studies in Mystical Religion* in 1909, *The Quakers in the American Colonies* (with others) in 1911, *Spiritual Reformers in the 16th and 17th Centuries* in 1914, and *The Later Periods of Quakerism* in 1921. Two volumes on early English Quakerism by William Charles Braithwaite rounded out the series. which stands as an impressive record and interpretation of spiritual religion in western culture. Of the more than 50 hooks which Jones published between 1889 and 1948, the majority dealt with one aspect or another of mysticism.

But Jones himself was never merely the cloistered mystic and scholar. When the United States entered World War I he joined other Friends in organizing the American Friends Service committee, which provided opportunities for conscientious objectors to do relief work in Europe as an alternative to military service. During the next three decades till his death on June 16, 1948, he was steadily active in the committee's work, serving during most of that period as its chairman or honorary chairman. Through his preaching, his writing, his humanitarianism. and his radiant, buoyant personality he became the most widely known and respected American Quaker of his time. Within the Society of Friends Jones was a powerful force for unity and liberal thought; among religious people generally he was considered the leading C.S. exponent of the mystical viewpoint.

BIBLIOGRAPHY.—*Autobiographical: A Small-town Boy* (New York, 1941); *Finding the Trail of Life* (New York, 1926); *The Trail of Life in College* (Sew York, 1929); *The Trail of Life in the Middle Years* (New Work, 1934). *Biographical:* David Hinshaw, *Rufus Jones, Master Quaker* (New York, 1951); *Anthology:* H. E. Fosdick (ed.), *Rufus Jones Speaks to Our Time* (New York, 1951). **(F.** B. T.)

JONES, SIR WILLIAM (1746–1794), British orientalist and jurist, was born in London, Sept. 28, 1746. He studied oriental languages at Harrow, teaching himself the rudiments of Arabic, and reading Hebrew. In 1764 he entered University college, Oxford, where he studied oriental literature; he also studied Persian, Arabic, Hebrew, Chinese and various European languages. In 1766 he obtained a fellowship. When Christian VII of Denmark visited England in 1768, bringing a life of Nadir Shah in Persian, Jones was asked to translate the ms. into French. The translation appeared in 1770. In 1771 he published a *Dissertation sur la littérature orientale,* defending Oxford scholars against the criticisms made by Anquetil Du Perron in the introduction to his translation of the *Zend-Avesta.* In 1774 a treatise entitled *Poeseos Asiaticae comntentatorium libvi sex* definitely confirmed his authority as an oriental scholar. For financial reasons Jones began to study law, and was called to the bar in 1774. In 1776 he was appointed a commissioner in bankruptcy. Besides writing an *Essay on the Law of Bailments,* which enjoyed a high reputation both in England and America, Jones translated, in 1778, the speeches of Isaeus on the Athenian right of inheritance. In 1783 he was appointed judge of the supreme court of judicature at Calcutta, then "Fort William," and was knighted. He founded, in Jan. 1784, the Bengal Asiatic society, of which he remained president till his death. Convinced of the importance of consulting the Hindu legal authorities in the original, he began the study of Sanskrit. He planned (1785) a digest of Hindu and Mohammedan law, but did not live to complete it. Before his death he had published *Institutes of Hindu Law, or the Ordinances* of *Manu* (1794); his *Mohammedan Law of Succession to Property of Intestates;* and his *Mohammedan Law* of *Inheritance* (1792). His other publications include, *Traité sur la poésie orientale* (1770); *a* French metrical translation of the odes of Hafiz; *Grammar of the Persian Language* (1771); *Poems, Chiefly Translations from Asiatic Languages, etc.* (1772); a translation of the seven ancient Arabic poems called *Moallakât* (1783); a translation of Kālidāsa's famous drama, *Sakuntalā* (1789). He also translated the collection of fables entitled the *Hitopadesa,* the *Gitagovinda,* and considerable portions of the Vedas, besides editing the text of Kālidāsa's poem *Ritusamhara.* He died at Calcutta on April 27. 1794. As a pioneer in Sanskrit learning and as founder of the Asiatic Society he rendered the language and literature of the ancient Hindus accessible to European scholars, and thus became the indirect cause of later achievements in the field of Sanskrit and comparative philology.

JONESCU, TAKE (1858–1922), Rumanian statesman. was born at Ploesci on Oct. 26. 1858, and after studying law in Paris, was in 1884 elected a deputy. He was minister of public instruction and finance in various Conservative cabinets until 1908 when he founded the Conservative-Democratic party. In 1912 his group formed a Coalition cabinet under Maiorescu. in which Jonescu was minister of the interior. He represented Rumania at the Peace Conference of Bucharest in 1913, and in 1914 he ne-

gotiated at Athens the peace between Greece and Turkey. When World War I broke out, Jonescu was, from the first, in favour of intervention on the side of the Allies. In 1918 he went to Paris, and as head of the Rumanian national committee he contributed greatly to the reintegration of Rumania in her rights as an ally when Germany was finally defeated. Jonescu was appointed foreign minister in April 1920, in the Averescu government. His own original plan for solving the problems created by the peace settlement was that of an economic Danube federation; but finding Czechoslovakia and Yugoslavia hostile to such an idea, he collaborated with their foreign ministers to create the Little Entente (*q.v.*). He died in Rome on June 21, 1922.

JONGEN, JOSEPH (1873–1953), outstanding modern Belgian composer, was born at Likge on Dec. 14, 1873. He studied at the Conservatoire there. After winning the Belgian Grand Prix de Rome in 1897 uith his cantata *Comala,* he studied in Italy. Germany and France. In 1903 he became professor of harmony at Likge. As a refugee in England during World War I. he formed a piano quartet uith D. Defauw, L. Tertis and E. Doehaerd. He became professor of composition at Brussels Conservatoire in 1920 and director. 1925–39. Of his numerous works, the most widely known are Harp Concerto (1944). Concert *à cinq* (1923). three string quartets and two pianoforte trios. He died July 13. 1953, at Sart-lez-Spa, near Liige. (H. GA.)

JONGKIND, JOHANN BARTHOLD (1819–1891); Dutch painter and engraver, an important figure in the development of Impressionism, was born at Lattrop, near Rotterdam. on June 3, 1819. He studied at The Hague in the studio of Steffens and at the Academy under the landscape painter, A. Schelfhout In 1846 he moved to Paris. and worked under J. B. Isabey and François Picot. He exhibited at the Salon in 1848, and again in 1852, when he received a medal and norked much at Le Havre. After a stay in the Netherlands (1855–60) he returned to Paris His works were exhibited with those of Corot, Daubigny and Troyon at an exhibition arranged by Count Armand Doria. and by his style he belonged to the Fontainebleau group. He chose his subjects on the banks of the Seine and in other picturesque old quarters of Paris. on the sea coast of Normandy and on the Dutch canals. Refused at the Salon of 1863, he joined in the Salon des Refusés, and made the acquaintance of Claude Monet His rendering of atmosphere and his study of fleeting effects of light and reflections make him a pioneer of Impressionism — though his oil pictures mere not painted directly from nature, and are carefully arranged compositions. His drawings and water colours were done out of doors In 1878 he settled at Côte-Saint-André (Isère), where he painted the simple landscape motifs for nhich his art is famous. He died at Côte-Saint-André on Feb. 9. 1891. *See* also PAINTING: *The Netherlands: 18th* and *19th* Centuries.

JÖNKÖPING, a town of Sweden, capital of the county (*län*) of Jonkoping, 230 mi. S.W. of Stockholm by rail. Pop. (1950) 44.350. Jonkoping received the earliest extant Swedish charter in 1284 from Magnus I, and was the scene of parliaments in 1357, 1439 and 1599; of the meeting of the Danish and Swedish plenipotentiaries in 1448; and of the death of Sten Sture, the elder, in 1503. In 1612 Gustavus Adolphus caused the inhabitants to destroy their town lest it should fall into the hands of the Danes; but it was rebuilt soon after. and in 1620 received special privileges from the king. At this period a textile industry was started there, the first of any importance in Sweden, and it was from the Dutch and German workmen. introduced at this time. that the quarter Tyska Mad received its name. It stands at the southern end of Lake Vetter. Two quarters of the town, Svenska Mad and Tyska Mad, recall the time when the site was a marsh (mad). and buildings were constructed on piles. The church of St. Kristine (c. 1650), the courthouses, tonn hall and government buildings are noteworthy. The town is one of the leading industrial centres in Sweden. The match manufacture, for which it is principally famous, was founded in 1844. There are also textile manufgctures, paper factories and mechanical works.

JONQUIERE, a city of Chicoutimi county, south central Quebec. Can., on the Au Sable river (tributary of the Saguenay river), 10 mi. W. of Chicoutimi on the Canadian National railway, is an important wood-pulp and lumber centre. The city was named after the marquis de la Jonquikre, who was governor of New France, 1749–52. Settlement began in the area in 1847, and the township was incorporated in 1866. Jonquikre became an incorporated village in 1904, a town in 1912 and a city in 1956. In addition to a large pulp mill, there are several small manufacturing plants, and retail trade was increasing in importance in the second half of the 20th century. Many of the inhabitants uork in the nearby aluminum-producing town of Arvida, and it is commonly considered part of the metropolitan area that also includes the town of Kénogami (pop. [1956] 11,309) to the north. The population of Jonquière was 25,550 in 1956. (J. D. I.)

JONQUIL, the name applied to several species of *Narcissus* (*q.v.*), especially the yellow-flowered *N. jonquilla* of southern Europe and Africa, and the Campernelle jonquil (N. *odorus*).

JONSON, BEN (1572–1637), English dramatist, was born. probably in Westminster in the beginning of the year 1573, or, if reckoned by the unadopted modern calendar. in late 1572. By the poet's account his grandfather had been a gentleman who "came from" Carlisle, and originally, the grandson thought, from Annandale. His arms, "three spindles of rhombi," are the family device of the Johnstones of Annandale. Ben Jonson said that he was born a month after the death of his father, who, after suffering in estate and person under Queen Mary, had in the end "turned minister." Two years after the birth of her son the widow married again; her second husband was a master bricklayer, living in Hartshorn lane, near Charing Cross, who sent his stepson to a private school in St. Martin's lane. Jonson was then sent to Westminster school at the expense, it is said, of William Camden. His gratitude for an education to which in truth he owed an almost inestimable debt concentrated itself upon the "most reverend head" of his benefactor, then second and afterwards head master of the famous school, and the firm friend of his pupil in later life. He was put to his stepfather's trade immediately on leaving school, and the most learned of Elizabethan dramatists appears to have missed the university. Both Aubrey and Fuller, however, say that he went to Cambridge, but there is no record of his presence in the registers. He soon had enough of bricklaying. Either before or after his marriage—more probably before, as Sir Francis Vere's three English regiments were not removed from the Low Countries till 1592—he spent some time in that country soldiering.

Ben Jonson married not later than 1592. The registers of St. Martin's church state that his eldest daughter Maria died in Nov. 1593 when she was, Jonson tells us (epigram 22), only six months old. His eldest son Benjamin died of the plague ten years later (epigram 45). (A younger Benjamin died in 1635.) His wife Jonson characterized to Drummond as "a shrew, but honest"; and for a period (undated) of five years he preferred to live without her, enjoying the hospitality of Lord Albany (afterwards duke of Lennox). Long burnings of oil among his books, and long spells of recreation at the tavern, such as Jonson loved, are not the most favoured accompaniments of family life. But Jonson was no stranger to the tenderest of affections; two at least of the several children whom his wife bore to him he commemorated in touching little tributes of verse; nor in speaking of his lost eldest daughter did he forget "her mother's tears."

On July 28, 1597, there is an entry in Philip Henslowe's diary of a loan of £4 to "Bengemen Johnson player" and another of 3s. 6d. "received of Bengemenes Johnsones share." Henslowe advanced 20s. on Dec. 3, 1597, for a play to be completed before Christmas. This was the day on which the theatres were suppressed on account of the performance of the *Isle* of Dogs. A privy council minute of Oct. 8, 1597, records the "warrant for the releasing of Benjamin Johnson" on Oct. 3. Jonson therefore appears to have suffered for his part in this play the "bondage" for his "first error" of which he speaks in a letter to Salisbury in 1605. He is recorded to have borrowed 5s. from Henslowe on Jan. 3, 1598. His relation with Henslowe and the lord admiral's company was intermittent, and was, as n e shall see, broken by a serious quarrel.

Early Comedies. — According to Aubrey, whose statement must be taken for what it is worth, "Jonson was never a good

actor, but an excellent instructor." His physique was certainly not well adapted to the histrionic conditions of his — perhaps of any — day; but, in any case, it was not long before he found his place in the organism of his company. In 1598 Jonson was mentioned by Meres in his *Palladis Tamie* as one of "the best for tragedy," without any reference to a connection on his part with the other branch of the drama. Whether this was a criticism based on material evidence or an unconscious slip, Ben Jonson in the same year 1598 (at some date before Sept. 20) produced one of the most famous of English comedies, *Every Man in his Humour*, which mas first acted — probably in the earlier part of September — by the lord chamberlain's company at the Curtain Shakespeare was one of the actors in this first production of Jonson's comedy, and it is in the character of Old Knowell in this very play that, according to a bold but ingenious guess, he is represented in the half-length portrait of him in the folio of 1623, beneath which were printed Jonson's lines concerning the picture. *Every Man in his Humour* was published in 1601; the critical prologue first appears in the folio of 1616, and there are other divergences. After the Restoration the play was revived in 1751 by Garrick (who acted Kitely) with alterations, and long continued to be known on the stage. *The Case is Altered*, acted by the children of the Blackfriars, which contains a satirical attack upon the pageant poet, Anthony Munday, has been generally assigned to the end of 1598, but E. K. Chambers gives reasons (*Elizabethan Stage*, iii. 357) suggesting the date as 1597 This comedy, which was not included in the folio editions, is one of intrigue rather than of character; it contains obvious reminiscences of Shylock and his daughter.

Before the year 1598 was out, however, Jonson found himself in prison and in danger of the gallows. In a duel, fought on Sept. 22, in Hogsden Fields, he had killed an actor of Henslowe's company named Gabriel Spenser. It seems clear that he acted in self-defence, and the attack may have had something to do with Jonson's work for a rival company. In prison Jonson mas visited by a Roman Catholic priest, and the result (certainly strange, if Jonson's parentage is considered) was his conversion to the Church of Rome, to which he adhered for 12 years. He pleaded guilty to the charge of manslaughter brought against him, as the rolls of Middlesex sessions show; but, aiter a short imprisonment. he was released by benefit of clergy, forfeiting his "goods and chattels," and being branded on his left thumb

The affair did not affect his reputation; in 1599, Henslowe, who had commercial sense, had made up the quarrel, and Jonson received (Sept. 2;). together with Dekker, Chettle and "another gentleman," earnest-money for a tragedy (undiscovered) called *Robert II., King of Scots*. He had a share in other ephemeral pieces of the period. In 1599 he brought out through the lord chamberlain's company at the Globe the elaborate comedy of *Every Man out of his Humour* (quarto 1600; fol. 1616) — a play subsequently presented before Queen Elizabeth. In this play he opened battle, though not yet overtly, on contemporary writers. *Cynthia's Revels*, performed by the chapel children in 1600 and printed with the first title of *The Fountain of Self-Love* in 1601, though it was no doubt primarily designed as a compliment to the queen. contained attacks on his old friends and associates Dekker and Marston. According to Jonson, his quarrel with Marston had begun by the latter attacking his morals, and in the course of it they came to blows, and might have come to worse. In *Cynthia's Revels*, Dekker is generally held to be satirized as Hedon, and Marston as Anaides (Fleay, however, thinks Anaides is Dekker, and Hedon Daniel), while the character of Crites was assumed, perhaps unjustly, by Dekker to refer to Jonson himself. Learning the intention of the two writers whom he had satirized, or at all events of Dekker, to wreak literary vengeance upon him, he anticipated them in *The Poetaster* (1601), again played by the children of the queen's chapel at the Blackfriars and printed in 1602; Marston and Dekker are here ridiculed respectively as the aristocratic Crispinus and the vulgar Democritus The play was completed 15 weeks after its plot was first conceived. Fleay's supposition that the "purge," said in the *Returne front Parnassus* (Pt. II. act iv. sc. iii.) to have been administered by Shakespeare to Jonson in return for Horace's "pill to the poets" in this piece, consisted of *Troilus and Cressida* is supremely ingenious, but cannot be examined here. Dekker retaliated on *The Poetaster* by the *Satiromastix, or The Untrussing of the Humorous Poet* (1602). Some more last words were indeed attempted on Jonson's part, but in the *Apologetic Dialogue* added to *The Poetaster* in the edition of 1616, though excluded from that of 1602, he says he intends to turn his attention to tragedy.

Tragedies and Masques. — This intention he apparently carried out at once, for in 1602 he received £10 from Henslowe for a play, entitled *Richard Crookbacke*, now lost — unfortunately so, for purposes of comparison in particular, even if it was only, as Fleay conjectures. "an alteration of Marlowe's play." According to a statement by Overbury, early in 1603, "Ben Jonson, the poet, now lives upon one Townesend," supposed to have been the poet and masque-writer Aurelian Townshend, at one time steward to the 1st earl of Salisbury! "and scornes the world." To his other early patron. Lord Albany, Jonson dedicated the first of his two extant tragedies, *Sejanus*, produced by the king's servants at the Globe late in 1603, Shakespeare once more taking a part in the performance. Either on its performance or on its appearing in print in 1605, Jonson was called before the privy council by the Earl of Northampton. But it is open to question whether this was the occasion on which, according to Jonson's statement to Drummond, Northampton "accused him both of popery and treason."

When the reign of James I. opened in England, Jonson's genius, which, far from being "ponderous" in its operations, was singularly swift and flexible in adapting itself to the demands made upon it, met the new taste ior masques and entertainments — new of course in degree rather than in kind — introduced with the new reign and fostered by both the king and his consort. The pageant which on May 7, 1603, bade the king welcome to London was partly of Jonson's, partly of Dekker's, devising, and he was able to deepen and diversify the impression by the composition of masques presented to James I. when entertained at houses of the nobility. *The Satyr* (June 25, 1603) was produced on one of these occasions, Queen Anne's sojourn at Xlthorpe, the seat of Sir Robert 'Spencer, afterwards Lord Althorpe, who seems to have previously bestowed some patronage upon him. *The Penates* followed on May-day 1604 at the house of Sir William Cornwallis at Highgate. The queen herself with her ladies danced in Jonson's *Masque of Blackness* at Whitehall on Jan. 6, 1605 He was soon occasionally employed by the court itself — already in 1606 in conjunction with Inigo Jones, as responsible for the "painting and carpentry" — and thus speedily showed himself master in a species of composition for which, more than any other English poet before Milton, he secured an enduring place in the national poetic literature. Incidentally, joint employment in *The King's Entertainment* (1604) had reconciled him with Dekker; and with Marston also, who in 1604 dedicated to him his *Malcontent*, he was again on pleasant terms. When, therefore, in 1604–05 Marston and Chapman (who, Jonson told Drummond, was loved of him). produced the excellent comedy of *Eastward Ho*, it contained some contributions by Jonson. At all events, when the authors were arrested on account of passages deemed insulting to the Scots, he "voluntarily imprisoned himself" with them. They were soon released, and a banquet at his expense, attended by Camden and Selden, terminated the incident.

If Jonson is to be believed, the prisoners had been threatened with mutilation of their ears and noses, and, "at the midst of the feast his old mother drank to him, and showed him a paper which she had intended (if the sentence had taken execution) to have mixed in the prison among his drink, which was full of lusty strong poison: and that she was no churl, she told him, she minded first to have drunk of it herself." This incident can hardly be the imprisonment during which Jonson sought the good offices of the earl of Salisbury in a letter endorsed 1605, in which he explains that since his "first error" he has so "attempered" his style as to have "given no cause to any good man of grief." Some authorities have surmised that there were two imprisonments, and that the play which occasioned the trouble, in which both Chapman and

Jonson took part, was *Sir Gyles Goosecappe,* and that the last imprisonment of the two poets was shortly after the discovery of the Gunpowder Plot. In the mysterious history of the Gunpowder Plot Jonson certainly had some obscure part. On Nov. 7, very soon after the discovery of the conspiracy, the council appears to have sent for him and to have asked him, as a loyal Roman Catholic, to use his good offices in inducing the priests to do something required by the council. Jonson tried, and failed; he declares, in a letter to Lord Salisbury, that "they (the priests) are all so enweaved in it that it will make 500 gentlemen less of the religion within this week, if they carry their understanding about them." Jonson did not himself return to the Church of England until five years later, however much it might have been to his advantage to do so.

The Works of His Prime.—His powers as a dramatist were at their height during the earlier half of the reign of James I.; and by the year 1616 he had produced nearly all the plays which are worthy of his genius. They include the tragedy of *Catiline* (acted and printed 1611), which achieved only a doubtful success, and the comedies of *Volpone, or the Fox* (acted 160; or 1606, and printed in 1607 with a dedication "from my house in the Blackfriars"), *Epicene, or the Silent Woman* (1609; entered in the Stationers' Register 1610), the *Alchemist* (1610; printed in 1610), *Bartholomew Fair* and *The Devil is an Ass* (acted respectively in 1614 and 1616). During the same period he produced several masques; usually in connection with Inigo Jones; with whom. however, he seems to have quarrelled already, though it is very doubtful whether the architect is really intended to be ridiculed in *Bartholomew Fair* under the character of Lanthorn Leatherhead. Littlewit, according to Fleay, is Daniel. The masques of this period are: the *Masque of Blackness* (1605) already mentioned: *Hymenaei* (1606), written for the wedding of Robert, earl of Essex; the *Masque of Beauty* (1608); *The Hue and Cry after Cupid* (1608), written for Lord Haddington's wedding; the *Masque of Queens* (1609), described by Swinburne as "the most splendid of all masques" and as "one of the typically splendid monuments or trophies of English literature"; *Oberon, the Faery Prince* (1611), a "masque of Prince Henries"; and five other court masques: *Love freed from Ignorance and Folly* (1611), *Love Restored* (1612), *The Irish Masque* (1613), *Mercury vindicated from the Alchemists* (161*j*), and *Tlze Golden Age Restored* (1616). In 1616 a modest pension of 100 marks a year was conferred upon him, and Jonson published the first volume of the folio collected edition of his works.

He had other patrons more bountiful than the Crown, and (in 1613) had travelled to France as governor to the eldest son of Sir Walter Raleigh, then a State prisoner in the Tower, for whose society Jonson probably gained a liking at the Mermaid Tavern in Brest street, Cheapside. After 1616 Jonson continued to produce masques and entertainments when called upon; but he was attracted by many other literary pursuits. He was already entitled to lord it at the Mermaid, where his quick antagonist in earlier wit-combats (if Fuller's famous description be authentic) no longer apeared even on a visit from his comfortable retreat at Stratford. That on the other hand Ben carried his wicked town habits into Warwickshire, and there, together with Drayton, made Shakespeare drink so hard with them as to bring upon himself the fatal fever which ended his days, is a scandal with which we may fairly refuse to load Jonson's memory. That he had a share in the preparing for the press of the first folio of Shakespeare, or in the composition of its preface, is of course a mere conjecture.

In the year 1618, like Samuel Johnson a century and a half afterwards. Ben resolved to have a real holiday for once: and about midsummer started for his ancestral country, Scotland. He had determined to make the journey on foot; and he was followed by John Taylor, the water-poet. who proposed to accomplish his pilgrimage without a penny in his pocket. Jonson. who put money in his good friend's purse when he came up with him at Leith, spent more than a year and a half in Scotland. being elected a burgess in Edinburgh. The best-remembered hospitality which he enjoyed was that of the learned Scottish poet, William Drummond of Hawthornden, to which we owe the so-called *Conversations. In* these famous jottings, the work of no extenuating hand. Jonson lives for us to this day, delivering his censures, terse as they are, in an expansive mood whether of praise or of blame; he is ungenerously described in the postscript added by his fatigued and at times irritated host as "a great lover and praiser of himself, a contemner and scorner of others." A poetical account of his journey, "with all the adventures," which Jonson had intended to entitle *The Discoverie,* was burnt with Jonson's library, a calamity which befell him probably in 1623–24.

After his return to London early in May 1619, Jonson visited Oxford to receive the degree of RIA. Among his noble patrons and patronesses were the countess of Rutland (Sidney's daughter) and her cousin Lady Wroth The extremely spirited *Gipsies Metamorphosed* (1621) was thrice presented before the king, who granted the poet the reversion of the office of master of the revels, besides proposing to confer upon him the honour of knighthood. This honour Jonson (hardly in deference to the memory of Sir Petronel Flash) declined; but there was no reason why he should not gratefully accept the increase of his pensisn in the same year (1621) to £200—a temporary increase only, inasmuch as it still stood at 100 marks when afterwards augmented by Charles I.

Last Plays.—The close of King James I.'s reign found the foremost of its poets in anything but a prosperous condition. Disease had weakened Jonson's strength, and the burning of his hbrary and of his own mss , as his *Execration upon Vulcan* sufficiently shows, must have been no mere transitory trouble to a poor poet and scholar. Moreover, from the time of the accession of Charles I. early in 1625 onwards, royal patronage would no longer be due in part to intellectual sympathy. Jonson therefore returned to writing for the stage, and in 1625 produced, with no faint heart, but with a very clear anticipation of the comments which would be made upon the reappearance of the "huge, overgrown play-maker," *The Staple of News* (pr. 1631), a comedy excellent in some respects, but little calculated to become popular. Jonson, whose habit of body was not more conducive than were his ways of life to a healthy old age, had a paralytic stroke in 1626, and a second in 1628. In the latter year, on the death of Middleton, the appointment of city chronologer, with a salary of 100 nobles a pear, was bestowed upon him. He appears to have considered the duties of his office as purely ornamental; but in 1631 his salary was suspended until he should have presented some fruits of his labours in his place, or—as he more succinctly phrased it—"yesterday the barbarous court of aldermen have withdrawn their chandlerly pension for verjuice and mustard, £33, 6s. 8d." Arrested in 1628 by mistake on the false charge of having eulogized the assassin of Buckingham, he was soon released, and apology was made for the error. In 1629 he once more essayed the stage with the comedy of The *New Inn,* which was damned on the first performance. It was printed in 1631, "as it was never acted but most negligently played"; and Jonson defended himself against his critics in his spirited *Ode* to *Hintself.* The epilogue to *The New Inn* having dwelt not without dignity upon the neglect which the poet had experienced, King Charles sent the unlucky author a gift of £100, and then increased his standing salary to the same sum, with the addition of an annual tierce oi canary—the poet-laureate's customary royal gift, though this designation of an office, of which Jonson discharged some of what became the ordinary functions, is not mentioned in the warrant dated March 26. 1630. In 1634, by the king's desire, Jonson's salary as chronologer to the city was again paid. To his later years belong the comedies, *The Magnetic Lady* (1632) and *The Tale of a Tub* (1633), both printed in 1640, and some masques Jonson had quarrelled with Inigo Jones, and mocked him as Vitruvius Hoop in his last comedy.

The patronage of liberal-minded men, such as the earl, afterwards duke, of Newcastle—by whom he must have been commissioned to write his last two masques *Love's Welcome at Welbeck* (1633) and *Love's Welcome at Bolsover* (1634)—and Viscount Falkland, was not wanting. Jonson was the acknowledged chief of the English world of letters, both at the festive meetings where he ruled the roast among the younger authors whose pride it was to be "sealed of the tribe of Ben," and by the

avowal of grave writers, old or young, not one of whom would have ventured to dispute his titular pre-eminence. Nor was he to the last unconscious of the claims upon him which his position brought with it. When, nearly two years after he had lost his surviving son, death came upon the sick old man on Aug. 6, 1637, he left behind him an unfinished work of great beauty, the pastoral drama of *The Sad Shepherd* (printed in 1641). For 40 years, he said in the prologue, he had feasted the public; at first he could scarce hit its taste, but patience had at last enabled it to identify itself with the working of his pen.

Jonson was buried on the north side of the nave in Westminster Abbey, and the inscription, "O Rare Ben Jonson," was cut in the slab over his grave In the beginning of the 18th century a portrait bust was put up to his memory in the Poets' Corner by Harley, earl of Oxford. Of Honthorst's portrait of Jonson at Knole Park there is a copy in the National Portrait Gallery; another was engraved by W. Marshall for the 1640 edition of his *Poems*.

We are so accustomed to think of Ben Jonson presiding, attentive to his own applause, over a circle of younger followers and admirers that we are apt to forget the hard struggle which he had passed through before gaining the crown now universally acknowledged to be his. Howell records, in the year before Ben's death, that a solemn supper at the poet's own house. where the host had almost spoiled the relish of the feast by vilifying others and magnifying himself, "T Ca" (Thomas Carew) buzzed in the writer's ear "that, though Ben had barrelled up a great deal of knowledge, yet it seemed he had not read the *Ethics,* xhich, among other precepts of morality, forbid self-commendation." Jonson's quarrels do not appear to have entered deeply into his soul, or indeed usually to have lasted long. He was too exuberant in his vituperations to be bitter, and too outspoken to be malicious. He loved of all things to be called "honest," and there is every reason to suppose that he deserved the epithet. The old superstition that Jonson was filled with malignant envy of the greatest of his fellow-dramatists, and lost no opportunity of giving expression to it, hardly needs notice. Those who consider that Shakespeare was beyond criticism may find blasphemy in the saying of Jonson that Shakespeare "wanted art." Occasional jesting allusions to particular plays of Shakespeare may be found in Jonson, among which should hardly be included the sneer at "mouldy" Pericles in his *Ode to Himself* But these amount to nothing collectively, and to very little individually; and against them have to be set. not only the many pleasant traditions concerning the long intimacy betneen the pair, but also the lines, prefixed to the first Shakespeare folio, as noble as they are judicious, dedicated by the survivor to "the star of poets," and the adaptation, clearly sympathetic notwithstanding all its buts, *de Shakespeare nostrat* in the *Discoveries*.

Non-dramatic **Works.**—Jonson's learning and industry, which were alike exceptional, by no means exhausted themselves in furnishing and elaborating the materials of his dramatic works His classical scholarship shows itself in other directions besides his translations from the Latin poets (the *Ars poetica* in particular), in addition to which he appears to have written a version of Barclay's *Argenis;* it was likewise the basis of his *English Grammar,* of which nothing but the rough draft remains (the ms itself having perished in the fire in his library). And its effects are very visible in some of the most pleasing of his non-dramatic poems, which often display that combination of polish and simplicity hardly to be reached—or even to be appreciated—without some measure of classical training.

Exclusively of the few lyrics in Jonson's dramas his non-dramatic works are comprised in the *Epigrams* (published in the first folio of 1616), the lyrics and epistles of *The Forest* (also in the first folio); and the miscellaneous poems in *Underwoods* (published collectively in the 2nd folio). To these pieces in verse should be added the *Discoveries—Timber, or Discoveries made upon Men and Matters,* a commonplace book of aphorisms noted by the poet in his daily readings—thoughts adopted and adapted in more tranquil and perhaps more sober moods than those which gave rise to the outpourings of the *Conversatzons* at *Hawthornden.* As to the critical value of these *Conversations* it is far from being only negative; he knew how to admire as well as how to disdain. For these thoughts, though abounding with biographical as well as general interest, Jonson was almost entirely indebted to ancient writers, or to the humanists of the Renaissance.

His Dramatic Genius.—The extant dramatic works of Ben Jonson fall into three or, if his fragmentary pastoral drama be considered to stand by itself, into four distinct divisions The tragedies are only two in number—*Sejanus his Fall* and *Catiline his Conspiracy.* Of these the earlier, as is worth noting, was produced at Shakespeare's theatre, in all probability before the first of Shakespeare's Roman dramas, and still contains a considerable admixture of rhyme in the dialogue. In both plays the action is powerfully conducted, and the care bestowed by the dramatist upon the great variety of characters introduced cannot, as in some of his comedies, be said to distract the interest of the reader. Both these tragedies are noble works, but both were alike too manifestly intended by their author to court the goodwill of what he calls the "extraordinary" reader. It is difficult to imagine that (with the aid of judicious shortenings) either could altogether miss its effect on the stage; but, while Shakespeare causes us to forget, Jonson seems to wish us to remember, his authorities. He has had to pay the penalty incurred by too obvious a desire to underline the learning of the author.

The strength of Jonson's dramatic genius lay in the power of depicting a great variety of characters, and in comedy alone he succeeded in finding a wide field for the exercise of this power. There may have been no very original or very profound discovery in the idea which he illustrated in *Every Man in his Humour,* and, as it were, technically elaborated in *Every Man out of his Humour*—that in many men one quality is pbservable which so possesses them as to draw the whole of their individualities one way, and that this phenomenon "may be truly said to be a humour." By refusing to apply the term "humour" (*q.v.*) to a mere peculiarity or affectation of manners, and restricting its use to actual or implied differences or distinctions of character, he broadened the whole basis of English comedy after his fashion, as Molière at a later date, keeping in closer touch with the common experience of human life, with a lighter hand broadened the basis of French and of modern Western comedy at large. It is a futile criticism to condemn Jonson's characters as a mere series of types of general ideas; on the other hand, it is a very sound criticism to object, with Barry Cornwall, to the "multitude of characters who throw no light upon the story, and lend no interest to it, occupying space that had better have been bestowed upon the principal agents of the plot."

Dryden, when criticizing Ben Jonson's comedies, thought fit, while allowing the old master humour and incontestable "pleasantness," to deny him wit and those ornaments thereof which Quintilian reckons up under the terms *urbana, salsa, faceta* and so forth. Such wit as Dryden has in view is the mere outward fashion or style of the day, the euphuism or "sheerwit" or *chic* which is the creed of Fastidious Brisks and of their astute purveyors at any given moment. In this Ben Jonson was no doubt defective; but it would be an error to suppose him, as a comic dramatist, to have maintained towards the world around him the attitude of a philosopher, careless of mere transient externalisms. It is said that the scene of his *Every Man in his Humour* was originally laid near Florence; and his *Volpone,* which is perhaps the darkest social picture ever drawn by him, plays at Venice. But the real atmosphere of his comedies is that of London town; and Ben Jonson's times live for us in his men and women, his country gulls and town gulls, his alchemists and exorcists, his "skeldring" captains and whining Puritans, and the whole ragamuffin rout of his *Bartholomew Fair,* the comedy *par excellence* of Elizabethan low life. He described the pastimes, fashionable and unfashionable, of his age, its feeble superstitions and its flaunting naughtinesses, its vapouring affectations and its lying effronteries, with an odour as of "divine tobacco" pervading the whole.

The richness and versatility of Jonson's genius cannot be fully appreciated without the study of what is preserved to us of his

"masques" and cognate entertainments. He was conscious enough of his success in this direction—"next himself," he said, "only Fletcher and Chapman could write a masque." He introduced, or at least established, the ingenious innovation of the anti-masque, which Schlegel has described as a species of "parody added by the poet to his device, and usually prefixed to the serious entry," and which accordingly supplies a grotesque antidote to the often extravagantly imaginative main conception. Jonson's learning, creative power and humorous ingenuity—combined, it should not be forgotten, with lyrical genius—all found abundant opportunities in these productions. The masque was by him thoroughly domesticated in the high places of English literature. He lived long enough to see its poetic masterpiece in *Comus*.

The Sad Shepherd, of which Jonson left behind him three acts and a prologue, is distinguished among English pastoral dramas by its freshness of tone; it breathes something of the spirit of the greenwood, and is not unnatural even in its supernatural element. The piece, with its charming love-scenes between Robin Hood and Maid Marion, unhappily, remains a fragment.

Though Ben Jonson never altogether recognized the truth of the maxim that the dramatic art has properly speaking no didactic purpose, his long and laborious life was not wasted upon a barren endeavour. In tragedy he added two works of uncommon merit to our dramatic literature. In comedy his aim was higher, his effort more sustained, and his success more solid than were those of any of his fellows. In the subsidiary and hybrid species of the masque, he helped to open a new and attractive though undoubtedly devious path in the field of dramatic literature. His intellectual endowments surpassed those of most of the great English dramatists in richness and breadth; and in energy of application he probably left them all behind. Inferior to more than one of his fellow-dramatists in the power of imaginative sympathy, he was first among the Elizabethans in the power of observation; and there is point in Barrett Wendell's paradox, that as a dramatist he was not really a poet but a painter. Yet it is less by these gifts, or even by his unexcelled capacity for hard work, than by the true ring of manliness that he will always remain distinguished among his peers.

BIBLIOGRAPHY.—The first folio volume of Jonson's *Works* (of which title his novel but characteristic use in applying it to plays was at the time much ridiculed) appeared in 1616; the second, professedly published in 1640, is described by Gifford as "a wretched continuation of the first, printed from mss. surreptitiously obtained during his life, or ignorantly hurried through the press after his death, and bearing a variety of dates from 1631 to 1641 inclusive." The works were reprinted in a single folio volume in 1692, in which *The New Inn* and *The Case is Altered* were included for the first time, and again in 6 vols. 8vo in 1715. Modern editions are by William Gifford (9 vols., 1816; often reprinted); selections in the Mermaid Series (3 vol., 1893–95), ed. B. Nicholson (reissue, with pref. by C. H. Herford, 1904). There are numerous critical editions of individual plays, for particulars of which the reader may be reierred to the articles on the separate plays in E. K. Chambers, *The Elizabethan Stage* (1923), vol. iii.; among these may be mentioned the editions of *Every Man in his Humour* and *Every Man out of his Humour* in No. 16 and 17 (1905 and 1907) of Bang's *Materialien zur Kunde des alten englischen Dramas*, by W. Bang and W. W. Greg; some by American scholars in the *Yale Studies in English*, ed. by A. S. *Cook*—*The Poetaster*, ed. *H*. S. Mallory (1905); *The Alchenzist*, ed. C. M. Hathaway (1903); *The Devil is an Ass*, ed. W. S. Johnson (1905); *The Staple of News*, ed. De Winter (1905); *The New Inn*, ed. by *G*. Bremner (1908); *The Sad Shepherd* (with Waldron's continuation) has been edited by W. W. Greg for Bang's *Materialien zur Kunde des alten englischen Dramas* (1905).

The criticisms oi Ben Jonson are too numerous for cataloguing here; among those by eminent Englishmen should be specially mentioned John Dryden's, particularly those in his *Essay on Dramatic Poësy* (1667–68; revised 1684), and in the preface to *An Evening's Love, or the Mock Astrologer* (1668), and A. C. Swinburne's *Study of Ben Jonson* (1889), in which, however, the significance of the *Discoveries* is misapprehended. *See* also F. G. Fleay, *Biographical Chronicle of the English Drama* (1891), i. 311–387, ii. 1–18; C. H. Herford, "Ben Jonson" (art. in *Dict. Nat. Biog.*, vol. xxx., 1802); A. W. Ward, *History of English Dramatic Literature* (2nd ed., 1899), ii. 296–407; and for a list of early impressions, W. W. Greg, *List of English Plays written before 1643 and printed before 1700* (Bibliographical Society, 1900), pp. 55–58 and supplement 11–15. An important French work on Ben Jonson, both biographical and critical, and containing, besides many translations of scenes and passages, some valuable appendices, to more than one of which reference has been made above, is Maurice Castelain's *Ben Jonson, l'homme et l'oeuvre* (1907). Among treatises or essays on particular aspects of his literary work may be mentioned Emil Koeppel's *Quellenstudien zu den Dramen Ben Jonson's*, etc. (1895); the same writer's "Ben Jonson's Wirkung auf zeitgenossische Dramatiker," etc., in *Anglicistische Forschungen*, 20 (1906); F. E. Schelling's *Ben Jonson and the Classical School* (1898); and as to his masques, A. Soergel, *Die englischen Maskenspiele* (1882) and J. Schmidt, "Uber Ben Jonson's Maskenspiele," in Herrig's *Archiv*, etc., xxvii. 51–91. *See* also H. Reinsch, "Ben Jonson's Poetik und seine Beziehungen zu Horaz," in *Münchener Beitrage*, 16 (1899), and G. Gregory Smith, *Ben Jonson* (1910) in the English Men of Letters Series. (A. W. WA.; X.)

JOPLIN, a city in the Ozarks region of southwest Missouri, U.S., near the Kansas and Oklahoma borders, and 134 mi. S. of Kansas City. Once the centre of an important lead- and zinc-mining area, Joplin has after World War II attracted other industries. Products include automotive and aircraft parts, mining machinery, leather goods, lead oxides. batteries, insulation and work clothing. The school system received national recognition for the Joplin reading plan, an innovation in the teaching of reading, instituted in 1953 and designed to improve reading skills in the elementary grades. The city also operates a junior college, opened in 1937. The council-manager form of government was instituted in Joplin in 1954.

A Tennessee preacher gave his name to the creek and the settlement near it, in 1838. Joplin was incorporated as a town in 1871 and as a city in 1873. In the 1890s mining made it a boom town and gave it a cosmopolitan population; the tailing piles in the vicinity are virtually the only remnants of the once thriving industry.

For comparative population figures *see* table in MISSOURI: *Population.* (E. R. ST.)

JOPPA, an ancient city on the seacoast of Israel, the port for Jerusalem. Mod. *Yāfā*, Jaffa. It was taken in 1472 B.C. by the general of Tuthmosis III by a clever stratagem. It is twice mentioned (Ya-pu) in the Tell-Amarna letters; and in the Papyrus Anastasi I (13th century B.C.) the traveling "mohar" found there excellent workers in wood, metal and leather. In the Old Testament it is ascribed to Dan, and is mentioned as a seaport for the importation of Lebanon timber floated down the coast (I Kings ix. 26). In 701 B.C. Sennacherib besieged Joppa, then a fief of Askalon. The inscriptions of Eshmunazar (*c.* 400 B.C.) record that Jaffa was given to the Sidonians by the Persian monarch, but 50 years later it is recorded as independent. The conquest of Alexander, who established a mint there, changed its name to Joppe. Ptolemy I garrisoned it (318 B.C.), and it was besieged and taken by Antigonus (315 B.C.). A den of pirates, it was destroyed by Vespasian during the Jewish War (A.D. 68). St. Peter remained at Joppa for a season, restored Tabitha to life and had his remarkable vision.

The legend of Andromeda and the sea monster is located there, and Pompey's captain, Scaurus, could display to the wondering eyes of Rome the carcass of the monster which he had transported from Joppa.

In Christian times it became the see of a bishop. The crusaders captured it (1126) and lost it to Saladin (1187). It was recaptured by Richard Coeur de Lion (1191) and finally lost in 1196. Joppa was razed to the ground and its harbour choked by Sultan. Nasir ed-Din Mohammed in 1345 because of a threatened new crusade. Toward the end of the 17th century it began afresh to develop as a seaport. Napoleon took possession of the town in 1799. On Nov. 16, 1917, it was entered by British troops without opposition.

The population of Jaffa in 1939 was 77,400 (52,700 Moslems, 24,700 Jews). It is a great pilgrim port for Jerusalem. About 400 steamers call there annually. The chief exports are fruit (especially oranges), corn, sesame, cotton and leather. The imports include cotton and woolen manufactures, colonial requisites, iron, bricks, wood and building materials generally. In 1950 Jaffa was incorporated into Tel Aviv. The Tel Aviv-Jaffa population (1956 est.) was 370,000.

Jaffa gave its name to one of the seven official districts into which the mandated territory was divided for administrative purposes. It has no proper harbour. Plans for a harbour have been prepared, but their execution has been delayed because of cost.

Haifa proved a formidable rival to Jaffa. The industries of the town include soap making, milling, cement making, building and the manufacture of furniture. The streets and the buildings have little to commend them. Electricity has recently been introduced. Jaffa has daily rail and post communication with Egypt and Haifa; it has several monasteries and four hospitals.

See S. Tolkowsky, *The Gateway of Palestine: a History of Jaffa* (1924), and "New Light on the History of Jaffa," *Journ. Pal. Orient. Soc.*, 5, 82 *seq.* (1925). (E. Ro.)

JORDAENS, JACOB (1593–1678), outstanding Flemish historical, genre and portrait painter of the baroque school, a successor to Rubens, was born at Antwerp on May 19, 1593. He studied, like Rubens, under Adam van Noort, and he married his master's daughter in 1616, the year after his admission to the guild of painters as a painter in water colours, though he painted mostly in oil. He never went to Italy like other Flemish artists of his time and his work is essentially Flemish in its exaggerated treatment of form and crude humour. His colour is warm and glowing, his figures incline to corpulency, his faces are red and healthy. He was a prolific painter and employed a large number of pupils in his studio.

Although he was a Calvinist, Jordaens received numerous commissions for Catholic churches, and after the death of Rubens he was considered the greatest painter in his country. He is represented in many galleries in Europe and North America. In 1652 he decorated the "Huis ten Bosch" near The Hague with mural paintings representing the "Triumph of Frederick Henry of Orange, Stadtholder of Holland" and "The Victory of Time."

He also executed designs for tapestries. A large number of his drawings and water colours are extant; and nine engravings are ascribed to him. He died at Antwerp on Oct. 18, 1678.

See Max Rooses, *J. Jordaens, His Life and Work* (English trans., 1908).

JORDAN, (MARIE ENNEMOND) CAMILLE (1838–1922), French mathematician who specialized in higher algebra, was born at Lyons on Jan. 5, 1838. He was educated at Paris and mas professor of mathematics in the École Polytechnique from 1876 until he retired in 1912. Jordan edited the *Journal de Mathkmatiques* from 188*j* until he died at Milan on Jan. 20, 1922.

Jordan's early researches were on geometry. In 1870 he was awarded the Poncelet prize for his *Traité des substitutions et des équations algébriques*, a comprehensive account of Galois's theory of groups of substitutions which Jordan applied to algebraic equations. He was able to solve a problem suggested by Niels Abel as to whether a given algebraic equation is soluble by radicals. Jordan published his lectures, together with most of his researches on analysis, in his *Cours d'Analyse de l'École Polytechnique* (3 vol., 1882). The third edition (1909–15) of this notable work contained a good deal more of Jordan's own work than the first. He treated the theory of functions from the modern point of view. He dealt with the function of bounded variation and applied it to the curve known as Jordan's curve.

JORDAN, DAVID STARR (1851–1931), U.S. educator, naturalist and philosopher, was born at Gainesville, N.Y., on Jan. 19, 1851. After study at Cornell university and Indiana medical college (M.D., 1874), he became in 1879 professor of zoology at Indiana university and in 1885 president. From 1891 to 1913 he was president of Stanford university. His later career Jordan devoted primarily to the cause of peace, acting as chief director of the World Peace foundation and receiving in 1924 a $25,000 prize for a plan of education to promote peace. He opposed imperialism and U.S. participation in World War I and advocated world federalism. An apostle of Puritanism and of Nordic superiority, he was also an ardent defender of freedom and a champion of progressive reforms. He died at Stanford, Calif., on Sept. 19, 1931. Jordan wrote over 50 books, including *Manual of the Vertebrates of the Northern U.S.* (1876), *Imperial Democracy* (1899), *The Heredity of Richard Roe* (1911), *War and Waste* (1914), *Democracy and World Relations* (1918) and *The Days of a Man* (1922).

See E. M. Burns, *David Starr Jordan: Prophet of Freedom* (1953); O. L. Elliott, *Stanford University, tlze First Twenty-five Years* (1937). (E. McN. B.)

JORDAN, DOROTHEA (DOROTHY) (1762–1816), Irish actress, especially famed for her playing in high-spirited comedy parts, was born near Waterford, Ire.. in 1762. Her mother, Grace Phillips, also known as Mrs. Frances, was a Dublin actress. Her father, named Bland, was said to have been an army captain but was most probably a stage hand. Dorothea Jordan made her first stage appearance in 1777 in Dublin as Phoebe in *As You Like It*. She came to Drury Lane theatre, London, in 1785 as Peggy in *A Country Girl* and soon became an established favourite, her comedy acting being declared second only to that of Kitty Clive. She played a great variety of parts, being especially successful as Lady Teazle, Rosalind and Imogen, and in "breeches" parts as well. After the fire of 1809 which destroyed Drury Lane, she went to the Haymarket theatre and then in 1811 to Covent Garden. She remained there until 1814, when, except for an appearance at Margate the following year, she retired. She had a daughter by her first manager in Dublin, four children by Sir Richard Ford, whose name she bore for some years, and ten children by the duke of Clarence (afterward William IV). These last were ennobled under the name of Fitzclarence, the eldest being created earl of Munster. In 1811 she and the duke separated by mutual consent and Mrs. Jordan received a handsome allowance. In 1815 she went to France and is said to have died at St. Cloud, near Paris, in 1816, although there is a legend that she returned to England and lived for several years after her presumed death.

See Philip W. Sargeant, *Mrs. Jordan* (1913); Clare Jerrold, *The Story of Dorothy Jordan* (1914). (W. J. M.-P.)

JORDAN, THOMAS (1612?–1685), English poet and pamphleteer, was born in London and started life as an actor at the Red Bull theatre in Clerkenwell. He published in 1637 his first volume of poems, entitled *Poetical1 Varieties*, and in the same year appeared *A Pill to Purge Melancholy*. In 1639 he recited one of his poems before King Charles I. He was a prolific Royalist pamphleteer, wrote many volumes of verse, and after the Restoration many plays, in at least one of which, *Money is an Ass* (1668), he acted. In 1671 he was appointed laureate to the city of London; from this date till his death in 1685 he annually composed a panegyric on the lord mayor, and arranged the pageantry of the lord mayor's shows, which he celebrated in verse. Many volumes of these curious productions are preserved in the British Museum.

In addition to Jordan's numerous printed works, of which perhaps *A Royal Arbour of Loyall Poesie* (1664) and *A Nursery of Novelties in Variety of Poetry* are most deserving of mention, several volumes of his poems exist in manuscript.

See F. W. Fairholt, *Lord Mayor's Pageants* (Percy Society, 1843), containing a memoir of Thomas Jordan.

JORDAN, that is, the HASREMITE KINGDOM OF JORDAN, comprises the formerly mandated territory of Transjordan and that part of central Palestine which remained in Arab hands after the signature of the armistice agreements between Jordan and Israel in 1949. Of the total area (37,301 sq.mi.), the territory east of the Jordan is about 35,000 sq.mi.; that of the western region, about 2,000 sq.mi. The country is bounded on the north by Israel and by Syria; on the east by Iraq and by Saudi Arabia; on the south by Saudi Arabia; and on the west by Israel.

Physiography. — Eastern Jordan rises, by a series of escarpments, from the depressions of the river Jordan (between Lake Tiberias and the Dead sea) and of the Wadi Araba (between the Dead sea and the Gulf of Aqaba) to a height of 4,000 ft. above sea level; the highlands are interrupted from north to south by a series of wadis, of which the principal are the Yarmuk and the Zerka (through which flow the main tributaries of the Jordan) and the Wadi Mojib (which enters the Dead sea through a deep gorge about 20 mi. S. of its northern shore). Farther east, beyond these highlands, begin the desert lands, which fall gently from west to east across the Arabian peninsula to the Persian gulf. The surface is mainly limestone, overspread in the north by sheets of lava extending from the Jebel ed Druz in Syria; and a second broad belt of lava occurs farther south and east. The high ridge forming the eastern side of the Wadi Araba is granite, and there is a sandstone region cut by canyons 2,000 ft. deep in which lie the ruins of Petra.

The Jordanian territory west of the river Jordan (since 1949) includes parts of the biblical kingdoms of Israel and Judah extending from a line north of Jenin southward to a line about 15 mi. S. of Hebron. The western frontier divides Jerusalem, the Old City being in Jordan. Except for the eastern projection of Israel up to Jerusalem. the territory in Jordanian hands comprises most of the central mountainous region between the coastal plains of Palestine and the Jordan valley. North of Jerusalem there are fertile plains and valleys; south and east are rugged and barren hills with scant patches on which cultivation is possible.

The climate of the uplands of Palestine and of the highlands of Jordan is very similar. Westerly winds bring winter and spring rains to the plateau west of the river and to the eastern escarpment (the western escarpment lying in the "rain shadow" of the plateau). The average annual rainfall is higher to the west (32 in.), drops to 4 in. in the Jordan valley (the Ghor) and is about 24 in. over the northern highlands of Jordan. It drops again to 8 in. to the east and to the south, where rainfall is very uncertain. Snow is not uncommon, and in the higher regions a fall in February is usual; but it is unknown in the Jordan valley.

Temperatures on the Jordan plateau and in the hills of Judaea, west of the river, are very similar, though the average maxima tend to be somewhat higher on the east and average minima tend to be lower. At Amman the daily maximum is about 90° F. in summer, as compared with 88° F. in Jerusalem. In the Jordan valley the heat is oppressive in summer (the mean daily maximum at Jericho being 103°), with an absolute maximum of 120°. In winter the climate in the valley is pleasant, with mean daily maxima of about 70° in December, January and February. The mean daily temperature at Amman is about 48° (cf. Jerusalem 49") in winter. with a mean daily minimum of 39° (cf. Jerusalem 42°), and frosts are not infrequent. In spring and autumn the trend of the temperature may be interrupted by hot spells.

The flora and fauna of Jordan are similar to those of Palestine (*q.v.*) and include Mediterranean, steppe and desert types according to the distribution of the rainfall.

History. — The ancient history of the country is clearly divided into periods of prosperity separated by centuries during which the area seems to have been inhabited by nomadic tribes from the east. Such a period of prosperity occurred during the Bronze Age, but came to an end *c.* 1800 B.C., after which the country returned to its primitive state for 500 years. New people then came and rebuilt the cities. In the north the Egyptians were in control; in the south the Edomites established their rule c. 1170 B.C., with the Moabites and Amorites to the north of them and the kingdom of Ammon on the Belqa highland (see AMMONITES; AMORITES; EDOM; MOAB). The caravan routes between Egypt, Mesopotamia and eastern and southern Arabia brought wealth to the country. The Israelites subdued the tribes of Moab, Ammon and the Amorites at a date which is uncertain; and the Israelite tribes of Reuben, Gad and half of Manesseh remained on the east of the Jordan. After King Solomon's death (c. 937 B.C.), Ammon recovered its independence; and before the end of the kingdom of Judah all its territory east of the river had been lost. The Nabataeans (*q.v.*), an Arabian people, who by the end of the Assyrian empire had gained ascendancy in this region, established their capital at Petra (*q.v.*; perhaps identifiable with the biblical Sela) on the caravan route. The breakup of the Persian empire by the Diadochi after Alexander the Great caused an interruption of the more northerly trade routes and increased the importance of those passing through Petra. The Ptolemies of Egypt occupied Transjordan during the 3rd century B.C. but did not subdue the Nabataeans or take Petra. Meanwhile the Seleucids were advancing from the north; after expelling the Egyptians at the beginning of the 2nd century B C. they built a chain of colonies southward from Damascus and spread Greek culture among the population. Philadelphia (the modern Amman) became a Greek city, and Gerasa (the modern Jerash) and other centres were revived.

In Palestine the Maccabees resisted Hellenization; and the Nabataeans. who were not directly affected by these troubles, took the opportunity to spread northward. By 64 B.C., however, when Pompey conquered Syria, the whole of northern Transjordan was Jewish and reached the region of Jerash and Amman, which was independent. The Nabataeans ruled in the south and, as Roman vassals, later extended their sway as far north as Damascus. When Trajan annexed the Nabataean kingdom (A.D. 105/106), he moved the administrative centre from Petra to Bostra (the modern Bosra). The country enjoyed a period of great prosperity as part of the Roman province of Arabia Petraea. The Nabataeans had developed an efficient system of water conservation and agriculture; and, thanks to the peace between Rome and the Parthian rulers of Mesopotamla, trade flourished until the Persian Sassanids replaced the Parthians and war with Rome followed (3rd century). By the 6th century Petra had been deserted and the Nabataeans replaced by Arab nomads from the south, who became vassals of the Roman emperors of Byzantium. These Ghassanid Christians were overthrown by the Moslems, whose first advance was made in 633 and who had taken the whole country, with Palestine and Syria. by 640.

Only during the 11th and 12th centuries, when the Latin kingdom of Jerusalem was extended eastward of the Jordan, does the country emerge from a period of obscurity, which enveloped it until it was rediscovered by explorers in the 19th. To that period belong the crusader castles of which the ruins are still to be seen at Kerak (Krak or Crac du Désert) and elsewhere.

Both Palestine and Transjordan were neglected by the Ottoman sultans, and the Hejaz railway, on which work was started in 1900 and which reached Ma'an in 1904, contributed nothing to the well-being of the country through which it passed (it reached Medina in 1908). In World War I, when the Arabs revolted against the Turks (1916), the tribes of Transjordan rose and took part in the operations with which the name of T. E. Lawrence is associated. The Turkish garrison in Medina was immobilized by well-judged raids on the railway upon which it depended for supplies and reinforcements. At the end of the war both Palestine and Transjordan were administered directly by the British. Then after the French had expelled Faisal of Iraq, son of King Husain of the Hejaz, from Damascus in 1920, Faisal's brother, the amir Abdullah, advanced against Syria from the south to avenge him; and in March 1921 he was dissuaded from this adventure by the British offer to him of rule over the country east of the Jordan under the provisions of the expected mandate for Palestine (finally passed by the League of Nations in 1922). With a small number of British advisers headed by a British resident, who was the representative of the high commissioner in Jerusalem, the amir ruled the country as a benevolent autocrat until 1939. Transjordan was expressly exempted from the clauses in the mandate which dealt with the foundation of the Jewish nationalist home in Palestine; and relations between the amir and the British government were regulated by a series of agreements between 1922 and 1939. Progress, though slow, was steady, and the administration, in which Arabs had the major share, suited the conditions of the people. In 1939 the powers of the British resident were reduced and a move toward the establishment of democratic institutions was made by the formation of a cabinet of departmental heads responsible to the amir and by the election of a legislative assembly of 20 members. From the earliest days of World War II the amir declared his loyalty to the Allies and firmly suppressed every sign of disaffection. In 1941 his army, the Arab legion, gave valuable assistance to the British force which crossed to Iraq to suppress pro-German activities there; and it later co-operated very successfully in the operations against the Vichy French in Syria.

In 1928 the amir had agreed by the terms of a treaty with Great Britain to be guided by British advice in questions concerning foreign relations, jurisdiction over foreigners, financial and other matters. In 1934 a supplementary agreement allowed the amir to appoint consular representatives to the Arab states. The amir having suggested, toward the end of World War II, that a revision of the treaty was desirable, a new treaty was signed in London on March 22, 1946. On May 25, 1946. the legislative assembly adopted an amendment to the constitution changing the amirate into a kingdom. and His Majesty King Abdullah I was proclaimed king of "the Hashemite Kingdom of the Jordan."

Among the other Arab states there had already been some criticism of what was regarded as an undue subservience to Great Britain. This criticism increased when the terms of the new treaty became known to Arab nationalists both within and without Transjordan; and, at the amir's request, it was replaced by a new treaty on March 1j, 1948. By the terms of that treaty both parties agreed to consult together and to concert measures for the peaceful settlement of any dispute with a third state. to concert measures of defense in case of a threat of war and to give immediate aid in the event of either party's nevertheless becoming involved in war.

Before the relinquishment of the mandate for Palestine by Great Britain on May 15, 1948, units of the Arab legion which had been assisting the British forces in Palestine were withdrawn by agreement with the British government. Jordan was a member of the League of Arab States which had been formed in 1945 and took part with Egyptian, Iraqi, Syrian and Lebanese troops in the operations against Israel, which opened immediately after the termination of the mandate. Early in 1949, when a series of armistice agreements was negotiated, the Jordanian Arab legion took over the northern sector of the line previously held by the Iraqis. Thus in the Jordan-Israeli armistice signed at Rhodes on April 3, 1949, Jordan held a frontier with Israel which included more than 2.000 sq.mi. of central Palestine, with the Old City of Jerusalem, Hebron and Bethlehem in the south and Ramallah and Nablus in the north. In spite of opposition from the other members of the Arab league this territory was formally incorporated in the kingdom in April 1950 by the vote of a parliament elected from both sides of the river. King Abdullah, however, was unpopular with certain Arab nationalists for several reasons: he was known to have ambitions to create a "Greater Syria" by the fusion of his brother Faisal's lost Syrian dominion and his own (a project to which republicans in Syria were naturally opposed); and the Palestinian Arab nationalists resented his incorporation of central Palestine into his kingdom in 1950, as they not only felt themselves to be culturally superior to the Arabs of Transjordan but also, in common with other Arabs, objected to his declared friendship with Great Britain (whom they blamed for their misfortunes in Palestine) and suspected him of being prepared to make peace with Israel. Their hostility culminated in the king's assassination by extremists in Jerusalem on July 20, 1951. Abdullah's eldest son Talal, who succeeded him, was a year later declared by parliament to be unfit to rule because of chronic mental instability; whereupon the kingdom passed to his 17-year-old son Hussein (Husain), who was crowned in Amman on May 2. 1953.

In 1955 Jordan rejected membership in the Baghdad pact, and in March 1956 King Hussein dismissed Lieut. Gen. John Bagot Glubb, commander of the Arab legion. In November Jordan announced the abrogation of the Anglo-Jordanian treaty. Under Prime Minister Suleiman Nabulsi, it continued to pursue an anti-western policy, maintaining close relations with Egypt and Syria. In April 1957, however, the king dismissed the Nabulsi government. martial law was declared and a pro-western cabinet was formed by Ibrahim Hashem. Relations with Egypt and Syria became tense. Two weeks after those countries announced their merger as the United Arab Republic, the short-lived (Feb. 14–Aug. 1, 1958) union of Jordan and Iraq was proclaimed under the name of the Arab Federation (see IRAQ).

Population.— The population of Jordan is preponderantly Arab by race, and both Moslems and Christians so describe themselves if they do not belong to one of the small groups of Circassians. Chechens, Turkomans, Armenians or Druzes. The large majority is Sunni Moslem, and Islam is the state religion. The settled inhabitants (who include all the non-Arabs) live on the west bank of the Jordan and in the northwestern part of Transjordan; the seminomads. who cultivate the land but live in tents, are found in the Amman highlands and in the neighbourhood of Kerak and Ma'an; and the nomads are scattered throughout the rest of the country and are entirely dependent on their flocks.

The population was increased in 1949 when the western part of the country was taken over from Palestine; there was also the influx of refugees from territory held by Israel. According to the 1952 census, the total population was 1,329,174. The total population was estimated in 1959 to be 1,658.313.

Amman, the capital (pop. [1959 est.] 133,201; cf. 30,000 before the Arab-Israeli War), is the ancient Rabbath Ammon, known as Philadelphia in the classical period; little remains of its ancient buildings except the ruins of a theatre and a small odeon. The other town of importance east of the Jordan is Irbid (28.481). West of the Jordan are Nablus (52,268), Jericho (51,155), Hebron (44,254). Tulkarm (26,901) and the Old City of Jerusalem (57,-450).

Economy.— The economy of Jordan depends mainly upon the agricultural and pastoral activities of its inhabitants. In the east, however, only about 1,935,000 ac. of a total area of 22,500,000 ac. are normally cultivated, the remainder being either desert or barren hills (Palestine Partition Commission, 1938). In western Jordan the situation is little better: the United Nations' Economic Survey mission, which visited Palestine in 1949, described it as being probably the poorest agricultural land in the country. In addition to cereals, in which Jordan is self-supporting in good years, olives and vines are cultivated, and vegetables and fruits of all kinds are grown.

The influx of refugees after the outbreak of fighting in 1948 brought with it a temporary, artificial prosperity but greatly aggravated Jordan's already serious economic problems. Without aid to the refugees from the United Nations, British loans and subsidies and Point Four aid from the United States, Jordan could not hope to bear its heavy burdens.

Industrial development was slow, but a cement factory, opened in 1954, was before the end of the year already producing enough for Jordan's requirements. Prospecting for phosphates gave satisfactory results; manganese and copper were less promising; prospecting for oil was disappointing. Less important industries were flour milling, tobacco manufacture, olive-oil extraction and fisheries (at Aqaba); some effort was made to develop the tourist trade.

Some progress was made with the construction and maintenance of roads and in the provision of locomotives and rolling stock for the Hejaz railway, which terminated at Ma'an. The port of Aqaba, linked by road with Ma'an, was developed.

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JORDAN (the down-comer; Arab. esh-Sheri'a, the watering-place), a river of Israel and Jordan flowing from north to south in one of the most remarkable depressions of the earth's crust. It was the Aulon of the Greeks and the Ghôr of the Arabs.

The Jordan valley is considered to be a great rift valley, in which a large section of the earth's crust has been let down between a series of faults. This line of weakness can be traced north of the Jordan valley proper between Lebanon and Hermon and southward through the Dead sea, Wel Jeib, the Gulf of 'Akaba, the Red sea and into east Africa. The valley of Jordan proper has Cretaceous material on both its banks, with patches of Eocene on the northwest of the Sea of Galilee and on the west bank near the mouth of the Brook Cherith. The northern reaches of the valley, particularly in the neighbourhood of the Sea of Galilee has much volcanic material, perhaps in part responsible for the formation of the lake.

River terraces are very marked throughout the course. For two-thirds of its length the river lies below the level of the sea; navigation is impossible.

Throughout history it has roughly divided the settled from the nomadic populations; and the crossing of Jordan, one way or the other, was alaays an event in the history of Israel. In Hebrew times its valley was regarded as a wilderness and, except in the Roman era, seems always to have been as sparsely inhabited as now.

Such human life as may be found in the valley is mainly

migratory. The villagers use it in winter as pasture-ground, and cultivate plots here and there. They retire on the approach of summer. Jericho is the only considerable settlement in the lower valley, and it lies some distance west of the stream on the lower slopes of the Judaean heights.

From its sources to the Dead sea the Jordan flows down a continuous inclined plane, broken here and there by rapids and small falls; between the Sea of Galilee and the Dead sea it meanders to such an extent that in a direct distance of 65 m. it traverses at least zoo m. The mean fall is about 9 ft. in the mile. The Jordan has two great sources, one in Tell el-Kadi (Dan) whence springs the Nahr Leddan, the other at Banias (anc. Paneas, Caesarea-Philippi), some 4 m. N., where the Nahr Banias issues from a cave in the Cretaceous rock. Two longer streams with less water may be included among the sources—the Nahr Barrighit and the Nahr Hasbany; the latter occupies a portion of the northward continuation of the Jordan structufal depression. The four streams unite below Banias, once the gateway of the valley, and flow into a marshy tract now called Huleh (Semechonitis, and perhaps Merom of Joshua). There the Jordan begins to fall below sea-level, rushing down 680 ft. in g m. to a delta, which opens in to the Sea of Galilee.

Thereafter it follows a valley which is usually not above 4 m. broad, but opens out twice into the small plains of Bethshan and Jericho. The river actually flows in a depression, the Zor, which it has hollowed out for itself in the bed of the Ghor. During the rainy season (January and February), when the Jordan overflows its banks, the Zor is flooded, but when the water falls it produces rich crops. The floor of the Ghor falls gently to the Zor, and is intersected by deep channels, which have been cut by the small streams and winter torrents that traverse it on their way to the Jordan. As far south as Kurn Surtabeh most of the valley is fertile, and even between that point and the Dead sea there are several well-watered oases. In summer the heat in the Ghor is intense, 110° F in the shade, but in winter the temperature falls to 40°, and sometimes to 32° at night. During the seasons of rain and melting snow the river is very full. On leaving the Sea of Galilee the water is clear, but it soon becomes laden with soft marl which it washes away from its banks and deposits in the Dead sea. On the whole it is an unpleasant foul stream running between poisonous banks, and as such it seems to have been regarded by the Jews and other Syrians.

The Hebrew poets did not sing its praises, and others compared it unfavourably with the clear rivers of Damascus. The clay of the valley was used for brickmaking, and Solomon established brass foundries there. In Roman times it had extensive palm-groves and some small villages, and there were bridges on all the great lines of communication between eastern and western Palestine, and ferries at other places. The natural products of the Jordan valley—a tropical oasis sunk in the temperate zone, and overhung by Alpine Hermon—are unique. Papyrus grows in Lake Huleh, and rice and cereals thrive on its shores, whilst below the Sea of Galilee the vegetation is almost tropical. Sugar-cane has been grown since the days of the Crusades. The flora and fauna present a large infusion of Ethiopian types; and the fish have a great affinity with those of the rivers and lakes of east Africa. The neighbourhood of the Dead sea is very barren. It reaches the lake at 1,290 ft. below the level of the Mediterranean, the depression continuing downwards to twice that depth in the bed of the Dead sea. From the left the Jordan receives the Yarmuk (Hieromax) which flows in from the volcanic water bearing Jaulan a little south of the Sea of Galilee, and the Jabbok (Zerka) which comes from the Belka district to a point more than half-way down the lower course. On the right the Jalud descends from the plain of Esdraelon to near Beisan, and the Fara from near Nablus. Various salt springs rise in the lower valley. The rest of the tributaries are wadis, dry except after rains.

JORDANES (*fl. c.* 550), the historian of the Gothic nation. In his history of the Goths (cap. 50), he tells us that his grandfather Paria was notary to Candac, the chief of a confederation of Alans and other tribes settled during the latter half of the 5th century on the south of the Danube, and that he himself was the notary of Candac's nephew, the Gothic chief Gunthigis, until he became a monk. He belonged to a confederation of Germanic tribes, embracing Alans and Scyrians, which had come under the influence of the Ostrogoths settled on the lower Danube. He is accordingly friendly to the Goths, even apart from the influence of Cassiodorus, to whom he is largely indebted for his material; but he is also prepossessed in favour of the eastern emperors in whose territories this confederation lived. This makes him an impartial authority on the last days of the Ostrogoths. His interests lie, as Mommsen says, within a triangle of which the three points are Sirmium, Larissa and Constantinople.

We pass from the shadowy personality of Jordanes to his works.

1. The *Romana,* or, as he himself calls it, *De summa temporum vel origine actibusque gentis Romanorum,* was composed in 551. It was begun before, but published after, the *Getica.* It is *a* sketch of the history of the world from the creation, based on Jerome, the epitome of Florus, Orosius and the ecclesiastical history of Socrates, but it is valuable only for Jordanes's own period.

2. The other work commonly called *De rebus Geticis* or *Getica,* was styled by its author, *De origine actibusque Getarum.* He informs us that while he was engaged upon the *Romana* a friend named Castalius invited him to compress the twelve books—now lost—of the senator Cassiodorus, on *The Origin and Actions of the Goths.* Jordanes professes to have had this work for but three days, and to reproduce the sense not the words; but his book evidently contains long verbatim extracts. The preface is also taken almost word for word from Rufinus's translation of Origen's commentary on the epistle to the Romans. In the 18 years which elapsed between 533, the date when Cassiodorus finished his work, and the composition of the *Getica* of Jordanes, great events, most disastrous for the Romano-Gothic monarchy of Theodoric, had taken place. It was no longer possible to write as if the whole civilization of the Western world would sit down contentedly under the shadow of East Gothic dominion and Amal sovereignty. And, moreover, the instincts of Jordanes, as a subject of the Eastern Empire, predisposed him to flatter Justinian who had overthrown the barbarian kingdom in Italy. Hence we perceive two currents in the *Getica.* On the one hand, as a transcriber of the philo-Goth Cassiodorus, he magnifies the race of Alaric and Theodoric, and on the other hand he speaks of the great anti-Teuton emperor Justinian, and of his reversal of the German conquests of the 5th century, in language which would have grated on the ears of Totila and his heroes.

The *Getica* falls naturally into four parts. The first (chs. i.–xiii.) gives a geographical description of the three-quarters of the world, and in more detail of Britain and Scanzia (Sweden), from which the Goths under their king Berig migrated to the southern coast of the Baltic. Their migration across what has since been called Lithuania, and their differentiation into Visigoths and Ostrogoths, are next described. The second section (chs. xiv.–xxiv.) sets forth the genealogy of the Amal kings, and describes the inroads of the Goths into the Roman Empire in the 3rd century, with the foundation and the overthrow of the kingdom of Hermanric. The third section (chs. xxv.–xlvii.) traces the history of the West Goths from the Hunnish invasion to the downfall of the Gothic kingdom in Gaul under Alaric II. (376–507), the best part being the seven chapters devoted to Attila's invasion of Gaul and the battle of the Mauriac plains. The fourth section (chs. xlviii.–lx.) traces the history of the East Goths from the same Hunnish invasion to the first overthrow of the Gothic monarchy in Italy (376–539).

Jordanes has preserved extremely precious information. The Teutonic tribes whose dim origins he records have in the course of centuries attained to world-wide dominion. The battle in the Mauriac plains of which he is really the sole historian, is now seen to have had important bearings on the destinies of the world. Thus the hasty pamphlet of a half-educated Gothic monk has been forced into prominence, almost into rivalry with finished classical productions.

The classical edition of the above works is that of Mommsen (in

Mon. Germ. hist. auct. antiq., v., 1882), which supersedes the older editions, such as that in Muratori's *Scriptt. rer. Ital.*, vol. i. *See* Von Sybel, *De fontibus Jordanis* (1838); Schirren, *De ratione quae inter Jordanem et Cassiodorum intercedat Commentatio* (Dorpat, 1858); Kopke's *Die Anfange des Königthums bei den Gothen* (1859); Dahn's *Die Konige der Germanen*, vol. ii (Munich, 1861); Ebert's *Geschichte der Christlich-Lateinischen Literatur* (Leipzig, 1874); Wattenbach's *Deutschlands Geschichtsquellen im Mittelalter* (1877); and the introduction of Mommsen to his edition.

JORDANUS CATALANI (d. after 1330), French Dominican missionary and explorer in Asia. He went to the east in 1302, and in 1321 he was on his way to China when his fellow missionaries were massacred at Tana near Bombay. After working in Gujarat and at Suali near Surat, he revisited Europe in 1328. In 1330 he was appointed bishop of Columbum (Quilon) in Travancore. He wrote several letters, and the *Mirabilia* (Eng. trans. by H. Yule, 1863), with excellent information on India.

See C. R. Beazley, *The Dawn of Modern Geography*, vol. 3, pp. 215–235 (1906). (H. C. G.)

JORGA, NICOLAS (1871–1940), Rumanian historian and statesman, was born at Botosani on June 17, 1871, and studied in Jassy, Paris, Berlin and Leipzig. In 1894 he was appointed professor of universal history at the University of Bucharest. Jorga made extensive researches in libraries and archives abroad and collected notes referring to the history of the Rumanian nation. As a result of his researches, he published over 20.000 documents in the *Annals* of the Rumanian Academy, of which he became one of the most prominent members. He was also associate professor at the Sorbonne, and holder of many foreign distinctions.

Jorga produced innumerable biographical and historical works, as well as many volumes on Rumanian art, towns, monasteries and historical monuments. He wrote several plays (historical dramas and comedies) which form part of the repertory of the Rumanian national theatres. He became also the director of *Neamul Românesc*, the official organ of the National Rumanian party. Jorga was for many years the chief of the nationalist party, which later combined with other political groups to form the National Rumanian party. He was prime minister from April 1931 to May 1932. Among his best known works are: *Geschichte des rumänischen Volkes* (1905); *Geschichte des osmanischen Reiches* (5 vol., 1908, etc.); *The Byzantine Empire* (Eng. trans. by A. H. Powles, 1907); *Histoire des ktats balcaniques jusqu'à 1924* (1925), and a *History of Rumania* (Eng. trans. 1925). He was killed in Nov. 1940, in the purges following the abdication of King Carol.

JORIS, DAVID, the common name of JAN JORISZ or JORISZOON (*c.* 1501–1556), Anabaptist heresiarch who called himself later JAN VAN BRUGGE; was the son of Georgius Joris de Koman, otherwise Joris van Amersfoordt, of Delft. In the year 1524 he began to issue appeals in prose and verse against the Mass and against the pope as antichrist. On Ascension Day 1528 he committed an outrage on the Eucharist carried in procession; he was placed in the pillory, had his tongue bored, and was banished from Delft for three years. He turned to the Anabaptists. was rebaptized in 1533, and for some years led a wandering life. He came into relations with Jan Laski, and with Menno Simons. Much influenced by Melchior Hofmann, he had no sympathy with the fanatic violence of the Munster faction. At the Buckholdt conference in August 1536 he played a mediating part. His mother, in 1537. suffered martyrdom as an Anabaptist. Soon after he took up the role of a new Messiah. From April 1. 1544, bringing with him some of his followers, he lived in Basel, which was to be the New Jerusalem, under the name of Jan van Brugge. His writings all in Dutch amounted to over zoo in number. His *magnum opus* was *'T* Wonder *Boeck* (*n.d.* 1542, 2 pts.; 1551, 4 pts.; both editions anonymous). He died on Aug. 25, 1556, and was buried, with all religious honours, in the church of St. Leonard, Basel. Three years later, Nicolas Blesdijk denounced the dead man to the authorities of Basel. An investigation took place in 1559, a conviction for heresy followed, and the exhumed body of Jorisz was burned, together with his portrait.

See P. Burckhardt, *Basler Biographien* (1900); Hegler, in Hauck's *Realencyklopädie* (1901), and the bibliography by A. van der Linde, 1867, supplemented by E. Weller, 1869.

JOSEL OF ROSHEIM (JOSELMANN, JOSELIN; JOSEPH BEN GERSHON LOANS) (*c.* 1478–1554), Jewish leader and diplomatic spokesman *(shtadlan)* in Germany. Born to a family which had included several martyrs of a "blood accusation" in Endingen, Baden, Josel early realized the precarious status of German Jewry, caught between rival imperial, princely and municipal sovereignties. Although never officiating as a rabbi, he was learned enough in the principles of Judaism to challenge Martin Luther and other theologians to public debates and to write a Hebrew apologetic treatise, *An Epistle of Comfort*. Josel's main achievements, however, were diplomatic. He found listeners at the imperial court, which, through him, sought to strengthen its own hold over the Jewish communities. An imperial decree of 1545 styled Josel the "commander of all our Jewry in the Holy Empire." Soon after the coronation in 1530 of the emperor Charles V, Josel presented him a memorandum defending the Jews against the widespread accusation of their alliance with the expansive Ottoman empire, and he later secured a number of significant imperial decrees for German Jewry. He was less effective in his negotiations with the electors of Brandenburg and Saxony and other princes. Josel exercised also considerable influence on the inner affairs of German Jewry. In connection with the Diet of Augsburg of 1530 he convoked an assembly of representatives of all German-Jewish communities, whose decisions he formally submitted to the Diet.

Josel's writings, including his *Memoirs*, are only partially preserved in the excerpts published in Joseph Hahn's *Yosif Omez*.

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JOSEPH, in the Old Testament, the son of the patriarch Jacob by Rachel and the name of a tribe of Israel. Unlike the other "sons" of Jacob, Joseph is usually reckoned as two tribes (viz., his "sons," Ephraim and Manasseh), and closely associated with them is the small tribe of Benjamin, which lay immediately to the south. These three constituted the "sons" of Rachel, and with the "sons" of Leah are thus on a higher level than the "sons" of Jacob's concubines. The "house of Joseph" and its offshoots occupied the centre of Palestine from the plain of Esdraelon to the mountain country of Benjamin, with dependencies in Bashan and northern Gilead. Practically it comprised the northern kingdom. and the name is used in this sense in II Sam. xix. 20; Amos, v. 6 and vi. 6; the extension of the term being parallel to the development of the name Jacob. The story of the tribal ancestor is recounted in Gen. xxxvii, 1. Joseph, the younger and envied son is seized by his brothers at Dothan and is sold to a party of Ishmaelites or Midianites, who carry him to Egypt. After various vicissitudes he gains the favour of the king of Egypt by the interpretation of a dream. and obtains a high place in the kingdom. Forced by a famine, his brothers come to buy food. and in the incidents that follow Joseph shows his preference for his young brother Benjamin *(cf.* the tribal data above). Jacob is invited to come to Goshen. where a settlement is provided for the family and their flocks. This is followed many years later by the exodus. the conquest of Palestine, and the burial of Joseph's body in the grave at Shechem which his father had bought. *See* also TWELVE TRIBES OF ISRAEL. (T. H. R.)

JOSEPH, in the New Testament the husband of Mary. His genealogy appears in Matt. i., 1–17 and Luke iii., 23–38. The former. obviously artificial in structure (notice 3×14 generations), traces the Davidic descent through Kings to prove the Messianic claim. The facts concerning Joseph, common to the birth-narratives (Matt, i.–ii.. Luke i.–ii.), are *(a)* that he was a descendant of David; *(b)* that Mary was already betrothed to him at the birth of Jesus; and *(c)* that after the birth he lived at Nazareth; but these facts are handled differently, Joseph being prominent in Matt. but completely subordinated in Luke. At Nazareth Joseph followed the trade of a carpenter or builder (Matt. xiii.. 55), and probably died before the public ministry of Christ began (cf. John xix, 26). Against Cerinthus and the modern rationalist

school, Christian tradition as a whole testifies to Joseph's virginity before and after his marriage with Mary. The statement of the *Protoevangel of James*, hesitantly accepted by Origen and a few Fathers, that "the brethren of Jesus" were sons of Joseph by a former marriage, is quite untenable. In the Roman Catholic Church, March 19 is a Feast in Joseph's honour, as well as the Third Wednesday after Easter (the patronage, St. Joseph being the patron of the whole Church); Jan. 23 commemorates the betrothal of Mary and Joseph. *See* further JOHN, SAINT (the Baptist) for Birth-Narratives.

JOSEPH I. (1678–1711), Roman emperor, elder son of the emperor Leopold I. and his third wife, Eleanora, was born in Vienna on July 26, 1678. In 1687 he received the crown of Hungary, and he was elected king of the Romans in 1690. In 1699 he married Wilhelmina Amalia of Brunswick-Luneburg, by whom he had two daughters. In 1702, on the outbreak of the War of the Spanish Succession, he joined the imperial general Louis of Baden in the siege of Landau. He succeeded his father as emperor in 1705, and during his reign the imperial general Prince Eugène, either acting alone in Italy or with the duke of Marlborough in Germany and Flanders, defeated the armies of Louis XIV. Hungary was disturbed by the conflict with Francis Rickóczy II., who eventually took refuge in France. The conflict was ended by the peace of Szatmar (1711). The emperor reversed many of the pedantically authoritative measures of his father, but he fought stoutly for what he believed to be his rights. Joseph showed himself hostile to the Jesuits, by whom his father had been much influenced. He began the attempts to settle the question of the Austrian inheritance by a pragmatic sanction *(see* HABSBURG [HAPSBURG]), which were continued by his brother Charles VI. Joseph died in Vienna on April 17, 1711, of small-pox. He was a good musician; his musical works, with those of Ferdinand III. and Leopold I. were edited in 1892–93 by G. Adler.

See F. Krones von Marchland, *Grundriss der Oesterreichischen Geschichte* (1882); *F.* Wagner, *Historia Josephi Caesaris* (1746); J. C. Herchenhahn, *Geschichte der Regierung Kaiser Josephs I.* (1786–89); C. van Noorden, *Europäische Geschichte im 18. Jahrhundert* (1870–82).

JOSEPH II. (1741–1790), Roman emperor, eldest son of the empress Maria Theresa and her husband Francis I., was born on March 13, 1741, in the first stress of the War of the Austrian Succession. Maria Theresa gave orders that he was only to be taught as if he were amusing himself; the result was that he acquired a habit of crude and superficial study. He derived his real education from the writings of Voltaire and the encyclopaedists and from the example of Frederick the Great. Government officials instructed him in the mechanical details of the administration of the Austrian hereditary lands. In 1761 he was made a member of the newly constituted council of State (*Staatsrath*) and began to draw up memoranda (*Reveries*) for his mother to read. These papers contain the germs of his later policy. He was a friend to religious toleration, anxious to reduce the power of the church, to relieve the peasantry of feudal burdens, and to remove restrictions on trade and on knowledge. So far he did not differ from Frederick, Catherine of Russia or his own brother and successor Leopold II., all enlightened rulers of the 18th-century stamp. Where Joseph differed from great contemporary rulers was in the fanatical intensity of his belief in the power of the State when directed by reason, of his right to speak for the State uncontrolled by laws, and of the reasonableness of his own reasons.

After the death of his father in 1765 he became emperor and was made co-regent by his mother in the Austrian dominions, but until his mother's death his activity was limited to the army, foreign affairs, and a limited jurisdiction in the administration of justice. Maria Theresa was resolved that neither husband nor son should ever deprive her of sovereign control in her hereditary dominions. Joseph, by threatening to resign his place as co-regent, could induce his mother to abate her dislike to religious toleration. He could, and he did, place a great strain on her patience and temper, as in the case of the first partition of Poland and the Bavarian War of 1778, but in the last resort the empress spoke the final word. During these wars Joseph met Frederick the Great privately at Neisse in 1769, and again at Mährisch-Neustadt in 1770. On the second occasion he was accompanied by Prince Kaunitz, whose conversation with Frederick may be said to mark the starting-point of the first partition of Poland. To this and to every other measure which promised to extend the dominions of his house Joseph gave hearty approval. Thus he was eager to enforce its claim on Bavaria upon the death of the elector Maximilian Joseph in 1777. In April of that year he paid a visit to his sister the queen of France *(see* MARIE ANTOINETTE), travelling under the name of Count Falkenstein. His observations led him to predict the approaching downfall of the French monarchy, and he was not impressed favourably by the army or navy. In April 1780 he paid a visit to Catherine of Russia, against the wish of his mother.

The death of Maria Theresa on Nov. 27, 1780, left Joseph free. He immediately directed his Government on a new course, full speed ahead. He proceeded to attempt to realize his ideal of a paternal despotism acting on a definite system for the good of all. He completed the emancipation of the serfs begun by his mother. Other changes were the spread of education, the secularization of church lands, the reduction of the religious orders and the clergy to complete submission to the lay State, and the promotion of unity by the compulsory use of the German language. He established asylums, hospitals, orphanages, and training institutions. He settled German colonists in Hungary and on the Slav lands of the Empire. Joseph also sought to realize large reforms in taxation and in the administration of justice. His anti-clerical innovations (*Josephiomus*) induced Pope Pius VI. to pay him a visit in July 1782. Joseph received the pope politely, and showed himself a good Catholic, but refused to be influenced.

Joseph's anti-clerical policy and his interference with ancient custom caused unrest in the hereditary lands of the empire. Meanwhile he adopted a succession of foreign policies all aimed at aggrandisement, and all equally calculated to offend his neighbours—all taken up with zeal, and dropped in discouragement. He endeavoured to get rid of the Barrier Treaty. which debarred his Flemish subjects from the navigation of the Scheldt; when he was opposed by France he turned to other schemes of alliance with Russia for the partition of Turkey and Venice. They also had to be given up in the face of the opposition of neighbours, and in particular of France. Then he resumed his attempts to obtain Bavaria—this time by exchanging it for Belgium—and only provoked the formation of the *Fürstenbund* organized by the king of Prussia. Finally he joined Russia in an attempt to pillage Turkey, beginning with an unsuccessful attempt to surprise Belgrade in time of peace. In the Turkish campaign of 1788 he accompanied his army, but showed no capacity for war. In November he returned to Vienna with ruined health, and during 1789 was a dying man. The concentration of his troops in the east gave the malcontents of Belgium an opportunity to revolt. In Hungary the nobles were all but in open rebellion, and in his other States there were peasant risings, and a revival of particularist sentiments. Joseph was left entirely alone. His minister Kaunitz refused to visit his sick-room, and did not see him for two years. His brother Leopold remained at Florence. At last Joseph, worn out and broken-hearted, recognized that his servants could not, or would not, carry out his plans. On Jan. 30, 1790, he formally withdrew all his reforms, and he died on Feb. 20.

Joseph II. was twice married, first to Isabella (d. 1763), daughter of Philip, duke of Parma, to whom he was attached. After her death, a political marriage was arranged with Josepha (d. 1767), daughter of Charles Albert, elector of Bavaria (the emperor Charles VII.). It proved extremely unhappy. Joseph left no children, and was succeeded by his brother Leopold II.

Many volumes of the emperor's correspondence have been published Among them are *Maria Theresia und Joseph II. Ihre Korrespondenz samt Briefen Josephs an seinen Bruder Leopold* (1867–68); *Joseph II. und Leopold von Toskana. Ihr Briefwechsel 1781–1790* (1872); *Joseph II. und Katharina von Russland. Ihr Briefwechsel* (1869); and *Maria Antoinette, Joseph II. und Leopold II. Ihr Briefwechsel* (1866); all edit. by A. Ritter von Ameth. Other collections are: *Joseph II., Leopold II. und Kaunitz, Ihr Briefwechsel*, edit. by A. Beer (1873); *Correspondances intimes de l'empereur Joseph II. avec son ami, le comte de*

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JOSEPH, former Archduke of Austria (1872–), Austro-Hungarian field-marshal, was born at the chateau of Alcsuth in Hungary on August 9, 1872, the son of the Archduke Joseph and Marie Clotilde of Saxe-Coburg. The prince belongs to the "Hungarian branch" of the House of Habsburg-Lorraine, and is a nephew of the last Palatine of Hungary, the Archduke Stephen. Joseph took over at the outbreak of the World War the post of commander of the VII. Army corps and fought against Serbia, then in the Carpathians, and in Poland against Russia; subsequently he commanded the IX. Corps in nine battles on the Isonzo, then commanded on the Russian front, extending from the south-east corner of Transylvania along the ridges of the Carpathians as far as the Upper Theiss, and finally was leader of the V. Army against Italy. He displayed most conspicuous personal bravery, and understood in a remarkable degree how to attach the troops to his person. At the outbreak of the revolution he conducted negotiations, as *homo regius,* between King Charles and the Karolyi party (see HUNGARY). After the fall of the Soviet Republic he was at first made Regent of Hungary (Aug.–Sept. 1919), but was compelled to retire owing to the intervention of the Entente Powers, who would not permit any Habsburg to hold a commanding position in Hungary. He married in 1893 the Princess Augusta of Bavaria.

JOSEPH, FATHER (FRANÇOIS LECLERC DU TREMBLAY) (1577–1638), French Capuchin monk, the confidant of Richelieu, eldest son of Jean Leclerc du Tremblay, president of the chamber of requests of the parlement of Paris, served in the army and in diplomacy until 1599, vhen he entered the Capuchin monastery of Orleans, and became a notable preacher and reformer. In 1606 he aided Antoinette d'Orléans, a nun of Fontevrault, to found the reformed order of the Filles du Calvaire, and wrote a manual of devotion for the nuns. His proselytizing zeal led him to send missionaries throughout the Huguenot ccntres—he had become provincial of Touraine in 1613. At the conferences of Loudun he opposed the Gallican claims advanced by the parlement, which the princes were upholding. In 1612 he began close personal relations with Richelieu which have indissolubly joined in history and legend the cardinal and the "Eminence grise." As Richelieu's agent he manoeuvred at the diet of Regensburg (1630) to thwart the aggression of the emperor, and then advised the intervention of Gustavus Adolphus, reconciling himself to the use of Protestant armies by the theory that one poison would counteract another. He died in 1638, just as the cardinalate was to be conferred upon him.

See Fagniez, *Le Père Joseph et Richelieu* (1894).

JOSEPH OF ARIMATHAEA (presumably the Ramathaim of 1 Macc. xi. 34 and the Ramathaim-Zophim of 1 Sam. i. 1, in the hill country of Ephraim), according to all four Gospels buried Jesus Christ. According to Mark he was an honourable councillor (εὐσχήμων βουλευτής), who was waiting for the Kingdom of God. The Sabbath was approaching, *i.e.*, it was nightfall on Friday afternoon, and had he not intervened the body would have been left for more than 24 hours. The law of Deut. xxi. 23 ordered that the body of a malefactor hung on a tree should not remain there all night. Joseph went to Pilate and got leave to bury the body. He did this with reverence and laid it in a rock-hewn tomb, rolling a stone in front of the entrance. There is no reason to think that he was a disciple of Jesus. Respect for the law is sufficient motive. His approach to Pilate is more intelligible if he was a member of the Sanhedrin or acting on their instructions. He used the nearest tomb; to search for a suitable one at a distance might have entailed breaking the Sabbath.

Such is Mark's story (xv. 42–46), which it is excessive scepticism to doubt. The later narratives add nothing of historical value. Luke and John have access to good Jerusalem tradition for the closing scenes of the Gospel story, but neither they nor Matthew seem to have any other source than Mark for the burial. Their additions and variations must therefore be attributed to the natural growth of Christian tradition. Matthew makes Joseph a rich man and a disciple of Jesus, and the tomb his own new one. Luke makes it clear that he was a member of the Sanhedrin, who had not consented to the condemnation. John says that he was a secret disciple and that Nicodemus was associated with him in the burial. In a later tradition, "the Gospel of Peter," Joseph is a friend of Pilate and arranges with him for the burial before the Crucifixion.

In a picturesque legend Joseph is said to have come to Britain and constructed the first Christian church in the land on an island in Somerset, afterwards Glastonbury. The passages in William of Malmesbury which contain the legend are said by J. A. Robinson in his *Two Glastonbury* Legends to be interpolations. In any case they belong to the realm of poetry rather than genuine tradition.

(W. K. L. C.)

JOSEPHINE (MARIE ROSE JOSEPHINE TASCHER DE LA PAGERIE) (1763–1814), empress of the French, was born in the island of Martinique June 23, 1763, being the eldest of three daughters of Joseph Tascher de la Pagerie, lieutenant of marines. She married in 1779 Viscount Alexandre Beauharnais. There were two children of the marriage, Eugène and Hortense Eugénie (see BEAUHARNAIS). After a visit to her native island Josephine returned to Paris and made some sensation in society. As the Revolution ran its course her husband, as an ex-noble, incurred the suspicion and hostility of the Jacobins; and his ill-success at the head of a French army on the Rhine led to his arrest and execution. Josephine was left in a position of much perplexity and some hardship, but Paul Barras and Madame Tallien assisted her, and she was one of the queens of Parisian society in the year 179j, when Napoleon Bonaparte's fame was beginning. His nomination to the command of the army of Italy appears to have decided her to marry him. The civil marriage took place March 8, 1796, two days before the bridegroom set out for his command. Josephine declined to accompany him to Nice and Italy.

Bonaparte's letters to Josephine during the campaign reveal the ardour of his love, while she rarely answered them. During his absence in Egypt in 1798–99, her relations to an officer, Hippolyte Charles, were most compromising; and Bonaparte on his return thought of divorcing her. Her tears and the entreaties of Eugène and Hortense brought about a reconciliation; and during the period of the consulate (1799–1804) their relations were on the whole happy, though Napoleon's conduct now gave his consort grave cause for concern. His brothers and sisters more than once begged him to divorce Josephine, and from the time when he became first consul for life (August 1802) with large powers over the choice of a successor, he kept open the alternative of a divorce. Josephine's anxieties increased on the proclamation of the Empire (May 18, 1804); and on the 1st of December 1804, the eve of the coronation at Notre Dame, she gained her wish that she should be married anew to Napoleon with religious rites: Despite Josephine's care, Napoleon procured omission of one formality, the presence of the parish priest; but at the coronation scene Josephine appeared radiant with triumph over her envious relatives. The august marriages contracted by her children Eugène and Hortense seemed to establish her position; but her ceaseless extravagance and, above all, the impossibility that she should bear a son strained the relations between Napoleon and Josephine. She complained of his infidelities and growing callousness. The end came in sight after the campaign of 1809, when Napoleon caused the announcement to be made to her that reasons of state compelled him to divorce her. Despite all her pleadings he held to his

resolve. The most was made of the slight technical irregularity at the marriage ceremony of Dec. 5, 1804; and the marriage was declared null and void. At her private retreat, La Malmaison, near Paris, which she had beautified with curios and rare plants and flowers, Josephine closed her life in dignified retirement. Napoleon more than once came to consult her upon matters in which he valued her tact and good sense. She died May 29, 1814.

See M. A. Le Normand, *Mémoires historiques et secrets de Joséphine* (2 vols., 1820); *Lettres de Napoléon à Joséphine* (1833); J. A. Aubenas, *Hist. de l'impératrice Joséphine* (2 vols., 1858–59); J. Turquan, *L'Impératrice Joséphine* (2 vols., 1895–96); F. Masson, *Joséphine* (3 vols., 1899–1902); *Napoleon's Letters to Josephine* (1796–1812), translated and edited by H. F. Hall (1903); P. W. Sergeant, *The Empress Josephine* (1908); Gérard d'Houville, *La vie amoureuse de l'impératrice Joséphine* (1925); Walter Geer, *Napoleon and Josephine, The Rise of the Empire* (1924); Ida M. Tarbell, *A Life of Napoleon Bonaparte, with a Sketch of Josephine, Empress of the French*, 2nd ed. (1926).

JOSEPHUS, FLAVIUS (A.D. 37–95?), Jewish historian and military commander, born in the first year of Caligula (37–38). A precocious student of the Law, he made trial of the three sects of Judaism — Pharisees, Sadducees and Essenes — before he reached the age of nineteen. Then, having spent three years in the desert with the hermit Banus, who was presumably an Essene, he became a Pharisee. In 64 he went to Rome to intercede on behalf of some priests, his friends, whom the procurator Felix had sent to render account to Caesar for some insignificant offense. Making friends with Alityrus, a Jewish actor, who was a favourite of Nero, Josephus obtained an introduction to the empress Poppaea and effected his purpose by her help. His visit to Rome enabled him to speak from personal experience of the power of the Empire, when he expostulated with the revolutionary Jews on his return to Palestine. But they refused to listen; and he, with all the Jews who did not fly the country, was dragged into the great rebellion of 66. In company with two other priests, Josephus was sent to Galilee under orders (he says) to persuade the ill-affected to lay down their arms and return to the Roman allegiance, which the Jewish aristocracy had not yet renounced. Having sent his two companions back to Jerusalem, he organized the forces at his disposal, and made arrangements for the government of his province. His obvious desire to preserve law and order excited the hostility of John of Giscala, who endeavoured vainly to remove him as a traitor to the national cause by inciting the Galileans to kill him and by persuading the Sanhedrin at Jerusalem to recall him. In the spring of 67 the Jewish troops, whom Josephus had drilled so sedulously, fled before the Roman forces of Vespasian and Titus. He sent to Jerusalem for reinforcements, but none came. With the stragglers who remained, he held a stronghold against the Romans by dint of his native cunning, and finally, when the place was taken, persuaded forty men, who shared his hiding-place, to kill one another in turn rather than commit suicide. They agreed to cast lots, on the understanding that the second should kill the first and so on. Josephus providentially drew the last lot and prevailed upon his destined victim to live. Their companions were all dead in accordance with the compact; but Josephus at any rate survived and surrendered. Being led before Vespasian, he was inspired to prophesy that Vespasian would become emperor. When his prophecy was fulfilled he was liberated, assumed the name of Flavius, the family name of Vespasian, and accompanied his patron to Alexandria. He returned to Rome, was awarded a pension, and was made a Roman citizen, receiving an estate in Judaea.

WORKS.—1. *The Jewish War* (Περὶ τοῦ Ἰουδαϊκοῦ πολέμου), the oldest of Josephus' extant writings, was written towards the end of Vespasian's reign (69–79).

2. *The Jewish Antiquities* (Ἰουδαϊκὴ Ἀρχαιολογία) covers in twenty books the history of the Jews from the creation of the world to the outbreak of the war with Rome. It was finished in the thirteenth year of Domitian (93).

3. Josephus wrote a narrative of his own *Life* in order to defend himself against the accusation brought by his enemy Justus of Tiberias to the effect that he had caused the Jewish rebellion.

4. The two books *Against Apion* are a defence or apology directed against current misrepresentations of the Jews. Earlier titles are *Concerning the Antiquity of the Jews* or *Against the Greeks*.

The Greek text of Josephus was edited by B. Niese (Berlin, 1885–95), S. A. Naber (Leipzig, 1888–96), and H. St. John Thackeray and R. Marcus (*Loeb Classical Library*, with a new translation to supersede the standard English version by W. Whiston [1737]). For bibliography, *see* Schürer's *History of the Jewish People* and the *Universal Jewish Encyclopedia*. (J. H. A. H.; X.)

JOSHUA, BOOK OF, the sixth book of the Old Testament, and the first of the group known as the "Former Prophets." It takes its name from Joshua the son of Nūn, an Ephraimite who, on the death of Moses, assumed the leadership to which he had previously been designated by his chief (Deut. xxxi. 14 *seq.*, 23), and proceeded to the conquest of the land of Canaan. The book differs from the Pentateuch in the absence of legal matter, and in its intimate connection with the narrative in the books which follow. It is, however, the proper sequel to the origins of the people as related in Genesis, to the exodus of the Israelite tribes from Egypt, and their journeyings in the wilderness. On these and also on literary grounds it is often convenient to class the first six books of the Bible as a unit under the term "Hexateuch" (*q.v.*), for an exhaustive detailed study has revealed many signs of diversity of authorship which combine to show that the book is due to the incorporation of older material in two main redactions; one deeply imbued with the language and thought of Deuteronomy itself (D), the other of the post-exilic priestly circle (P) which gave the Pentateuch its present form. That the older sources (which often prove to be composite) are actually identical with the Yahwist or Judaean (J) and the Elohist or Ephraimite (E) narratives (on which *see* BIBLE: *Old Testament*) is not impossible, though still uncertain.

The book falls naturally into two main parts, of which the first, the crossing of the Jordan and the conquest of Palestine (i.–xii.), is mainly due to Deuteronomic compilers. It opens with the preparations for the crossing of the Jordan and the capture of the powerful city, Jericho. Ai, near Bethel, is taken after a temporary repulse, and Joshua proceeds to erect an altar upon Mt. Ebal (north of Shechem). The erection of the altar, not at the scene of battle (*cf.* 1 Sam. xiv. 35) but on Mt. Ebal (viii. 30–35, D), presupposes the conquest of central Palestine and the removal of the ark from Gilgal. These, however, are not narrated, and unless some account of them has been replaced by the present passage, this portion of the conquest was ignored. Possibly the passage is not in its original position: in the Septuagint it appears after ix. 2, while Josephus (*Ant.* v. 1, 19) and the Samaritan Book of Joshua read it before ch. xiii.; Dillmann, however, would place it after xi. 23. The capture of Jericho and Ai is followed by the successful stratagem of the Gibeonites to make peace with Israel (ix.). This involved them in a war with a south Canaanite coalition and Joshua obtains a crowning victory. In x. 16–24 the kings of the south are pursued to Makkedah and slain, in *v.* 11 they are smitten by a great hailstorm in their flight to Azekah (*cf.* 1 Sam. vii. 10, xiv. 15, in the same district). Redactional links have been added, apparently by D, to whom is possibly due the stanza quoted from the Book of Jashar (v. 12 seq.), a poetical address to the sun and moon, of the nature of a prayer or spell for their aid (*cf.* Judges v. 20, and *see* Ecclus. xlvi. 4). The literal interpretation of this picturesque quotation has been influenced by the prosaic comments at the end of v. 13 and beginning of v. 14. The description of the conquest of the northern Canaanites is very similar to that of the south. The main part is from an older source (xi. 1, 4–9; *see* DEBORAH), the amplifications (*vv.* 2 *seq.*) are due to D, as also are the summary (*vv.* 10–23, cf. style of x. 28–43), and the enumeration of the total results of the invasion (xii.), which includes names not previously mentioned.

The result of the events narrated in the first part of the book is to ascribe the entire subjugation of Canaan to Joshua, whose centre was at Gilgal (x. 15, 43). He is now "old and advanced in years," and although much outlying land remained to be possessed, he is instructed to divide the conquered districts among the western tribes (xiii. 1 sqq.). This is detailed at length in the second part of the book. With the completion of the division his mission is accomplished. The main body of this part (xiii. 15–xiv. 5; xv.–xvii.; xviii. 11–xxi. 42; xxii. 7–34) is in its present form almost entirely due to P. As regards details, P's account of the altar beyond the Jordan (*see* xxii. 34) is apparently a late re-writing of some now obscure incident to emphasize the unity of worship. The

account of the distribution of land among the nine and *a half* tribes by Eleazar and Joshua (from xiv. 1–5 to xix. 51) appears to have been on the lines laid down in Num. xxxiv. (P). The scene, according to xviii. 1, is Shiloh, and this verse, which does not belong to the context, should apparently precede P's narrative in xiv. 1. But of the occupation of Shiloh, the famous Ephraimite sanctuary and the seat of the ark, we have no information. The older source, however, presupposes that Judah and the two Joseph tribes have acquired their territory; the remaining seven are blamed for their indifference (xviii. 2–10), and receive their lot conjointly at the camp at *Shiloh*. But if the location is an attempt to harmonize with xviii. 1, Gilgal should probably be restored. The section xviii. 2–10 is followed by xxi. 43 seq. and may have been preceded originally by xiii. 1, 7 (where read: inheritance for the seven tribes); in its present form it appears to be due to D. Another account of the exploits of Judah and Joseph can be traced here and there; *e.g.*, in xiv. 6–15 (where Caleb receives Hebron as his inheritance and the "land had rest from war"), and xvii. 14–18 (where Joseph receives an additional lot); but where these traditions have not been worked into later narratives, they exist only in fragmentary form. They are characterized by the view that the conquest was neither the work of a single man nor at his instigation. but due entirely to individual or tribal achievements. This view can be traced in xiii. 13, xv. 63 (*cf.* the parallel Judges i. 21 in contrast to v. 8), xvi. 10 (Judges i. 29), xvii. 11–13 (Judges i. 27 seq.), and in the references to separate tribal or family exploits: xv. 13–19, xix. 47 (*cf.* Judges i. 34 seq., xviii.).

Two closing addresses are ascribed to Joshua, one an exhortation similar to the homilies in secondary portions of Deuteronomy (xxiii.; cf. Moses in Deut. xxviii. seq., and Samuel's last address in 1 Sam. xii.), which virtually excludes the other (xxiv.), where Joshua assembles the tribes at Shechem (Shiloh, in the Septuagint) and passes under review the history of Israel from the days of heathenism (before Abraham was brought into Canaan) down through the oppression in Egypt, the exodus, the conquest in East Jordan and the occupation of Canaan. A few otherwise unknown details are to be found (xxiv. 2, 11 seq. 14). The address (which is extremely important for its representation of the religious conditions) presupposes the complete subjugation of the Canaanites. A solemn covenant, whereby the people agree to cleave to Yahweh alone, is commemorated by the erection of a stone under the oak by the sanctuary of Yahweh (for the tree with its sacred pillar, see Gen. xxxv. 4; Judges ix. 6). The people are then dismissed. and the book closes in ordinary narrative style with the death of Joshua and his burial in his inheritance at Timnath-serah in Mt. Ephraim (cf. xix. 49 seq.); the burial of Joseph in Shechem; and the death and burial of Eleazar the son of Aaron in the "hill of Phinehas."

Both Joshua xxiii. and xxiv. are closely connected with the very complicated introduction to the era of the "judges" in Judges ii. 6 seq., and ii. 6–9 actually resume Joshua xxiv. 28 seq., while the Septuagint appends to the close of Joshua the beginning of the story of Ehud (Judges iii. 12 seq.). Both Judges i.–ii. 5 and chap. xvii.–xxi. are of post-Deuteronomic insertion, and they represent conditions analogous to the older notices embedded in the later work of P (Judges i. 21, xix. 10–12, *cf.* Joshua, xv. 63). Moreover, P in its turn shows elsewhere definite indications of different periods and standpoints, and the fluid state of the book at a late age is shown by the presence of Deuteronomic elements in Joshua xx., not found in the Septuagint, and by the numerous and often striking readings which the latter recension presents.

The value of the book of Joshua is primarily religious; its conviction of the destiny of Israel and its inculcation of the unity and greatness of the God of Israel give expression to the philosophy of Israelite historians. As an historical record its value must depend upon a careful criticism of its contents in the light of biblical history and external information. Its description of the conquest of Canaan comes from an age when the event was a shadow of the past. It is an ideal view of the manner in which a Divinely appointed leader guided a united people into the promised land of their ancestors, and, after a few brief wars of extermination (x.–xii.), died leaving the people in quiet possession of their new inheritance (xi. 23; xxi. 44 *seq.;* xxiii. 1). To this there is, as Moore points out (Ency. **Bib.** col. 2608 n.2), an Instructive parallel in the Greek legends of the Dorian invasion of the Peloponnesus (the "return" of the Heracleidae, the partition of the land by lot, etc.). On the other hand the earlier inhabitants were not finally subjugated until Solomon's reign (1 Kings ix. 20); Jerusalem was taken by David from the Jebusites (2 Sam. v.), and several sites in its neighbourhood (including Gibeon, 2 Sam. xxi. 2), together with important fortresses like Gezer, Megiddo and Taanach, were not held by Israel at the first. There are traces of other conflicting traditions representing independent tribal efforts which were not successful, and the Israelites are even said to live in the midst of Canaanites, intermarrying with them and adopting their cult (Judges i.–iii. 6). From a careful consideration of all the evidence, both internal and external, biblical scholars are now almost unanimous that the more finished picture of the Israelite invasion and settlement cannot be accepted as a historical record for the age. It accords with this that the elaborate tribal-lists and boundaries prove to be of greater value for the geography than for the history of Palestine, and the attempts to use them as evidence for the early history of Israel have involved numerous additional difficulties and confusion.

The prominence of Joshua as military and religious leader, and especially his connection with Shechem and Shiloh, have suggested that he was a hero of the Joseph tribes of central Palestine (viz. Ephraim and Manasseh). But he probably had no place in the oldest narratives of the exodus; and only later sources add him to Caleb (Num. xiv. 30; the reference in Deut. i. 38 is part of an insertion), or regard him as the leader of all the tribes (Deut. iii. 21, 28). As an attendant of Moses at the tent of meeting he appears in quite secondary passages (Exod. xxxiii. 7–11; Num. xi. 28). His defeat of the Amalekites is in a narrative (Exod. xvii. 8–16) which belongs more naturally to the wilderness of Shur, and it associates him with traditions of a movement direct into south Palestine which finds its counterpart when the clan Caleb (*q.v.*) is artificially treated as possessing its seats with Joshua's permission.

BIBLIOGRAPHY.—*See* the commentaries or articles on Joshua by G. A. Smith, *Hastings's* D.B.; G. F. Moore, Ency. **Bib.;** H. W. Robinson, *Century* Bible; G. **A.** Cooke, ***Cambridge Bible;*** and Carpenter and Harford-Battersby, *Hexateuch,* ch. xvii. (S. A. C.)

JOSHUA THE STYLITE, the reputed author of a chronicle which narrates the history of the war between the Greeks and Persians in 502–506, and which is one of the earliest and best historical documents preserved to us in Syriac. The author was an eyewitness of many of the events which he describes, and must have been living at Edessa during the years when it suffered so severely from the Persian War.

The chronicle was first made known by Assemani's abridged Latin version (B.O. i. 260–283), and was edited in 1876 by the abbé Martin, and (with an English translation) by W. Wright, in 1882. After an elaborate dedication to a friend—the "priest and abbot" Sergius—a brief recapitulation of events from the death of Julian in 363, and a fuller account of the reigns of the Persian kings Pērōz (457–484) and Balāsh (484–488), the writer enters upon his main theme—the history of the disturbed relations between the Persian and Greek Empires from the beginning of the reign of Kawād I. (489–531), which culminated in the great war of 502–506.

JOSIAH, was the grandson of Manasseh, king of Judah (II Kings xxii. 1–xxiii. 30). He was born in 647 B.C., and ascended the throne after the assassination of his father Amon in 639. His reign witnessed the collapse of the Assyrian empire, whose last great king, Asshur-bani-pal, died in 626, and the final destruction of Nineveh. Egypt also was weak, and few kings of Judah since the days of Solomon can have been as independent as Josiah. It was, perhaps, this freedom from interference which enabled him to carry out in 621 a thorough religious reform, based on a book of law discovered in the Temple during some repairs, and commonly (though not now universally) identified with Deuteronomy or a part of it. The Temple at Jerusalem was purged of all foreign

cults, and dedicated wholly to the worship of Yahweh, and all local sanctuaries were abolished, sacrifice being concentrated at Jerusalem. (See DEUTERONOMY, JEREMIAH.)

Egypt, meanwhile, had revived, and the young king Necho made an effort to save the falling Assyrian empire. Josiah seems to have taken the opposite side, either secretly or openly. He met Necho during one of the latter's expeditions to Mesopotamia, and was put to death at Megiddo. The Chronicler (II Chron. xxxv. 20–24) speaks of a battle in which Josiah was killed by the Egyptian archers, but this may be a much later exaggeration of a slight skirmish in which his attendants were involved, and the Book of Kings does not in the least suggest an armed expedition.

Josiah was long remembered as approaching the Israelite ideal of monarchy, kindly, open and democratic in ways and spirit, and scrupulously fair in judicial procedure. (T. H. R.)

JOSIPPON, the name of a chronicle of Jewish history from Adam to Titus attributed to "Josippon" or Joseph ben Gorion (see Josephus, Bell. Jud., ii. 20. 3, with Whiston's notes). The name, once identified with Josephus, is perhaps a corruption of Hegesippus on whom (according to Tricher) the author drew largely. The chronicle was probably compiled in Hebrew early in the 10th century, by a Jew of south Italy. It was first printed at Mantua in 1476, and subsequently appeared in many forms, abridged or interpolated, one of the most popular being in Yiddish, with quaint illustrations. Though the chronicle is mainly legendary, the author probably used some good and ancient sources. Peter Morvyn in 1558 translated an abbreviated version into English, and many editions were asked for. Lucien Wolf has shown that the English translations of the Bible roused much interest among the Jews, and led to this wide circulation of Josippon, which thus bore a part in the chain of events that ended in the readmission of the Jews to England under Cromwell.

JOSQUIN DES PRÉS: see DESPRÈS, JOSQUIN.

JOSS, in the pidgin-English of Chinese seaports. the name given to idols and deities. It is used adjectivally in regard to many things connected with religious rites. such as "joss-house," a temple; "joss-stick," a stick which is burned as incense; "joss-paper," paper cut to resemble money (and sometimes with prayers written upon it) burned in funeral and other ceremonies "Joss" is possibly a corruption of the Portuguese *deos*, "god," applied by Portuguese navigators in the 16th century to the idols worshiped in the East Indies.

JOTA, a Spanish national dance. It is a form of waltz in ¾ time danced in couples and is usually accompanied with guitars, castanets and other instruments. The Jota takes many forms, each town having its own variation.

JOTUNHEIM or **JOTUN FJELDE,** a mountainous region of southern Norway, lying between Gudbrandsdal and Jostedalsbre. Within an area of about 950 sq.mi. it contains the highest mountain in the Scandinavian Peninsula—Glittertind (8,140 ft.)—and several others but little inferior. Such are Galdhöpiggen (8,100 ft.). and Memurutind (7.756 ft.); Knutshultind (7.677 ft.) and several other peaks exceeding 7,000 ft., to the south. between lakes Gjende and Bygdin, and Skagastolstind (7,890 ft.) in the west of the region, above the Utladal, the chief summit of the magnificent Horunger.

The upper parts of the main valleys are of characteristic form, not ending in lofty mountain-walls but comparatively low and level, and bearing lakes.

JOUBERT, BARTHÉLEMY CATHERINE (1769–1799), French general, was born at Pont de Vaux (Ain) on April 14, 1769. He joined the revolutionary army in 1791, and fought with the army in Italy in 1793. By the end of 1796 he was a general of division. He was in charge of the retaining force at the battle of Rivoli, and in the campaign of 1799 (invasion of Austria) he commanded the detached left wing of Bonaparte's army in Tirol, and fought his way through the mountains to rejoin his chief in Styria. He held various commands in Holland, on the Rhine and in Italy, where up to January 1799 he commanded in chief. Resigning the post in consequence of a dispute with the civil authorities, Joubert returned to France. He was almost immediately summoned to take over the command in Italy from Moreau; but he persuaded his predecessor to remain at the front and was largely guided by his advice. The odds against the French troops in the disastrous campaign of 1799 (see FRENCH REVOLUTIONARY WARS) were too heavy. Joubert and Moreau were compelled to give battle by Suvorov, and Joubert fell at the battle of Novi (Aug. 15, 1799). Joubert died before it could be shown whether his genius was of the first rank, but he was marked out as a future great captain by Napoleon, and his countrymen associated him with Hoche and Marceau as a great leader.

See Guilbert, *Notice sur* la *vie* de B. C. Joubert; Chevrier, *Le Général* Joubert *d'après* sa correspondance (2nd ed. 1884).

JOUBERT, JOSEPH (1754–1824), French moralist, born at Montignac (Correze) on May 6, 1754, is famous for the luminous criticism of literature and morals contained in the posthumous *Pensées, essais, maximes* et *correspondance* (2 vols., 1842), edited by his nephew, Paul de Raynal. Some part of this work was already known, for Chateaubriand, to whose charge Joubert had left his mss., had issued a selection for private circulation in 1838. He died May 3, 1824.

See Matthew Arnold, Essays in Criticism (1st series); Sainte-Beuve, *Causeries du* Lundi vol. i., and Portraits *littéraires* vol. ii.

JOUBERT, PETRUS JACOBUS (1834–1900), commandant-general of the South African republic from 1880 to 1900, was born at Cango, in the district of Oudtshoorn, Cape Colony, on Jan. 20, 1834, of a family of Huguenot origin. Left an orphan at an early age, Joubert migrated to the Transvaal, where he settled in the Wakkerstroom district near Laing's Nek and the north-east angle of Natal. There he farmed with great success, and studied law. He was elected to the *volksraad* as member for Wakkerstroom early in the sixties, Marthinus Pretorius being then in his second term of office as president. In 1870 Joubert was again elected, he became attorney-general of the republic, and in 1875 was acting president.

During the first British annexation of the Transvaal, Joubert was a consistent irreconcilable. In the war of 1880–81, he was commandant-general of the Boer forces and a member of the triumvirate that administered the provisional Boer Government set up in Dec. 1880 at Heidelberg. He was in command of the Boer forces at Laing's Nek, Ingogo, and Majuba Hill, and he conducted the earlier peace negotiations that led to the conclusion of the Pretoria convention.

In 1883 he was a candidate for the presidency of the Transvaal. but received only 1,171 votes as against 3,431 cast for Kruger. In 1893 he again opposed Kruger in the contest for the presidency, representing the progressive Boer elements. He was defeated by a small majority, 7,911 votes being cast for Kruger and 7,246 for Joubert. He stood again in 1898, but the Jameson raid had made Kruger's position impregnable. When war broke out with Great Britain Joubert assumed nomina! command of the operations, but he gave up to others the chief share in the direction of the war. His cautious nature had in early life gained him the sobriquet of "Slim Piet." He died at Pretoria on March 28, 1900.

JOUFFROY, THÉODORE SIMON (1796–1842), French philosopher. was born at Pontets, near Mouthe. At the normal school. Paris, he came under the influence of Victor Cousin, and in 1817 was appointed assistant professor of philosophy at the normal and Bourbon schools. Attracted to the philosophical system of Thomas Reid and Dugald Stewart, he wrote in 1826 a preface to a translation of the *Moral* Philosophy of Stewart, demonstrating the possibility of a scientific statement of the laws of consciousness. In 1828 he began a translation of the works of Reid. and in his preface estimated the influence of Scottish criticism upon philosophy. He was appointed professor of Greek and Roman philosophy at the Collège de France in 1833, and shortly afternard published the *Mélanges philosophiques* (4th ed., 1866; Eng. trans.. 1835). Following a visit to Italy in search of health in 1835. he became librarian to the University of Paris, and took the chair of philosophy at the faculty of letters. He died in Paris on Feb. 4. 1842. having done much to arouse in France an interest in the Scottish school. After his death were published *Nouveaux mélanges philosophiques* (3rd ed., 1872) and *Cours d'esthétique* (3rd ed.. 1875). His correspondence was edited by A. Lair (1901).

His claim to distinction rests upon his ability as an expositor of other men's ideas.

JOUGS, JUGGS or JOGGS, an instrument of punishment formerly in use in Scotland. Holland and possibly other countries. It was an iron collar fastened by a short chain to a wall, often of the parish church. or to a tree. Jougs were used for ecclesiastical as well as civil offenses. See PILLORY.

JOUHAUX, LÉON (1879–1954), French trade-union leader, was born in Paris, July 1. 1879. Prior to World War I he was one of the leading propagandists of revolutionary syndicalism, his chief organ being La *Bataille* syndicaliste, which he edited 1911–21. During the war his views changed; he advocated co-operation with the Socialist party and also uith the government. Jouhaux was secretary of the Confédération Générale du Travail (C.G.T.; the federation of French trade unions) 1909–40. After his imprisonment in Germany (1941–45), he again became secretary of C.G.T. (1945–47). In 1951 he was awarded the Nobel peace prize. Jouhaux died in Paris on April 28, 1954.

JOULE, JAMES PRESCOTT (1818–1889), English physicist who established the principle of the interconvertibility of the various forms of energy, *i.e.,* the first law of thermodynamics, and whose name was given to an energy unit, the "joule." He was born at Salford. Lancashire, on Dec. 24. 1818. Except for some tuition from John Dalton, he was self-taught in science; but early realized the importance of accurate measurement, and the attainment of exact quantitative data became characteristic of his researches. In a long series of experiments he studied the quantitative relation betneen electrical, mechanical and chemical effects, and was thus led to his great discovery. Joule announced in 1843 his determination of the amount of work required to produce a unit of heat. This is called the mechanical equivalent of heat (see HEAT: Mechanical Theory of Heat). He used four increasingly accurate methods of obtaining this. The first consisted in measuring the rise in temperature, the current and the mechanical work resulting from the rotation of a small electromagnet in water between the poles of another magnet. By the second method, rise in temperature was measured on the forcing of water through capillary tubes. The third depended on the compression of air. The fourth method, now the best known, produced heat from friction in water by means of paddles rotating under the action of a falling weight. An experiment of this last type in 1845 gave a result of 890 foot-pounds (ft.-lb.) per British thermal unit; the result obtained in 1847 was 781.5 ft.-lb., and an attempt with sperm oil gave 782.1 ft.-lb. Joule adopted the mean result of 781.8 ft.-lb. In 1849, with water again, he obtained 772 ft.-lb. In 1853, with W. Thomson (later Lord Kelvin), he made researches on the work done in compressing gases, and on the thermal changes which they undergo when forced under pressure through small apertures. Joule also studied the change of volume on solution, the change of temperature produced by the longitudinal extension and compression of solids, etc. His Scientific Papers were collected and published in two volumes by the Physical Society of London (1885–87). Joule died at Sale, Cheshire, on Oct. 11, 1889. (D. McK.)

JOURDAN, JEAN BAPTISTE, COUNT (1762–1833), marshal of France, was born at Limoges on April 29, 1762. He was apprenticed to a silk merchant, but enlisted for the American Revolutionary War. Invalided from the West Indies in 1784, he became a draper at Limoges, where in 1791 he was elected lieutenant colonel of volunteers. Partly thanks to a Limoges official of the ministry of war, he became a general in May 1793 and, shortly after the battle of Hondschoote (September), commander in chief of the army of the north. With L. N. M. Carnot he won the victory of Wattignies (Oct. 15–16, 1793), but Carnot found him too pessimistic and, in Jan. 1794, retired him on pension. He was recalled next March for the Moselle command and, moving to the Sambre, won the victory of Fleurus on June 26. His army, famous as the Sambre-et-Meuse, made the first passage of the Rhine on Sept. 5, 1795.

In 1796 his army formed the left wing of the advance into Bavaria. During the French advance on Vienna, the Austrians were at first driven back by J. V. M. Moreau and by Jourdan, but the archduke Charles threw his whole weight on Jourdan, who was defeated at Amberg and at Würzburg and forced over the Rhine. Jourdan was made the scapegoat of the government's mistakes and was not employed for two years. Elected a deputy, he framed the famous conscription law of 1798. In 1799, however, he was placed at the head of the army on the Rhine but was defeated by the archduke Charles at Stockach (March 25). Disappointed and broken in health he handed over the command to André Masséna.

Resuming his political duties. Jourdan opposed the coup d'ktat of 18 Brumaire. Napoleon never forgot this, but used him in Italy and, in 1804, made him commander in chief and marshal. Replaced by Masséna when war began, he was sent in 1806 to be governor of Naples for Joseph Bonaparte and in 1808 to Spain as Joseph's chief of staff.

Jourdan's advice was too often set aside by Napoleon or by the marshals (*e.g.*, in the battle of Talavera), and he asked for his recall. In 1811 he was sent back to King Joseph. The same difficulties and his own weakness led to the battle of Vitoria, where his marshal's baton was taken. He was retired in disgrace, yet in 1814 he commanded Rouen both under Napoleon and under Louis XVIII. A member of Napoleon's chamber of peers during the Hundred Days, he submitted to the Bourbons again after Waterloo. He refused, however, to be a member of the court which tried Marshal Ney. He was made a count, a peer of France (1819) and governor of Grenoble (1816). In politics he was a prominent opponent of the royalist reactionaries and supported the revolution of 1830 Jourdan died on Nov. 23, 1833.

JOURNAL, a word which came into English from late Latin diurnalis, through French journal with the original meaning of "daily." as in Spenser's Faerie Queene (xi, 31): Phoebus' steeds, descending into the west, "watred in ocean deepe, Whiles from their journall laboures they did rest." Later and current meanings are derived from the idea of daily records, though the periodicity of the record may now be anything from daily to annual. Thus. journal as diary need not have daily entries; journal as official record of meetings (as journal of house of lords, begun 1509; of house of commons, 1547; of U.S. congress, 1789; of learned societies) is set down by sessions; and a published journal may be daily, monthly, quarterly or even annual. Diurnal and journal were both used for periodical in the 17th and 18th centuries. In the 20th century journal is more frequently applied to reviews and learned publications. (F. L. MT.)

JOURNAL, that part of a shaft or axle which makes circumferential contact in the bearing, or a plain shaft bearing as distinguished from an end or thrust bearing. An axle box for a railroad-car axle is often called a journal box. Ball and roller bearings have displaced solid plain bearings in most classes of machinery. See BEARINGS; SHAFT, DRIVING.

JOURNALISM. Journalism includes the writing and editing of newspapers and periodicals. Although this is the basic definition, various tasks and processes intimately connected with the production of serial publications are commonly classified as journalistic. Thus the gathering and transmission of news, business management of journals, and advertising in all its phases are often thought of as coming within the field of journalism. And following the advent of radio and television, there was a trend toward including all communication dealing with current affairs in the term.

The scope of the field and the vagueness of its limits are emphasized by the number of men who gained equal fame as journalists and statesmen, journalists and men of letters, etc. Benjamin Franklin, Alexander Hamilton, William Cullen Bryant, Mark Twain, Walt Whitman and Theodore Roosevelt are only a few of many famous in other fields to be closely identified with journalism in the United States; in Britain, Joseph Addison, Samuel Johnson, Daniel Defoe, Thomas Macaulay, Charles Dickens, William Makepeace Thackeray, William Gladstone and Winston Churchill were editors or constant contributors to journals; in France a long line of statesmen from Richelieu to Clemenceau and in Germany such great writers as Goethe and Schiller were journalists. Both Hitler and Mussolini came to power largely through journals they controlled and edited respectively.

The tradition that anyone could be a journalist first came into conflict, however, during the second quarter of the 20th century with a growing sense of professionalism among workers for press and radio. Important factors in this trend nere: (1) the organization of working pressmen; (2) specialized education for journalism; (3) a growing literature dealing with the history. problems and techniques of mass communication; and (4) an increasing sense of social responsibility on the part of journalists.

By the second half of the 20th century, organizations of journalists abounded throughout the world. One of the oldest and strongest of general organizations was England's chartered Institute of Journalists, founded in 1883 and recognized by proprietors as an official body for salary negotiation. There is also the National Union of Journalists (1907) affiliated with the Trades Union Congress and also recognized for negotiation; and there are many special professional groups, such as the Association of British Science Writers, the Press Photographic Guild and the Guild of British Newspaper Editors (provincial. 1946).

In the United States. the American Newspaper Guild was organized in 1933 and soon became the bargaining union of journalists on most of the large papers, wire services, etc. The American Society of Newspaper Editors (1922) is professional in intent and widely influential; and there are scores of specialized groups of writers for the press. In France the chief association of journalists is Fédération Nationale de la Presse française, and in Italy Federazione Nazionale della Stampa Italiana.

The literature of the subject, which in 1900 was limited to two textbooks, a few collections of lectures and essays, and a small shelf-full of histories and biographies, became copious and varied in the 20th century.

The sense of social responsibility, the chief criterion of professionalism, made notable growth in the period referred to, as a result of specialized education and widespread discussion of press responsibilities in books, in periodicals and at the meetings of the associations. Such reports as that of the Royal Commission on the Press (1949) in Great Britain, and the less extensive *A Free and Responsible Press* (1947) by an unofficial Commission on the Freedom of the Press in the U.S did much to stimulate self-examination on the part of practising journalists. Printed discussions of such matters occupied much space in the magazines and reviews, and oral discussions of them were prominent in group meetings. They also occupied some space in such trade periodicals as *World Press News* (London). *Editor & Publisher* (New York), and *L'Echo de la Presse et de la Publicité* (Paris). Before World War II scholarly quarterlies in several countries were devoted to the problems of journalism. such as *Zeitungswissenschaft* (Berlin), *Cahiers de la Presse* (Paris) and *Journalism Quarterly* (Minneapolis. Minn.): after the 1930s only the last named persisted. A new quarterly entitled *Gazette: International Journal oj the Press* was begun in Leiden, Neth., in 1955.

The heart of all journalism is the news. The task of the journalist is the gathering, recording and distribution of news and comment upon news. Thus timeliness. or recency is a chief concern of the journalist; and this resulted in the continual increase of transmission speeds during the century beginning in the 1840s. Though western journalism as a systematic process began with written newsletters as early as the jth century B C., this element of speed, which distinguishes modern journalism. TI-as limited (except for occasional use of smoke, flash and flag signals, and pigeon posts) to the rate of progress of the horse on land and the sailing ship at sea. Then in a single decade came the locomotive, steamship and telegraph, and a little later the submarine cable. By mid-20th century such developments as wireless transmission of both messages and pictures, the teletype and teletypesetter, and television had brought journalism not merely up to the day, as its name indicates, but up to the minute and the second. For ihe history of Journalism *see* NEWSPAPER; *see* also PHOTOGRAPHY: *Press Photography*; REPORTING.

Education.--United States.—The first program looking toward the preparation of young men for journalism to be adopted by any educational institution was one proposed by Pres. Robert E. Lee, of Washington college, later Washington and Lee university (Lexington, Va.), and carried on there in 1869–71. This plan. under nhich several boys were enrolled, provided for a regular classical course of study combined uith work in a printing office. A few years later Cornell university (Ithaca, N.Y.) offered a similar program for a short time The first university course in journalism was taught by David R. McAnally at the University of Missouri (Columbia) in 1879–84. It dealt with the history of journalism and "practical explanations of daily newspaper life."

The Wharton school of business in the University of Pennsylvania offered the first curriculum in journalism in 1893, and the University of Illinois the first four-year curriculum in 1904. The first regularly organized school of journalism was established in the University of Missouri under Dean Walter Williams in 1908. Joseph Pulitzer in 1903 had agreed to endow Columbia university with $2,000,000 to establish a graduate school of journalism, but the program did not open until 1912. By the 1950s approximately 600 schools and colleges were offering a course or a sequence of courses in journalism.

The professional journalism schools confine their work in general to the last two years of the student's four-year course, with roughly half the junior and senior years devoted to technical courses, thereby giving about three-fourths of the curriculum to arts and sciences and the other fourth to training based on laboratory work, courses in the history and principles of journalism, studies in theories of communication. etc. A fifth year, leading to the master's degree, is offered by many schools, and a few (notably the one at Columbia university) accept only students who have already completed four years in arts and sciences. Thus education for journalism in the United States represents a combination of (1) work in arts and sciences; (2) technical training based on laboratory work; and (3) study of press and communications in general.

Europe.—The first recognized institutions for education in journalism in England were established in 1919—the London school of journalism, and the diploma course for journalism of London university. The first was founded under the patronage of Lord Northcliffe and other newspaper proprietors and offers instruction by correspondence. The latter, which was discontinued on the outbreak of World War I, had a small yearly enrollment. In 1952 the National Council for the Training of Journalists was organized by leading trade and editorial associations; it established a system of three-year apprenticeships on newspapers, combined with some courses in local colleges for further education.

In Germany several important institutes for the study of *Zeitungswissenschaft* ("journalism") flourished under the Weimar republic; five were revived after World War II, some changing emphasis from journalism to *Publizistik* ("publicity"). These institutes represent the German tradition of studying communications from sociologicnl. psychological and anthropological viewpoints. Schools of journalism set up at Aix-la-Chapelle and Munich (in 1945 and 1949 respectively). however. included technical training.

In France. institutions for education in journalism include Centre de formation des journalistes (Paris) and the Catholic École supérieure de journalisme (Lille). Belgium established an institute at Brussels governed by press associations, a department at the University of Brussels. and a school at the Catholic University of Louvain. The Institute of Press Studies. University of Amsterdam (Netherlands); schools at Xarhus (Denmark) and Oslo (Norway); and courses at the University of Goteborg and Stockholm (Sweden) are supported in varying degrees by press associations. The school at the University of Madrid is government controlled. Italy has a Public Opinion centre and a Catholic institute in Rome, and departments at the universities of Urbino and Palermo. Journalism schools or courses were developed after World War II at the universities of Vienna, Istanbul, Helsinki and Warsaw, and at Charles and Comenius universities in Czechoslovakia.

In the U.S.S.R. official faculties of journalism administered work in a number of institutions, the largest at Lomonossov university (Moscow); these are five-year courses including labora-

tory and internship.

Other *Countries.*—Between World War I and II China had ten schools of journalism; in 1960 there were three on the mainland and one in Taipei, Formosa. By that year Japan had ten. Korea five, India eight. Pakistan three. the Philippines two, and Thailand one. Australia's "cadet" system resembled England's apprentice plan, but there were also courses at the universities of Melbourne and Queensland. On the U.S. plan were Canada's schools at Carleton university and the University of Western Ontario; and Egypt's at American university and Egyptian university. Latin-American countries with schools or courses in journalism included Argentina. Brazil. Chile, Colombia. Cuba. Dominican Republic, Ecuador, Guatemala. Mexico and Venezuela. (F. L. MT.)

JOUVENEL, HENRI DE (1876–193j), French politician, was born in Paris on April 2, 1876. Secretary of the committee of democratic conferences in 1900, he was made chef de cabinet in the ministry of justice in 1902, and *directeur* de cabinet in the ministry of commerce in 1905. He entered journalism shortly afterwards as chief correspondent on Le *Matin.* In Jan. 1921 de Jouvenel mas elected senator for the Corrèze, and became a member of the foreign affairs commission. He was a French delegate on the assembly of the League of Nations in 1922, and was instrumental in admitting Abyssinia to the League, and took an active part in the work of the commission of intellectual co-operation. He again represented his country in the League in 1924, and became minister of public instruction in the second Poincaré cabinet in the same year. In 1925 he was appointed French high commissioner in Syria in succession to General Sarrail. De Jouvenel at once set himself to the task of pacification, and early in 1926 visited Angora to prepare a treaty with Turkey. As French ambassador in Rome from Jan. to June 1933, he did much to improve Franco-Italian relations.

JOUVENET, JEAN (1644–1717), French painter of religious subjects, was born at Rouen. He was the most celebrated of a family of artists; and was the son and pupil of Laurent Jouvenet. On arriving in Paris in 1661 he attracted the attention of Charles Le Brun, by whom he was employed at Versailles, and under whose auspices, in 1675, he became a member of the Académie Royale, of which he was elected professor in 1681, and one of the four perpetual rectors in 1707. Four large paintings at the Louvre, Paris, include the celebrated "Miraculous Draft of Fish" and "Descent From the Cross." Jouvenet died on April 5, 1717.

JOUVET, LOUIS (1887–1951), French actor, director, designer, and technician, was born in Crozon, Finistère, on Dec. 24, 1887. Beginning as a pharmacist at his parents' wishes, he soon turned to his real interest. the theatre. and, after being refused admission several times to the Conservatoire for stuttering. made his Paris debut in 1910 in The Brothers Karamazov. He served in World War I, and in 1924 became director of the Comédie des Champs-Élysées in Paris where he remained until 1934 when he was appointed director of the Athenée. a position he retained until his death in Paris, Aug. 16. 1951. Jouvet introduced the playwright Jean Giraudoux and the designer Christian Bérard to the theatre, brought new insight to the interpretation of Molière's plays, developed lighting techniques, created simplified but highly suggestive settings, and brought new importance to the interpretive power of the actor's voice. His greatest successes as actor-producer-director were School for Wives (1936) and The *Madwoman* of Chaillot (1945), and as an actor in the motion pictures Carnival in *Flanders* (1935), *Volpone* (1940), and Life Dances On (1949). He was a deeply respected and indefatigable theatre worker, a teacher, lecturer, and writer and an honoured citizen and cultural ambassador of his country when he and his company toured North and South America.

See Alice Venezky, "Reflections of an Actor," Theatre Arts, vol. 35, pp. 19, 82–83 (Dec. 1951); Bettina Knapp, Louis Jouvet, Man of the Theatre (1957). (E. P. K.)

JOVANOVIĆ, LJUBA (1865–1928), Yugoslav politician. was born at Cattaro, then Austrian territory, on Feb. 2. 1865. Owing to his activities in favour of Yugoslav unity, he was forced to emigrate to Montenegro, then to Serbia, where, after fighting as a volunteer in the Serbo-Bulgar war of 1885, he became a teacher, librarian to the National Library (1901), and professor of history at Belgrade university (1903). He had previously joined the Serb radical party as a strong Nationalist, and on entering the Skupština in 1905, became president of the chamber, then minister of the interior (1909), of education (1911) and again of the interior (1914–18). From 1919–20 he was a councillor of state, then again minister of education, and 1923–24 president of the chamber. His attempts to reconcile the Serb radicals with the Croats and alleged federalist inclinations involved him in a quarrel with Nikola Pašić (*q.v.*). In 1924, then, Jovanović published in an annual called *Krv* Slovenstva (Slav Blood) an article entitled "After Vidov Den 1914" alleging that he, Pašić and others had had foreknowledge of the plot against the Archduke Francis Ferdinand in 1914. The British Institute of International Affairs reprinted the article in 1925 as "The Murder of Sarajevo" (see also the Belgrade *Politika,* April 7, 1925). After a furious quarrel, Jovanović was, by a majority, excluded from the radical party in 1926. With his adherents, he formed an independent anti-Pašić party, but rejoined the radicals after Pašić's death. He died on Feb. 10, 1928.

JOVELLANOS (JOVE LLANOS), **GASPAR MELCHOR DE** (1744–1811), Spanish statesman and author, born at Gijón (Asturias) on Jan. 5, 1744. Criminal judge at Seville in 1767, judge in Madrid (1778) and a member of the council of military orders (1780), he was involved in the fall of Cabarrus, and banished (1790–97) to Gijón. Recalled in 1797, he was named minister of grace and justice under Godoy, whose policy and conduct so offended his proud integrity that he combined with his colleague Saavedra to procure Godoy's dismissal. On the latter's return to power (1798). Jovellanos was banished to Gijón and imprisoned (1801) in Majorca. The revolution of 1808 set him at liberty. Disdaining the most brilliant offers from Joseph Bonaparte, Jovellanos joined the central junta and contributed to reorganize the cortes. This accomplished, the junta at once fell under suspicion, and Jovellanos was involved in its fall. He died at Vega (Asturias) on Nov. 27, 1811.

The poetical works of Jovellanos comprise a tragedy, El Pelayo, a comedy, El *delincuente* honrado, satires, miscellaneous pieces and a translation of the first book of Paradise Lost. His prose works, especially those on political and legislative economy, constitute his real title to literary fame. In them depth of thought and clear-sighted sagacity are couched in a certain Ciceronian elegance and classical purity of style. Perhaps the *Informe sobre un proyecto* de ley *agraria* (1787) is his most valuable work.

JOVIAN (FLAVIUS IOVIANUS) (331–364), Roman emperor from June 363 to Feb. 364, was born in 331. As captain of the imperial bodyguard he accompanied Julian in his Persian expedition: and on the day after that emperor's death Jovian was unexpectedly chosen emperor by the army to succeed him. He at once continued the retreat begun by Julian, and, continually harassed by the Persians, succeeded in reaching the banks of the Tigris, where a humiliating treaty was concluded with the Persian king. Shapur II (*q.v.*). Five provinces which had been conquered by Galerius in 298 were surrendered, together with Nisibis and other cities. The Romans also gave up all their interests in the kingdom of Armenia, and abandoned its Christian prince Arsaces to the Persians. During his return to Constantinople Jovian was found dead in his bed at Dadsstana. halfway between Ancyra and Nicaea. Under Jovian. Christianity was established as the state religion and Athanasius was once more reinstated on the archiepiscopal throne of Alexandria. Paganism, however, seems to have been tolerated. In Syriac literature Jovian became the hero of a Christian romance (G. Hoffmann, *Julianus* der *Abtrünnige,* 1880).

See Ammianus Marcellinus, xxv, 5–10; Tillemont, *Histoire* des *empereurs,* vol. iv; Gibbon, Decline *and* Fall, ch. xxiv, xxv; J. Wordsworth in Smith and Wace's *Dictionary* of Christian Biography; H, Schiller, *Geschichte* der *römischen* Kaiserzeit, vol. ii (1887); A. de Broglie, *L'Église* et *l'empire romain au iv^e siècle,* 4th ed. (1882); Seek, Gesch, des Untergangs der *antiken* Welt, iv, 338; and article in Pauly-Wissowa, Real-Encyclopiidie der classischen *Altertumswissenschaft.* For the relations of Rome and Persia see PERSIA: History.

JOVIUS, PAULUS (PAOLO GIOVIO) (1483–1552), Italian historian, the author of vivid historical works in Latin and the owner of a famous early art collection. He was born at Como on April 19, 1483, studied at Pavia and Padua and qualified as a doctor. About 1513 he settled in Rome and was favoured by Leo X (who compared him to Livy). and even more by Cardinal Giulio de' Medici, later Clement T'II, whom he helped during the 1527 siege. In 1528 he became bishop of Nocera. Giovio wrote a Latin history of Florence from 1494 to 1547, *Historzarum sui temporis libri XLV* (1550–52) and a series of lives of famous men. He was dependent on patronage and has been accused of having one pen for his friends and one for his enemies; but though he may soften or sharpen he does not actually distort facts. His work lacks depth and political interest, but it is sparkling, elegantly written and full of useful information. After Clement VII's death Giovio retired to his villa on Lake Como where he invested the wealth he had acquired in antiquities, pictures and curiosities, some from the new world. He died in Florence on Dec. 10, 1552.

See L. Ravelli, *L'opera storica e artistica di Paolo Giovio* (1928); B. Croce, *Conversazioni critiche* (1932).

JOWETT, BENJAMIN (1817–1893), English scholar and theologian, and outstanding tutor of great influence who became master of Balliol college, Oxford, was born at Camberwell, London, on April 15, 1817. and educated at St. Paul's school and Balliol. His scholarship secured for him a fellowship at Balliol in 1838 and an appointment as tutor in the college in 1842. the year in which he was ordained. His friendship with A. P. Stanley led him to adopt liberal theological views. When a tutor he spent the long vacations on the continent of Europe, meeting many distinguished scholars who anakened in him an interest in the philosophy of Hegel. In 1848 he planned nith Stanley an edition of the Pauline epistles. but the work was interrupted by the royal commission on Oxford university. Stanley wrote the report and Jowett. in giving evidence, expressed his belief in the retention of the college system but also in an increase in the number of professors.

After failing to be elected as master of Balliol in 1854, in the folloning year Jomett finished his book on *The Epistles of St. Paul* His essay on the atonement was attacked as unorthodox, but in spite of strong opposition he was appointed regius professor of Greek with an annual salary of £40. His contribution to *Essays and Reviews* (1860) caused his opponents to accuse him of heresy before the vice-chancellor's court, but proceedings were eventually dropped. Nevertheless. attempts to augment his salary were opposed and it was not until 1865 that Christ Church freed endowments to produce a stipend of £500 a year. During this period his lectures on the *Republic* stimulated intense interest in Plato.

His election as master of Balliol in 1870 enabled him to rebuild a considerable portion of the college, to establish a hall for non-collegiate students and to publish his translations of the *Dialogues of Plato* (1871) and Thucydides' *History* (1881). As vice-chancellor of the university (1882–86) he encouraged drama and music and completed his translation of Aristotle's *Politics,* but the publication of his edition of the *Republic,* on which he had worked for 30 years, was undertaken by Lewis Campbell in 1894. The strain of his numerous activities produced a series of illnesses nhich culminated in his death at Headley Park, the Hampshire home of an old pupil, Sir Robert S Wright, on Oct. 1. 1893.

Jowett was a distinguished classical scholar rather than an original philosopher, and one of the greatest teachers of the 19th century. An insight into human nature, devotion to his pupils, many of whom became life-long friends, and a belief in the value of close contact betneen tutor and individual minds, combined in inspiring scores of young men nho were called upon to take a leading part in the national life. Jowett never failed in assisting men of ability. whether of the poorer or more wealthy classes. All he required was sincerity and promise of ability.

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JOYCE, JAMES (1882–1941), Irish author, was born in Rathgar. Dublin. on Feb. 2, 1882, to John Stanislaus Joyce, a witty but improvident Corkonian, and Mary Jane Murray, originally of Longford. Educated at Clongowes Wood college, Belvedere college, and at University college, Dublin, Jesuit institutions, Joyce gradually changed from a devout Catholic to a fierce anti-Catholic. In 1904 he left Ireland for the continent to work out his destiny as an artist independently of family, country, and religion. Living in Italy, Switzerland and France, he earned a meagre livelihood at various occupations until subsidized by friends. Though he left Dublin permanently, he devoted himself to a lifelong treatment of his native city.

Besides coming under the influence of the tradition of English letters. Joyce, at University college, specialized in modern languages. A gifted tenor, he amassed an encyclopaedic knowledge of music; he began the study of medicine; he considered founding a great Irish daily; he opened a motion-picture theatre in Dublin, and in Zurich he engaged in the legitimate theatre. This variety of interests does much to explain the extraordinary combination, in his writings, of tradition and experiment.

In 1914, after years of delay caused by publishers' objections to Joyce's candour, *Dubliners* appeared—15 stories of which the author said: "My intention was to write a chapter of the moral history of my country and I chose Dublin for the scene because that city seemed to me the centre of paralysis. I have tried to present it to the indifferent public under four of its aspects: childhood, adolescence, maturity and public life. The stories are arranged in this order. I have written it for the most part in a style of scrupulous meanness . . ." In 1916 appeared *A Portrait of the Artist as a Young Man,* a superb autobiographical novel chronicling the development of Stephen Dedalus and his shift from religion to art. Written from the point of view of the central character. the book is Joyce's first full-length essay in the stream-of-consciousness technique. In 1918, Joyce published an Ibsenesque play. *Exiles.*

On Joyce's 40th birthday, after interrupted and partial serialization in *The Little Review, Ulysses* came out in Paris—the story, chiefly. of a day in the lives of three Dubliners: Stephen Dedalus, Leopold Bloom, and the latter's wife, Molly. The title points to a detailed. if not always accessible, parallel with the *Odyssey* which implies an unflattering view of both the modern world and the classical and expands the significance of the novel by projecting it against the history of western civilization. Divided into 18 episodes, each with a special technique, the work is closely knit by an elaborate network of subtly recurring motifs. The stream of inchoate, fragmentary thoughts and feelings of each of the main characters is vividly and distinctively rendered by the use of the internal monologue. a device which Joyce borrowed from Édouard Dujardin's *Les lauriers sont coupés* (1887) and. under the influence of modern psychology, considerably developed. *Collected Poems* (1936) added a single poem to *Chamber Music* (1907), a slender volume of lucid, delicate lyrics in the Elizabethan tradition, and *Pomes Penyeach* (1927), a handful of less derivative pieces.

Ulysses closes fittingly with Molly Bloom's famous monologue between waking and sleeping, for from the waking mind Joyce moved on to treat, in his last nork. *Finnegans Wake* (1939), the sleeping. The title. taken from an Irish comic song, announces the theme: the death and resurrection. the fall and regeneration of man. Humphrey Chimpden Earwicker. Anna Livia Plurabelle, Shem and Shaun move about in a dream world in which any characters, events, times and places may dissolve into one another. Joyce divided his work to accord with Vico's philosophy of history as a four-part cycle: theocracy. aristocracy, democracy and chaos. While the permutations of dream and myth give unity to all human experience, and sound and rhythm are employed with extraordinary success, Joyce's word-technique, endlessly blending meaning with meaning and allusion with allusion. not only in English but in other languages, leaves the reader floundering in a welter of possible interpretations.

If *Finnegans Wake* alienated some readers of Joyce, the posthumous publication of *Stephen Hero* (1944), a part of the first draft of *A Portrait of the Artist as a Young Man,* may serve *to*

remind them of two things. First, Joyce's earlier works—including the bulk of *Ulysses*, for people brought up on a literature produced largely under its influence—are eminently readable. Secondly, Joyce, who typifies the artist in exile, was paradoxically destined. as this youthful work intimates, to develop into one of the most significant spokesmen of his time.

Against the odds of poverty, illness and British and U.S. publishing conventions, Joyce saw his immense self-confidence justified by a steadily rising reputation. With *Dubliners* he joined the ranks of the foremost writers of the short story. *A Portrait of the Artist as a Young Man* established him as a notable novelist. *Ulysses* placed him squarely in the van of those who, after World War I, reflecting in literature the chaos of society, experimented in various directions upon English and other languages. He became the centre of a cult and of a controversy; and his book, banned in English-speaking countries for years, exerted an ever widening influence upon his contemporaries. The internal monologue in particular seemed to them vividly to reflect the fragmentation of the modern mind into a whirl of atoms so heterogeneous that only some such device as the Homeric parallel could impose the order of art upon it. With *Finnegans Wake* bewildering even his votaries, it is understandable that at the time of Joyce's death his work should have come to stand for the extreme of obscurity in modern literature. A measure of his total achievement. however, may well be T. S. Eliot's remark that Joyce was the greatest master of the English language since Milton.

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JOYEUSE, town in Ardèche, France, from which the family of Joyeuse derives its name. Anne de Joyeuse (1561–1587) was a favourite of Henry III of France, who created him duke and peer (1581), admiral of France (1582), and governor of Normandy (1586), and married him to Marguerite de Lorraine-Vaudémont, younger sister of the queen. He had three brothers: François de Joyeuse (d. 1615), cardinal archbishop of Rouen, who brought about the reconciliation of Henry IV with the pope; Henri, count of Bouchage, and later duke of Joyeuse, who was a Capuchin friar, then a soldier, became a marshal of France, and finally re-entered the church, dying in 1608; Antoine Scipion, grand prior of Toulouse in the order of the Knights of Malta, who was one of the leaders in the League, and died in the retreat of Villemur (1592). Henriette Catherine de Joyeuse, daughter of Henri, married in 1611 Charles of Lorraine, duke of Guise, to whom she brought the duchy of Joyeuse. On the death of her great-grandson, François Joseph de Lorraine, duke bf Guise, in 1675, without issue. the duchy of Joyeuse was declared extinct, but it was revived in 1714, in favour of Louis de Melun, prince of Épinoy. Pop. (1954) 943.

JOYEUSE ENTRÉE, a famous charter of liberty granted to Brabant by Duke John III in 1354. John summoned the representatives of the cities of the duchy to Louvain to announce to them the marriage of his daughter and heiress Jeanne of Brabant to Wenzel duke of Luxembourg, and he offered them liberal concessions in order to secure their assent to the change of dynasty. John III died in 1355, and Wenzel and Jeanne, on the occasion of their state entry into Brussels, solemnly swore to observe all the provisions of the charter which had been drawn up. From the occasion on which it was first proclaimed this charter has since been known in history as *La Joyeuse Entrke*. By this document the dukes of Brabant undertook to maintain the integrity of the duchy, and not to wage war, make treaties or impose taxes without the consent of their subjects, as represented by the municipalities. All members of the duke's council were to be native-born Brabanters. This charter became the model for other provinces and the bulwark of the liberties of the Netherlands. Its provisions remained practically unchanged from the reign of Charles V onwards. The ill-advised attempt of the emperor Joseph 11 in his reforming zeal to abrogate the *Joyeuse Entrée* caused a Brabançon revolt under Henry van der Noot, before which he had to yield (1789–90).

JÓZSEF, ATTILA (1905–1937), one of the greatest Hungarian poets of the 20th century, was born in Budapest, on April 11, 1905, into a poor family. His first poems were published when he was only 17, but he was never able to make a living from poetry. From the age of seven he had to support himself by casual labour and his life was spent in great poverty. Although his works were known and loved by a small circle of devotees, real fame came only after his death. Attracted by Marxist ideology, in 1928 he became a member of the then illegal Communist party but was soon expelled. In both political and private life József remained a forlorn. solitary figure. In 1932 he launched a short-lived literary periodical, *Valóság,* and in 1936 became one of the cofounders of the review *Szép Szó*. His last poems reveal his desperate struggle against schizophrenia. He threw himself under a train and died at Balatonszárszó, Dec. 3, 1937.

No one in Hungarian literature has drawn so intimate a picture of proletarian life as Attila József. His mother, a poor washerwoman whom he immortalized in many poems, became the symbol of her class. His technique is varied and free: he created a style of his own, a melancholy realism shot through with irrationality, capable of expressing the complex feelings of modern men, and revealing his own sensitive personality, and the faith in life's essential beauty and harmony which, despite his tragic experiences, never left him.

See the critical edition of his works, 3 vol. (1955–58); J. Rousslot, *Attila József, sa vie, son oeuvre* (1958). (N. Ki.)

.JUAN DE FUCA strait lies between the Olympic peninsula of Washington state and Vancouver Island, B.C., Can. The international boundary between the United States and Canada lies in its mid-channel. The strait is about 90 mi. in east-west length and averages about 15 mi. wide. The eastern end of the strait is separated from the waters of Puget sound mainly by Whidbey Island. Mid-channel depths average about 50 fathoms at the eastern end of the strait and increase steadily to the westward to depths of about 150 fathoms where the strait opens out to the Pacific ocean opposite Cape Flattery. Tidal movements are complicated owing to the northward-moving flood tide from the Pacific coast of Washington entering the strait during part of the time when a conflicting west-moving ebb tide is coming out. Tide rips are common off prominent points or over shallow banks. Strong winds are frequent through the strait, coming from the west or southwest. Incoming flood-tide waters are cold (40°–45° F.), due to upwelling of cold Pacific ocean waters off the strait entrance. (J. L. R.)

JUAN FERNÁNDEZ ISLANDS (ISLAS JUAN FERNÁNDEZ), a small group in the South Pacific ocean, between latitude 33° and 34" S. and longitude 78° and 81° W., which belongs to Chile and is administered as a part of Valparaiso (*q.v.*) province, 400 mi. to the east. The principal island is called Más a Tierra (Spanish for "nearer land") to distinguish it from a slightly smaller island Más Afuera ("farther out"), 100 mi. farther west. Off the southwest of Más a Tierra lies the islet of Santa Clara. The islands are volcanic peaks rising from the Juan Fernández submarine ridge, Más a Tierra having a summit, 3,002 ft. above sea level, called El Yunque from its resemblance to a massive anvil, and Más Afuera a summit, even more precipitous, of 5,415 ft. The areas of the two islands are 36 and 33 sq.mi. respectively, Más a Tierra being about 13 mi. long and from 2 to 4 mi. wide. Cumberland bay on the north side of Más a Tierra and Padre bay at the western extremity are the only fair anchorages. A wide valley watered by several streams opens into the former bay, and is partially enclosed and cultivated. The islands abound in springs, waterfalls and deep ravines.

Más Afuera is quite heavily wooded but on Más a Tierra most of the valuable indigenous trees have been practically exterminated, such as the sandalwood, which the earlier navigators found one of the most valuable products of the island. Ferns are prominent among the flora, about one-third of which consists of endemic species. There are no indigenous land mammals but birdlife is varied and peculiar, the hummingbirds being especially interesting. Pigs, cattle, horses, donkeys and dogs have been

introduced, and goats in considerable numbers run wild. Sea elephants and fur seals were formerly plentiful, but the latter were so hunted by British and United States fur traders that they have almost disappeared. The waters around Más Afuera are especially rich in species of fish

Juan Fernández was discovered about 1563 by a Spanish navigator of that name *(see* FERNÁNDEZ, JUAN), who obtained from the Spanish government a grant of the islands. where he resided for some time, stocking them with goats and pigs. He soon, however, appears to have abandoned his possessions, which were afterward for many years visited only occasionally by fishermen from the coasts of Chile and Peru. In 1616 Jakob Le Maire and Willem Schouten, after rounding Cape Horn which they named called at Juan Fernández for water and fresh provisions Pigs and goats were then abundant on the islands, and many ships called to refresh their sick crews, usually decimated by scurvy, with fresh water, palm cabbage, meat and fish In 1704 an English privateering galley "Cinque Ports" entered Cumberland bay. Alexander Selkirk *(q.v.)*, one of her crew, quarreled with the captain, Thomas Stradling, and demanded to be set ashore nith his property. He became the island's most famous colonist, for his adventures are commonly believed to have inspired Daniel Defoe's *Robinson Crusoe.* A tablet to commemorate Selkirk's lonely four-year sojourn on the island was erected there in 1858 by British naval officers. The visit of Commodore George Anson in the "Centurion" in 1741 led, on his return home, to a proposal to form an English settlement on Juan Fernández; but the Spaniards hearing of this, decided to occupy the island, and it was accordingly garrisoned in 1750 With the coming of Chilean independence at the beginning of the 19th century, the islands passed into the possession of that country. On many occasions Más a Tierra was used as a penal settlement by the Chilean government, particularly for political prisoners. This nas especially the case during the dictatorship of Diego Portales. but in 1837 the islands were uninhabited, remaining so until 1877 when Alfredo de Rodt leased them and went to live there. Más Xfuera and Santa Clara are still uninhabited.

During World War I the German cruiser "Dresden" anchored in Cumberland bay in 1915, and failing to obtain an extension of time in neutral waters was interned. A British naval division finding her demanded her surrender, but the "Dresden" was scuttled by the captain, who blew up the ship's ammunition store

The population in 1952 was 333. most of whom lived in the village of San Juan Bautista on Cumberland bay. Their principal occupation is lobster fishing, the lobsters being shipped to the mainland as the island's only exportable produce. With regular communications, the abundant variety of fish could be commercially exploited. Tourists occasionally visit Más a Tierra from central Chile during the summer months. the climate being mild and the historical associations of the island most attractive. A naval wireless station maintains contact with the mainland.

(G. J. B)

JUAN MANUEL, DON (1282–1349), infante of Castile, son of the infante Don Manuel and Beatrix of Savoy and grandson of St. Ferdinand, born at Escalona, May 5, 1282. A favourite of Sancho IV., he served in his twelfth year as *adelantado mayor* of Murcia against the Moors at Granada. In 1304 he successfully conducted political negotiations with James II. of Aragon on behalf of Ferdinand IV., then under age; his marriage with James II.'s daughter, Constantina, added to his prestige. Regent until the proclamation of Alphonso XI.'s majority (1325), his ambitious designs of continuing in power were defeated by the king, who married Constanza, his daughter, and removed Juan Manuel from the scene by nominating him *adelantado mayor de la frontera.* Alphonso XI.'s repudiation of Constanza led to civil war. Don Juan Manuel (whose wife Constantina died in 1327) married Doña Blanca de la Cerda, secured the support of Juan Nuñez, *alférez* of Castile, won over Portugal by promising the hand of the ex-queen Constanza to its infante, and entered into alliance with Mahomet III. of Granada. Faced by this formidable coalition, Alphonso XI. sued for terms in 1328. War speedily broke out anew, and lasted till 1331, when Alphonso XI. invited Juan Manuel and Juan Nuñez to a banquet with the intention, it was believed, of assassinating them; the plot failed and Juan Manuel joined forces with Peter IV. of Aragon. Besieged by Alphonso XI. at Garci-Nuñez, he escaped on July 30, 1336, fled into exile, and kept the rebellion alive till 1338, when he made his peace with the king. He proved his loyalty by serving in further expeditions against the Moors of Granada and Africa, and died a tranquil death in 1349.

Distinguished as an astute politician, Don Juan Manuel is an author of the highest eminence and, considering the circumstances of his stormy life, his voluminousness is remarkable. Setting aside the works that have disappeared — Libro *de los Sabios, Libro de Engeiios, Reglas de como se debe trobar, Libro de los Cantares* (all written before 1329), *Libro de la Caballeria (c.* 1320–1322) — there remain the *Cronica abreviada* (c. 1320–1324), the *Libro de la Caza (c.* 1325–1326), the *Libro del Caballero et del Escudero,* the *Libro de los Estados* (1330), *El Conde Lucanor* (1328–1335), a devout *Tractado* on the Virgin (dedicated to the prior of Peñafiel Monastery, to which Juan Manuel bequeathed his manuscripts), the *Libro de los Castigos, Libro infenido (c.* 1334), *Las Maneras de Amor* and the *Libro de las Armas,* both about 1334–1337.

The historical summaries, pious dissertations and miscellaneous writings are of secondary interest. The *Libro del Caballero et del Escudero* is on another plane; it is no doubt suggested by Lull's *Libre del orde de Cavalleria,* but the morbid mysticism of Lull is rejected and the carefully finished style justifies. the special pride which the author took in this performance. The influence of Lull's *Blanquerna* is likewise visible in the *Libro de los Estados,* but the marked divergences of substance prove Juan Manuel's acquaintance with some version of the Barlaam and Josaphat legend. Nothing is more striking than the curious and varied erudition of the turbulent prince who weaves his personal experiences with historical or legendary incidents, with reminiscences of Aesop and Phaedrus, with the *Disciplina clericalis,* with *Kalilah and Dimnuh,* with countless oriental traditions and with all the material of anecdotic literature which he embodies in *El Conde Lucanor* (or *Libro de Patronio).* This work, printed in 1575, revealed Juan Manuel as a master of prose composition, and as the predecessor of Boccaccio in the province of romantic narrative.

A conscious artist, deliberative and selective in his methods, Juan Manuel has not Boccaccio's festive fancy nor his constructive skill; he is too persistently didactic; but he excels in knowledge of human nature, in the faculty of ironical presentation, in tolerant wisdom and in luminous conciseness. He naturalizes the eastern apologue in Spain, and by the laconic picturesqueness of his expression imparts a new quality into Spanish prose. Lope de Vega, Ruiz de Alarcon and Calderon drew on his themes for dramatic purposes, and there is an evident, though remote, relation between *Enxemplo.* xxxv. and *The Taming of the Shrew;* and a more direct connection exists between some of the *enxemplos* and some of Andersen's fairy tales.

See *Obras,* ed. P. de Gayangos (1857); *El Conde Lucanor,* ed. *H.* Knust and A. Birch-Hirschfeld (Leipzig, 1900); *El Libro de la Caza,* ed. G. Baist (Halle, 1880); *El Libro del Caballero y del Escudero,* ed. S. Graienberg (*Romanische Forschungen,* vii., 1893); J. B. Trend, Introd. to *Count Lucanor* . . . trans. J. York, 1868 (1924).

JUAREZ, BENITO (PABLO) (1806–1872), was born at Guelatao, near the city of Oaxaca, Mexico, March 21, 1806, of full-blooded Zapotec parents. He was educated for the church by a charitable merchant of Oaxaca, but in 1827 entered the Institute of Arts and Sciences to study law. In 1832 he received his degree of bachelor of law, and two years later was appointed advocate of the Supreme Court of the republic. He was governor of Oaxaca, 1847–52, and in this post showed himself so ardent a partisan of liberal ideas that, when Santa Anna seized the Government in 1853, he was imprisoned. Escaping to New Orleans, he returned to Mexico in 1855 to assist in a successful revolt against Santa Anna led by Álvarez and Cornonfort, and held the portfolio of justice in Comonfort's Government. In this capacity he issued the first of his great reform measures restricting the privileges of the military and the clergy (1855, 1856, 1857), which, culminating in the famous anti-clerical Constitution of 1857, caused **a**

nation-wide rebellion and precipitated the War of the Reform. In Jan. 1858, Comonfort fled the country and Zuloaga, supported by the clericals and the army, declared himself de facto president and seized the capital. Juárez, as constitutional successor to Comonfort, declared himself the de *jure* head of the nation and established himself at Veracruz (May 1858). His Government was recognized by the United States in April 1859, and in July he felt himself strong enough to issue the Reform Laws of 1859, which completely nationalized and secularized the church. By the beginning of 1861 the clericals had been everywhere defeated, and on Jan. 11, 1861, Juárez entered Mexico City, and was constitutionally elected president. But his Government was without funds, foreign creditors were clamouring for satisfaction, and the country, after five years of civil war, was in a state of economic chaos; so that in July 1861 he issued a decree suspending for two years payment on the national debt. This embroiled him immediately in a new conflict. Napoleon III., who had for some time been contemplating intervention in Mexico, promptly seized upon Juárez's decree as a pretext, and induced England and Spain (Convention of London, Oct. 1861) to join him in the ostensible purpose of enforcing the payment of foreign creditors. Armed forces appeared at Veracruz in Dec. 1861. Juárez showed himself conciliatory and in Feb. 1862 commissioners of the four Governments ratified the peace treaty of La Soledad. In March Gen. Lorencez landed with large French reinforcements; the English and Spanish'commissioners withdrew their co-operation, and on April 12, 1862, Juárez declared war upon France. In June 1863 Gen. Bazaine entered Mexico City and on July 8 declared a monarchy. Maximilian arrived on May 28, 1864, and was crowned in the capital in July. By the spring of 1865 there were 30,000 French soldiers in the country, Juárez had been driven northward to the Paso del Norte, almost to the U.S. border, his armies were shattered, his Government almost penniless. But he refused to relinquish his stand as constitutional president. The end of the year saw a great change. Maximilian was bankrupt; Napoleon saw the futility of his imperial project and the United States, now that the Civil War was over, insistently demanded the withdrawal of the French troops. In Feb. 1867, the last French troops sailed from Veracruz. Maximilian was captured at Querétaro on May 15 and executed on June 19, and on July 1j Juárez returned to Mexico City. He was re-elected president in August. But his genius was not equal to the appalling problem of reconstruction which confronted him. Insurrections and revolts harassed his entire term. In the election of 1870 Porfirio Díaz and Lerdo de Tejada appeared as rival candidates, and Diaz, when congress announced that Juárez had been again re-elected, immediately headed a revolt. The movement failed, but in the midst of it, on July 18, 1872, Juárez died of apoplexy in Mexico City. With his death ends one stage of Mexican history. He did not, as Diaz was to do, wholly dominate his epoch, but during the most momentous period of Mexico's history he was the guiding genius, and is by many called Mexico's national hero.

For a comprehensive bibliography of the life and career of Juárez, see H. I. Priestley, *The Mexican Nation--a History* (New York, 1923).

JUBA, the name of two kings of Numidia.

JUBA I. (1st century B.C.), son and successor of Hiempsal, king of Numidia. During the civil wars at Rome he sided with Pompey, partly from gratitude because he had reinstated his father on his throne (Appian, B.C., i. 80), and partly from enmity to Caesar, who had insulted him at Rome by pulling his beard (Suet., Caesar, 71). Further, C. Scribonius Curio, Caesar's general in Africa, had proposed, 50 B.C., when tribune of the plebs, that Numidia should be sold to colonists, and the king reduced to a private station. In 49 Juba heavily defeated the Caesarean army, in which Curio was slain (Vell. Pat. ii. 54; Caesar, B.C. ii. 40). Juba's attention was distracted by a counter invasion of his territories by Bocchus the younger and Sittius; but he rejoined the Pompeians with a large force, and shared the defeat at Thapsus. Fleeing from the field with the Roman general M. Petreius, he wandered about as a fugitive. At length, in despair, Juba killed Petreius, and sought the aid of a slave in despatching himself (46). Juba was a thorough savage; brave, treacherous, insolent and cruel. (*See* NUMIDIA.)

JUBA II., son of the above. On the death of his father in 46 B.C. he was carried to Rome to grace Caesar's triumph. Augustus in 29, after Mark Antony's death, gave him the hand of Cleopatra Selene, daughter of Antony and Cleopatra, and placed him on his father's throne. In 25, however, he transferred him from Numidia to Mauretania, to which was added a part of Gaetulia. (See NUMIDIA.) In AD. 6 the Gaetulians rose in a revolt, which was suppressed by Cornelius Lentulus Cossus. The date of Juba's death has been put between A.D. 19 and 24. Juba, according to Pliny, is mainly memorable for his writings. He has been called the African Varro.

He wrote many historical and geographical works, of which some seem to have been voluminous and of considerable value on account of the sources to which their author had access: (1) Ῥωμαϊκὴ ἱστορία: *(2)* Ἀσσυριακά: *(3)* Λιβυκά:(4) *De Arabia sive De expeditione arabica; (5) Physiologa; (6) De Euphorbia herba; (7)* Περὶ ὄποῦ: *(8)* Περὶ γραφικῆς (Περὶ ζωγράφων): (9) Θεατρικὴ ἱστορία: (10)Ὁμοιότητες: *(11)* Περὶ φθορᾶς λέξεως: (12) Ἐπίγραμμα.

Fragments and life in Müller, *Frag. Hist. Graec.*, vol. iii.; *see* also Sevin, *Mém. de l'Acad. des Inscriptions*, vol. iv.; Hullemann, *De vita et scriptis Jubae (1846).* For the denarii of Juba II. found in *1908* at El Ksar on the coast of Morocco *see* Dieudonné in *Revue Numism.* (1908), pp. *350 seq.* They are interesting mainly as throwing light on the chronology of the reign.

JUBA (JUB, DJIUBA), a river of east Africa, exceeding 1,000 mi. in length, rising on the south-east border of the Ethiopian highlands and flowing south, leaving Ethiopia at Dolo and then flowing through Somalia. It is formed by the junction of three streams, all having their source in the mountain range north-east of Lake Rudolf which is the water-parting between the Nile basin and the rivers flowing to the Indian ocean.

Of the three headstreams, the Web, the Ganale and the Daua, the Ganale is the central river. It has two chief branches, the Black and the Great Ganale. The last-named, the most remote source of the river, rises in 7° 30' N., 38° E. at an altitude of about 7,500 ft. The banks are clothed with dense jungle and the hills beyond with thorn-bush. Lower down the river has formed a narrow valley, 1,500 to 2,000 ft. below the general level of the country, after which it enters a large slightly undulating grass plain which extends south of the valley of the Daua and occupies all the country eastward to the junction of the two rivers. The Web, which near its source passes through a cañon 500 ft. deep and then underground for some distance, joins the Ganale (left) above its junction with the Daua (right). The latter is similar to the Ganale and their courses are parallel.

Below the Daua the river, now known as the Juba, receives no tributary of importance. It first flows in a valley bounded, especially towards the west, by the escarpments of a high plateau, and containing the towns of Lugh (in 3° 50′ N., the centre of active trade), Bardera, with Serenli opposite to it 387 m. above the mouth at a crossing-place for caravans. Beyond 1" 45' N. the country becomes more level and the course of the river very tortuous. Just south of the equator channels from the long, branching Lake Deshekwama, fed by the Lakdera river, enter from the west, and in 0° 15′ S. the Juba enters the sea across a dangerous bar, which has only one fathom of water at high tide. From its mouth to 20 m. above Bardera, where at 2° 35' N. rapids occur, the Juba is navigable by shallow-draught steamers. Just above its mouth it is a fine stream 250 yd. wide, with a current of 2½ knots.

The hills in which the river rises are formed of Archean rocks (schists, gneisses, granites, etc.). In its middle course it crosses Triassic rocks and lower down passes over the Jurassic formations which disappear beneath the coastal alluvium near Sarori. Below the mountainous region of the headstreams the Juba and its tributaries flow through a country generally arid away from the banks of the streams. The soil is sandy, covered either with thorn-scrub or rank grass, which in the rainy season affords herbage for the herds of cattle, sheep and camels owned by the Boran Gallas and the Somali who inhabit the district. But by the banks of the lower river the character of the country changes. The soils of the Gosha district of the Lower Juba are clayey, but remarkably rich in lime and magnesia and with adequate amounts of potash and

phosphoric acid. There are considerable tracts of forest, and the level of flood water is higher than much of the surrounding land. This low-lying fertile belt stretches for about 300 mi., but is not more than a mile or tno wide. In the river valley maize. rice, cotton and other crops are cultivated.

JUBALAND, east Africa, formerly a province of Kenya colony. In 1925 the greater part of the province. about 36,000 sq.mi. (including the port of Kismayu). was transferred from Great Britain to Italy. Trans-Juba (Oltre Giuba), the ceded territory, after being administered as a separate colony for one year. was incorporated into former Italian Somaliland (*q.v.*). Before the transfer the Juba river formed the frontier. The valley of the Juba is fertile, the rest of the area is semiarid. The inhabitants are Somalis whose chief wealth is in cattle and camels.

The British White Paper *Treaty Series* No. *29* (1925) gives the text of the Anglo-Italian treaty and a map. *See* also R. Cani, *Il Giubaland* (1921); G. de Agostini (ed.), *La Vallata del Giuba* (1928).

JUBAYL: *see* BYBLOS.

JUBBULPORE (JUBBULPUR, JABALPUR, etc.), a city, district and division of Madhya Pradesh, India. The city is 198 mi S.W. of Allahabad. The numerous gorges in the neighbouring rocks have been taken advantage of to surround the city with a series of small lakes which, shaded by fine trees and bordered by fantastic crags, add much beauty to the suburbs. Headquarters of the district, the city itself is modern with wide and regular streets. The cantonment and civil station (government and professional residents' quarter) were largely expanded and the total population was 256.998 in 1951. Jubbulpore is a large military station with a government gun-carriage factory, a railway centre on the Bombay-Calcutta route via Xllahabad, and it is also the educational centre of the Hindi-speaking districts of Madhya Pradesh; 11 of the 21 colleges connected with Saugor university are there. A narrow-gauge line connects it with the Satpura districts and the south of the state. It has cotton mills, glass and ceramics factories and cement works and is an important trade centre.

JUBBULPORE DISTRICT has an area of 3.918 sq.mi.; pop. (1951) 1,045,596. The northern and eastern tracts are drained by the Son river system into the Jumna and Ganges, but the southern and southwestern parts lie in the Narbada valley. This area is a fertile plain with rich black soil and embanked fields producing plentiful wheat crops. There are deposits of iron ore. which is smelted in small charcoal furnaces in the jungle. bauxite. manganese ore of low grade and very valuable limestone as well as clays and earths specially suitable for bricks. pottery and glassnare. The Narbada, 11 mi. from Jubbulpore. after a fall of 30 ft., forces its way through the famous Marble Rocks (Bheraghat) gorge.

The district is a beautiful one. well wooded. with hills always in view. There are many sacred spots on the Narbada river. The rich country is almost free from famine, but the light soil areas producing rice and small millet suffered from recurring droughts partly relieved by irrigation projects under nay in the 1950s.

Katni (Murwara), on the Eastern railway, 57 mi. N. of Jubbulpore, has gronn from a village of 2.000 to a busy town of 33.884 (1951) and is the centre of the lime and cement industry.

Jubbulpore division comprises Jubbulpore, Mandla. Balaghat, Chhindwara. Seoni. Sagar, Damoh and Narsimhapur districts. Pop. (1951) 3,410,644; area 20,704 sq.mi.

JUBE, in architecture, a term (from the French *jubé*) for a construction marking off the chancel (q v) or sanctuary of a church from the rest of the interior, as an area of particular reverence. Its mature medieval form consisted of three basic elements: a screen (knonn also in England as a rood screen), varying from solid partitions to open latticework; a gallery or loft above (the rood loft). from which the words *Iube Domine benedicere* (hence *jubé*) were spoken: and a crucifix (rood) surmounting the nhole. Jubes offered magnificent opportunities for sculpture and decorative nork through the later middle ages and the Renaissance; *e.g.,* in the Flamboyant Gothic church of the Madeleine at Troyes and in St Étienne du Mont. Paris (*c.* 1600).

From the 17th century. however. use of jubes declined steadily. Because they divided church interiors into isolated areas. jubes obstructed the favourite baroque effect of a single dramatic vista culminating in the altar. By the early 18th century open ironwork grilles (often of marvelous rococo intricacy) were generally substituted for jubes in France and elsewhere on the continent. Later, as secular clergy took over more and more churches in France, the practical need for separate areas for chapters of monks and nuns diminished, so that by 1800 jubes had become almost obsolete. (AN. G.)

JUBILEE or **JUBILE,** YEAR OF, in the Bible the name applied in the Holiness section of the priestly code of the Hexateuch (Lev. xxv) to the observance of every 50th year (determined by the lapse of seven seven-year periods) as a year of perfect rest, when there was to be no sowing, nor even gathering of the natural products of the field and, the vine. At the beginning of the jubilee year the liberation of all Israelitish slaves and the restoration of ancestral possessions was to be proclaimed. Modern scholars are agreed that the name (Heb. *yōbēl*) signifies "ram" or "ram's horn"; "year of Jubilee" would mean, therefore. the year that is inaugurated by the blowing of the ram's horn (Lev. xxv, 9).

According to Lev. xxv, 8–12, at the completion of seven sabbaths of years (*i.e.*, $7\times7=49$ years) the trumpet of the Jubilee is to be sounded "through the land" on the 10th day of the seventh month (Tisri 10), the great Day of Atonement. The 50th year thus announced is to be "hallowed"; *i* e., liberty is to be proclaimed everynhere to everyone, and the people are to return "every man unto his possession and unto his family." The conditions of the Sabbatical year are repeated as regards the law of real property in relation to the Jubilee (cf. Lev. xxv. 13–34).

The tendency to impose checks upon the alienation of landed property was exceptionally strong in Israel. The fundamental principle is that the land is a sacred possession belonging to Yahweh. and as such it is not to be alienated from Yahweh's people, to whom it was originally assigned. For the law as to property in slaves, especially as this affected Jews who had sold themselves into slavery, *see* Lev. xxv, 35–55. These enactments are only in the latest legal code of the Hexateuch. They can only be understood in the light of the previous enactments regarding the Sabbatical year (cf. Ex. xxi, 2 ff., xxiii, 10 ff.; Deut. xv).

The Book of the Covenant enjoined that the land should lie fallow and Jewish slaves be liberated in the seventh year: Deuteronomy required also the remission of debts. It is evident that these enactments proved impracticable (cf. Jer. xxxiv, 8 ff.), and so it was necessary in the later legislation, represented in the present form of Lev. xxv, to relegate them to the 50th year. the year of Jubilee. This purely theoretical development never could have been actually carried out. According to rabbinical tradition the Jubilee years. though reckoned, were not observed.

Kuenen's conjecture that Lev. xxv. 8 ff. first referred to the seventh year is highly probable. as may also be true with Ezek. xlvi, 16–18 (cf. Jer xxiv, 14). A later rabbinical device for evading the law was the *prosbul.* Further enactments are in Lev. xxvii, 17–25: Sum. xxxvi. 4. (G. H. B.; X.)

JUBILEES, BOOK OF, an apocryphal work of the Old Testament. It is the most advanced pre-Christian representative of the Midrashic tendency, which had already been at work in the Old Testament Chronicles. As the chronicler had rewritten the history of Israel and Judah from the standpoint of the Priests' Code. so our author re-edited from the Pharisaic standpoint of his time the history of the world from the creation to the publication of the Law on Sinai. His work constitutes the oldest commentary in the world on Genesis and part of Exodus, an enlarged Targum on these books, in which difficulties in the biblical narration are solved, gaps supplied, dogmatically offensive elements removed and the genuine spirit of later Judaism infused into the primitive history of the world.

Titles of the Book.——"Jubilees" is an admirable title as the book divides into jubilee periods of forty-nine years each the history of the world from the creation to the legislation on Sinai. It is also frequently designated "The Little Genesis." a title which may have arisen from its dealing more fully with details and minutiae than the biblical work. For other names used, *see* Charles's *The Book* pf *Jubilees,* pp. xvii.–xx.

Object.— The object of our author is the defence and exposi-

tion of Judaism from the Pharisaic standpoint of the 2nd century B.C. against the disintegrating effects of Hellenism. In his elaborate defence of Judaism our author glorifies circumcision and the sabbath, the bulwarks of Judaism, as heavenly ordinances, the sphere of which was so far extended as to embrace Israel on earth. The Law, as a whole, was to our author the realization in time of what was in a sense timeless and eternal. Though revealed in time it was superior to time. Before it had been made known in sundry portions to the fathers, it had been kept in heaven by the angels, and to its observance there was no limit in time or in eternity. Our author next defends Judaism by his glorification of Israel. Whereas the various nations of the Gentiles were subject to angels, Israel was subject to God alone. Israel was God's son, and not only did the nation stand in this relation to God, but also its individual members. Israel received circumcision as a sign that they were the Lord's, and this privilege of circumcision they enjoyed in common with the two highest orders of angels. Hence Israel was to unite with God and these two orders in the observance of the sabbath. Finally the destinies of the world were bound up with Israel. The world was renewed in the creation of the true man Jacob, and its final renewal was to synchronize with the setting-up of God's sanctuary in Zion and the establishment of the Messianic kingdom. In this kingdom the Gentiles had neither part nor lot.

Date. — (I) The book was written during the pontificate of the Maccabean family, and not earlier than 135 B.C. For in xxxii. 1, Levi is called a "priest of the Most High God." Now the only high priests who bore this title were the Maccabean, who appear to have assumed it as reviving the order of Melchizedek when they displaced the Zadokite order of Aaron. Jewish tradition ascribes the assumption of this title to John Hyrcanus. It was retained by his successors down to Hyrcanus II. (2) It was written before 96 B.C. or some years earlier in the reign of John Hyrcanus; for since our author is of the strictest sect, a Pharisee, and at the same time an upholder of the Maccabean pontificate, Jubilees cannot have been written after 96 when the Pharisees and Alexander Jannaeus came to open strife. Nay more, it cannot have been written after the open breach between Hyrcanus and the Pharisees, when the former joined the Sadducean party. We may, however, observe that our book points to the period already past— of stress and persecution that preceded the recovery of national independence under the Maccabees, and presupposes as its historical background the most flourishing period of the Maccabean hegemony.

Author. — The author was a Pharisee of the straitest sect. He maintained the everlasting validity of the law, he held the strictest views on circumcision, the sabbath, and the duty of shunning all intercourse with the Gentiles; he believed in angels, and in a blessed immortality. He was an upholder of the Maccabean pontificate. He glorifies Levi's successors as high-priests and civil rulers, and applies to them the title assumed by the Maccabean princes, though he does not, like the author of the Testaments of the Twelve Patriarchs, expect the Messiah to come forth from among them. He may have been a priest.

The Views of the Author on the Messianic Kingdom and the Future Life. — According to our author the Messianic kingdom was to be brought about gradually by the progressive spiritual development of man and a corresponding transformation of nature. Its members were to reach the limit of 1,000 years in happiness and peace. During its continuance the powers of evil were to be restrained, and the last judgment was apparently to take place at its close. As regards the doctrine of a future life, our author adopts a position novel for a Palestinian writer. He abandons the hope of a resurrection of the body. The souls of the righteous are to enjoy a blessed immortality after death. This is the earliest attested instance of this expectation in the last two centuries B.C.

Literature — *See* the commentaries by R. H. Charles, *The Book of Jubilees or the Little Genesis* (1902), which deals exhaustively with all the questions treated in this article; his edition in *Apocrypha and Pseudepigrapha* (vol. ii. 1913); and his English translation in the S.P.C.K. *Translations of Early Documents* (1917).

(R. H. Ch.; W. O. E. O.)

JUBILEE YEAR, an institution in the Roman Catholic Church, observed every twenty-fifth year, from Christmas to Christmas. During its continuance plenary indulgence is obtainable by all the faithful, on condition of their penitently confessing their sins and visiting certain churches a stated number of times, or doing an equivalent amount of meritorious work. The institution dates from the time of Boniface VIII., whose bull *Antiquorum habet fidem* is dated the 22nd of February 1300. According to contemporary statements, a rumour spread through Rome at the close of 1299 that every one visiting St. Peter's on the 1st of January 1300 would receive full absolution. The result was an enormous influx of pilgrims to Rome, which stirred the pope's attention. Nothing was found in the archives, but an old peasant 107 years of age avowed that his father had been similarly benefited a century previously. The bull was then issued, and the pilgrims became even more numerous, to the profit of both clergy and citizens. At the request of the Roman people, which was supported by St. Bridget of Sweden and by Petrarch, Clement VI. in 1343 appointed, by the bull *Unigenitus Dei filius*, that the jubilee should recur every fifty years instead of every hundred years as had been originally contemplated in the constitution of Boniface; Urban VI., who was badly in need of money, by the bull *Salvator noster* in 1389 reduced the interval still further to thirty-three years (the supposed duration of the earthly life of Christ); and Paul II. by the bull *Ineffabilis* (April 19, 1470) finally fixed it at twenty-five years.

See H. Thurston, art. "Jubilee" in the *Catholic Encyclopaedia.*

JUCAR, a river of eastern Spain. It rises in the north of the province of Cuenca, at the foot of the Cerro de San Felipe (5,906 ft.), and flows south past Cuenca to the borders of Albacete; here it bends towards the east, and maintains this direction for the greater part of its remaining course. On the right it is connected with the city of Albacete by the Maria Cristina canal. It enters the Mediterranean Sea at Cullera, after a course of 314 miles.

JUD, LEO (1482–1542), known to his contemporaries as Meister Leu, Swiss reformer, was born in Alsace and educated at Basel, where he came under the influence of Zwingli. After serving for four years (1518–22) as pastor of Einsiedeln Jud became Zwingli's colleague at Ziirich. He had a share in the translation of the Ziirich Bible and also made a Latin version of the Old Testament. He died at Ziirich on June 19, 1542.

See *Life* by C. Pestalozzi, *Leo Jud* (1860).

JUDAEA, the southern part of Palestine, occupied by the Jewish community in post-exilic days under Persian, Greek and Roman overlordship. In Luke and Acts the term is sometimes used loosely to denote the whole of western Palestine. The limits of Judaea were never precisely defined and varied from time to time. After the death of Herod, Archelaus became ethnarch of Samaria, Idumaea and Judaea, and when he was deposed Judaea was merged in Syria, being governed by a procurator whose headquarters were in Caesarea.

For a description of the natural features of the country *see* **Palestine;** for its history *see* Jews and Judah. *See* also T. Mommsen, *The Provinces of the Roman Empire,* ch. xi.

JUDAH, a district of ancient Palestine to the south of the kingdom of Israel, between the Dead sea and the Philistine plain. It falls physically into three parts: the hill-country from Hebron northwards through Jerusalem; the lowland (Heb. *Shĕphelah*) on the west; and the steppes or "dry land" (Heb. *Negeb*) on the south. The district is one of striking contrasts, with a lofty and stony table-land in the centre (which reaches a height of 3,300 ft. just north of Hebron), with a strategically important valley dividing the central mountains from the lowland, and with the most desolate of tracts to the east (by the Dead sea) and south. Some parts, especially around Hebron, are extremely fertile, but the land as a whole has the characteristics of the southern wilderness and was more fitted for pastoral occupations; *see* further G. A. Smith, *Hist. Geog. Holy Land,* chs. x.–xv.

Life in ancient Judah is frequently depicted in the Bible, but much of the Judaean history is obscure. In the days of the old Hebrew monarchy there were periods of conflict and rivalry between Judah and Israel — and times when the latter incorporated, or at least claimed supremacy over, the former. Later, from the 5th

century B.C., there was a long and serious breach between the Jews (the name is derived from Judah) and the Samaritans (*q.v.*). Judah's stormy history, continued under Greek and Roman domination, reached its climax in the birth of Christianity, and ended with the fall of Jerusalem in A.D. 70. *See* JEWS, PALESTINE.

JUDAISM. The Hebrews were Western Semites, and from the Semites sprang Judaism, Christianity and Islam. It is not uncommon to regard Judaism, or the Hebrew religion, primarily based on the Old Testament, as coming to an end with the rise of Christianity. As against this is the considerable body of opinion which holds that the line of Hebrew religion has come down in unbroken continuity through Pharisaism to the Judaism of today; and this is the view here maintained. By Judaism, therefore, we mean that religion which, going back to the Hebrew scriptures, extends beyond their chronological limits down to modern times —the religion of the Jews (*i.e.*, "Judaeans"). Attempts to reconstruct Hebrew history and religion within the framework of the documentary theory have been recognized as highly subjective and unconvincing. Furthermore, the fundamental assumption in Old-Testament criticism that the Prophets precede the law stands controverted by a mass of contemporary external material from which it is clear that many of the decisive biblical passages relating alike to basic Jewish doctrine and practice belong to the pre-Prophetic age. For this reason the present treatment follows the Pentateuchal tradition, "the substantially Mosaic character" of which, in the words of W. F. Albright, "it is sheer hypercriticism to deny" (The Archaeology of Palestine, p. 224, Penguin Books Ltd, Harmondsworth, 1942).

Introductory.— Judaism rests on two basic doctrines: (1) monotheism, the belief in the one and only God; (2) the covenant election of Israel to be the bearers of this belief. Monotheistic tendencies and beliefs as well as notions of covenanting gods have been traced in other religions, but whereas elsewhere the relation between the deity and the worshippers is rooted in the natural and physical. in Judaism it is determined exclusively by an act of free choice whereby God discloses his presence and will to his elect. The denial of any nature bond between God and his people produces results which constitute the distinguishing features of Judaism, as compared with any other form of god belief, and can be summarized as follows:

1. Divine Transcendence.—The substitution of the covenant relation for the nature bond has as its correlative the idea of the transcendence of God. Everywhere else the divine is comprehended as immanent, as compounded with nature; in Hebrew monotheism God is conceived as transcendent, unbounded by any form or manifestation of physical existence.

2. God as Ground of All Existence.—Transcending every phenomenon, God is the only ground of all existence, the sole creator of all things. The creative principle is thus no longer to be looked for as elsewhere in the regenerative powers of some natural element, from which the deity itself was said to emerge, but in the enlivening spirit and free will of God himself.

3. Ethical Conception of God.—As the transcendent creator, God is not force but character, a free personality possessed of ethical attributes. The moral qualities ascribed to the deity in some of the nature religions do not necessarily make the god ethical, as these qualities are invariably identified with the selfish interests of the tribe, not with the cause of ethical virtue itself, as in the case in Hebrew monotheism.

4. Concern for *Individual Moral* Culture.—Hebrew monotheism not only affirms the ethical character of God, but also makes conformity to the divine pattern the supreme task of man (Lev. xix, 2). This is in contrast to nature religions in which the gods worshipped, even when conduct comes under their control, are at best mere custodians of tribal custom and morality, with no concern for individual moral character.

5. Universalism.—The transcendental ethical conception of God implies universalism, alike in religion and morality. All men are bound to seek God, the creator of the world and the maker of them all, and to obey his moral law.

6. Election for Service.—Universality of true religion and morality demands for its realization a knowledge of God and his law. Hence the Hebrew doctrine of election by virtue of which a people or individuals become the recipients of the divine revelation which they are called to share with all men. The idea of divine choice and mission that is found throughout the ancient near east has nothing in common with the Hebrew conception, where alone election is not for domination but for service.

7. Unity of History in the Purpose of God.—This universal quest for the one and only God imparts a unity to all history in the purpose of God. Everywhere else history is at bottom meaningless, a mere repetition of sin and misery; in Judaism it is full of meaning and significance, every fresh phase in the historical process being a further stage in the development of the purpose of God for the establishment of his universal rule among all the sons of men.

Origins.— The Hebrew religion, according to the Bible, originated with Abraham. He is said to have learned by reflection and revelation of the existence of the one, everlasting God, maker of heaven and earth, who rules the world and whose way is "the doing of righteousness and justice" (Gen. xviii, 19). The recognition of Abraham as founder of the Hebrew religion is not now deemed as eccentric as it would have been in the rationalist period of the 19th century when the biblical patriarchs were considered mere mythical figures. Archaeolagical discoveries in the 20th century, particularly at Mari on the middle Euphrates, have confirmed in many details the narratives of Abraham, so that "the tradition of his birth at Ur may be fearlessly accepted" (C. J. Gadd, History and Monuments of *Ur,* p. 180, Chatto and Windus Ltd, London, 1929). It is now known that Ur was a great centre of the worship of the moon, and its cult was probably included among those of the "strange gods" served by Terah, the father of Abraham, and his household (Josh. xxiv, 2). After a sojourn for some time at Harran, which was also a centre of moon worship, Abraham, in response to a divine urge, left his native country and kindred and, gaining converts to his new faith, made his way to Canaan. According to biblical chronology Abraham's migration to the west took place in the late 20th century B.C.,' a date which, as the explorations of W. F. Albright and Nelson Glueck show, fits well into the framework of general contemporaneous history.

In Canaan God is said to have entered with Abraham into a covenant to give the land to his seed and to make them a blessing to all the nations of the earth. This covenant was sealed by the rite of circumcision, a rite which provided for the inclusion within its scope of all the sons of men (Genesis, chapter xvii). Here it is of importance to note that the passages in which expression is given to these two basic monotheistic conceptions of covenant election and universalism, belong even on the critical view to the pre-Prophetic age; which makes the insistence that monotheism is but the product of the 8th- and 7th-century prophets difficult to follow. That does not, however, mean to imply that Abraham discovered what is commonly called monotheism. Evidence is not wanting that the ancient Semites had the idea of one single God, the maker of all things, one supreme El; and the Bible itself confirms that in Canaan there was a king of Salem (Jerusalem) who was the priest of El *Elyon* (Most High God), who was called "possessor (or maker) of heaven and earth" (Gen. xiv, 19); and that the religion of the Sumerians, of which Ur was one of the states, was originally monotheistic is a view which was argued with considerable force by Stephen Langdon (Evangelical Quarterly, April 1931). But it was not transcendental-ethical and therefore faded into polytheism. It was only with Abraham that transcendental-ethical monotheism came on the scene. Whether or not Abraham formally denied the reality of other gods is more of speculative than practical interest. All that matters from the religious standpoint is the fact that the God whom he worshipped, though named also Shaddai, which is taken to mean "[God] of the mountain," was no territorial deity, nor bound to any natural phenomenon, but was the one and only creator, whose dominion was absolute and universal and who was just and righteous; this of necessity implied that all other gods, even if they did exist as genii, or demons, were of no account.

The Exodus and Sinai.—From Abraham the ideals of mono-

theism were transmitted to Isaac and Jacob, with both of whom God renewed the covenant that he had made with Abraham, and from them to their descendants until we come to the Exodus (which, according to the biblical dating, adopted by a large number of scholars, took place in the 15th century B.C.) and to the revelation at Sinai, when, under the dominating personality of Moses, the formerly enslaved Hebrew tribes, now known as the children of Israel, became a nation and Hebrew monotheism was organized and developed. But the religion which Moses brought to them was not a new creation; it had its roots in the lives of the patriarchs. YHWH,[1] the God who appeared to Moses at the burning bush under the name EHYEH (Exod. iii, 14; the form of the divine name when used by God himself) and in whose name Moses brought a message of deliverance to the people, was the God of Abraham, Isaac and Jacob and the God whose name they already knew. And the covenant which he was subsequently to make with them was but a renewal of the covenant he had already made with the patriarchs. and of which they had been aware. Various etymologies have been proposed for the name YHWH, but the biblical derivation from the verb *hawah* ("to be"), the form being the third person singular of the simple imperfect, with reference to his existence, remains the most satisfactory. More obscure is the origin of the name. Attempts to connect it with the alleged YW of the Ras Shamra tablets (discovered near Latakia, Syria) have found little acceptance. **A** tradition that the worship of YHWH antedates Moses is preserved in Gen. iv, 26, as well as in many subsequent passages (*e.g.*, xii, 8; xv, 8) which claim that the name was known to the patriarchs. Historical criticism would therefore assign these Genesis passages to a different author, "J" (Jehovist) ; but this is not warranted as the revelation to Moses did not concern the name in itself but, as the context indicates, its significance, as denoting the God who is ever present in history and with his people. The name YHWH was thus the covenant name of God in Israel, the covenant which was to be initiated by mighty acts of deliverance and to constitute the charter of the divine election of Israel. It was this significance of the name, not fully realized in the experiences of the patriarchs, which was revealed to Moses at the burning bush and communicated by him in turn to Israel. There is thus no ground for the view that Exod. vi, 3, was a later recension of the Elohist author. The hypothesis that YHWH was a Kenite deity, a storm god, first suggested by Richard von der Alm in 1862, no longer enjoys the vogue that it did, as it is realized that Moses could hardly have succeeded in inducing the people to entrust their fate to a foreign god of whom they had no knowledge and upon whom they could not look with anything but distrust. YHWH, in whose name Moses brought the enslaved tribes a message of deliverance, was indeed their God and the God of their ancestors, whose name they had known but whose full power was yet to be made manifest to them. Thus it is that the people followed Moses out of bondage and repaired to Sinai, where God's covenant with the patriarchs received its ratification, in all its implications, alike for their descendants and for all other peoples. The election for service which the covenant involved was expressed in the words "And you shall be unto me a kingdom of priests and a holy nation" (Exod. xix, 6). As such, the covenant rested on moral principles, and its operation depended on the people's loyalty to these principles. What these principles were was promulgated at the revelation of Sinai. The psychological experience involved in the Sinaitic revelation, like all other self-disclosures of the divine to man, cannot be determined; but it is unique in its claim to have been shared by a whole nation.

Connected with the Sinaitic revelation are the Ten Commandments. Basic to them is the interdependence of morality and religion. They forbid the deification of nature, as well as the making of graven images, and enjoin the observance of the day of rest, the honour of parents, respect for property, life and a woman's honour, and the eschewing of any deed or thought potentially inimical to one's fellow men. The lofty ethic of the Ten Commandments is no longer considered a valid argument against its antiquity, as modern biblical scholarship has moved considerably from the position held previously regarding the supposedly slow and unilinear evolution of the ancient religion of Israel. The Ten Commandments were followed by a series of revelations to Moses, which he transmitted to the people, and which, incorporating the Decalogue, finally became Torah, of which the Pentateuch is the written record.

The Torah. — Torah, usually translated "law," denotes "teaching" and includes doctrine and practice, religion and morals. The Torah was a necessary consequence of the covenant. Its object was to train the people in holiness, in conformity with the covenant. The significance of this holiness is indicated in the meaning of its Hebrew equivalent kadosh which, whatever its etymology, expresses a quality which consists negatively in "separation from" and positively in "dedication to." Applied to the Hebrew people, holiness, in the negative sense, entailed separation from all the demoralizing influences of the sensuous cults and self-centred morals of the surrounding idolatrous nations. Positively considered, holiness involved a dedication to the service of God. In the midst of the evil order it was not enough for them simply to keep aloof from all that was abominable and evil, they also had to strive to cultivate the good and noble. For the fulfilment of this twofold task, the Hebrews were given the Torah. Instead of a cult that was degrading, the Torah offered a system of religious observances which was conducive to their moralization. Instead of a morality which was self-centred, the Torah provided an ethic which placed service to others at the centre of its system.

Religious Observances. — As for the religious observances, these extended to almost every detail of life and their underlying motive of holiness was introduced and maintained by special symbols, such as the fringes and the frontlets under the technical names "remembrances" or "signs" (see, *e.g.*, Num. xv, 40). Special emphasis on the motive of holiness seems to have been laid in connection with observances which had their counterpart in practices observed among other peoples, but for reasons essentially idolatrous. Thus the prohibition of eating the flesh of certain animals, classed as unclean, is motivated over and again by the principle of holiness (see Lev. xi, 44–45) in marked contrast to the totem notion which lay behind the abstention from certain flesh in vogue among other Semitic peoples. Similarly with the Sabbath. Whatever the connection of the Hebrew Sabbath with the Babylonian *Shappatu* or with some tabu of the Kenite smiths (B. D. Eerdmans, The Religion of Israel, Leyden, 1947) may have been, the peculiar quality of holiness ascribed to it has transformed it from a day of danger to a day blessed by God (Exod. xx, 11). The same is true of the three pilgrimage festivals: the Feasts of Unleavened Bread, of Weeks and of Booths, all of which were of distinctly agricultural character corresponding respectively to the barley harvest, wheat harvest and vintage. They are all described as "holy convocations" in contrast to the harvest festivals of the Canaanites which were marked by obscene fertility rites and orgiastic scenes. The discovery at Ras Shamra of texts which show that the Tammuz ritual formed the central feature of the Canaanite New-Year celebrations gave new significance to the ascription of "holy convocation" to the biblical New Year, which, as is generally recognized, is the festival referred to in Num. xxix, 1, as well as the Day of Atonement, with which it is closely connected.

Holiness is particularly stressed as the keynote of the sacrificial system of the Torah. The Ras Shamra materials have proved that much of what the original school of J. Wellhausen had taken to be the innovation of the so-called P (the "Priestly" section of the Hexateuch) was really very ancient. But this very antiquity of sacrifices made it all the more necessary to safeguard the institution against the introduction of any idolatrous elements. This was provided for by enveloping the whole system with holiness. Everything pertaining to the sacrifices, the sanctuary, the priests, the vessels and the offerings themselves, were designated holy. But in biblical thought, ritual holiness with reference to any object, whether things or places or human beings, has nothing to do with the tabu which was the common feeling among all Semites, as the holy does not attach itself to any object, but to God, or to whatever belongs to God. An object becomes holy

[1]The pronunciation of the Tetragrammaton is unknown, and the pronunciation of this divine name is best left unvocalized. *(See* JEHOVAH.)

not because it is tabu, but becomes tabu because it has come to belong to God. And the holiness ascribed to the sacrificial system and all its appurtenances was symbolic of the divine holiness which was to influence individual and corporate life.

Moral Conduct.—Applied to moral conduct, holiness was to express itself in terms of justice and righteousness. In the common life, this meant the recognition of six fundamental rights: the right to live, the right of possession, the right to work, the right to clothing, the right to shelter and finally the right of person, which, as exemplified in the Sabbath law, includes the right of leisure and the right of liberty. The concern of the poor and the weak, the afflicted and oppressed, and the restrictions placed on the powerful, as set forth in Lev. xix, 15, show how deeply this passion for justice and righteousness was to be felt. It was also to be shown in the conception of earthly goods, the possession of which was to be regarded not as a natural thing, but as a divine trust. The misfortunes of our fellow men were not to be exploited to increase our income. When a neighbour was in difficulties, a loan was to be made to him for which no interest could be charged. All land of inheritance sold was to return to the original owners or their heirs in the Jubilee Year, thus preventing the land from becoming concentrated in the hands of a few to the impoverishment of the masses. Economic life in Torah ethics was thus to mean service to fellow man. And behind this ethic stood as a whole the law of love as formulated in the command: "Thou shalt love thy fellow as thyself" (Lev. xix, 18) which is expressly stated (verse 34) also to include strangers.

The Unity in the Laws of the Torah.—But over and above the ritual and moral laws stood the will of God, as their common source of authority and sanction. It is this which imparts to the Torah its unity, allowing for no distinction between one class of law and another, a conception nowhere more strikingly illustrated than in Leviticus, chapter xix, where the golden rule of love to fellow man (verse 18) is followed by the ritual law forbidding the mixture of species in animals, seed and garments (verse 19).

With the divine will as their common source the violation of any of these laws was a sin against God which could not go unpunished. The Torah accordingly provides a system of penalties, varying in accordance with the gravity of the offense and the intent with which it had been committed. Promises of rewards, primarily temporal and national, are also made for obedience. No specific mention is made of reward and punishment after death. Yet it would be wrong to infer from this silence that the early Hebrews did not believe in survival beyond the grave. In a world largely dominated by the prospect of life after death it would be strange if the Hebrews alone did not share this belief. As a matter of fact, they had some notion of the hereafter which in its practical bearing was not different from what is known as immortality. The verse which speaks of God breathing into man's nostrils the breath of life (Gen. ii, 7) can only mean that the "breath breathed in by the Creator who was immortal conferred upon man the faculty of becoming immortal" (W. O. E. Oesterley, Immortality and the Unseen World, p. 198, Society for Promoting Christian Knowledge, London, 1921). Yet, notwithstanding this conviction, the Hebrew scriptures found it necessary to observe a reticence over the question of man's survival in order to wean the people away from the idolatrous cult of the dead with which this belief was generally associated.

The fear of God's punishment and the hope of his reward is held up as motive for obedience; but equally stressed is the higher motive of the love of God. In the love of God, no appeal is made to the senses as in the polytheistic cults. In every case the call is followed by the injunction to observe his commandment (*e.g.*, Exod. xx, 6; Deut. vi, 4-8).

Holiness was not the only charge laid upon the people. By virtue of the covenant Israel was to become also a kingdom of priests, a call which signifies spiritual ministration to others. Israel had thus to be apart from the world and yet to remain of the world. While resisting any accommodation to the corrupting influence of surrounding heathen nations, their priestly mission demanded that they should not only be good themselves, but also seek to establish goodness everywhere.

Israel's Accommodation to Idolatry.—The charge that accompanied the Hebrew tribes on their entry into Canaan was not beyond their power. As all evidence goes to show, when Israel reached Canaan, under Joshua, they were already imbued with a national consciousness which made them feel and act as one people, with a common resolve to take possession of that little land to which they were drawn by the thought that it had been the home of their fathers. To this national consciousness was linked a national religion, fostered by an organized sacrificial ritual and a code of ethical, civil and religious laws (such as presented in the brief outline above), uhich, as a result of the researches of Albrecht Alt, Anton Jirku and W. F. Albright, among others, it is captious to refuse to ascribe to Moses, whatever the views as to the date of the particular documents in which they are recorded. But this national and religious unity did not survive the days of Joshua, which were followed by a period of almost complete political anarchy (see Judg. xvii, 6). Corresponding with this loosening of the national bond was the loosening of the religious bond. In settling down from a nomadic to an agricultural life, the Israelites had to learn these matters from the Canaanites and, in the process, came under the influence of the sensuous fertility cults of the natives, with their child sacrifices, sacred prostitutions and totally depraved godlets. Some deserted YHWH for the local Baals and Astartes, to whom they came to ascribe the yield of the soil and the increase of cattle. Others served YHWH and Baal, YHWH being the custodian deity of the nation and the Baals the territorial gods, the givers of the harvest and vintage. Others again practised a syncretism, transferring to YHWH all the titles, attributes and modes of worship of the local gods. Brave resistance to these tendencies was offered by the Judges, who, appearing on the scene as liberators from foreign oppression, succeeded in recalling the people to the pure worship of YHWH; but their influence, which was rarely more than local, waned with the passing of each of the successive crises. Yet by dint of the persistent efforts of generations of leaders, supported by the Levites, who were in charge of the ark and of the sanctuary, the cause of YHWH advanced, so that by the time of Samuel the worship of YHWH had established itself firmly in the north, where was situated the central sanctuary of Shiloh, the historicity of which the researches of A. Alt and M. Noth into the amphictyonic systems in the Mediterranean basin during the early centuries of the first millennium B.C. did much to confirm. The capture of the ark and the destruction of Shiloh by the Philistines made a deep impression upon the tribes, and Samuel, taking advantage of the situation, brought about a reform which led to the abolition of the Baal worship from Israel, to be restored only about two centuries later by the Sidonian princess Jezebel. The revival of the national religion coupled with the Philistine advance, which threatened to reduce Israel to hopeless servitude, worked in favour of centralization of authority. Thus arose the clamour for a king, not so much to fight their battles as to judge them (I Sam. viii, 5). Saul, the first to become king, did not, however, realize the hopes placed in him, and he was followed by David who, as a result of a series of brilliant victories over external enemies, became king over all the tribes, north and south, and succeeded in effecting true unity, cementing it by making Jerusalem both the national capital and the seat of the ark and thus the symbol of religious no less than national unity. This work of centralization was carried on and developed by his son Solomon, whose reign was marked by the systematic administration of the country and the building of the Temple. Whatever foreign models and designs may have been adapted by the Tyrian artisans in the building of the Temple, there is not the slightest indication that these in any way influenced the Israelites' idea of God, who remained invisible, enthroned in majesty in the holy of holies above the cherubim, derived only in name and form from contemporary Canaanite art but neither worshipped nor thought of as intercessors. The Temple was intended to serve not simply, as J. Wellhausen maintains, as royal chapel. but as a central sanctuary, superseding all the multiplicity of local shrines, the high places (see HIGH **PLACE**), which since the destruction of Shiloh had been considered legitimate places of worship but

which because of their idolatrous associations, were henceforth forbidden. But the centralizing influences of the Temple were unable to eradicate from the peoples' mind the false notions about God's character which had come down to them through generations of apostasy. YHWH was no longer the one and only God, but a mere national God, fettered to his people by some nature bond and standing in the same relation to Israel as Chemosh to Moab. This was not without effect upon personal religion, as it was not the part of a national god to concern himself directly with the individual, to whom he was linked by ties of the most precarious character. Thus was the way open for the intrusion of all kinds of petty cults (*e.g.*, inagic and necromancy) for the satisfaction of individual desires. as well as for the accommodation of Yahwism to strange gods of all sorts, as political expediency (foreign alliances, marriages and economic relations) dictated. This accommodation varied in intensity throughout the remaining centuries of the first Hebrew state, north and south, ranging from the caif cult introduced by Jeroboam on the division of the monarchy, which apparently involved nothing beyond a mere visual representation of YHWH, to the introduction and establishment by Ahab, under the influence of Jezebel, of Baalism as the state religion of the northern kingdom, in rivalry to YHWH. The same idolatrous accommodation proceeded in the southern kingdom, where during the early period of its existence it was practised mainly by the court and nobility, while the people as a whole remained loyal to YHWH, notwithstanding the recrudescence of sacrifices on high places (which, although equipped in Canaanite fashion with pillars and sacred poles, did not affect the purity of the cult itself). It was this loyalty of the masses that made possible the several reformations, varying in scope and character, under Asa. Jehoash and Hezekiah, which marked the religious history of the kingdom. Yet, in spite of the outward loyalty of the masses. their notions of YHWH did not differ much from those entertained by their brethren in the north, and all Israel was thus in danger of succumbing to the sensual spell of polytheism, involving ultimately their own extinction as well as the loss of all true religion and morality.

The Rise of the Prophets. — With the crisis of those times a line of great prophets arose and saved the situation. The first of these prophets was Elijah, the prophet of action. His firm stand for YHWH against Baal was followed by his fearless denunciation of Ahab on account of the judicial murder of Naboth (I Kings, chapter xxi), which was a practicai affirmation of the Hebrew monotheistic doctrine that YHWH was not only the God of nature but also the God of righteousness, whose demands stood above everything else, even above the interests of the state; while his commissioning Elisha, his disciple, to anoint, in the name of God, Hazael as king of the Syrians, so that he might scourge the northern kingdom for its sins, was but a public demonstration that God was not only the God of Israel but also the God of all nations, whom he used as instruments of his purpose. Elijah's attitude was enforced by the "literary prophets" of the 8th and 7th centuries. Amos, Hosea, Isaiah. In the days of Amos and Hosea, Israel had entered into world history. Almost overwhelmed by its former ally, Damascus, it had been brilliantly restored by Jeroboam II. These were no mere interstate rivalries; the great powers of Assyria and Urartu (Ararat, Armenia) themselves had been behind these vicissitudes. Israel had now seen its national God moving history on its behalf. Amos, however, shifted the emphasis from Israel's national God who had restored his people to a universal God, of universal righteousness, whose relation nas based on an eternal moral law and who required a higher standard of life from an Israel who claimed to stand in a unique relationship to him (Amos iii, 2). Hosea stressed the personal side of the relationship between God and Israel. It was a relationship which was rooted in God's love for Israel, and this made its sins, religious and moral, all the more heinous since these offended against divine love. Amos and Hosea thus attacked the idolatrous accominodation which fostered unethical conceptions of God, as well as the resultant moral corruption which existed on every side. Israel's deflection from the required standards could not fail to provoke divine punishment in the form of defeat and exile, through God's appointed instrument, Assyria, which was a mere tool in his hands but no more than a tool; for YHWH, who threatens Israel or punishes it, continued to be the God who would ultimately restore his own people to himself.

Isaiah began his prophetic activity when Israel was in the throes of dissolution as a result of the Assyrian attacks, and Judah was facing peril from the encroachments of the same foe. He took up the same burden as his predecessors and directed it against both Israel and Judah; but in denouncing the religious decay in Judah he struck a new note. What he condemned there mas not the cult itself but the way in which it was practised by the people, the divorcement of inner piety and moral integrity from their worship, from their Temple sacrifices, from their Sabbaths and from their prayers.

Deuteronomy. — The warnings and exhortations of the prophets went unheeded and the northern kingdom succumbed to its fate in 721 B.C. Nor did the prophets meet with greater success a century later, when Judah was entering upon its decline. That this failure of Hebrew prophecy in its own age did not spell its failure on the permanent field of history was due to the discovery of the book on which the reforms of Josiah (II Kings, chapters xxii–xxiii; II Chronicles, chapter xxxiv) were based, now generally identified with the whole or part of Deuteronomy. But this identification throws no light either on the date of Deuteronomy or on the origin of the one sanctuary law. As against the long-prevalent view that Deuteronomy is a product of the 7th century are the opinions of many modern scholars who assign it to an earlier date, not a few insisting that the conditions reflected in the book fit best the Mosaic age; as already mentioned, research tends to confirm the existence of a central sanctuary from the earliest times of Israelite history. Edward Robertson sums up the situation correctly when he writes (*The* Old Testament Problem, p. 142, Manchester University Press, 1950) that the old Deuteronomic law of the central sanctuary was rendered inoperative with the disruption of the monarchy and that the "re-discovery of the book in the reign of Josiah was opportune, for by then the Northern Kingdom had fallen and 'all Israel' could be reunited under the same code." In any event it was the reading of Deuteronomy, as is evident from the scriptural account, that affected deeply the king and roused him to action. The rediscovery of the book (or of the volume that contained it) thus preserved for Israel an authentic and inspired guide which, by its unique blending of ritual law and ethical precept, of outward action and inward motive, saved the teaching of the prophets from evaporation into platitudinous vagueness and thereby enabled Israel to rediscover, amid the ravages of defeat and exile, the way to a personal faith in a truly living God and to his service in all walks of life.

The idea that Deuteronomy is an attempt at a compromise between the prophetic and the priestly spirit is based on the supposition of an antagonism between prophet and priest for which there is no support in the Old Testament. The prophets were first and foremost teachers of religion, not of ethics. Their supreme concern was the will of God, rather than the rule of righteousness. Fundamentally then, the prophet was animated by the same ideal as the priest, who also, in his own manner, sought to win obedience to the divine will, although they differed in their approach, the prophet by emphasizing moral and religious principles, the priest by attending to ritual and worship. There could consequently be no conflict between prophet and priest. The conflict, when it did arise. was between the true prophet and the false priest who misrepresented the character of God by encouraging a belief that sacrifices were more pleasing to him than moral conduct; just as the true prophet clashed with the false prophet who, misconstruing the purpose of God, lulled the people into a false sense of security.

The Prophets of the 6th Century. — The same period witnessed the activity of Jeremiah and Ezekiel, who in their enunciation of individual responsibility sought to restore to the people the sense of personal relationship to God, which they had lost under the impact of pagan influence. This was a time of general national disintegration, when religious and social organizations were rapidly breaking up. Jerusalem and the Temple were shortly

to be destroyed by the Babylonians (586 B.C.) and religion stripped of its national associations, which for many meant the end of all religion. From various writings of that period (*e.g.*, Jeremiah, Habakkuk, Zephaniah) it can be seen that serious minds were utterly overwhelmed by the changing conditions. Some surrendered to a blank scepticism (Zeph. i, 12); while the generation of Jeremiah, blind to their own moral turpitude, were impugning the justice of God who had brought upon them suffering for sins which not they, but their ancestors had committed. Jeremiah, after repudiating the popular notion concerning the transference of punishment from ancestors to descendants and from the guilty to the innocent, sought to impress upon the people the stark fact of their own sinfulness, as well as the recognition of the responsibility that they each bore for the misfortunes that had overtaken them (Jeremiah, chapter xxxi). Ezekiel, taking up Jeremiah's teaching, strove to educate the exiled people in the faithful consciousness of personal accountability for sin and to bring at the same time a message to all sin-conscious individual souls of divine reconciliation through an inward renewal wrought by the power of God (Ezekiel, chapter xviii). This reality of personal relationship with God meant that city, Temple and sacrifices were no longer indispensable and that the people in exile could individually, as well as corporately, be both loyal to their new home and worshippers of YHWH, who would be with them wherever they might be. Jeremiah nevertheless foresaw the restoration of historic Israel, which was one day to lead all nations to the worship of the one and only God through their realization of the worthlessness of their idols (Jer. xvi, 19). The key to this universal consummation was to be the new covenant (Jer. xxxi, 31–34) which God would inscribe upon the heart of the people and which would be grounded, not in the mighty acts of deliverance that he had done for them in the far-off days of the past, but in his deeds of salvation in their everyday life; so that the knowledge of him would become the common possession of all Israel and, through them, of all nations of the world. But while Jeremiah's gaze here was directed toward the horizon of the distant days to come, Ezekiel was concerned with the more immediate future, and he accordingly drew up an order of worship and of society for the community of exiles who were about to be restored.

The Servant of **YHWH.**—Jeremiah's vision of Israel's world-wide mission receives powerful expression in Isaiah, chapter xl, et seq. and in the "Servant of YHWH" chapters, where in a series of passages of unequalled force the prophet passes from the unique monotheistic teaching of Israel's God to the unique world destiny of his people Israel. The interpretation of these biblical passages has been keenly disputed, but their application to the people Israel still holds the field. The prophet depicts a scene of universal salvation in the midst of which stands the servant of YHWH—Israel —whom hitherto the nations had thought to have been forsaken by God; now, however, they had come to realize that all the sorrows which he had endured were but the work of their own wickedness and misdeeds. It was they who had sinned in crushing the servant of God; while he, by a martyrdom endured without flinching, had been able to fulfil his divinely imposed duty culminating in the salvation that they were all now sharing in common.

So penetrating is this doctrine in its significance for religious thought that all earlier conceptions of the special relation between God and Israel here reach their climax. Israel had been called for high office, and this demanded a readiness to submit to the severest tests and trials without murmur and without losing faith or hope in the ultimate vindication of its cause.

The Prophets **of the** Return.— The severe discipline of the Babylonian exile, which came to an end in 538 B.C., purged the people from all idolatrous taints and tendencies; and the monotheistic faith became as a result irrevocably established in Israel. But the moralization of the conception of God and his relation to man, which had now found common acceptance, led many to disparage the Temple and its cult. As against this attitude, Haggai, Zechariah and Malachi insisted on the need of the Temple for the strengthening of religious life. Again. the removal of idolatry—which, the people had always been told, was the root of all evil—meant for macy the fulfilment of the moral law with no further claims upon them. Zechariah, who made this problem his own, urged upon the people those moral and spiritual truths without which Temple worship would be a hollow mockery (Zech. viii, 16–17).

The Temple was rebuilt under the Davidic Zerubbabel in 516 B.C.; and Malachi, in the spirit of his predecessors, shows equal zeal for the Temple cult and for ethical conduct and, while exhibiting an extraordinary universalistic attitude (Mal, i, 11), concludes with an exhortation to remember the law of Moses, its statutes and judgments (religion and ethical precepts). With this message Hebrew prophecy takes leave of Israel and the rest of mankind. It has by now fulfilled its divinely appointed role, having told Israel and, through Israel, the world the principles by which nations and individuals must live in fulfilment of their destiny.

Ezra and **the** Survival of Judaism.— The years following the building of the Temple present a complete blank, but in the meantime great changes took place in Judaea and outside. The old monarchy of Israel had been destroyed, the old land broken up; the disorganization seemed complete. Yet under Persian tutelage, there arose an autonomous theocratic state, and disintegration gave place to reintegration, a new national consciousness and new corporate responsibility. Outside Judaea, in the places of dispersion, with their main centres in Babylon and Egypt, the old religion, under influences and circumstances which have been concealed and forgotten, was stripped of its territorial limitations and political loyalties and became a religion founded on a common tradition, ideals and hopes, fed and sustained by the religious centre in Jerusalem. The study of the changes involved continues to absorb scholars, so vital are the problems. In any event it is remarkable that, notwithstanding the immense political and social changes arising out of the Assyrian conquests and after the fall of Nineveh (612 B.C.), a continuity was maintained, and the individualism of an age of disintegration was followed by a rebirth and reorganization amid the decay and death of other nations. Israel's kindred, Edom, Ammon. Moab, like the great surrounding empires, fell in their day; even Samaria disappeared from history, but Hebrew religion, or what has since come to be known as Judaism, survived. This is due mainly to Ezra, who came up from Babylonia (in 457, according to the traditional date) with the book of the law of God and was chiefly instrumental in getting it put in force as the law of the returned exiles in Judaea. The view that Ezra's main concern was with the Temple and the priesthood is contradicted by the terms of the royal warrant (Ezra vi, 11–26) and the other relevant documents, the authenticity of which is strongly maintained by scholars of repute (*e.g.*, E. Meyer and W. F. Albright). The fact is that what saved Judaism from becoming a purely priestly religion was the work of Ezra. When he came to Judah there was already in existence a Temple, a high priest and a sacrificial system in operation, but little more of organized religious and spiritual life. The plea of the prophets Zechariah and Malachi for the whole Torah had yet to take effect. Then came Ezra who "set his heart to seek the Torah of the Lord, and to teach to Israel statutes and judgments" (Ezra vii, 10); and under his leadership the Torah in its entirety —alike in its religious and moral aspects—was established sovereign in the state, and knowledge of it was no longer as hitherto the exclusive monopoly of a class but the common possession of the nation as a whole. This enthronement of the Torah in the heart and mind of the people provided a powerful safeguard against the heathen accommodation which brought about the destruction of the first Hebrew state and thus ensured the purity of the national religion and survival of Judaism.

The **Sopherim** (Scribes).--After Ezra there follows another obscure period, during which Persian rule in Palestine was replaced by the Macedonian and the Ptolemaic, but it is a period which is of great importance in the history of Judaism. This is not because of any direct influence on the religion which can be traced to Persian or to Greek thought. Such influences are still largely a matter of debate and in any case were not more than peripheral and never central. As a matter of fact the better the knowledge of the cultural milieu of the early phase of Hebrew history be-

comes, the more consistently does modern scholarship affirm the independence and in many ways the priority of such central concepts as the kingdom of God, resurrection and immortality, as well as the idea of angels, in ancient Israel. The importance of this obscure period is that, under the patronage of its foreign rulers, the little Judaean community was able to maintain and develop without any outside interference the work begun by Ezra. A succession of teachers known as Sopherim (scribes), generally identified with the "men of the great assembly," arose with the resolve to uphold the authority of the Torah and enhance its power as a sanctifying source of all life and action. With this aim in view, they interpreted the biblical ordinances, civil, domestic, economic and social (formulating their underlying principles, classifying their details, fixing their norms and regulating their usages), and adapted the laws to changes in conditions and circumstances. This was no innovation of the Sopherim; it was but an application, extension and development of the oral tradition which, going back to the earliest times, had been transmitted from generation to generation as oral Torah (Torah *she-be-al-peh*), in part interpreting, in part supplementing. the written Torah (Torah she-bi-kethabh) and in its total effect transforming scripture from being only a written document liable to become obsolete into a continuous revelation, keeping pace with the ages. In their interpretation of the holy writ the Sopherim sought to harmonize the spirit and the letter, as exemplified in their substitution of compensation for the *lex talionis*, as well as in their lenient application of the Sabbath law, in comparison with the rigorism of. say, Jubilees which, following the strict letter of the law, imposed complete abstention from all physical activity on the day of rest. On the other hand, in order to safeguard the scriptural ordinances against any infringement, they enacted stringent cautionary rules known as "fences for the Torah." They further held regular expositions of the scriptures, the law and the Prophets, as well as the other sacred books which belong to Israel's Wisdom literature (see WISDOM LITERATURE); organized daily worship, which included the rich expression of prayer and praise in the Psalms; and, prescribed the principal benedictions as well as most of the rites which constitute the present-day extra-biblical observances of the devout Jew. The effect of all this was a mass loyalty which proved its depth and strength in the revolt of the Maccabees (*q.v.*) against the totalitarian paganizing policy of Antiochus IV.

Pharisees and Sadducees.—Out of this struggle there gradually emerged a state which eventually became a kingdom. But no sooner had the new kingdom come into being than the question had to be faced as to the position of the Torah in the affairs of the state. We are here coming to the point of cleavage between the Sadducees and the Pharisees, the two principal parties of the period. The Pharisees desired that the new state in all its affairs should continue to be governed on strict Torah lines whereas the Sadducees maintained that it was all very well for the Torah to remain the constitution of the new state but that it was impossible to carry on a government under the changed conditions without making political expediency and economic interest the final arbiter of things. The issue involved was the inclusion of the oral tradition within the concept of Torah. If the Torah meant only the written text, then evidently it was impossible to obey it under the new conditions. If Torah: however, included the oral tradition, then the way was open for its interpreters to discover from the written text its true meaning as applied to the needs of their own time.

The Sadducees, with all their recognition of Torah, laid primary stress on the nation; the Pharisees, with all their attachment to the state, laid primary stress on Torah. This difference of attitude stemmed from their respective conceptions of God. To the Sadducees God was essentially a national God, the God of Israel only; to the Pharisees a universal God, a God of all mankind. The nationalist conception of religion had a pernicious effect on the subsequent trends in the kingdom. The Maccabees became fanatical nationalists: before long, John Hyrcanus mas conquering the Samaritans, destroying their temple; the Idumaeans (the earlier Edomites) were forcibly judaized; and a Jewish kingdom, almost Solomonic in its extent, flcurished between the end of the Seleucid and the beginning of the Roman period (141–63 B.C.). But with this policy they were merely sowing dragons' teeth. Through the Idumaean Herods, the Jews entered upon the last period of prosperity under Roman patronage with all the dangers that this meant for national Judaism; the final catastrophe (A.D. 70) was witnessed—if not hastened—by the last of this strangely non-Jewish family, Agrippa II.

Meanwhile, the Maccabean revolt against a semi-Greek and semioriental life had given a fresh endorsement to Judaism shortly before Judaea became subject to the Romans. It was a newly consolidated Judaism that now entered upon the western phase of its history, with a profounder conception of the part it was to play in universal history. The Jew with his Torah, his traditions and his universal God had something to offer a world from which, however, his own religion tended to keep him apart. Judaism had already attracted the attention of the world, whether from the curious Hecataeus of Abdera (fl. 4th century B.C.) or his contemporary, the anti-Jewish historian Manetho. Judaism in conformity with its priestly mission felt a world call, and classical authors testify to the vigour of Jewish missionary enterprise. Indeed there was a remarkable vigour throughout the oriental religions, and many diverse tendencies of thought and a variety of sects characterize the eastern Roman empire at the birth of Christianity—primarily another Jewish sect. Besides certain striking ethical tendencies and also the more impressive Messianic expectations (see MESSIAH), a Damascene body of Jewish covenanters, whose date is disputed and whose further history is unknown, looked for a "teacher of righteousness" (a name which reappears in the Dead Sea scrolls), who is to be followed by a Messiah. They testify to some reforming movement outside Judaea, and therefore in districts more remote from the Judaism of Jerusalem. Similarly. the book of Enoch (*q.v.*) appears to proceed from a north Palestinian (Galilean) district, largely non-Jewish. (See also JEWISH SECTS DURING THE SECOND COMMONWEALTH; PHARISEES; SCRIBES.)

Christianity and Judaism.—Christianity also began originally as a reform movement, which while accepting the law and the Prophets, refused to be bound by the oral tradition. Jesus claimed to "fulfil the law," but preferred to follow his own interpretations and particularly attacked the "fences for the Torah," such as the washing of hands, certain tithings and fasts, as well as other prescriptions which in his view were but heavy burdens imposed by scribes and Pharisees. In this respect he was much in sympathy with the Sadducees, which incidentally explains the reason why, notwithstanding their antagonism to Jesus, the Sadducees were spared his invectives, which are reserved principally for the Pharisees. Perhaps. in his attitude to the Pharisaic prescriptions, Jesus was influenced by the then universal belief that the end of the world and the Kingdom of Heaven were at hand, with everything moving toward fulfilment; so that consequently there was no longer need for the "fences" to make Torah inviolable. The same attitude was followed by the early adherents of Jesus, the Nazarenes and later on the Ebionites. Apart from their belief that Jesus was Messiah, they conformed in all things with the religious observances of the Torah. Yet, by rejecting the oral tradition, the Torah became for them an obsolete document to be discarded under the first pressure of events. This they demonstrated during the reign of Hadrian. when, in order to gain temporary advantages, they did not hesitate to renounce all the religious observances and, cutting themselves adrift from the main body of Jewish religious life and tradition, finally joined the mass of pagans who, under the influence of Paul, had during the intervening period been attracted to Christianity. Paul took his stand on classical Jewish ground (see below) when he did not require of his pagan converts the observance of the law. But his antagonism to the Torah sprang from the fact that it was too intimately bound up with the doctrine of God's election of Israel, the cornerstone of Paul's theology being that Israel had been rejected in favour of the Body of Christ.

The Torah and the election of Israel were, however, not the only differences between Christianity and Judaism. There were

other philosophical or theoretical differences to which attention may be directed. Judaism, rejecting alike the Trinity and the Incarnation, believes in a one and only God who is immanent as well as transcendent; a heavenly father to whom man, made in his image, has direct access without the intervention of a personal mediator. The various mediating terms in use (*e.g.,* Holy Spirit *[see* Is. lxiii, 10], the rabbinic *memra* ["word"] and *Skekhinah* ["indwelling presence"]) denote only aspects or qualities of the deity and are not to be regarded as beings of any kind, much less as personal beings. Even the Philonic Logos is to be understood as a mere instrument used by God, after the analogy of the angels. in the Bible, and not as an intermediary in creation or revelation to bridge some imaginary gulf between God and the world, or God and man. Judaism further denies the Christian doctrine of atonement and teaches that there is no original sin needing a superhuman counterweight but only the free choice to sin, an inevitable concomitant of free will. The reference to the death brought on all mankind through the sin of Adam found in Jewish writings is throughout to physical death only and is not to be confused with the spiritual death from which, in Christian doctrine, none can be saved except by faith in the risen Saviour. Man can, therefore, achieve his own redemption by penitence. Nothing analogous to the Mass exists in Judaism. The sacrifices were never regarded as a sacrament identifying man with God.

The essence of God consists for Judaism exclusively as the prototype for the morality of man, not as a substitute for man's salvation. Judaism makes salvation depend on right conduct and, accordingly, admits the righteous of all peoples to the world to come. From an early date Judaism differentiated mankind into those nho did and those who did not obey the seven Noachian laws. that is, the seven fundamental principles which can be said to form the religion of humanity: abstention from idolatry, from blasphemy, from incest, from murder. from theft and from the eating of limbs severed from living animals; and finally the command for the administration of justice. Those who observe these laws were accepted as "proselytes of the gate." Belief in the one and only God was not demanded. The conception of the Noachian laws reveals the real significance of the theocratic constitution of Israel: it rested not on the unity of the state and religion, but on the unity of the state and morality. It also determined the attitude of Judaism to conversions. When confronted with paganism, omnipotent and universal, Judaism was an actively proselytizing faith. But when paganism gave place to Christianity and Islam, Judaism was propagated by example. Proselytes, whose genuineness was proven, were received; but no efforts were made to win converts. The reason for this is not indifference to the environment. but a recognition that the daughter faiths, though incapable of so true a vision of God, share in common many truths — religious and moral—with the mother faith. The improvement must come in God's own time. This pragmatic attitude to other creeds is also reflected in the rabbinic law that whoever accepts Judaism must not commit his young children, who must be allowed to decide for themselves when they grow up if they are to follow Judaism or to remain Noachian. Judaism also differs from Christianity in rejecting asceticism as an end in itself. This world is not inherently evil; nor is man hopelessly corrupt; and Judaism consequently repudiates those Gospel sayings which condemn wealth and regard marriage with no particular favour. On the contrary "wealih and riches" are among the blessings promised to the man who fears God (Ps. cxii, 3), and the high priest was not permitted to perform the solemn service of the Day of Atonement unless he had a wife to make his home holy. Essentially optimistic, Judaism believes in the progressive evolution of mankind and looks forward to a Messianic future which will bring to pass a golden age for all peoples and the establishment of the kingdom of God here on earth. This golden age. it is held. will be ushered in by a personal Messiah; but this personage is not essential to Messianism. nor is he a supernatural or divine being, having a share in the forgiveness of sin; much less is he to be confused with God. At the highest the Messiah is a mortal leader who will be instrumental in fully rehabilitating Israel in its ancient homeland and, through a restored Israel, bring about a regeneration of humanity.

The Effects of **the** Fall of Jerusalem. — Christianity had at first regarded itself as part of Judaism, its early Jewish-Christian adherents being merely a sect, much as the Sadducees were. But with the destruction of the Temple, both the Jewish Christians and the Sadducees failed the Jewish people, the former making for the safe retreat of Pella, beyond the Jordan, while the latter vanished gradually from the scene. The only party to survive the national cataclysm and to step into the breach were the Pharisees. Their conditions had radically changed, but their conception of God as sole ruler had not changed. He was still master of events and would in the end shape all things for the nation's ultimate good. Moreover, the loss of political autonomy and the destruction of the Temple broke no essential links in Judaism as presented by the Pharisees. They had developed the institution of the synagogue with its elaborate liturgy. which now could take the place of the Temple and sacrifices. They gave prominence to the religious aspects of the festivals now that their national and agricultural significance had lost much of its relevance to their time. The name of the Festival of the Unleavened Bread was changed to Passover, with special reference to the grace of God in saving the first born of Israel in Goshen, while the Feast of Weeks was proclaimed as the Festival of Revelation and the first day of Tishri as the day inaugurating a period of divine judgment. In their eschatology the Pharisees emphasized the doctrine of resurrection, rather than immortality, because the implications of the former were essentially individualistic. while the latter could be merely cosmic. Furthermore, the conception of the oral law enabled them to reconcile development and change with loyalty to tradition and to undertake the far-reaching adjustments in Jewish life which the new conditions demanded.

The work of reconstruction, in which Rabbi Johanan ben Zakkai was a leader, proceeded, generally speaking, apace until it was wrecked completely by the failure of Barcocheba's revolt against Hadrian (A.D. 135). Jerusalem fell amid torrents of blood, the Temple was razed to the ground and desecrated, and the Jews were dispersed throughout the world. With a transformation in their surroundings and circumstances they were confronted with new dangers and new difficulties. The effect of all this was to force the Jewish people more and more into seclusion and to sever their cultural links with the outside world. From the time of Alexander the Great until the end of the 2nd century of the Christian era Jewish thought had absorbed much that was Hellenistic, so that a Jew such as Philo of Alexandria (c. 20–10 B.C.–after A.D. 40) could conceive the essence of Judaism in terms of contemporary Greek philosophy, which meant for him a not too radical Platonism. But the national debacle ended all that. Henceforth the Jewish people, fighting for its very survival, showed little inclination for alien philosophies but turned instead to its heritage and found its sole inspiration and guidance in its own sacred scriptures and its home-grown traditions. The result of all this devotion was the vast collections of the Jerusalem and of the major, or Babylonian Talmud, which. completed in the 6th century, still remains after the Bible the most fruitful, spiritual, moral and unifying force in Jewish life. "The Jew survived through the Talmud as the Talmud survives in him" (I. Abrahams, Some *Permanent Values,* p. 77, The Clarendon Press, Oxford, 1923). Notwithstanding the changed conditions which make many of the laws inapplicable to modern times. Jewish life even today is largely founded on Talmudic teaching and principles. The ritual, the liturgy, the festivals. the marriage lams all derive much directly from the Talmud, even as it is the Talmud which inspires those virtues associated with the Jew, sobriety, benevolence. sense of social justice. strong affection for family ties and desire for knowledge and social education.

And not on Jews and Judaism alone did the Talmud exercise its beneficent influence. Through the intellectual and moral discipline that it imparted, Talmudic thought helped to lead the thought of the middle ages into new channels and to prepare the way for what was of permanent value in the Renaissance and, through the Renaissance, for much that is best and noblest in modern civilization.

Rationalism and Mysticism. — A new development of Juda-

ism began with the 9th century, when, under the influence of Graeco-Arabic philosophy, Judaism was forced to consider its position in relation to the new intellectual thought which was stirring the Moslem-Jewish world. A conspicuous figure in this development was Saadia (Seadiah) ben Joseph (d. 942), who, under the impact of Arabic rational theology, the Kalam, wrote his Emunoth we-Deoth ("Beliefs and Opinions"), which presents the first systematic attempt to harmonize philosophy with revealed religion. A more important figure in this work of harmonization was Maimonides (1135–1204). His religious and philosophic system, which he constructed in his endeavour to solve the theological problems arising out of the divergence of the accepted teachings of Aristotle and those of the Bible and which exerted the profoundest influence on scholasticism, continued to serve as a living source of Jewish thought to the present day. A reaction against the Maimonidean rationalism gave, on the one hand, the fundamentalism of a Moses Taku (13th century) and, on the other, the mysticism of a Nahmanides (Moses ben Nahman, d. 1270). Jewish mystical doctrine, Kabbalah, both on the speculative and on the practical or theurgic side, has its roots in the remote past; but it was in Spain of the 13th century that Jewish mysticism reached its highest point of development, among its results being the Zohar, which after the Talmud has exercised the profoundest influence on Jewish thought and practice and also affected much Renaissance thought. Characteristic of Jewish mysticism is its Messianic tendency. It sees the whole of creation, animate and inanimate, held in the throes of a universal struggle for redemption from the evil which has somehow entered the world and for the restoration of that harmony in which the whole will find salvation in the establishment of the kingdom of God with the coming of the Messiah. From Spain the mystic lore reached Safed, Palestine, where, in the 16th century the speculative Kabbalah was further developed by Moses Cordovero (1522–70). whose Pardes ("The Orchard") is the clearest and most rational exposition of Kabbalah in existence; the practical side, with special emphasis on its application in prayers and religious observances, was cultivated by Isaac ben Solomon Luria (1534–72). A movement bringing the masses under the direct influence of the Lurianic Kabbalah was Hasidism, founded by Israel Baal Shem-Tob (1700–60), who stressed that prayer rather than the study of Torah was the ideal means of communion with God and thereby brought to the illiterate a consciousness of spiritual power. Opposed to them were the Mithnaggedim who saw in Hasidism an insurrection against organized Jewish life centred around Torah. Hasidism would indeed have degenerated into a mere sect, had not Rabbi Elijah ben Solomon of Wilna (1720–97) taken up the struggle which finally led Hasidism back to Talmudic Judaism.

The Rise of Reform. — The stirring of the new learning in Germany in the 18th century was not without far-reaching effects on Judaism, alike in matters of doctrine and practice. To this work of "inner enlightenment" no small share was contributed by Moses Mendelssohn (1729–86), who transformed the conception of Judaism in that he refused to admit any single article of faith save such as unaided reason could discover. A natural consequence of his rationalism was the reform movement which sought to accommodate Jewish belief and practice to the spirit of the age. Directed at first primarily against certain religious observances, the reform (or liberal, as it came to be known in England) movement resulted practically in the total elimination of ritual law, at least in the home, and the rejection in substance of a number of the fundamental creeds.

It repudiates the Sinaitic revelation and the belief in a personal Messiah, with its national implications, substituting, for the former, revelation through nature and the human spirit and, for the latter, the inevitability of human progress.

It also rejects the doctrine of resurrection, though generally upholding the belief in immortality.

Sects have not been unknown in Judaism. and the discoveries of the Dead Sea scrolls threw light on some sects whose identity was still uncertain. But sects have never thrived within Judaism. Once they detached themselves from the main body of Jenish life and tradition they lost their identity and finally disappeared. Jewish religious life in its traditional manifestation is guided by the Shulhan Arukh of Joseph Caro (1488–1575), published in 1565, which has never yet been superseded and has standardized Judaism. (See JEWISH SECTS DURING THE SECOND COMMONWEALTH; KARAISM; SAMARITANS.)

Nevertheless, development has not been altogether arrested. The ever-growing *responsa* literature written in extension or adaptation of the rulings of the Shulhan Arukh testify to the fluidity of Jewish law; notwithstanding the rigidity imposed upon it by the absence of a centralized authority since the termination of the gaonate (see GAON).

The establishment of the State of Israel should, however, eventually lead to a centralization of religious authority which will in turn restore to the Jewish law its inherent flexibility. (See also ISRAEL.)

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JUDAS ISCARIOT or **SCARIOT.** Ἰούδας Ἰσκαριώτης, Ἰσκαριώθ or Σκαριώθ. The 12th apostle and the traitor (Matt. x. 4). The term Iscariot or Scariot is used also of his father, Simon (John vi. 71; 1 xiii. 26). The usual explanation of "Iscariot" is a "a man of Kerioth" (Ish Kerioth). If this was the Kerioth in Judah (Josh. xv. 25), it implies only that he alone of the 12 was not a Galilean. If the Kerioth in Moab (Jer. xlviii. 24), it suggests also that he was of heathen environment, or even origin, as was the last of the Seven Deacons (Acts vi. 5), who presumably became the founder of the Nicolaitans (Rev. ii. 6). There is one parallel case to this transliteration of Ish in II Sam. x. 6, 8, where *Ish* Tob ("a man, or 'men' of Tob") is represented in the Septuagint by Ἰστώβ or Ἐιστώβ and in Josephus (Antt. vii. 6, 1 § 121) by Ἴστοβος. Jerome, however, prefers the meaning "of Isachar." "For Isachar is interpreted 'gain,' to signify the reward of the traitor" (on Matt. x. 4, Vallarsi, vii. 57).

There is, however, no little evidence for the reading "Scariot." So the Palestinian Syriac always, the Old Syriac generally, and the Peshitta Syriac and Aphrahat as often as "Iscariot." In Syriac tradition therefore no stress was laid on the first syllable, and the meaning of "man" was not given to it. In view of the facts that it is very rare for the first syllable of words beginning with a vowel and an "s" which is followed by another consonant to be omitted (Israel is shortened to Srahel once in *Crom.* and to Srhl once in T.Z. of the Vulgate MSS. of the N.T.), whereas there is an universal tendency to prefix a vowel to words beginning with "s" especially with "sk" (*e.g.*, Shekaniah becomes Ἰσχανία, I Chr. xxiv. 11. See also further Albrecht, *Neuhebr.* Gram. *auf.* Grund der Mishna, 1913 § 10), it seems probable that the Syriac writers thought primarily not of "Iscariot" but of "Scariot." This indeed is read by D in most places in the Synoptic Gospels, and once in the Fourth (John vi. 71), and is a very common reading in other Greek MSS. and the Latin MSS.

What then does "Scariot" mean? The Tosephta (2nd cent.) of Nedarim iv. 3 has Iscortya (var. lect. Scortya), and the Jerusalem Talmud of Nedarim vii. 3 p. 40c has Scortya without explanation. But in the parallel passage in the Babylonian Talmud (Nedarim 55 b) both forms occur, and the explanation given by Rabba bar BarChanah (c. A.D. 300) is "a coat of leather." It is, in fact, the Latin *scorteus,* the feminine of which, scortea, is used especially of a leathern garment. Hence John Lightfoot remarks "Now in such aprons they had purses sewn, in which they were wont to carry their money" (Exercit. on Matt. x. 4, Pitman xi. 172). Judas, however, held not a bag but a box (γλωσσόκομον) for the money (John xii. 6; xiii. 29), but a portable box would

certainly have been covered with leather to preserve it from the Eastern sun. Thus "Scariot" ("Iscariot") may refer to Judas as the one who kept the money-box. If, however, Westcott and Hort's text of John vi. 71; xiii. 26 is really right, in applying the term to the father of Judas it may be that the family were workers in leather.

Judas' object in betraying his Master is regarded in the Gospels as due to selfishness based on avarice. De Quincey thinks that it was rather to compel our Lord to display His Messianic power in saving Himself and delivering the nation (Judas *Iscariot,* 1857, Masson, viii. 177–206).

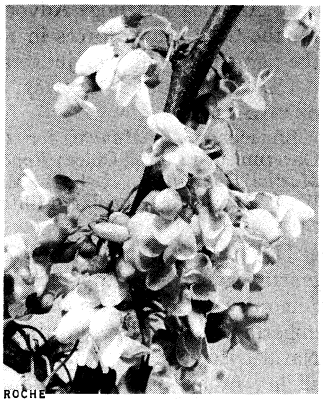
There are two accounts of what was done with the money that Judas received. Acts i. 18 says that he bought a field; Matt. xxvii. 3–8 that he threw down the money into the temple and the High Priests bought a field for a cemetery. This may be due to different traditions. But if his money was used ultimately to buy Akeldama it might well be said that he himself bought it.

It is difficult, still more difficult, to reconcile the statement of Matt. xxvii. 5 that Judas hanged himself, with that of Acts i. 18, that he became so swollen (πρηνής) that he burst asunder.

Many worthless tales were written in the Middle Ages about the history of Judas before the time he associated himself with our Lord. The popular hatred of Judas has sometimes been strangely expressed. In Corfu the people on Easter Eve throw down quantities of crockery into the streets, thus executing an imaginary stoning of the traitor.

(*See* Lord Kirkwall, *Ionian* Islands, 1864. ii. 47 *sq.*) Cf. the detestation of Haman expressed by Jews at Purim. (A. L. W.)

JUDAS TREE, the Cercis siliquastrum of botanists, belonging to the family Leguminosae. It is a native of southern Europe and Asia Minor and forms a handsome low tree with a flat spreading head. In spring it is covered with a profusion of purplish-pink flowers which appear before the leaves. The flowers have an agreeable acid taste and are eaten mixed with salad or made into fritters. The tree nas frequently figured by the older herbalists. One woodcut by Castor Durante has the figure of Judas Iscariot suspended from one of the branches, illustrating the popular tradition regarding this tree. Another species, *C.* canadensis, the American Judas tree, called also redbud, is found in North America from southern Ontario to eastern Nebraska and southward to Florida. Texas and Mexico, and differs from the European species in its smaller size and pointed leaves. The still smaller Texas redbud (C. *reniformis*), with kidney-shaped leaves, occurs in eastern Texas and adjacent Mexico, and the shrubby California redbud (C. *occidentalis*) is found chiefly in foothills and mountains in the interior parts of the state. The Chinese Judas tree (C. *chinensis*), native to eastern Asia, with large, whitish-margined leaves, is planted as an ornamental shrub.



AMERICAN JUDAS TREE (CERCIS CANADENSIS)

JUDD, CHARLES HUBBARD (1873–1946), U.S. psychologist and educator, a pioneer in the use of scientific methods in the study of educational problems, was born in Bareilly, India, on Feb. 20, 1873. He went to the United States in 1879, graduated from Wesleyan university, Middletown, Conn., and in 1896 secured a Ph.D. degree from the University of Leipzig. He taught philosophy and psychology at several universities and was director of the psychological laboratory at Yale university, 1907–09. In the latter year he became director of the school of education at The University of Chicago where he also was professor and head of the department of education (1909–38) and for a period of time chairman of the department of psychology.

Judd participated in numerous educational surveys, organized and directed many research studies and edited various journals and monographs. Of special significance was the wide influence and leadership he exerted at all levels of education through his writings, addresses and work for national committees and associations. He died at Santa Barbara, Calif., on July 18, 1946.

Among Judd's published works are Genetic *Psychology* for Teachers (1903), Psychology: General Introduction (1907), Psychology *of* High School Subjects (1915), Introduction to the Scientific Study of Education (1918), Psychology of Social Institutions (1926), Psychology of Secondary Education (1927), Education and Social Progress (1934), Education as Cultivation of the Higher Mental Processes (1936) and Educational Psychology (1939). (W. S. GY.)

JUDE, EPISTLE OF, a book of the New Testament. As with the epistle of James (*q.v.*) it is uncertain whether the epistle is by one of the "brethren" of Jesus or whether it is pseudonymous. Hegesippus (*ap.* Philip Sidetes) has it that the only survivors of the family, late in the reign of Domitian (81-96), were two grandsons of this same Jude, named James and Zoker (Zacharias). An authentic letter of Jude would therefore belong to an early date. To this both external and internal evidence are decidedly opposed. The language is not that of an unschooled Galilean, nor is it translated from Aramaic. As F. H. Chase has pointed out: (1) the terms κλητοί, πίστις, σωτηρία, have attained their later, technical sense; (2) "the writer is steeped in the language of the LXX.," employing its phraseology independently of other N.T. writers, and quoting not only from the canonical books but from the broader Alexandrian canon; (3) "he has at his command a large stock of stately, sonorous, sometimes poetical words," which prove him to be a "man of some culture, and, as it would seem, not without acquaintance with Greek writers." Moreover, the avowed object is to defend the purity of the "deposit of the faith (v. 3) against the demoralizing perversions of the false teachers who have "crept in privily" to corrupt the Church. These have diverted the writer from addressing his readers (the Church catholic) on the general subject of "our common salvation," and compelled him to undertake his apologetic.

The statement explains why so obscure a name as that of Judas "the brother of James" should be chosen, inasmuch as the writer clearly aims at following the example set in the larger "general" epistle, while making tho aim more specific. The series is continued by II Peter (*q.v.*), which incorporates the substance of Jude in its middle chapter. II Peter directs the denunciation still more specifically against those who (according to Polycarp's complaint) "denied the resurrection and judgment." Thus James, Jude and II Peter form a group of post-apostolic writings which use the authority of apostolic names against (1) "vain talk," (2) "lawlessness," and (3) Hellenizing opposition to the apocalyptic type of eschatology which the Church had inherited from Judaism. These are the three forms of error which were regarded by Church leaders of the first half of the 2nd century as most dangerous. If this late date is correct, the entire group must be regarded as pseudonymous.

This relatively late date (100–120?) is confirmed in the case of Jude by the literary connections, which are remarkably abundant for so brief a writing. The references to Enoch (v. 14=*Eth.* En. i. 9, but cf. F. H. Chase in Hastings' *Dict.* Bible, *s.v.* "Jude") and the Assumption of *Moses* (v. 9) have a certain bearing on the place of origin, since the stricter canon of the Palestinian synagogue excluded these apocryphal books of 90 B.C. to A.D. 40. A relatively late date is implied by the free use of the Pauline Epistles, especially 1 Cor. x. 1–13, Rom. xvi. 25 seq., and probably both Eph. and Col. Moreover, the writer explicitly refers to the apostolic age as already past, and to the fulfilment of the Pauline prediction (1 Tim. iv. 1 seq.) of the advent of heresy (v. 17 seq.). The Pauline doctrine of "grace" has been perverted to lasciviousness, as by the heretics whom Polycarp opposes (*Ep.* Polyc. vii.), and this doctrine is taught for "hire" (vv. 11, 12, 16; cf. 1 Tim. vi. 5). The unworthy "shepherds" (v. 12; cf. Ezek. xxxiv. 8; Joh. x. 12 seq.) live at the expense of their flocks, polluting the "love-feasts," corrupting the true disciples. Clement of Alexandria sees in this a portrait (written prophetically) of the Carpocratians, an antinomian Gnostic sect of c. 150. We too may recognize the portrait, but should not limit it too closely to the Carpocratians,

for Rev. ii. 14, 20 shows that as early as A.D. 93 ultra-Paulinists had already given rise to similar scandals in the Church. It is clear, however, that for our author both Pauline teaching and its perversion lie in the past, as is apparent also in Jas. ii. 1–14.

A terminus *ad quem* is furnished by the fact that practically the whole of Jude is taken up into II Peter, the later author merely avoiding, so far as he observes them, the quotations from apocryphal writings. The erratic attempt of Spitta (*Zur Gesch. u. Lit. d. Urchristenthums* ii., 409–411) to ascribe priority in this case to II Peter has been sufficiently refuted by F. H. Chase, *loc. cit.* p. 803. Unfortunately the date of II Peter is itself so difficult to fix that the employment only indicates a date prior to *c.* A.D. 150.

The history of the reception of the epistle into Church canons Is similar to that of James. It is quoted as the work of Jude by Clement of Alexandria (*Paed.* iii. 8), referred to by Tertullian (*De* cult. *fem.* i. 3), and endorsed more or less hesitantly by Origen ("if one might adduce the epistle of Jude," *In Matt.* tom. xvii. 30). Unlike James, Jude is admitted by the *Muratorian Canon* (180–200). Eusebius classed the epistle among the "disputed" books, declaring that "not many of the ancients have mentioned it" (H.E. ii. 23, 25).

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(B. W. BA.; X.)

JUDGE, in the widest legal sense an officer appointed by the sovereign power in a State to administer the law; in English practice, however, justices of the peace and magistrates are not usually regarded as "judges" in the titular sense. The duties of the judge, whether in a civil or a criminal matter, are to hear the statements on both sides in open court, to arrive at a conclusion as to the truth of the facts submitted to him or, when a jury is engaged, to direct the jury to find such a conclusion, to apply to the facts so found the appropriate rules of law, and to certify by his judgment the relief to which the parties are entitled or the obligations or penalties which they have incurred. With the judgment the office of the judge terminates, but the judgment sets in motion the executive whose duty it is to carry it into execution.

The following are points more specially characteristic of the Anglo-Saxon system: (1) Judges of the supreme court are absolutely protected from action for anything that they may do in the discharge of their judicial duties. "It is a principle of English law that no action will lie against a judge of one of the superior courts for a judicial act, though it be alleged to have been done maliciously and corruptly." Other judicial officers are also protected, though not to the same extent. (2) They are irremovable except by a resolution passed by both houses and assented to by the sovereign. The inferior judges and magistrates are removable for misconduct by the lord chancellor. (3) The judiciary in England is not a separate profession. The judges are chosen from the bar. (4) Judges of the supreme court (except the lord chief justice) and county court are in England nominated by the lord chancellor. In a few cases municipal corporations may appoint their own judicial officer.

See also LORD HIGH CHANCELLOR; LORD CHIEF JUSTICE OF ENGLAND; MASTER OF THE ROLLS, etc., etc. and the accounts of judicial systems under country headings.

The titles of "judge" and "justice" are applied in the United States to the members of courts of record of both original and appellate jurisdiction in both the Federal and State systems, the statute creating the court indicating which is the proper appellation. Courts not of record have "justices of the peace" and "magistrates" and frequently the individuals holding these positions are popularly addressed as "judge." Members of the Federal judiciary and of a few of the State courts, such as New Jersey and Minnesota, are appointed by executive authority. In most of the States, such officials are elected by popular vote, although often the governors may make temporary appointments to fill vacancies.

JUDGE ADVOCATE GENERAL, the chief legal officer, charged with the administration of military justice, of an army or other military establishment.

In the United States, there is a separate judge advocate general for the army, the navy, and the air force. Each is a major general or officer of equivalent grade, and must be a qualified attorney with at least eight years of experience in legal duties at the time of appointment. In supervising the administration of military justice, they are assisted by personnel who serve upon courts-martial as law officers (trial judges), counsel for the accused, and trial counsel (prosecutors). Boards of review, in the nature of military appellate tribunals, are appointed by the judge advocates general. As chief attorney for the armed service, the judge advocate general is concerned with such matters as litigation in the civilian courts or claims against the government when military matters are involved. The legal staff of each of the services is under the judge advocate general; the army has a separate judge advocate general's corps of qualified attorneys who also are military officers.

In England, a civilian appointee serves as judge advocate general for the army and air force; he must have at least ten years of legal experience at the time of appointment. England also has a director of army legal services, who is a military officer with the grade of brigadier.

In Canada, there is one judge advocate general for all three services, the army, the navy, and the air force. He is a military officer with the grade of brigadier.

Historically, the term "Judge Advocate of the Army" is found in the Articles of War of James I of England, promulgated in 1688; the British Articles of War of 1765 charged the "Judge Advocate General" with responsibility for prosecution in the name of the crown.

In America a "Judge Advocate for the Army" was designated for the Continental forces in 1775, but it was not until 1862 that the permanent office of judge advocate general was created.

(*See* also COURT-MARTIAL, MILITARY LAW, JUDGE-ADVOCATE OF THE FLEET).

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(E. M. B.)

JUDGE-ADVOCATE OF THE FLEET, in England, a practising barrister appointed by the sovereign, who advises the admiralty on all matters connected with courts-martial and on any important questions respecting administration of justice under the Naval Discipline act. Though s. 61 of the act recognized the possibility of his presence at courts-martial, he does not nowadays attend. His former functions at trials are performed by the deputy judge-advocate of the fleet (a senior officer of the supply and secretariat branch who is a barrister and is appointed by the admiralty) or an officiating deputy judge-advocate. All proceedings of trials by court-martial of officers and men of the royal navy, excepting those where the accused pleads guilty and no evidence is taken, are referred to the judge-advocate of the fleet for consideration of the legality of the charges, proceedings, findings and sentence, and he submits a minute on each case to the lords commissioners of the admiralty with regard to these points. He has no power to modify a sentence, a power which, like that of quashing a conviction, is reserved to the admiralty, except in the case of a death sentence, which can only be remitted by the crown.

All cases where the accused has pleaded guilty are examined in the admiralty, and where there has been any informality or where the accused may not have understood the effect of his plea, the case is submitted to the judge-advocate of the fleet for his opinion.

In the absence of the judge-advocate of the fleet and the deputy judge-advocate, an officiating deputy judge-advocate who is a legally trained naval officer of the supply and secretariat branch is appointed ad *hoc* for each court-martial by the admiralty, the commander in chief of the fleet of squadron who convenes the court-martial, or by the president of the court-martial. His duties are laid down in detail by an order-in-council which is reproduced in the queen's regulations and admiralty instructions and may be

summed up as consisting of pointing out any informalities or defects in the charges or in the constitution of the court, summoning the witnesses, advising on matters of law, assisting during the drawing up of the sentence and forwarding the minutes of proceedings to the admiralty. (S. Kz.)

JUDGES, THE BOOK OF. This book of the Old Testament constitutes a sequel to the book of Joshua, covering the period of history between the death of this conqueror and the birth of Samuel.

The book is so called because it contains the history of the Israelites before the establishment of the monarchy, when the government was in the hands of certain leaders who appear to have formed a continuous succession, although the office was not hereditary.

The only other biblical source ascribed to this period is Ruth, whose present position as an appendix to Judges is not original. *(See* BIBLE: Old *Testament;* RUTH, BOOK OF.)

It is now generally agreed that the present adjustment of the older historical books of the Old Testament to form a continuous record of events from the creation to the Babylonian exile is due to an editor, or rather to successive redactors, who pieced together and reduced to a certain unity older memoirs of very different dates; and closer examination shows that the continuity of many parts of the narrative is more apparent than real. This is very clearly the case in the book of Judges. It consists of three main portions:

1. an introduction, presenting one view of the occupation of Palestine by the Israelites (i, 1–ii, 5);
2. the history of the several judges (ii, 6–xvi);
3. an appendix containing two narratives of the period.

1. The first section relates events which are said to have taken place after the death of Joshua, but in reality it covers the same ground with the book of Joshua, giving a brief account of the occupation of Canaan, which in some particulars repeats the statements of the previous book, while in others it is quite independent. *(See* JOSHUA, BOOK OF.)

It is impossible to regard the warlike expeditions described in this section as supplementary campaigns undertaken after Joshua's death; they are represented as the first efforts of the Israelites to gain a firm footing in the land (at Hebron, Debir, Bethel) in the very cities which Joshua is related to have subdued (Josh. x, 39). Here then we have an account of the settlement of Israel east of the Jordan which is parallel to the book of Joshua, but makes no mention of Joshua himself, and places the tribe of Judah in the front.

The author of the chapter cannot have had Joshua or his history in his eye at all, and the words "and it came to pass after the death of Joshua" in Judges i, 1 are from the hand of the last editor, who desired to make the whole book of Judges, including chapter i, read continuously with that which now precedes it in the canon of the earlier prophets.

2. The second and main section (ii. 6–xvi) stands on quite another footing. According to Josh. xxiv, 31 the people "served Yahweh" during the lifetime of the great conqueror and his contemporaries. In Judges ii, 7 this statement is repeated, and the writer proceeds to explain that subsequent generations fell away from the faith and served the gods of the nations among which they dwelt (ii, 6–iii, 6).

The worship of other gods is represented, not as something which went on side by side with Yahweh worship *(cf.* x, 6), but as a revolt against Yahweh, periodically repeated and regularly chastised by foreign invasion. The history, therefore, falls into recurring cycles, each of which begins with religious corruption, followed by chastisement, which continues until Yahweh, in answer to the groans of his oppressed people, raises up a "judge" to deliver Israel. and recall them to the true faith On the death of the "judge." if not sooner, the corruption spreads anew and the same vicissitudes follow.

This religious explanation of the course of the history. formally expounded at the outset and repeated in more or less detail from chapter to chapter (especially vi, 1–10; x, 6–18), determines the form of the whole narrative. It is in general agreement nith the spirit as also with the language of Deuteronomy, and on this account this section may be conveniently called "the Deuteronomic Book of Judges." But the main religious ideas are not so late and are rather akin to those of Josh. xxiv; in particular the worship of the high places is not condemned, nor is it excused as in I Kings iii, 2.

The sources of the narrative are older than the theological exposition of its lessons, and herein lies the value and interest of Judges. The importance of such documents for the historian lies not so much in the events they record as it does in the unconscious witness they bear to the state of society in which the narrator poet lived.

From this point of view the parts of the book are by no means all of equal value; critical analysis shows that often parallel or distinct narratives have been fused together and that, while the older stories gave more prominence to ordinary human motives and combinations, the later ones are coloured by religious reflections and show the characteristic tendency of the Old Testament to retell the fortunes of Israel in a form that lays ever-increasing weight on the work of Yahweh for his people. That the pre-Deuteronomic sources are to be identified with the Judaean (J, or Yahwist) and Ephraimite (E, or Elohist) strands of the Hexateuch is, however, not certain.

To the unity of religious pragmatism in the main stock of the book of Judges corresponds a unity of chronological scheme. Although most of the "judges" had no more than a local influence, they are represented as successive rulers in Israel, and the history is dated by the years of each judgeship and those of the intervening periods of oppression.

But it is impossible to reconcile the numbers with the statement elsewhere, that the fourth year of Solomon was the 480th from the exodus (1 Kings vi. 1). *(See* BIBLE: *Old Testament.)*

The general introduction (ii, 6–iii, 6) is a blend of Deuteronomic and other sources. The intimate relation between it and the separate narratives (Josh. xxiv, 1–27, a late [Ephraimite] record inserted by a second Deuteronomic hand, and xxiii, D) appears both from their contents and from the fact that Judg. ii, 6–10, is almost identical with the narrative appended to Joshua's address (Josh. xxiv, 28–31). Judg. i–ii, 5, however, is not touched by D and hence was probably inserted in its present position at a later date.

According to the highly intricate introduction, the Hebrews were oppressed (1) to familiarize them with warfare—it is assumed that they had intermarried with the Canaanites and worshipped their gods (iii, 2, 6); (2) to test their loyalty to Yahweh (ii, 22; iii, 1); or (3) to punish them for their marriage with the heathen and their apostasy (D in ii, 12; *cf.* Josh. xxiii, and ibid. v. 12).

3. The third and last section of the book embraces chapters xvii–xxi and consists of two narratives independent of one another and of the main stock of the book, with which they are not brought into any chronological connection. They appear to owe their position to the latest redactor (akin to the latest stratum in the Hexateuch), who heavily worked over xix–xxi and put the book into its present form by the addition of i–ii, 5, ix and possibly of v. According to several critics, to the same post-exilic hand may also be ascribed the introduction of the "minor judges" and smaller additions here and there.

The first narrative, that of Micah and the Danites, is of the highest interest both as a record of the state of religion and for the picture it gives of the way in which one clan passed from the condition of an invading band into settled possession of land and city. Its interest lies in the foundation of the Ephraimite sanctuary by Micah as also in that of Dan. There are some repetitions in the account, but there is not enough evidence to restore two complete stories.

The history of the Levite and the Renjamites. on the other hand, is of quite another character and presupposes a degree of unity of feeling and action among the tribes of Israel which it is not easy to reconcile with the rest of the book. In its present form this episode appears to be not very ancient; it resembles Ruth in giving a good deal of curious archaeological detail (the

feast at Shiloh) in a form which suggests that the usages referred to were already obsolete when the narrative was composed. It appears to consist of an old story which has been heavily revised to form an edifying piece of exposition.

The older portions include: The story of the Levite (xix), the vengeance taken by Israel (*e.g.*, xx, 3–8, 14, 19, 29, 36–41, 47), and the reconstruction of the tribe by intermarriage with the women of Shiloh (xxi, 1, 15, 17–19, 21–23). The postexilic expansions (found chiefly in xx; xxi, 2–14, 16, 24 et seq.) describe the punishment of Benjamin by the religious assembly and the massacre of Jabesh-Gilead for its refusal to join Israel, 400 virgins of the Gileadites being saved for Benjamin. It is noteworthy that while Gibeah and Jabesh-Gilead, who appear here in a bad light, are known to be associated with Saul. the sufferer is a Levite of Bethlehem, the traditional home of David. The account of the great fight in xx is reminiscent of Joshua's battle at Ai (Josh. vii–viii).

Historical Value. — The Book of Judges consists of a number of narratives collected by Deuteronomic editors; and to the same circles are due accounts of the invasions of Palestine and settlement in Joshua, and of the foundation of the monarchy in 1 Samuel. The connection has been broken by the later insertion of matter (not necessarily of late origin itself), and the whole was finally formed into a distinct book by a postexilic hand. The dates of the older stories preserved in ii, 6–xvi, 6, are unknown. If they are trustworthy for the period to which they are relegated (approximately 14th–12th century B.C.), they are presumably of great antiquity, but if they belong to the sources J and E of the Hexateuch (at least about four or five centuries later) their value is seriously weakened. On the other hand, the belief that the monarchy had been preceded by national "judges" may have led to the formation of the collection. It is evident that there was more than one period in Israelite history in which one or other of these stories of local heroes would be equally suitable. They reflect tribal rivalry and jealousy (cf. Isa. ix, 21, and the successors of Jeroboam 11), attacks by nomads and wars with Ammon and Moab; conflicts between newly settled Israelites and indigenous Canaanites have been suspected in the story of Abimelech (*q.v.*). A striking exception to the lack of unity among the tribes is afforded by the account of the defeat of Sisera, and here the old poem represents a combined effort to throw off the yoke of a foreign oppressor, while the later prose version approximates the standpoint of Josh. xi, 1–15 with its defeat of the Canaanites. (See DEBORAH.) The general standpoint of the stories (especially Judges v) is that of central Palestine; the exceptions are Othniel and Samson — the latter interrupting the introduction in x, and its sequel, the former now entirely due to the Deuteronomic editor. Of the narratives which precede and follow, ch. i represents central Palestine separated by Canaanite cities from tribes to the south and north; it is the situation recognized in Judges xix 10–12, as well as in passages embedded in the latest portions of the book of Joshua, though it is in contradiction to the older traditions of that book. Chapters xvii seq. (like the preceding story of Samson) deal with Danites, and xix–xxi, by describing the extermination of Benjamin, form a link between the presence of the tribe in the late narratives of the exodus and its new prominence in the traditions of Saul (*q.v.*). As an historical source, therefore, the value of Judges will depend largely upon the question whether the editor (about 600 B.C.) had access to trustworthy documents relating to a period some six or seven centuries previously.

(See further JEWS, and SAMUEL, BOOKS OF.)

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JUDGMENT: for meanings in logic, in psychology and in law, see PROPOSITION; PSYCHOLOGY; PRACTICE AND PROCEDURE, respectively.

JUDGMENTS AND DECREES. A judgment or decree is an order of a court in a legal proceeding before it, adjudicating the rights of the parties there at issue. At common law the term "decree" more specifically denominated the final order of a court of equity or admiralty or probate and divorce, while "judgment" designated the final order of a court of law; in modern usage, however, the two terms are synonymous. (See Rule 54, Federal Rules of Civil Procedure.)

Finality. — A final judgment is usually a prerequisite of review of a court's decision by an appellate court, thus preventing piecemeal and fragmentary appeals on interlocutory rulings. This requirement is one of judicial economy and fairness to both courts and litigants. While a preliminary judicial ruling may seem of importance when rendered, it may become of only academic significance at the termination of the court proceeding. The parties may settle their differences; the party disfavoured by the preliminary ruling may nevertheless be awarded the final judgment; or the facts may be shown at the trial to be wholly different from those the court assumed to exist for purposes of its preliminary ruling. In addition, where review is necessary much judicial effort may be saved by the hearing on one appeal of all objections pressed to the actions taken by the trial court; and it is helpful to the appellate court to be able to view the disputed ruling in the perspective of the entire case. Final judgments include orders completely terminating the action or leaving the parties with only ministerial acts to perform. orders adjudicating one complete claim in a proceeding involving multiple claims where the court finds no just reason to delay entry of judgment as to it, and certain exceptional orders involving matters of lasting significance to the parties where the value of an appeal would be negated if it were postponed to the close of the proceedings.

Effect of a Judgment. — A judgment generally operates to settle finally and authoritatively matters in dispute before a court. Judgments may be classified as in personam, in rem or quasi in rem. An in *personam*, or personal, judgment — the type most commonly rendered by courts — imposes a personal liability or obligation upon one or more persons to one or more other persons. This obligation may be to pay a sum of money, to perform some act or to refrain from doing an act; or the judgment may be for the party moved against, thus declaring unmeritorious the plaintiff's claim for relief. An in rem judgment imposes no personal liability on anyone, but adjudicates the interests of all persons in a specific thing or property in the custody of the court or otherwise subject to its jurisdiction. And the designation quasi in rem is used to describe a judgment which affects the interests of particular persons, rather than all persons, in a thing or property within the custody or jurisdiction of the court.

Parties to a valid personal judgment may not relitigate between themselves the validity of the claims asserted in the action in which the judgment was rendered or any issue actually litigated in that proceeding and resolved by the judgment. If the judgment upholds a claim asserted by the plaintiff against the defendant, the plaintiff's rights are said to be merged in the judgment. Within the territorial jurisdiction of the issuing court it may be directly enforced by methods discussed below; in other jurisdictions the plaintiff may obtain similar relief without relitigating the merits of his original claim by bringing an action against the defendant on the judgment. Similarly, if the judgment rejects the plaintiff's claim on its merits, it acts as a complete bar to another attempt by the plaintiff to assert that claim even where the plaintiff discovers new arguments or evidence in support of his position. Additionally, whether the judgment rendered is in favour of the plaintiff or the defendant, both parties are bound by its conclusions on all issues actually litigated between them should these same issues again arise between them in any subsequent litigation.

Valid judgments in rem and quasi in rem also bar relitigation of the interests and claims of interests in a thing or property which they adjudicate. But unless the persons asserting these interests are also personally subject to the jurisdiction of the court, they are not bound in other litigation to the resolution of issues thus made.

Validity. — Under principles of law generally accepted in the western world, and in the United States in large measure required by the federal constitution, a judgment or decree is valid and of legal effect only if the court which issued it had competence to decide the questions of law presented by the case and jurisdic-

tion over the persons or things the judgment purports to affect. At common lam, jurisdiction over a person was obtained by personal service of a writ on him by the sheriff. While variations of this basic procedure are still widely used. most jurisdictions by statute have created additional means of acquiring personal jurisdiction. Thus often service may be made personally or by mail outside the state or country in which the court sits If service by these means is not feasible, the court may obtain personal jurisdiction of these same classes of defendants by publishing a notice of the pending litigation in specified regularly published newspapers for a prescribed period of time. Jurisdiction over property, a necessity to a valid judgment purporting to dispose of the property itself, may be obtained by attachment of the property — accomplished in the case of personal property by seizure of the property by the sheriff or other proper official of the court and in the case of realty by filing a notice of attachment at the appropriate land records office—or by one party depositing the property in the custody of the court. If the court purports to deal with the legal status of the parties before it as, for example, in an action for divorce, it is generally required that at least one of the parties be a domiciliary of the jurisdiction in nhich the court is located.

Questions of a court's competence to decide a case turn in most cases on details of the particular state or country's court structure With the exception of some questions concerning title to real property, the courts of one locality are generally competent to resolve disputes between citizens of another place or arising out of facts or occurrences which took place outside the state or country.

Generally, houever, by the laws of the state itself certain of its lesser courts may not hear cases involving more than a fixed sum of money; and often probate, family law and criminal matters are handled exclusively by specialized courts

A judgment not absolutely void, as is one lacking one of the above requisites to validity. is usually open to attack under proper procedures if the court's jurisdiction was fraudulently obtained or if the judgment was issued through a fraud on the court. Except on direct appeal. however. a judgment may not be attacked on the grounds that the court which issued it misapplied the lam or misunderstood the facts.

Enforcement. — In many instances the successful party to a lawsuit need take no additional measures to enforce its rights under the judgment auarded it, as, for example where the judgment merely disposes of property in the physical custody of the court or declares the rights of the parties before it, but orders no performance of any act by any of them. Similarly, in many jurisdictions today a judgment may itself operate to transfer title to land, although at common law a court of equity could only order the party who held the title to execute a conveyance of it to the other.

Where a judgment imposes a personal obligation on one party to another. however, the latter may have occasion to resort to a variety of remedies which the law provides for the enforcement of his judgment rights. If the judgment enjoins one party to do some act (other than the payment of money) or to refrain from some course of conduct — the typical equity decree — the court has at its disposal the full range of its powers to punish for contempt. to insure that its order will be carried out. It may fine the recalcitrant party a fixed sum or an amount due periodically until he complies with the terms of the judgment. and it may even imprison him for either a limited time or within broad limits of discretion until performance is had.

Enforcement of money judgments is a more complex matter, since it is governed by numerous rules of substantive and procedural law developed out of the agelong struggle betneen creditor and debtor. At common law the judgment creditor could seize his debtor's chattels in satisfaction of the judgment debt by a writ of *fieri* facias, or his chattels and the profits of his land by a writ of *levari* facias. After the Statute of Westminster II in 1285, by a nrit of elegit the creditor could take possession of half the debtor's lands until the judgment nas satisfied from the profits of the lands or otherwise, and since the Statute of 5 Geo. II, c. 7, lands have been subject to execution for debts on a par with personalty. Additionally, the common-law judgment creditor could avail himself of several ancillary equitable remedies.

Modern means of enforcing money judgments reflect these earlier procedures. The judgment itself when properly docketed operates as a lien on all of the debtor's property and all property which he has transferred away in fraud of his creditors. Unless it is otherwise satisfied, the creditor may instruct the sheriff to levy on this property by a writ of execution and sell the debtor's interest in it at an execution sale. The judgment creditor may also garnish wages or other sums owed his debtor, compelling the debtor's debtors to pay these sums to him in satisfaction of the judgment; and as an outgrowth of earlier equitable remedies, the judgment creditor may set aside conveyances made by the debtor in fraud of his creditors, subpoena and examine the debtor and other persons for the purpose of finding property of the debtor to satisfy the judgment, enjoin actions by third persons inimical to the judgment creditor's interest in the debtor's property, and obtain the appointment of a receiver to manage the property and collect and pay over to the judgment creditor the profits from it. Since the general abolition of imprisonment for debt, the more coercive sanctions used to enforce an affirmative decree are generally no longer available for enforcing monetary judgments. In many jurisdictions, however, a judgment debtor may still be imprisoned for failure to pay alimony or support ordered by the court or even to satisfy a judgment for damages for a tort, or where he has been guilty of fraud or has refused to surrender to his creditors property subject to execution.

In most jurisdictions an unsatisfied judgment will support the above enforcement remedies only for a period of time fixed by statute. After this time has expired the judgment becomes dormant and the judgment lien expires unless resort is had to revival proceedings. The usual means of reviving a judgment at common law was by a urit of scire facias — a writ directing the sheriff to make it known (scire facias) to the judgment debtor and requiring the latter to show cause why his creditor should not have the advantage of the judgment.

Although today revival proceedings in most jurisdictions are prescribed by statute. generally they follow the basic form of the common-law procedure, with resort to these proceedings itself limited in time.

See also APPEAL; PRACTICE AND PROCEDURE.

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(C. E. CL.)

JUDICATURE ACTS: see PRACTICE AND PROCEDURE.

JUDICIAL REFORM. By judicial reform is here meant changes in municipal law which have for their object the classification and simplification of law or improvement in the administration of justice. It includes. therefore, the more orderly expression of the law as well as changes in the training and qualifications required of members of the bar in the organization of courts and in judicial procedure. On the other hand, the term does not include those changes in municipal law induced by changes in political, social or economic conditions. The article deals only with the United States.

See PRACTICE AND PROCEDURE for legal procedural reform, etc.

Bar Associations. — A member of the bar in the United States is one who has a right to practise in one or more courts of record. The bar in some U.S. states is not a legally organized body. In these states, while each member of the bar of a court has, as such, rights and duties, the members as a group are not a corporation and do not as a body have any privileges or duties. They have not the right to exclude others from being admitted to practise,

or even to determine the standards which must be complied with by those seeking the right to practise. They have not the right to establish rules for the regulation of the fees to be charged clients nor to prescribe the conduct to be followed by members of the bar in the practice of law, and they cannot disbar any member of the bar for unethical conduct.

On the other hand, by 1940, 20 states and Puerto Rico had adopted laws establishing an "integrated" or "incorporated" bar to which all members of the profession in that state belong. Such integrated bars speak for the profession as a whole and usually have the power to discipline their own members.

Judicial reform in the United States largely came not through an officially organized bar with definite legal powers but rather as the result of the action of voluntary associations of members of the legal profession—judges, practitioners and law teachers.

These voluntary law associations are of two kinds—jurisdictional and scientific. There were more than 1,100 jurisdictional bar associations in the early 1950s. These admit their members from the lawyers within a definite territory rather than from the practitioners at a particular court, though, practically, they never admit a person who is not a member of the bar of some court. Thus there is a national bar association known as the American Bar association, founded in 1878, and a state bar association in each of the states, as well as local bar associations in all the large cities and in many of the counties. There was no integration of these associations, but in 1933 the American Bar association adopted the "national bar program" to promote co-operation among bar associations on all levels. This program was consistently followed.

With the exception of a few local associations which date from the first part of the 19th century nearly all the local, as well as all the state bar associations, and also the American Bar association came into existence after the close of the Civil War. Among scientific legal societies are the American Institute of Criminal Law and Criminology, the American Society of International Law, the American Judicature society, the American Law institute, the Institute of Judicial Administration and the Louisiana State Law institute. All are of comparatively recent origin. Except for the Louisiana State Law institute, they are all nation-wide in membership; each was founded to carry on investigation and promote improvement in law, either generally or with reference to particular subjects.

Beside these associations the Association of American Law Schools, composed of about 60 schools conforming to certain standards of admission, organization and conduct, has done much to promote improvement in legal education.

.The American Bar association and practically all the state and nearly all the local bar associations have committees which from time to time submit to their respective associations drafts of proposed legislation relating to the organization of the courts or to procedure and other matters pertaining to judicial reform. If the association approves the draft, the committee will be authorized to submit it to the legislature of the state and urge its adoption.

The National Legal Aid association promotes interest in legal aid for needy persons and fosters the establishment of local societies for that purpose.

20TH CENTURY REFORMS

Judicial reforms after 1900 may be classified as those designed (1) to elevate the character and improve the efficiency of the members of the bar; (2) to improve court organization; and (3) to unify, clarify or simplify existing law.

Reforms Designed to Improve the Efficiency of the Bar.—Requirements for admission to the bar were raised in great degree from 1925 onward. By 1953, 43 states required at least two years of general college work and three years of law study before the candidate was eligible for admission to practise. In 4 states a college degree was required. In 27 states office study under certified supervision was still permitted as a substitute for attendance at law school. But in the overwhelming number of cases the preparation of the practising lawyer or judge became attendance at a law school. By 1952, 80% of those practising law had a law-school degree.

This development in standards was aided by the American Bar association and its section on legal education. It was helped also by state and local associations and, likewise, by the universities. The improvement in legal education has kept pace with the increase in standards.

The quality of bar examinations also improved. A national association of bar examiners was established to provide a forum for examiners from the several states. In the early 1950s a movement for a partly standardized examination which would be taken by all candidates for admission to the bar in any state was begun. (See also LEGAL EDUCATION: United *States;* LEGAL PROFESSION.)

Reform in the Organization of State and Federal Courts.—The unit of state court organization in the United States was, and largely still is, the county or a unit called the judicial district composed of one or more counties. The principal trial court of each county or district is independent of similar courts in other counties or districts of the state.

From each of these county or district courts there is an appeal on questions of law to an appellate court of state-wide jurisdiction. In some states there are two appellate courts, one for cases involving comparatively small amounts, and in others a system of intermediate appellate courts, the case on appeal going from the trial court first to the intermediate appellate and finally to the highest court.

The striking feature of the state court organization in the United States is the absence of any co-ordination of the various state courts for the efficient carrying on of judicial business. Some progress was made toward better co-ordination, but no other state had gone so far by the early 1950s as New Jersey; under the machinery provided by a modern constitution, the New Jersey court system was effectively unified with a corresponding enormous increase in efficiency. There still remained, though in varying degree in the various states, much to be desired in the way of greater unification of court organization. While little definite progress toward this goal had been made in the second quarter of the 20th century, a general recognition of the importance of this co-ordination exists. A great deal was done in that direction by the American Judicature society, organized in 1913. A younger organization, the Institute of Judicial Administration, Inc., carried on scholarly work in the field.

The federal courts, other than the U.S. supreme court, were reorganized by the act of congress of March 3, 1911. Prior to the act, while the continental United States was nominally divided into nine judicial circuits, the real division for all practical purposes was the district, a much smaller unit. In each district there was a district court and a circuit court, the district court having federal criminal jurisdiction and jurisdiction in a few classes of civil cases. The circuit courts were the principal federal civil courts of first instance. There was an appeal directly from the district and circuit courts to the U.S. supreme court. The act of 1911 abolished the circuit courts, made the district court a court of first instance in practically all federal civil and criminal matters and divided the United States into nine circuits, with a circuit court of appeal in each circuit to act as an intermediate appellate court on questions of law. In 1953 the number of circuits was 11, including the District of Columbia which was classified as a circuit under the revision of the judicial code in 1948. Likewise, in 1951 there was established a court of military appeals, which hears appeals from all military tribunals. The courts of appeal in the various circuits have, in addition to jurisdiction over appeals from the district courts, review power in cases from many of the federal administrative agencies and the tax court of the United States.

The amount of federal judicial business increased enormously from 1900 to 1950. The number of civil and criminal cases begun in federal district courts increased from 28,000 in the year 1899–1900 to more than 70,000 in 1933–34, and to more than 90,000 in 1950–51. This represented an increase in case load per judge per year from 278 to 403. The consequent delay in the disposition of cases is shown by the increasing number of cases still

awaiting decision at the end of each fiscal year—38,795 in July 1940 and 62,785 in July 1951. Much of this increase was a result of the extension of federal powers into many fields which earlier had been left to the states.

The supreme court's burden was relieved by legislation making its exercise of jurisdiction discretionary in most cases. Thus the number of cases actually decided by the supreme court in the 1951 term was 201, although during that year the court passed upon 982 applications for certiorari.

Reforms Tending to Unify Existing Law.—The existence of separate state jurisdictions naturally leads in practice to a wide diversity in legislation. Again, while all the states, except Louisiana, have the English common law as modified to meet local conditions, there is no federal supreme tribunal to reconcile conflicting interpretations of the common law by the highest courts of the several states, and the possibility of a very considerable diversity in the law exists. The fact that land law, or the law of inheritance, or even the criminal law varies from state to state causes little or no inconvenience. The United States, however, attained a remarkable degree of uniformity in economic and social conditions. Economically and socially it is one nation. Diversity in commercial law, therefore, or the law of personal property, or the law of marriage and divorce is a source of much inconvenience and considerable injustice. One of the objects of the American Bar association was to promote uniformity of legislation and of judicial decision throughout the United States. The group that in 1878 founded this association began to take steps as early as 1881 to achieve this purpose.

The principal outcome of their efforts was the establishment in 1892 of the National Conference of Commissioners on Uniform State Laws. This conference is composed of delegates appointed by the governors of the states, usually under state acts authorizing the appointment.

As its name indicates, its object is to draft statutes which it recommends to the state legislatures for adoption. By 1952 the conference had drafted during the 60 years of its existence 84 acts which it still recommended for adoption; 62 of these had been adopted by at least one jurisdiction, and 13 by more than 30 jurisdictions. Many acts dealt with commercial subjects (*e.g.*, negotiable instruments, warehouse receipts and sales of goods). In 1952 there was completed a uniform commercial code which was the joint work of the National Conference of Commissioners on Uniform State Laws and the American Law institute. It was designed to cover the field of commercial transactions generally. Following approval by both bodies, the conference, in accordance with its usual practice, presented the code to the various legislatures for consideration and subsequent adoption. The first adoption was that by Pennsylvania in April 1953. The conference did not confine its activities to the preparation of commercial acts. Its Desertion and Non-Support act has been adopted in a number of states. An act approved in 1950, notable in the field of family legislation, is the Uniform Reciprocal Enforcement of Support act, designed to compel deserting husbands to support their families. By 1953 it had been adopted in 33 states.

The Clarification and Simplification **of** the Common Law.—Perhaps the most important of the legal institutions which the United States owes to England is the common-law system of expressing and developing law. The fundamental feature of the system is the general judicial recognition that a decision of a court in one case has a degree of binding force when later a case arises which presents similar or analogous facts. The common law is the law developed and expressed by judicial decisions. As a whole the decisions of the English and U.S. courts form one of the two great systems of law in force in the world today, the Roman law, the ultimate principal source of the codes of continental Europe and Central and South America, being the other.

The characteristic difference between a principle of law founded on decisions of the courts and a principle expressed in a statute is that the former, or common-law principle, is never absolutely binding on a court. The power that makes can always modify if the strict application of the prior rule to the instant case would, in the opinion of the court, produce injustice. The common law, therefore, has a flexibility which the law of statutes and codes does not possess.

Systems of law, however, like human beings, have the defects of their qualities. There is an element of uncertainty in the common law from which law expressed in properly drawn statutes is free. This uncertainty has not often proved a serious defect when the law is expressed and developed by one court or group of courts organized in a unified system. But in the United States with its separate state jurisdictions and a large number of federal courts distinct from the state courts, the conflict between the decisions in different states and between the states and the federal courts, as well as the uncertainty as to the law in any one state, produces the most unfortunate consequences.

From 1928 to 1953 the decisions of the supreme court increased from 278 to 344 volumes, of the New York court of appeals from 247 to 304 volumes and of the Illinois supreme court from 328 to 412 volumes. It has become manifest that the whole common-law system threatens to fall through the accumulation of an undigestible amount of authority.

The conditions described have given rise to an attempt on the part of the legal profession to preserve the common-law system by producing an orderly expression of the common law, which, though it will not have the binding force of statute law, will at least be regarded as having an authority far superior to that accorded any existing legal treatise.

The American Law institute, founded in 1923, undertook the execution of this work. The institute is a voluntary organization with two classes of members—life members and official members. The number of life members is limited; the official members are the members of the U.S. supreme court, the chief judge of the court of last resort in each state, the chief judge of each of the eleven circuit courts of appeal, the attorney general and the solicitor general. of the United States, the deans of the law schools belonging to the Association of American Law Schools, the president and principal officials of the American Bar association, the presidents of the state bar associations and the presidents of the principal scientific legal societies. The orderly expression of the common law on which the institute engaged is called the Restatement of the Law.

The first edition, financed by a grant from the Carnegie corporation, was completed in 1944.

The Restatement of the Law had great influence in modelling the course of judicial decision in nearly every state. By April 1, 1954, it had been cited 22,935 times by the appellate courts of the country. Of this number 2,271 were from Pennsylvania alone. The U.S. supreme court had cited it 160 times.

(W. D. L.; H. F. GH.)

GROWTH OF **OUTSIDE TRIBUNALS**

Since the great period of commercial expansion which culminated in the Spanish-American War, the best minds of the American bar have more and more had forced upon them an appreciation of the inadequacy of the courts to dispose efficiently of the volume of work being brought into them. Inspired by the delays and uncertainties which marred the work of the regular courts of law, two strong movements away from the courts manifested themselves. First is the tendency to create administrative quasi-judicial tribunals, manned presumably by experts. In federal matters instances are the Interstate Commerce commission, the Federal Trade commission, the Securities and Exchange commission, the Federal Power commission, the National Labor Relations board, the Federal Communications commission, the appeal boards for taxes and customs and numerous minor bodies in government departments. In the individual states the Workmen's Compensation boards, Public Utilities commissions, the Unemployment Compensation boards and many others showed a similar drift.

The necessity for such tribunals grew increasingly clear as the business of government became more and more complex. However, administrative tribunals sometimes showed a tendency to disregard individual rights in the pressure of getting their business done. To counteract this, the tendency has been to provide for

an increasing amount of judicial review of the action of these bodies, both federal and state. A striking instance of this regulation is found in the Administrative Procedure act passed by congress in 1946.

A second tendency away from the courts is the growth of arbitration. This method provides an informal way of handling disputes in commercial matters between businessmen and, perhaps even more important, between employers and labour organizations. An arbitration contract is a standard part in thousands of contracts made by unions on behalf of their members with the employer. Arbitration laws are found on the books of many states and the United States, and provision is frequently made for court enforcement of arbitration decisions if the unsuccessful party refuses to abide by the outcome. *(See* also COURT; INDUSTRIAL RELATIONS: United *States.)*

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(H. F. GH.)

JUDICIAL **REVIEW** is the power exerted by the courts of a country to examine the actions of the legislative, executive and administrative arms of government and ensure that such actions conform to the provisions of the nation's constitution. Actions not so conforming are considered unconstitutional, *i.e.,* illegal and of no effect. The institution of judicial review is predicated upon the existence of a written constitution that is also rigid in the sense of being changeable only by some extraordinary process, usually requiring some special legislative or popular (referendal) majorities. Normally, though not invariably, judicial review is associated also with a federal constitution, involving division of legislative powers between a central government and member states or provinces, and with a bill of rights or some other system of fundamental limitations on law-making power.

As a constitutional practice judicial review is usually considered as having begun with the assertion by Chief Justice John Marshall of the United States supreme court, in *Marbury* v. *Madison* in 1803, of the power to invalidate legislation enacted by congress. But there was some historical precedent for Marshall's action in the control exercised by the privy council, the highest tribunal of the old British colonial empire, in relation to the American colonies prior to 1776. To the extent that judicial review exists in the Commonwealth countries as part of the working machinery of government of such countries as Canada, Australia and the Union of South Africa, it is merely a historical continuation of the appellate review exercised by the privy council in by-gone colonial eras of their history.

A number of the constitutions drafted in Europe and Asia after World War II incorporate judicial review in various forms. France established a constitutional committee of mixed judicial-legislative character; Germany, Italy and Japan provided more directly for special constitutional courts; India and Pakistan set up supreme courts exercising judicial review on the general U.S. and Commonwealth pattern. Widespread pressures after World War II for the adoption of judicial review stemmed from a feeling, strongly influenced by U.S. constitutional ideas, that a system of constitutional checks and balances, involving either a formal separation of powers or at least some division of governmental powers between judiciary and executive-legislative authority, is an ,essential condition of democratic government, and in particular that it was the concentration of governmental power in the executive, substantially unchecked by other agencies of government, that so largely contributed in Germany and Japan to the rise of totalitarian regimes in the era between World War I and World War II.

United States.—The history of the United States reveals a constantly changing emphasis in the role of the supreme court in relation to the co-ordinate arms of government, and also frequent divisions of opinion among the justices themselves as to the proper functions of that court in exercising judicial review. There have been recurrent clashes between the court and executive authority —notably during Pres. Franklin D. Roosevelt's first two terms when a major political crisis arose over the court's invalidation of the main planks of the New Deal legislative program. Immediately after his landslide re-election in 1936, Roosevelt introduced his "court-packing" plan—a proposal for congressional legislation permitting the appointment of additional justices when incumbent members of the court were over 70 years of age. Since the court, as then constituted, was generally divided against the New Deal legislation by a narrow 5–4 vote, the proposed bill would have enabled Roosevelt to secure a pro-New Deal majority on the court bench. However, early in 1937 the supreme court, in a series of major decisions, began to reverse its opposition to the New Deal, the so-called "court revolution" of 1937; and since the "court-packing" plan had encountered considerable public opposition, even among President Roosevelt's strongest supporters in congress, it was allowed to lapse. Within a few years after 1937, most of the judicial opponents of Roosevelt's program had stepped down from the court, and a series of new presidential nominations soon produced a majority that was not disposed to resist the legislative program of the national government. After 1937, the changing majorities on the supreme court did in fact extend a general presumption of constitutionality to congressional legislation; only a handful of legislative measures initiated by the national government, generally only of minor significance, were invalidated by the court. The disagreements on the supreme court since 1937 (and these disagreements have been quite as frequent and as sharp as in the years immediately prior to 1937) have been over such questions as the proper attitude of the court vis-à-vis the states and vis-à-vis the activities of congressional investigatory committees, particularly concerning civil liberties questions. A group of judges, most prominent among them Justices Hugo L. Black and William O. Douglas, has contended that the court should maintain an activist position and protect interests in speech and political activity against any abridgment or limitation, particularly by state or local authority. On the other hand, a rival intellectual position, associated especially with Justice Felix Frankfurter, would assert that the judges should exercise the same general restraint in relation to state or local governmental activity as they have been prepared since 1937 to exercise in the case of the national government; and as a further point that the judges should avoid any double standard by maintaining the same attitude of noninvolvement in regard to governmental action trenching on civil liberties as the court majorities since 1937 have shown to legislation trenching on property and economic interests—the doctrine of judicial self-restraint. These main competing philosophies of judicial review are, of course, not nearly so clear-cut and absolute in their actual concrete application in individual cases coming before the court. Thus, although the court, in its relations to the co-ordinate arms of government, has agreed, after 1937, on the general principle of upholding legislation of congress, both the activists and the apostles of self-restraint united in striking down the actions of another arm of the national government—the executive—in the decision on Pres. Harry S. Truman's steel industry seizure of 1952. Again, the court was unanimous in its famous 1954 decisions ending racial segregation in the grade schools, both activists and nonactivists uniting behind Chief Justice Earl Warren's official opinion for the court though this involved, on the part of the supporters of self-restraint, a necessary repudiation of state rights in the sense of local, state determination of policy. On the other hand, a clear majority of the court refused to pursue an activist policy, in favour of claimed rights of free speech and political association in cases involving the issue of internal security during the "cold war" crisis of the early 1950s; congressional investigatory committees remained effectively free from control by the supreme court until a group of judicial decisions in the spring of 1957 when the court finally insisted on very narrowly defining the scope of permissible congressional investigations and on reaffirming the fullest availability, to witnesses before congressional committees, of the "privilege against self-incrimination" set out in the fifth amendment to the constitution.

Changing Philosophy of Law.—The disagreements on the United States supreme court, reflected in the spate of judicial opinions, both specially concurring and dissenting, filed in individual

cases, are basically a product of the changing emphases in the U.S. philosophy of law since the close of the 19th century, and in particular of the fairly universal acceptance of pragmatism (*q.v.*) as the governing philosophy in U.S. constitutional interpretation. The search for an absolute meaning of the words in the constitutional text as the governing test in constitutional interpretation has tended to be abandoned, under the influence of the American legal realists' thesis that such a search is a snare and a delusion, exposing the judges to the danger that they will be governed, anyway. in their ultimate decisions, by what Justice Oliver Wendell Holmes characterized as "inarticulate major premises" (concealed judicial value preferences). Thus the way is open for a conscious judicial approach to value choice and value implementation in the deciding of cases.

In this approach, legal doctrine — the words of the constitution and past judicial decisions on the constitution — is to be treated in a purely instrumental sense, and the principle of stare decisis (deference to the binding force of past judicial decisions) must yield to current judicial notions of policy. This judicial viewpoint explains the very free overruling of past court decisions since 1937, for there is as yet no real agreement among the members of the court as to what the correct policy should be in individual cases. The pragmatist approach on the U.S. supreme court is primarily methodological in emphasis; though it would test the validity of particular propositions of law by their consequences in action, when applied, we are given no very adequate criteria for ultimately testing or appraising those consequences.

The proponents of judicial self-restraint would try to immunize the court from the problems of value choice by minimizing the opportunities for the court's ruling on substantive issues, insisting on very strict observance of procedural requirements by the parties to a case before the court will rule on a policy question. The judicial activists, for their part, come out, ultimately, to favour principles very like the tenets of 19th-century English political liberalism: intrinsically, the activists' position is not very unlike that of the pre-1937 conservative judicial majority on the court, except that, instead of sponsoring economic and property interests that now seem in some fairly general judicial disfavour, they would sponsor interests in speech and political activity — the so-called "preferred position" of the first amendment to the constitution free-speech guarantees. Of course, to the extent that the activists' position would imply that the mere identification of one interest in the complex of interests before the court, as say, an interest in speech, should conclude the judicial inquiry and automatically decide the issue, it has brought the criticism that the activists are ceasing to exercise a balancing function and are retreating from the general, post-1937, pragmatist judicial philosophy into a natural law-type, absolutist position. For, to the extent that legal pragmatism involves the balancing-of-interests approach. the judges' problem in decision making is seen as being the weighing of one or more values against other, competing values; or of determining how much weight should be given to a particular value, having regard to the particular techniques actually employed by executive or legislative authority to achieve or implement that value in that case: consideration of means used by executive or legislature thereby should shape or condition judicial approval of ends sought to be attained by executive or legislature.

Taking the court as a whole, the majority solution, since 1937, to the dilemma of judicial choice of values has tended to be a purely societal, relafivist one — resolve the conflict of interests in any given case by reference to the prevailing attitudes (jural postulates) of the nation — the main thesis of the U.S. school of sociological jurisprudence led by Dean Roscoe Pound. In this particular respect — quite as much as in its frank deference to the views of psychologists as to the effects of segregation in education upon grade-school students — Chief Justice Earl Warren's official opinion of the court in the school-segregation decisions of 1954 has been widely characterized as being "sociological jurisprudence."

Other Countries. — The main differences between the working practice of judicial review in the United States and in other countries are largely to be found in differences in dominant judicial philosophies and in dominant conceptions of the role and responsibilities of the supreme court judge. The experience of the English-speaking countries other than the United States, especially the federal countries — Canada, Australia, and the Republic of India — shows, as did the experience of the United States up to 1937, some judicial favouring of economic and property interests accompanied by a firm insistence that the judges' task is a mechanical, value-neutral one, that of interpretation alone. It is worth noting, in this regard, that these countries' legal history shows no real exposure to or acceptance of the realist-pragmatist drives prominent in the United States. Of course, the supreme courts of the various Commonwealth countries are not merely constitutional courts but above all appellate tribunals for the adjudication of private law matters.

Concept of Judicial Function. — These dual (public law and private law) responsibilities, which largely disappeared, so far as the U.S. supreme court was concerned, with the passage of the Judiciary act in 1925 and the incidental procedural changes that converted it into essentially a public law court, have necessitated an executive attention in the Commonwealth countries to prior judicial experience or sustained professional practice of law, for purposes of appointments to the bench. The rather restrictive, rigorously "professional" conception of the judicial office that has ensued among members of the supreme courts of those countries is perhaps not surprising. On the other hand, in the case of the U.S. supreme court, strict professional expertise has often given way, in the making of judicial appointments, to capacity to handle policy issues: the executive preference for appointing "men of affairs" to the bench in the United States—*e.g.*, such chief justices as William Howard Taft, Charles Evans Hughes, Harlan F. Stone, Fred M. Vinson, and Earl Warren — stems, in some measure, from acceptance of the proposition that the criteria for supreme court decision making on such issues as school segregation and the limits of the constitutional guarantee of free speech during the "cold war" internal security crisis will not be very different from the policy considerations adverted to by members of the executive and legislative arms of government in resolving major political conflicts.

The unusual breadth and range of experience among the members of the U.S. supreme court explains, on the one hand, the vigour with which it has handled great social-political tension issues, and also the occasional popular charges that the court is "political" in its decisions. The answer may well be that, in constitutional law, a precise boundary line between law and politics becomes increasingly difficult or impossible to draw. and that it is the judge who insists on such a necessary dichotomy who is most likely to find (as Holmes in effect charged had been the case with the conservative majority on the court in the years before 1937) that his decision stems from "inarticulate major premises" that. because they are not fully revealed in the judge's own mind, are unlikely to be exposed to the correctives, in a democratic country, of public criticism and discussion. *See* also JURISPRUDENCE; SUPREME COURT OF THE UNITED STATES, THE.

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JUDICIAL TENURE: see TENURE, JUDICIAL.

JUDICIARY AND COURT OFFICERS. Despite similarities, Anglo-American judicial systems differ widely in organization and in the titles and functions assigned to different officials. Three basic divisions may be made for consideration of this sub-

ject: (1) the U.S. national judicial system, generally referred to as the federal courts; (2) the U.S. state judicial systems, which exist in each of the states as entities distinct from the federal system; and (3) the English courts and judiciary.

U.S. Federal System.—Basically, the federal system is a hierarchy of three levels. At the apex of the national judicial system is the supreme court of the United States. It is made up of nine judges: the chief justice of the United States and eight associate justices. Their business is primarily to review decisions of state courts and lower federal courts on questions of federal law which are of national importance. Sometimes they hear cases which originate in the supreme court because such cases involve controversies between states, or because an ambassador of a foreign government is involved, but these are rare exercises of their jurisdiction. When it is necessary to hear evidence in these cases of original jurisdiction, the supreme court usually appoints a master, who hears the evidence and makes a report, on the basis of which the court renders a decision.

Each of the justices of the supreme court is authorized to sit in the lower federal courts; originally the justices did go on circuit with the lower courts, but the press of business has long since eliminated the possibility of their exercising this function. It is now an extraordinary event for a justice to sit on a lower court, at least until he retires from the court and when he may be assigned, at his own request, to service in the lower federal courts. A justice will be called upon to act individually, in chambers, on motions from time to time. Otherwise, he will perform his functions as a member of the court.

The other court officers of the highest U.S. tribunal are the clerk, who is charged with the maintenance of the office of the court, the filing of papers, the preparations of orders, etc., and the marshal of the court, who is charged with the responsibility for policing and maintaining the building in which the court sits. Theoretically, the marshal is also charged with the enforcement of the writs and orders of the supreme court! but this is a duty he is seldom called upon to perform. In addition to the staff in the clerk's and marshal's offices! each justice is authorized to have two law clerks, who serve as research staff, a secretary, and a messenger. These, however, are personal staff and do not have any status as court officers.

The second tier of the federal judiciary is made up of the U.S. courts of appeals for the 11 circuits, each circuit comprising a definite geographic area. The officers of these courts are referred to as judges rather than justices, the latter title now being reserved, in the federal system, to members of the supreme court. Usually the judges within each circuit sit in panels of three, but occasionally, because of the importance of the case, the entire membership of the court of appeals for a circuit will sit together. Basically, the work of the courts of appeals is to review judgments entered by the lower federal courts and, as prescribed by statute, to review decisions of administrative agencies. Like the supreme court, each circuit court has a clerk and, in addition, each judge has the services of a bailiff, a law clerk and a secretary.

The trial court level is made up of about 100 district courts, a district being a smaller geographical area within a circuit. Although the number of judges within each district varies widely, each of them usually sits individually and presides over trials or other initial aspects of the litigation process. There is a clerk and a marshal for each district court. The marshal, in addition to his other duties, is in charge of service of process and generally has the powers of a sheriff. The personal staff of each district judge ordinarily, but not necessarily, will include a law clerk, a secretary and a bailiff. Although most of the business of the district courts is the trial, as an original matter, of the cases allocated to the federal courts by congressional legislation, they also function, to a limited extent, as bodies for the review of decisions of certain administrative agencies.

In this latter capacity, and in other extraordinary circumstances, the court will be made up of a circuit judge and two district court judges, sitting without a jury. When these special three-judge panels are convened, review of their decisions is directly by the supreme court rather than by the appropriate circuit court.

The district courts have the service of additional judicial officials. Commissioners for the district courts serve as committing magistrates in criminal cases and are authorized to issue search warrants and arrest warrants. Referees in bankruptcy in each district act as judicial officers in the disposition of bankruptcy cases, subject to review by the district court judges. The trial courts may also make use of referees, masters, assessors, etc., who will hear evidence for the purpose of reporting to the court, or to determine its admissibility in evidence or on depositions.

Outside the regular hierarchy of the federal courts are courts charged with the disposition of cases involving specialized subject matter. These include the court of claims, which entertains suits against the United States, and which also is empowered to review judgments of the district courts in certain cases, where the suit is against the United States; the court of customs and patent appeals, the customs court, and the tax court, whose specialized functions are indicated by their titles.

State Systems.—The system within each state approximates that of the federal government, except insofar as its specialized courts have different functions to perform. The highest state court, which is an appellate court, is usually referred to as the supreme court, though some jurisdictions use different names, *e.g.*, New York and Maryland, which call their high courts the court of appeals. Most states have a two-tier system; *i.e.*, appeals from the trial courts of general jurisdiction are usually taken directly to the supreme court. Again, the names for the trial courts differ widely: in New York, they are called supreme courts and in California, they are called superior courts; in Illinois they are circuit courts, except that Cook county also has a superior court. About 14 states have courts of intermediate appeal, and again the names differ so that the court is referred to as the appellate court in Illinois, the appellate division in New York and the district court of appeals in California.

Just as the names of the courts vary widely, so, too, do the titles of the judicial officers. In most states the high court members are called justices, the presiding officer being known as chief justice; in some of these all judicial personnel are referred to as justices. In others, the lower courts are staffed by judges rather than justices. in the same manner as the federal courts. In still others, as in New York and Maryland, the high court officials are called judges and the lower court title is justice.

Basically, the greatest diversity among the states occurs in their courts of special jurisdiction. Usually, the court charged with the administration of decedent's estates is a separate tribunal. In New Pork, this is called the surrogate's court and the presiding officer is referred to as a surrogate. In Pennsylvania, it is the orphan's court which performs this function and in Illinois it is the probate court. Similarly, special courts are often given jurisdiction over such matters as juvenile offenses and domestic relations problems. In some states, the criminal jurisdiction is separated from the civil, as in some counties of New York and in Pennsylvania. In the former of these the criminal court may be the court of special sessions, the court of general sessions or the county court; in the latter the terminology is court of oyer and terminer and general jail delivery or the court of quarter sessions of the peace.

Generally, the judicial officers of the state courts are known by the titles of their courts, so that a member of the high court will be referred to as a supreme court justice, of a lower court as a circuit judge, etc. In addition, the trial courts of general jurisdiction, especially in the more populated areas, have judicial officers in the nature of masters or referees to whom complicated cases are referred for purposes of taking evidence and reporting to the judge of the court to which they are attached.

In addition to trial courts of general jurisdiction, most states have local courts which entertain minor legal matters or matters peculiar to the locality. Again the names vary widely: there may be municipal courts, magistrates' courts, justices of the peace, etc. No generalization is possible in terms of description of judicial office.

Ordinarily. in the state courts, subsidiary officers are of the same nature as those associated with the federal courts.

English Judicial System.—The English judicial system is far more complicated than the U S. federal system, in some measure because of the retention of historical names and usages, in some measure because of the unusual distribution of judicial power and in some measure because of the fact that the judicial officials may perform many functions in different courts (see COURT: England).

Heading the English judicial system is the lord high chancellor, who also serves as speaker of the house of lords and as a member of the cabinet. He sometimes presides over the house of lords when it is sitting as a court. He is head of the chancery division, an ex officio member of the court of appeal and president of the supreme court of judicature, all nominal functions of no practical importance. The next ranking judicial officer is the lord chief justice, who usually presides over the court of criminal appeal, is an ex officio member of the court of appeal and sits as a member of the queen's bench division, of which he is presiding officer. The law lords, or lords of appeal in ordinary, are paid professional judges with life peerages and sit in the house of lords. The master of the rolls, who is also an ex officio member of the court of appeals, is the only one of the ex officio members who usually sits there. On the court of appeal are the lords justices of appeal; the primary function of this court is hearing and determining appeals in civil cases. A person appointed to the high court of justice will be assigned to one of the divisions and thus become known as a queen's bench judge or a chancery judge. Those who sit in queen's bench division also serve as members of the court of criminal appeal.

In addition, the assizes, which are sessions of the high court on circuit, are presided over by a high court judge, some of whom are queen's bench judges while others are divorce judges. Attached to the high court are masters and registrars who perform preliminary functions with regard to determining the place of trial and with reference to taking of evidence before trial. The county court judges preside over the local courts of that name. On the criminal side, the judges of central criminal court, "Old Bailey." sitting in London, include, in addition to judges of the queen's bench division, a recorder, a common sergeant. and judges of the mayor's and city of London courts. This court entertains important criminal cases in London, much as do the assizes in the local areas.

The magistrates courts, in which all criminal cases originate for presentation of evidence so that the magistrate may determine whether to hold the accused for trial and in which all summary offenses are tried, are presided over by an officer having various titles. In London, he is a metropolitan magistrate; outside of London, he would be a stipendiary magistrate or an unpaid justice of the peace; the latter cannot hold a court by himself but must sit with at least one other justice of the peace. Magistrates courts also do a fair amount of civil work, with appeal lying to quarter sessions or the queen's bench division. Less serious criminal offenses also may be tried at quarter sessions, nhich is made up of magistrates or justice of the peace and presided over by a recorder or by the chairman or deputy chairman of the quarter sessions.

This conglomeration of judicial officers, sitting in several different capacities, somehow or other works as well or better than any formalized system in the civilized world. If it lacks meticulous design there is a greater compensation in the form of justice done.

See also COURT; LEGAL PROFESSION.

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JUDITH, THE BOOK OF, one of the apocryphal books of the Old Testament, of which the argument is as follows: in the 12th year of his reign Nebuchadrezzar, who is described as king of Assyria, having his capital in Nineveh, makes war against Arphaxad, king of Media, and overcomes him in his 17th year. He dispatches his chief general Holofernes to take vengeance on the nations of the west who had withheld their assistance. The children of Israel, newly returned from captivity, are apprehensive of a desecration of their sanctuary and resolve on resistance. The inhabitants of Bethulia (Betylüa) and Betomestham in particular, directed by Joachim the high priest, guard the mountain passes near Dothaim and place their trust in God. Holofernes inquires of the chiefs who are with him about the Israelites, and Achior, the leader of the Ammonites, tells how the Israelites are invincible except when they have offended God. Achior is punished by being handed over to the Israelites, who lead him to Bethulia.

Next day the siege begins, and after 40 days the famished inhabitants urge the governor Ozias (Uzziah) to surrender, which he consents to do unless relieved in 5 days. Judith, a beautiful widow of the tribe of Simeon, now appears on the scene with a plan of deliverance. Wearing rich attire and accompanied by her maid, she goes over to the hostile camp, where she is conducted to the general, whose suspicions are disarmed by the tales she invents. After four days Holofernes, smitten with her charms, at the close of a sumptuous entertainment invites her to remain within his tent.

No sooner is Holofernes overcome with sleep than Judith, seizing his sword, strikes off his head and gives it to her maid; both now leave the camp (as they had previously been accustomed to do, ostensibly for prayer) and return to Bethulia where the trophy is displayed amid great rejoicings and thanksgivings. Achior now publicly professes Judaism. and at the instance of Judith the Israelites make a sudden victorious onslaught on the enemy. Judith now sings a song of praise. and all go up to Jerusalem to worship with sacrifice and rejoicing.

The book in its fuller form was most probably written in the 2nd century B.C. The writer places his romance two centuries earlier, in the time of Ochus. as we may reasonably infer from the attack made by Holofernes and Bagoas on Judea; for Artaxerxes Ochus made an expedition against Phoenicia and Egypt in 350 B.C., in which his chief generals were Holofernes and Bagoas. (R. H. CH.; W. O. E. O.)

JUDO: *see* JU-JUTSU.

JUDSON, ADONIRAM (1788–1850), U.S. Baptist missionary to Burma. translator of the Burmese Bible and author of a Burmese dictionary. was born at Malden, Mass., on Xug. 9, 1788. the son of the Rev. Xdoniram and Abigail (Brown) Judson. After graduating from Brown university in 1807. he studied theology at the nen-ly opened Xndover Theological seminary! a hotbed of zeal for evangelism and philanthropy. There. too. were those former Williams college students. led by Samuel J. Mills, who in 1806 had dedicated themselves to foreign missions (*see* MISSIONS). Judson. independently. but influenced by these forces. decided to become a missionary. Encouraged by a few influential pastors and teachers. six Andover students in 1810 presented to the General Association of Massachusetts (Congregational) a petition drafted by Judson. which led to the establishment of the American Board of Commissioners for Foreign Missions. The new board sent Judson to England to confer about affiliation with the London Missionary society. He was delayed when a French privateer captured his vessel. and growing international tensions on the eve of the War of 1812 made it desirable for the American board to act independently.

The first five missionaries were ordained for service in India at Salem. Mass.. on Feb. 6. 1812, and sailed for Calcutta. Tudson was accompanied by his bride. Ann (Nancy) Hasseltine (1789–1826). The Judsons. in expectation of meeting the Baptists at Serampore, made a study of baptism and were won to the Baptist viewpoint. They and Luther Rice were immersed and left the American board. Rice returned to the U.S. to rally the Baptist churches: and in 1814 there came into being the organization now called the American Baptist Foreign Mission society.

Opposed by the British East India company. the Judsons left India and in 1813 located at Rangoon Burma. The missionary

mastered the Burmese language and literature and learned Pali. the Buddhist canonical language. Translation and literary work were emphasized. Judson completed the Burmese Bible in 1834. His Burmese-English *Dictionary,* first issued in 1826 but revised repeatedly until the end of his life, continues to be regarded as standard. Judson adapted local customs to evangelism and opened his first public preaching place in 1819. Within two years he baptized 18 converts and founded a Burmese church. He established schools and trained preachers. From his pioneering there arose a Baptist Christian community of Burmese. Karens and other peoples of about 500,000. The British invasion of Burma in 1824 led to the imprisonment of Judson for two years, with extreme torture. The heroism of Ann Judson during that period became a legend. She died a few months later. Judson married second Sarah Hall Boardman (1803–45), widow of a colleague, and third the popular writer Emily Chubbuck (1817–54). He died at sea in the Indian ocean on April 12, 1850.

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JUDSON, EDWARD ZANE CARROLL (1823–1886), U.S. adventurer and writer. known by the pseudonym NED BUNTLINE! was an originator of the so-called dime novels—inexpensive sensation fiction featuring swashbuckling heroes and violence—which were popular during the later decades of the rgth century.

Judson's earlier stories were based on exploits of his own picaresque career. Born in Stamford. N.Y., on March 20. 1823, he began by going to sea as a cabin boy. He rose to the rating of midshipman, but in 1844 left the navy, reputedly to serve in the Seminole War and travel in the west. He contributed stories to the *Knickerbocker Magazine,* and in 1844 established in Cincinnati, O., the short-lived *Ned Buntline's Magazine.* After capturing two fugitives wanted for murder in Kentucky, he went to Nashville, Tenn.. and founded a sensational newspaper. *Ned Buntline's Own,* which he transferred to New York after a narrow escape from a lynching while being arraigned for the killing of his supposed mistress' husband. In 1849 he led a riot at the Astor Opera house in New York city and was imprisoned for a year. In 1852 he was again under indictment, this time in St. Louis, Mo., for participation in an election riot. He became an important organizer of the Know-Nothing party (*q.v.*). A member of the Union army during the Civil War, he was dishonourably discharged in 1864. He later met William F. Cody, whom he styled "Buffalo Bill" and portrayed as the hero of a number of his dime novels. In 1871 Judson retired to Stamford, N.Y., where he continued to produce his profitable fiction, and died July 16. 1886.

His hundreds of dime novels and serials included such titles as *The Mysteries and Miseries of New York* (1848); *Ned Buntline's Life Yarn* (1848); *Stella Delorme, or The Comanche's Dream* (1860); *Red Ralph: the Ranger* (1870); *BuffaloBill's First Trail; or Will Cody, the Pony Express Rider* (1888).

See Jay Monaghan, *The Great Rascal* (1952).

JUEL, NIELS (1629–1697), Danish admiral. was born of a distinguished family on May 8, 1629. at Christiania. He served his naval apprenticeship under Van Tromp and De Ruyter. taking part in all the chief engagements of the war of 1652–54 between England and Holland. During a long indisposition at Amsterdam in 1655–16j6 he acquired an excellent knowledge of ship-building, and returned to Denmark in 1656 a thoroughly equipped seaman. He served with distinction during the Swedo-Danish wars of 1658–60 and took a prominent part in the defence of Copenhagen against Charles X. During fifteen years of peace, Juel. as admiral of the fleet, improved the ;Danish navy. though he bitterly resented the setting over his head in 1663 of Cort Adelaar on his return from the Turkish wars. On the outbreak of the Scanian War he served at first under Adelaar, but on the death of the latter in November 167j was appointed to the supreme command. He raised Danish sea-power to unprecedented eminence, by the system of naval tactics. afterwards perfected by Nelson. which consists in cutting off a part of the enemy's force and concentrating the whole attack on it. He first employed this manoeuvre at the battle of Jasmund off Rügen (May 25, 1676) when he broke through the enemy's line in close column and cut off five of their ships. A few days after the battle of Jasmund, Cornelius Van Tromp the younger, with 17 fresh Danish and Dutch ships of the line, superseded Juel in the supreme command.

Juel took a leading part in Van Tromp's great victory off Öland (June 1, 1676), which enabled the Danes to invade Scania unopposed. On June 1, 1677 Juel defeated the Swedish admiral Sjoblad off Moen; on June 30, 1677 he won his greatest victory, in the Bay of Kjoge, where, with 25 ships of the line and 1,267 guns, he routed the Swedish admiral Evert Horn with 36 ships of the line and 1,800 guns. For this great triumph he was made lieutenant admiral general and a privy councillor. This victory, besides permanently crippling the Swedish navy, gave the Danes a self-confidence which enabled them to keep their Dutch allies in their proper place. In the following year Van Tromp, whose high-handedness had become unbearable, was discharged by Christian V., who gave the supreme command to Juel. In the spring of 1678 Juel put to sea with 84 ships carrying 2,400 cannon, but as the Swedes did not venture out to sea, his operations were limited to blockading the Swedish ports and transporting troops to Riigen. After the peace of Lund Juel devoted himself to the development of the fleet. He died on April 8, 1697.

See Garde, *Niels Juel* (1842), and Den *dansk. norske Sömagts Historie, 1535–1700* (1861).

JUGGERNAUT (JAGANNATH), the form under which the Hindu god Vishnu is worshiped at Puri (Orissa), one of the most famous religious centres of India, and at Ballabhpur, a suburb of Serampur, West Bengal. The name is derived from Sanskrit, *Jagannatha,* "lord of the world." The temple at Puri (*q.v.*), built in the 12th century, stands in an enclosure with about 120 other temples, towering above them with its round-ended tower, which stands 192 ft. high and is crowned with Vishnu's flag and wheel. In the sanctuary roughhewn wooden images represent Jagannath, his brother Balabhadra and Subhadra, his sister. The god is tended with elaborate ceremony, and special servants feed, bathe and clothe him.

Legends indicate that the cult evolved from one centred on an aboriginal fetish; it is said that Jagannath's image was discovered and secretly worshiped by a Savara hillsman, or alternatively that. appearing to King Indrayumna in a dream, the god revealed the whereabouts of the wood from which his image was to be fashioned. Buddhist influence has been detected in the threefold nature of the temple image and in the most important of the numerous yearly festivals, the Rathayatra, which takes place in June or July. The image is placed in a car so heavy that the efforts of hundreds of devotees are required to move it, and dragged through deep sand to the country house of the god. The journey takes several days and thousands of pilgrims participate. Reports of these processions in the past have been much exaggerated. Human sacrifice is abhorrent to Vishnuism and would never be practised in the temple; also no vast numbers were crushed to death in the crowds, although accidents are common and occasionally a frenzied pilgrim attempts to throw himself under the car.

See N. K. Sahu (ed.), *A History of Orissa,* vol. i (1956); L. S. S. O'Malley, "Puri," *Bengal District Gazetteer* (1908).

JUGGLER, a term coming from the Latin *joculare,* "to jest," and used to describe a particular type of entertainer who specializes in balancing and in feats of dexterity in tossing and catching balls, plates, knives, etc. Its French equivalent, *jongleur,* signifies much more than just "juggling." It was applied in medieval times to the wandering minstrels, or troubadours, who went from court to court declaiming epic poetry or singing and composing songs. At the end of the 14th century, when minstrelsy began to decline, they became *sauteurs,* or tumblers, and kept the populace amused with feats of agility and skill, including legerdemain. Much the same kind of dexterity and nimbleness is required in sleight of hand as in juggling, and books on juggling are still sometimes catalogued in libraries under "legerdemain."

Skill in throning and catching balls and knives is not a modern innovation Juggling was practised by the Egyptians. Greeks and Romans, and evidence of it is to be found in sculpture, coins

and ancient manuscripts. If some of the records are to be believed, feats of juggling had for centuries been performed that would tax the skill even of a modern Rastelli. Comparison with these ancient records reveals that although juggling has advanced in technical perfection, the underlying principles are still the same. In an early manuscript a bear is shown standing on its hind legs and juggling with three knives, a feat that gave rise among scholars to much skepticism. In the modern Russian circus, Valentin Filatov trained a bear to lie in a trinka (a small cradle in which an antipode lies while juggling with his feet) and with its hind legs juggle a flaming torch at a speed few humans could equal.

In the 17th and 18th centuries, the juggler found a living in the fairs, but it was not until the 19th century that he came into his own in the circus and in the music hall. These new fields provided a unique training ground for fresh talent and before long had produced outstanding artists such as Severus Scheffer, Kara, Paul Cinquevalli and Enrico Rastelli, and the greatest of these was Rastelli. Rastelli lived for nothing but his art and he could juggle with ten separate balls, constituting in the juggling world a kind of miracle. Ball juggling is no longer popular because much the same effect can be achieved with three balls by a juggler aith a sense of style as with seven or eight balls, nhich requires enormous concentration and practice. The modern tendency is to be more spectacular. Feats performed in Rastelli's day are now accomplished blindfolded on horseback, on a perch or high wire or, as done by Rudy Horn, on a unicycle. The advent of television gave an impetus to juggling at a time when it looked as though it was on its way out.

See R. Ingalese, ***Juggling*** (1921). (R. T.-ST.)

JUGOSLAVIA: ***see*** **YUGOSLAVIA.**

JUGURTHA (Gr. **Ἰογόρθας**), king of Numidia, an illegitimate son of Mastanabal, and grandson of Massinissa. After his father's death he was brought up by his uncle Micipsa together with his cousins Adherbal and Hiempsal. Jugurtha inherited much of Massinissa's political ability. Micipsa, naturally afraid of him, sent him to Spain (134 B.C.) in command of a Numidian force, to serve under P. Cornelius Scipio Africanus Minor. He became a favourite with Scipio and the Roman nobles, some of whom put into his head the idea of making himself sole king of Numidia.

In 118 B.C. Micipsa died. By his will, Jugurtha was associated with Adherbal and Hiempsal in the government of Numidia. Scipio had written to Micipsa a strong letter of recommendation in favour of Jugurtha; and to Scipio, accordingly, Micipsa entrusted the execution of his will.. His testamentary arrangements utterly failed. The princes soon quarrelled, and Jugurtha claimed the entire kingdom. Hiempsal he contrived to have assassinated; Adherbal he quickly drove out of Numidia. He then sent envoys to Rome to defend his usurpation on the ground that he was the injured party. The senate decided that Numidia was to be divided, and gave the western, the richer and more populous half, to Jugurtha, while the sands and deserts of the eastern half were left to Adherbal. Jugurtha's envoys appear to have bribed several Roman nobles and senators. Jugurtha at once began to provoke Adherbal to a war of self-defence. He defeated him near the modern Philippeville, and Adherbal sought safety in the fortress of Cirta (Constantine). Here he was besieged by Jugurtha, who forced the place to capitulate, and treacherously massacred all the inhabitants, among them his cousin Adherbal and a number of Italian merchants.

The Roman senate, a majority of which still clung to Jugurtha, were persuaded in the same year (111) to declare war. An army was despatched to Africa under the consul L. Calpurnius Bestia, several of the Numidian towns voluntarily surrendered, and Bocchus, the king of Mauretania, and Jugurtha's father-in-law, offered the Romans his alliance. Jugurtha having at his command the accumulated treasures of Massinissa, succeeded in arranging with the Roman general a peace which left him in possession of the whole of Numidia. But the tribune Memmius insisted that Jugurtha should appear in person and be questioned as to the negotiations. Jugurtha appeared under a safe conduct, but his partisans took care that his mouth should be closed. Soon afterwards he caused his cousin Massiva, then resident at Rome and a claimant to the throne of Numidia, to be assassinated. The treaty was thereupon set aside, and Jugurtha was ordered to quit Rome. On this occasion he uttered the well-known words, "A city for sale, and doomed to perish as soon as it finds a purchaser!" (Livy, *Epit.* 64.)

The war was renewed, and the consul Spurius Albinus entrusted with the command. The Roman army in Africa was thoroughly demoralized. An unsuccessful attempt was made on a fortified town, Suthul, in which the royal treasures were deposited. The army was surprised by the enemy in a night attack, and the camp was taken and plundered. Every Roman was driven out of Numidia, and a disgraceful peace was concluded (109).

The war was now entrusted to Quintus Metellus, an able soldier and stern disciplinarian, and from the year 109 to its close in 106 the contest was carried on with credit to the Roman arms. Jugurtha was defeated on the river Muthul, after an obstinate and skilful resistance. Once again, however, he succeeded in surprising the Roman camp and forcing Metellus into winter quarters. There were fresh negotiations, but Metellus insisted on the surrender of the king's person, and this Jugurtha refused. In 106, Marius was called on by the vote of the Roman people to supersede Metellus, but it was through the perfidy of Bocchus acd the diplomacy of L. Cornelius Sulla, Marius's quaestor, that the war was ended. Jugurtha fell into an ambush, and was conveyed a prisoner to Rome. Two years afterwards, in 104, he figured with his two sons in Marius's triumph, and in the subterranean prison beneath the Capitol he was either strangled or starved to death.

Jugurtha mainly owes his historical importance to the full and minute account of him which we have from the hand of Sallust, himself afterwards governor of Numidia.

See A. H. J. Greenidge, *Hist. of* Rome (1904); T. Mommsen, ***Hist.*** of ***Rome*** (1854, etc.), book iv. ch. v.; the chief ancient authorities (besides Sallust) are Livy, *Epit.*, lxii.–lxvii.; Plutarch, *Marius and Sulla;* Velleius Paterculus, ii.; Diod. Sic., ***Excerpta,*** xxxiv.; Florus, iii. 1. See also MARIUS, GAIUS; SULLA, LUCIUS CORNELIUS; NUMIDIA.

JUILLIARD, AUGUSTUS D. (1840–1919), American capitalist, was born in Canton, O. His parents were French Huguenots, natives of Burgundy, France, who emigrated to America in 1836. He was for many years head of a dry goods commission house in New York city, which bore his name, and a notable figure in banking and insurance circles. In his will, provision was made for the founding of the Juilliard Musical Foundation in New York city, which was incorporated under. a special act of the legislature on March 30, 1920, and to which he bequeathed the residue of his estate, estimated at $12,000,000. The purposes of the foundation are: to aid worthy students of music in securing an adequate musical education; to promote enterprises for the education and instruction of the general public in musical arts; to afford facilities for the encouragement of a deeper interest in music in the United States. Juilliard died in New York city on April aj, 1919.

JUJUBE. While this name is often applied to variously flavoured confections of gum arabic, gelatin, etc., it belongs properly to the small, spiny trees of two species of *Zizyphus* (of the buckthorn family. Rhamnaceae) and their fruit. The best jujubes arc produced by Chinese varieties of Z. *jujuba,* the native home of which is thought to be China, where they have been extensively cultivated for at least 4,000 years. This species, reaching to 25 or 30 ft., has alternate three-veined elliptic to ovate leaves one to three inches in length. The small greenish flowers are followed by dark brown, round to oblong fruits the size of small plums, each containing white. crisp flesh and a single large. pointed stone. When processed in sirup the fruits make an excellent confection, much resembling Persian dates—hence the name "Chinese dates" by which they are sometimes known. Jujube still remains one of the five chief fruits of China. Though introduced into the Cnited States in 1837, the jujube attracted little attention until superior varieties were obtained from China about 1906.

Z. mauritiana, the Indian jujube or ber, differs botanically from Z. *jujuba* in having leaves that are woolly beneath instead of smooth. The fruit is commonly smaller and of poorer quality.

Both species are subtropical in character; thriving in hot, dry

climates where winter temperatures do not go below 15° F. They are well adapted to cultivation in the southwestern U.S., where they are occasionally seen as dooryard trees. Jujubes have not been planted commercially to any extent in the U.S., but because of their remarkable resistance to pests they show promise for exploitation. Propagation is by means of seed, though the named Chinese varieties must be propagated vegetatively. Suckers, root cuttings and grafting are used in China; in California whip grafting on two-year-old rootstocks is recommended. The trees are precocious and prolific in fruiting, rarely failing to yield good crops. (W. Po.; X.)

JU-JUTSU (JIU-JITSU), popularly called judo, a Japanese method of self-defense and offense without weapons in personal encounter. Originally known principally as Japanese wrestling, it was integrated, with modifications, into occidental combative techniques during World War II and became a training device among practically all nations.

Lama monks in ancient China developed ju-jutsu as a protection against robber bands. Ancient Japan developed an elemental, weaponless combat practised by the samurai (nobility). About 1600 Japanese travelers to the mainland brought back techniques of the lama monks; the Japanese, impressed with their effectiveness, combined them with their traditional methods of combat and added over 300 throws and holds.

At first limited to the nobility, particularly the samurai, it was a secretly taught art for centuries and the "professors" of ju-jutsu guarded its complicated techniques so jealously that very few students became complete masters. With the end of feudalism it became a popular sport in Japan, and is taught in schools and public and private gymnasiums as well as to recruits in the army, navy and police.

There are as many varieties of ju-jutsu as there are clans. Tokyo alone has over jo types. In 1882 Jigoro Rano founded the most popular modern style, consolidating the best techniques of each clan and developing the most exacting form, which he called judo.

Students are classified according to their progress, which is indicated by belt colour; novices wear white belts and are examined upon completion of a prescribed program. If successful, they receive the brown belt consisting of three degrees. On completion of these exacting steps, a black belt is awarded, of which there are nine degrees. Only rarely does a person reach the ninth degree.

Ju-jutsu attracted attention in Europe and the United States about 1900, but only after World War II did it become popular. Shortly thereafter, the Amateur Athletic union (A.A.U.) of the United States, recognizing ju-jutsu as a sport, organized committees, established official rules and conducted tournaments.

Techniques. — Some translate ju-jutsu as "to conquer by yielding" (Jap. *ju*, "pliant"), others, as the "gentle art." Both phrases express a salient characteristic of the art, since the weight and strength of an opponent are used to his undoing, as is the ju-jutsu man's knowledge of the points of weakness in human anatomy. The technique offsets the effectiveness of powerful muscles by employing body skills through so-called "simple" maneuvers that overpower an opponent. But ju-jutsu is no simple sport: it requires extensive practice under competitive conditions. The student must acquire a knowledge of nerve, joint and muscle positions, holds, blows, vulnerable body areas, leverages and counters. Courage, sufficient strength, endurance, co-ordination, alert re-Hexes, good balance, presence of mind and suppleness of body are required. Only from actual competition can proper footwork, use of body weight and quick acting and reacting be learned.

Ju-jutsu wrestlers fight as well on their backs as on their feet, making use of the edge of the hand. tips of fingers, elbows: knees and heels and soles of the feet. They undergo strenuous physical training programs. Ju-jutsu is one of the best methods of physical training known.

A knowledge of anatomy is essential so that body weaknesses may be attacked. Sensitive areas where nerves are near the surface, such as the elbow, the complex of nerves over the stomach (solar plexus) and the chin, are familiar to occidentals but ju-jutsu men are acquainted with many more areas that, when compressed, struck or pinched, cause temporary pain and paralysis, either minor or severe. Included are the armpit, liver, groin, coccyx, larynx and the side of the neck above the collarbone. In life-and-death struggles the combatant must know and be able to resort to all dangerous thrusts, kicks and blows which cause more than temporary incapacity; thus broken bones and badly torn muscles and ligaments are among the least of the injuries befalling a victim.

Judo as a Sport. — Rules governing competitions in the sport assume the knowledge by competitors of trips, holds, strangles and throws, as well as of the danger of resisting too long. Contestants acknowledge defeat (to avoid disablement) by two or more quick slaps on the mat or on the opponent's body. A similar procedure existed in the pancratium of the ancient Olympic games, where a contest continued until one man acknowledged defeat or was beaten into insensibility. Rules governing judo are outlined in the official guide of the Amateur Athletic union (A.A.U.). A bout begins with an exchange of salutes, the opponents bowing to each other simultaneously from standing position or from the more formal Japanese kneeling posture. Contestants wear jackets with belts; at the start each grips the jacket lapel of his opponent with one hand and grasps his opponent's elbow or belt with the other. Through a variety of maneuvers he trips, throws, pulls or pushes his opponent into a backfall or a position where he can subdue him. Locked-joint holds are placed on the wrist, elbow, shoulder, ankle, knee or neck so firmly that a seized man can only go to the mat, sometimes being thrown over his opponent's head with considerable force. Ju-jutsu men are experts at falling without injury.

Most contests are judged on the basis of throwing or grappling. but unlike catch-as-catch-can wrestling: a particular position does not always mean victory; however, under A.A.U. rules, if an opponent is thrown from standing position and strikes the mat on his back with appreciable force, the bout is concluded. In contests following more traditional rules, a fall such as this does not necessarily end the match, which continues with a great amount of maneuvering on the mat.

See also WRESTLING.

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JUJUY, a province in the extreme northwestern part of Argentina. Area 20,545 sq.mi. Pop. (1956 est.) 236,470; (1947) 166,700. The terrain is rugged although not unattractive and the varying altitudes exhibit a tremendous range in climate, temperature and vegetation. The eastern valleys, at less than 1,000 ft., are warm and humid. In sharp contrast are the treeless wastes of Puna and the cold, dry basins of the north and west at 10,000 ft., ringed by snow-capped peaks, which rise to more than 15,000 ft. in height.

Like the other northwestern Argentine provinces, Jujuy owed its early settlement and prosperity during the 16th and 17th centuries to the Spanish mines of Peru and Bolivia. The city of Jujuy, the provincial capital, pop. (1956 est.) 44,061, was founded in 1593 at the southern limit of the Humahuaca gorge, 4,127 ft. above sea level. The city and surrounding area prospered from the raising of mules and foodstuffs for the mines, and a flourishing trade was carried on across the mountains to Bolivia. In the 20th century the province was linked by railroad to Bolivia and an alternate route of the Pan American highway passed through the province from Bolivia. The prosperity of the area declined in the 19th century, however, as the focus of a national economy and commerce shifted to the littoral and to Buenos Aires.

At mid-20th century Jujuy was the major producer of minerals in Argentina, supplying most of the national production of zinc, lead, tin, silver and antimony as well as considerable amounts of salt, borates and gold. Efforts had been made to exploit the high-grade iron ore from the Zapla mines and a blast furnace at Palpalá had been completed, but full development was hampered

by inadequate coal supplies and transportation facilities. The mountainous and arid terrain is not suited to agriculture and crops are restricted to the eastern valleys. Not much more than a tenth of the total area of the province was under cultivation in the 1950s.

Mules, asses and llamas are used extensively as pack animals and are raised in considerable numbers, as are sheep, goats and cattle. (Js. R. S.)

JUKES, JOSEPH BEETE (1811–1869), English geologist, was born at Summer Hill, near Birmingham, on Oct. 10, 1811. He was naturalist to H.M.S. "Fly" on the expedition (1842) to survey Torres strait, New Guinea and the east coast of Australia. After his return home he served on the geological surveys of Great Britain and of Ireland. He was professor of geology at the Royal college of Science in Dublin. Jukes died on July 29, 1869.

Jukes wrote many papers for London and Dublin geological journals and he was also the author of *Excursions in and about Newfoundland* (2 vols., 1842); *Narrative of the Surveying Voyage of H.M.S. "Fly"* (2 vols., 1847); *A Sketch of the Physical Structure of Australia* (1850); *Popular Physical Geology* (1853); *Student's Manual of Geology* (1857; 2nd ed. 1862; a later edition was revised by A. Geikie, 1872); the article "Geology" in the *Ency. Brit.* 8th ed. (1858) and *School Manual of Geology* (1863). See *Letters, &c., of J. Beete Jukes, edited, with Connecting Memorial Notes, by his Sister* (C. A. Browne) (1871), to which is added a chronological list of Jukes's writings.

JUKUN (JUKON), a small tribe living on the upper Benue river in Nigeria, commonly believed to be composed of descendants of Kororofa, one of the most powerful Sudanic kingdoms in the late middle ages. The ruins of a great settlement to the northeast of the tribe's present location, on the south bank of the Benue, are said to be those of the capital of that kingdom, but the claim has not as yet been investigated by archaeologists. It is true, however, that many royal families of Nigerian tribes, such as those of the Nupe and the Igala, trace their ancestry back to this area and to the Jukun royal family.

The population amounts to about 11,000 people who speak six separate dialects of their Kua language. The tribe is a congeries of many smaller groups, each organized according to different principles, although the polygynous extended family seems to be the dominant social group in all. The characteristic which most marks the Jukun, however, is their complex system of offices which have both a political and a religious aspect. Such a system resembles the political organization of many African states, but the Jukun are a society of princes without subjects. The offices are also part of a priesthood which practises an involved form of religion, marked by a diurnal and annual round of ritual and sacrifice.

The king, called the Aka Cku, was—until he became a member of northern Nigeria's house of chiefs in 1947—an almost perfect example of the semidivine priest-king.

See C. K. Meek, *A Sudanese Kingdom (1931).* (P. J. B.)

JULIAN (FLAVIUS CLAUDIUS JULIANUS) (c. 331–363), commonly called JULIAN THE APOSTATE, Roman emperor, was born in Constantinople in 332 (probably), the son of Julius Constantius and his wife Baslina, and nephew of Constantine the Great. Julian lost his mother not many months after he was born. In 337 Constantine died, and the whole of Julian's family, except his half-brother, Gallus, was murdered by the soldiers to ensure the undisputed succession of the sons of Constantine. Gallus was banished, but Julian was allowed to remain in Constantinople, where he was carefully educated under the supervision of the family eunuch, Mardonius, and of Eusebius, bishop of Nicomedia. About 341 Gallus was recalled, and the two brothers were removed to Macellum, a remote and lonely castle in Cappadocia. Julian was trained to the profession of the Christian religion; but he became early attracted to the old faith, or rather to the idealized amalgam of paganism and philosophy which was current among his teachers, the rhetoricians. The old Hellenic world had an irresistible attraction for him. Love for its culture was, in Julian's mind, associated with loyalty to its religion.

Early **Life** and Campaigns.—A short visit to Constantinople was followed by exile to Nicomedia again, where he came under the influence of Libanius, though forbidden to attend his lectures, and at this stage probably became finally contracted to paganism. In 351 Gallus was made Caesar, and Julian liberated; but not for long. In 354 Gallus was executed for misgovernment, and Julian came under suspicion again. He was confined in Milan, released, recalled to Milan, and eventually, by the intercession of the empress Eusebia, allowed to return to Athens. Here he was initiated into Mithraism (355). The emperor Constantius and Julian were now the sole surviving male members of the family of Constantine; and, as the emperor again felt himself oppressed by the cares of government, there was no alternative but to call Julian to his assistance. At the instance of the empress he was summoned to Milan, where Constantius bestowed upon him the hand of his sister, Helena, together with the title of Caesar and the government of Gaul.

A task of extreme difficulty awaited him beyond the Alps. During recent troubles the Alamanni and other German tribes had crossed the Rhine; they had burned many flourishing cities, and extended their ravages far into the interior of Gaul. The internal government of the province had also fallen into great confusion. In his first campaign, in 356, he co-operated with Constantius, who advanced from Raetia, while Julian moved up the left bank of the Rhine. The only notable fighting was Julian's successful defence of Sens at the end of the year. The next year he was by himself; Barbatio, left to support him with a large force, deserted, and Julian extricated himself from great danger with a great victory at Strasbourg (357). This season saw the lower Rhine cleared as well. The year 358 was devoted to the recovery of the captures from Gaul beyond the Rhine and the re-organization of the frontier defences. In Gaul, Julian rebuilt the cities which had been laid waste, re-established the administration on a just and secure footing, and, as far as possible, lightened the taxes which weighed so heavily on the poor provincials. Paris was the usual residence of Julian during his government of Gaul, and his name has become inseparably associated with the early history of the city.

Meanwhile the inner circle of Constantius's court were doing their best to poison the emperor's mind against Julian. In 360 he received the emperor's orders withdrawing a number of troops for the renewed war with Persia. and putting them at once under a different command. Julian first objected, then submitted; the soldiers themselves halted at Paris on the way east and proclaimed him emperor. He accepted, and at once tried to negotiate with Constantius, who was campaigning in the East. The message being disregarded, both sides prepared for a decisive struggle. After a march of unexampled rapidity through the Black forest and down the Danube, Julian reached Sirmium, and he was on the way to Constantinople when he received news of the death of Constantius, who had set out from Syria to meet him, at Mopsucrene in Cilicia (Wov. 3, 361). Without further trouble Julian found himself everywhere acknowledged the sole ruler of the Roman empire; it is even asserted that Constantius himself, on his deathbed, had designated him his successor. Julian entered Constantinople on Dec. 11, 361.

His **Reign.**—Julian had already made a public avowal of paganism, of which he had been a secret adherent at the age of 20. His reign was too short to show what precise form the pagan revival might have taken, how far his feelings might have become embittered by his conflict with the Christian faith, whether persecution, violence and civil war might not have taken the place of moral suasion, which was the method he originally affected. He issued an edict of universal toleration; but in many respects he used his imperial influence to advance the work of restoration. Paganism was demanded of the teachers in the schools; without directly excluding Christians from the high offices of State, he held that the worshippers of the gods ought to have preference. In short, though there was no direct persecution, he exerted much more than a moral pressure to restore the power and prestige of the old faith. Julian himself became *pontifex maximus*, and the new cult was organized on more or less Christian lines as a State church.

Having spent the winter of 361–362 at Constantinople, Julian proceeded to Antioch, to prepare for his great expedition against

Persia. His stay there was a curious episode in his life. It is doubtful whether his pagan convictions or ascetic life, after the fashion of an antique philosopher, gave most offence to the so-called Christians of the dissolute city. They soon grew heartily tired of each other, and Julian took up his winter quarters at Tarsus, from which, in the early spring, he marched against Persia. At the head of a powerful and well-appointed army, and accompanied down the Euphrates by a fleet, he advanced through Mesopotamia and Assyria as far as Ctesiphon, near which he crossed the Tigris, in face of a Persian army, which he defeated. Misled by the treacherous advice of a Persian nobleman, he desisted from the siege, and set out to seek the main army of the enemy under Shapur II. (*q.v.*). After a long, useless march he was forced to retreat, and found himself enveloped by the whole Persian army in a waterless and desolate country, at the hottest season of the year. The Romans repulsed the enemy in many an obstinate battle, but on June 26, 363, Julian, who was ever in the front, was mortally wounded. The same night he died in his tent. The story that he was murdered by a Christian is unauthenticated. But though *Vicisti, Galilaee* is a fabrication, it represents the facts. His work died with him.

From Julian's unique position as the last champion of a dying polytheism, his character has always excited interest. Taught from his youth to regard Christianity as a persecuting force, he found sympathy and intellectual companionship only among the pagan rhetoricians and philosophers, and was thus attracted to paganism. But the religion he attempted to foist on the world was not a paganism that had ever existed. The real pagans of the day, like Amnianus, were tolerant monotheists. Julian's creed was a curious mixture of active polytheism, combined with the emotional appeal of the mysteries, which had never in ancient times really coalesced with the formal public worship of gods, and held together by the Neoplatonist philosophy—surely the greatest feat of eclecticism ever performed, even by that eclectic system.

In other respects Julian was no unworthy successor of the Antonines. Though brought up in a studious solitude, he was no sooner called to the government of Gaul than he displayed all the energy, the hardihood and the practical sagacity of an old Roman. In temperance, self-control and zeal for the public good, as he understood it, he was unsurpassed. To these Roman qualities he added the culture, literary instincts and speculative curiosity of a Greek. One of the most remarkable features of his public life was the perfect ease and mastery with which he associated the cares of war and statesmanship with the assiduous cultivation of literature and philosophy.

BIBLIOGRAPHY.—The works of Julian, of which there are complete editions by E. Spanheim (Leipzig, 1696) and F. C. Hertlein (Teubner series, 1875–76), consist of the following: (1) *Letters,* of which more than 80 have been preserved under his name, although the genuineness of several has been disputed. Six new letters were discovered in 1884 by A. Papadopulos Kerameus in a monastery on the island of Chalcis near Constantinople (see *Rheinisches Museum,* xliii, 1887). Separate edition of the letters by L. H. Heyler (1828); *see* also J. Bidez and F. Cumont, "Recherches sur la tradition ms. des lettres de l'empereur Julien" in *Mémoires couronnées . . . publiés par l'Acad. royale de Belgique,* lvii (1898); and F. Cumont, *Sur l'authenticité de quelques lettres de Julien* (1889). (2) *Orations,* eight in number—two panegyrics on Constantius, one on the empress Eusebia, two theosophical declamations on King Helios and the Mother of the Gods, two essays on true and false cynicism and a consolatory address to himself on the departure of his friend Salustius to the east. (3) *Caesares* or *Symposium,* a satirical composition after the manner of Seneca's *Apocolocyntosis.* (4) *Misopogon* (the beard-hater), written at Antioch, a satire on the licentiousness of its inhabitants. (5) Five epigrams, two of which (*Anth. Pal.,* ix, 365, 368) are of some interest. (6) Κατὰ Χριστιανων (*Adversus Christianos*) in three books, an attack on Christianity written during the Persian campaign, is lost. Theodosius II ordered all copies of it to be destroyed, and our knowledge of its contents is derived almost entirely from the *Contra Julianum* of Cyril, bishop of Alexandria, written 60 years later (see *Juliani librorum contra Christianos quae supersunt,* C. J. Neumann [ed.], 1880). *English Translations:* Select works by J. Duncombe (1784) containing all except the first seven orations (viii and the fable from vii are included); the theosophical addresses to King Helios and the Mother of the Gods by Thomas Taylor (1793) and C. W. King in Bohn's *Classical Library* (1888); complete edn. and trans. by W. C. Wright, 1913–23.

1. Ancient authorities: (*a*) Pagan writers. Ammianus Marcellinus (xv, 8–xxv), a contemporary and in part an eyewitness of the events he describes (other historians are Zosimus and Eutropius); the sophist Libanius and Claudius Mamertinus, the panegyrist, are less trustworthy. (*b*) Christian writers. Gregory of Nazianzus, the author of two violent invectives against Julian; Rufinus; Socrates; Sozomen; Theodoret; Philostorgius; the poems of Ephraem Syrus written in 363; Zonaras; Cedrenus; and later Byzantine chronographers. The impression which Julian produced on the Christians of the east is reflected in two Syriac romances published by J. G. E. Hoffmann, *Julianos der Abtrünnige* (1880); *see* also T. Nöldeke, *Zeitschrift der deutschen morgenländischen Gesellschaft,* xxviii, 263 (1874).

2. Modern: For works before 1878 *see* R. Engelmann, *Scriptores Graeci,* 8th ed., by E. Preuss (1880). Of later works the most important are G. H. Rendall, *The Emperor Julian, Paganism and Christianity* (1879); Alice Gardner, *Julian, Philosopher and Emperor* (1895); G. Negri, *Julian the Apostate* (Eng. trans., 1905); E. Müller, *Kaiser Flavius Claudius Julianus* (1901); P. Allard, *Julien l'apostat* (1900–03); G. Mau, *Die Religionsphilosophie Kaiser Julians in seinen Reden auf König Helios und die Göttermutter* (1907); J. E. Sandys, *History of Classical Scholarship,* p. 356 (1906); W. Christ, *Geschichte der griechischen Litteratur,* sec. 603 (1898); J. Geffcken, "Kaiser Julianus und die Streitschriften seiner Gegner," in *Neue Jahrb. f. das klassische Altertum,* pp. 161–195 (1908); J. Geffcken, *Kaiser Julianus* (1914). The article by A. Harnack in J. J. Herzog and A. Hauck, *Realencyklopädie für protestantische Theologie und Kirche,* ix (1901) is valuable, especially for the bibliography. (T. Kl.; J. H. F.)

JULIANA (1909–), queen of the Netherlands, was born April 30, 1909, only child of Queen Wilhelmina and Prince Consort Henry. She was married in 1937 to Prince Bernhard zu Lippe-Biesterfeld. Of this marriage four daughters were born: Beatrix (b. Jan. 31, 1938), Irene, Margriet and Maria. Juliana became queen Sept. 6, 1948, after her mother's abdication.

JULIAN DAY, a chronological device of numbering the days of the Julian period (*see* CALENDAR). Greenwich mean noon of Monday, Jan. 1, 4713 B.C. corresponds to Julian Day 0.0. The day of the week of a date is given by the remainder of the division of the J.D. number by 7; remainder 0 means Monday, 1 means Tuesday, . . . 6 means Sunday. J.D. 2,436,935 began at Greenwich mean noon of Friday, Jan. 1, 1960, Gregorian calendar. (A. Po.)

JÜLICH (Fr. *Juliers*), a town in North Rhine-Westphalia, Ger., on the right bank of the Roer, 16 mi. northeast of Aachen. Pop. (1950) 9,260. Jülich (formerly also Gülch, Guliche), the capital of the former duchy of that name, is the Juliacum of the *Antonini Itinerarium.* It became a fortress in the 17th century, and was captured by the Dutch under Maurice of Orange in 1610 and by the Spaniards in 1622. Until 1860, when its works were demolished, Jülich ranked as a fortress of the second class.

The Duchy of Jülich (or Juliers).—From the 11th to the 15th century Jülich was ruled by a line of hereditary counts. The county was raised to the rank of a duchy in 1356, but its importance in general history is the result of its later association with the neighbouring duchies of Berg and Cleve. In 1423 Jülich passed to Adolph, duke of Berg (d. 1437), who belonged to a younger branch of the ruling family. Nearly a century later Mary (d. 1543), the heiress of these two duchies, married John, the heir of the duchy of Cleve. John died in 1539 and was succeeded by his son William, who reigned until 1592.

At the beginning of the 17th century the reigning duke, John William, was childless and insane. Among the claimants to his lands the most important were two Protestant princes, Philip Louis, count palatine of Neuburg, husband of the duke's sister Anna, and John Sigismund, elector of Brandenburg, whose wife was the daughter of another sister. Moreover, by virtue of an imperial promise made in 1485 and renewed in 1495, the elector of Saxony claimed the duchies of Jülich and Berg, while the proximity of the coveted lands to the Netherlands made their fate a matter of great moment to the Dutch. The situation was made dangerous by the tension between the Roman Catholics and the Protestants, who were fairly evenly matched in the duchies, and by the rivalry between France and the empire. In March 1609 Duke John William died. Having assured themselves of the support of Henry IV of France and of the Evangelical Union, Brandenburg and Neuburg at once occupied the duchies. Thereupon the emperor Rudolph II ordered some imperialist and Spanish troops to seize the disputed lands, and a great European war was narrowly avoided. The emperor adjudged the duchies to Saxony, while the Dutch captured the fortress of Jülich; but the "possessing princes," as Brandenburg and Neuburg were called, continued to occupy and administer the lands. These two princes had made a compact at Dortmund in 1609 to act together

in defense of their rights, but differences soon arose between them which were increased by the conversion of the count palatine's heir, Wolfgang William of Neuburg. to Roman Catholicism, and his marriage with a daughter of the powerful Roman Catholic prince, Duke Maximilian of Bavaria. Each party then invited foreign aid, but through the intervention oi England and France the treaty oi Xanten was signed in Nov. 1614 by which Brandenbur:: obtained Cleve and Mark, the rest of the lands falling to the count palatine. In 1666 the great elector. Frederick William of Brandenburg, made with William, count palatine of Seuburg, a treaty providing that in case the male line of either house became extinct the other should inherit its lands.

When, early in the 18th century, the lattrr family was threatened with extinction. the emperor Charles VI promised the succession to Julich to the Prussian king, Frederick William I, in return for a guarantee of the pragmatic sanction. A little later, however, he promised the same duchy to the count palatine of Sulzbach, a kinsman of the count palatine of Neuburg. Then Frederick the Great, having secured Silesia, abandoned his claim to Julich. which thus passed to Sulzbach when, in 1742, the family of Neuburg became extinct. From Sulzbach the duchy came to the electors palatine of the Rhine, and, when this family died out in 1799, to the elector of Bavaria, the head of the other branch of the house of Wittelsbach. In 1801 Julich was seized by France, and by the settlement of 1815 it came into the hands of Prussia. Its area was slightly more than 1,600 sq.mi. and its population about 400,000. During World War II the town of Julich was bombed by the British several times.

See M. Ritter. *Sachsen und der jüliche Erbfolgestreit* (1873) and *Der jüliche Erbfolgekrieg, 1610 und 1611* (1877).

JULIUS, the name of three popes.

ST. JULIUS I (d. 352), pope from 337 to 352, was elected successor to Marcus on Feb. 6, 337. In the Arian struggle he was the chief prop of orthodoxy; in 339 he gave refuge at Rome to Athanasius (*q.v.*), who had been deposed and expelled from the see of Alexandria by the Arians. At the Council of Sardica (343–344), which he convoked, Julius tried to unite the west against Arianism. The third canon of the same council declared the right of the bishop of Rome to judge cases of rightful possession of episcopal sees. thus enforcing the pope's power in ecclesiastical affairs. In Rome. Julius founded two basilicas now known as the Church of the Twelve Apostles and Sta. Maria in Trastévere. He died on April 12, 352. His feast day is April 12.

Julius' two famous letters are preserved in Athanasius' *Apology Against the Arians.*

See Karl Bihlmeyer, *Church History,* vol. 1, trans. by V. E. Mills (1958). (E. G. RN.)

JULIUS II (Giuliano della Rovere) was pope from 1503 to 1513. A Franciscan, made cardinal by his uncle Pope Sixtus IV, Julius was elected on Nov. 1, 1503. He was an energetic military pope who restored papal authority over the estates of the church. He made alliances to defeat the Venetians and to frustrate French ambitions in Italy. Though primarily concerned with restoring the temporal power of the papacy, he was actively interested in missions; he created new bishoprics in the West Indies and sent missionaries to India, Ethiopia and the Congo. A patron of the arts, he laid the foundation stone of the new St. Peter's in Rome (1506). Through his efforts the papacy again became a European power of the first rank. Julius II died during the night of Feb. 20–21, 1513.

See Philip Hughes, *A History of the Church,* vol. iii (1947); Ludwig Pastor, *The History of the Popes,* vol. vi (1898).

JULIUS III (Giovanni Maria Ciocchi del Monte) (1487–1555), pope from 1550 to 1555, was born at Rome on Sept. 10, 1487. He was elected pope on Feb. 7, 1550. Although a Renaissance prelate, Julius was aware of the urgent need for a reform of the church. He appointed a commission to study general questions of reform: and it recommended resumption of the Council of Trent. Julius tried to check plurality of benefices among the cardinals and to restore monastic discipline. The Collegium Germanicum, founded in 1552 for the training of German priests in Rome under the Jesuits, reflects his interest in combating Protestantism. He died March 23, 1555.

See Ludwig Pastor, *The History of the Popes,* vol. xiii (1923). (J. A. CT.)

JULLUNDUR (JALANDHAR), a city giving its name to a district and a division of Punjab state. India. The city is 260 mi. N.W. of Delhi by rail. Pop. (1961) 221,952. Eight of the colleges connected with Panjab university. Solan. are in Jullundur.

JULLUNDUR DISTRICT occupies the southwestern part of the Jullundur Doab. between the Sutlej and Beas rivers, except that it is separated from the Beas by Kapurthala district of the Patiala and East Punjab States union. Area 1,334 sq.mi. Pop. (1961) 1,224,434; the average density of the rural population in 1951 was 585 persons per square mile, being one of the highest in the state. Cotton weaving and sugar manufacture are the principal industries of more than local importance, and silk goods and wheat are also sent elsewhere in the country.

The Jullundur Doab in early times formed the Hindu kingdom of Katoch, ruled by a family of Rajputs whose descendants still exist among the petty princes of the Kangra hills. Under Mohammedan rule the Doab was generally attached to the province of Lahore. In 1766 the town of Jullundur fell into the hands of the Sikhs. It was annexed by Ranjit Singh in 1811 and became the capital of the Lahore possessions in the Doab until the British annexation at the close of the first Sikh war (1846).

JULLUNDUR DIVISION (22,197 sq.mi.; pop. [1951] 7,436,587) comprises Hoahiarpur. Jullundur, Ludhiana, Ferozepur, Amritsar and Gurdaspur districts.

JULY, the seventh month in the modern calendar, consisting of 31 days. It was originally the fifth month of the year, and as such was called by the Romans *Quintilis.* The later name of Julius was given in honour of Julius Caesar (who was born in the month); it came into use in the year of his death. The Anglo-Saxons called July *Heg-mônath,* "hay-month," or *Maed-mônath,* "mead-month," the meadows being then in bloom.

JUMALA, indicating godhead rather than a divine being; the supreme god of the ancient Finns and Lapps. among some tribes called Num or Jilibenmbaertje. as protector of the flocks.

JUMIEGES, a village of northern France. in the *département* of Seine-Maritime, 17 mi. W. of Rouen by road, is situated on a peninsula formed by a bend of the lower Seine. Pop. (1954) 326. Jumièges was a great Benedictine house, a magnificent example of Norman Romanesque architecture of the middle of the 11th century. The fine façade. flanked by two great towers, 172 ft. high, the walls of the nave and part of the central tower remain. The adjacent church of St. Pierre (14th century) occupies the site of a church of the period of Charlemagne, of which a fragment survives. The abbey was founded in 654 by St. Philibert and, after its destruction by the Normans, was rebuilt in 928 and continued till 1790. Charles VII often resided there with Agnes Sorel, who died in the monastery in 1450, and whose gravestone is preserved in a small museum. (AR. E. S.)

JUMNA (anc. JOMANES), a river of northern India. Rising in the Himalayas in Tehri-Garhwal district. Uttar Pradesh, about 5 mi. N. of the Jamnotri hot springs. in 31° 3' N. and 78° 30' E.. the stream first flows south, then southwest and afterward due south, receiving several small tributaries in its course. It then turns sharply to the west and is joined by the large Tons river from the north. The Jumna there emerges from the Himalayas into the valley of the Dun, and flows southwest. It then. at the 95th mi. of its course. forces its way through the Siwalik hills, and debouches upon the plains of India at Faizabad in Saharanpur district.

By this time a large river: it gives off, near Faizabad, the eastern and western Jumna canals. From Faizabad the .river flows for 6; mi. in a south-southwesterly direction. receiving the Maskarra stream from the east. Near Bidhauli, in Muzaffarnagar district, it turns due south for 80 mi. to Delhi city, thence southeast for 27 mi. to near Dankaur, receiving the waters of the Hindan river on the east. From a point just northwest of Dankaur to a point some 40 mi. to the south it forms the Punjab-Uttar Pradesh boundary. From Dankaur it resumes its southerly course for 100 mi. to Mahaban near Muttra, where it turns east for nearly aoo mi.. passing the towns of Agra, Ferozabad and Etawah, receiving on its left bank the Karwannadi, and on its right the Banganga (Utanghan). From Etawah it flows 140 mi. S.E. to Hamirpur. being joined by the Sengar on its north bank, and on the south by the great Chambal river (650 mi. long) from the west. and by the Sind.

From Hamirpur, the Jumna flows nearly due east, until it enters Allahabad district and passes Allahabad city, below the fort

of which it falls into the Ganges. In this last part of its 860-mi. course it receives the waters of the Betwa and the Ken. Where the Jumna and Ganges unite is the Prayag, or place of pilgrimage (*see* GANGES).

The Jumna, after issuing from the hills, has a longer course through Uttar Pradesh than the Ganges, but is not so large nor so important; and above Agra in the hot season it dwindles to a small stream. This is caused partly by the Jumna canals, of which the former irrigates nearly 400.000 ac. in Uttar Pradesh, while the latter serves 55.000 ac. in the Punjab.

The traffic on the Jumna, which is carried in barges, is not large. Its waters are clear and blue, while those of the Ganges are yellow and muddy; the difference between the streams can be discerned for some distance below the point at which they unite. Its banks are high and rugged, as it traverses the extreme edge of the alluvial plain of Hindustan, and in the latter part of its course it almost touches the Bundelkhand offshoots of the Vindhya mountains. The Jumna at its source is 10,849 ft. above sea level; in the next 16 mi. it falls at the rate of 314 ft. in a mile. The catchment area of the river is 121,000 sq.mi.

The Jumna is crossed by railway bridges at Delhi. Muttra. Agra and Allahabad, while there are bridges of boats at many places.

JUMPING, according to the ancient *Book* of *Leinster,* was one of the five track and field events of the annual Tailteann games. held at Tailtiu, County Meath. Ire.. as early as 1829 B C. It was also one of the features of the Pentathlon (*q.v.*) when it was introduced at the ancient Olympic games. Through the centuries, three types of competitive jumping evolved: the high jump. the broad (long) jump and the triple jump or hop, step and jump. Some competitions were with hand weights, some from a standing position and some with an unrestricted run. Both jumping with hand weights and standing jumps have passed from the athletic scene and are no longer a part of major track and field competition.

History. — Jumping with a 5-lb. weight in each hand, at Chester, Eng., on May 8. 1854, J. Howard, with an unrestricted run, leaped 29 ft. 7 in. from a block of wood 1-ft. wide, 2-ft. long, 3-in. thick and raised 4 in. in front.

The greatest all-around standing jumper was perhaps Ray C. Ewry of the New York Athletic club. Confined to a wheel chair when quite young and not expected to walk, Ewry faithfully practised a set of daily exercises he had devised, developing great strength in his legs, body co-ordination, smooth rhythmic movements, a remarkable sense of timing and power that enabled him to spring upward. forward or backward from a standing position. Before he ended his remarkable athletic career he had set an Olympic record for individual victories with a total of eight.

The first running high jumper to leap 6 ft. or more was M. J. Brooks (Oxford university) — 6 ft. $2\frac{1}{2}$ in. in 1876. George L. Horine of California, changing to a run from the side of the bar, instead of from the front, eventually developed a style which became known as the western roll and in 1912 he raised the record to 6 ft. 7 in. The western roll or its variation, the straddle jump, was employed by all the world record holders after 1914. Finally, on June 29, 1956, Charlie Dumas of California broke the 7-ft. barrier with a leap of 7 ft. & in.

F. H. Gooch (Oxford university) was the first intercollegiate running broad-jump champion with a leap of 18 ft. in 1864. J. Lane (Ireland) was the first of the 23-ft. jumpers with 23 ft. $1\frac{1}{2}$ in. (1874), and W. J. M. Newburn, a fellow countryman, passed 24 ft. in 1898. Edwin Gourdin (Harvard university), first of the great Negro jumpers, leaped 25 ft. 3 in. (1921) and Silvio Cator (Haiti) passed the 26-ft. mark in 1928 with 26 ft. $\frac{1}{8}$ in. Jesse Owens' record of 26 ft. $8\frac{1}{4}$ in. endured for 25 years before being broken by Ralph Boston, a fellow American, who jumped 26 ft. $11\frac{1}{4}$ in. in 1960. The following year Boston became the first jumper to pass the 27-ft. barrier with a leap of 27 ft. $\frac{1}{2}$ in.

In the running hop. step and jump, John Purcell of Ireland raised the record from 42 ft. 10 in. (1884) to 48 ft. 3 in (1887). Irish-born Daniel F. Ahearn's record of 50 ft. 11 in., set in 1909, stood for 15 years. Thereafter, until Adhemar Ferreira da Silva of Brazil set records of 52 ft. $6\frac{1}{4}$ in. (1951) and 54 ft. 4 in. (1955), the field was dominated by Japanese athletes, including Naoto Tajima who leaped 52 ft. $5\frac{7}{8}$ in. in 1936. In 1960 Joszef Schmidt of Poland passed the 55 ft. barrier and broke the existing record by more than a foot with a triple jump of 55 ft. $10\frac{1}{2}$ in.

Technique. — The most commonly used methods of high jumping are the western roll and a modification of it called the straddle jump. These two methods are preferred because the jumper is lifted in a vertical position and his body passes over the bar parallel to it. To accomplish a western roll the jumper starts approximately 35 ft. from the bar which allows him about six running steps. Approaching the bar at a 45° angle, he takes off on the inside foot and at the same time kicks the outside foot to help lift him in a vertical plane. The take-off leg is brought up to the chest and remains there until the bar is cleared; it is then allowed to drop and the jumper lands on it. The body passes over the bar with the left side down, the left leg tucked tightly and the head in a drooped position.

After the jumper has mastered the western roll the straddle jump is simple, as the mechanics are the same. However, the take-off (left) leg is brought up even with the right leg and kicked behind it. As the body goes over the bar it is face down and the jumper lands on his right foot.

Broad jumping from a running start has four basic parts. Number one is the approach, which starts at a mark determined by the jumper, approximately 100 ft. from the take-off board He runs at full speed. shortening the last two strides in order to relax and gather himself for the jump. Now he comes to the second part which is the take-off. His take-off foot has landed heel first and, as he pushes off the ball of the same foot, every effort is made to attain height and distance. Part three is the flight. Most commonly used methods are the knee tuck and the hitch kick. Beginners usually find the knee tuck easier to learn. It requires height and speed with the knees brought to the chest in a sitting position. Acquiring height is important and most champions are from four to five feet in the air on their best jumps. The hitch kick is a continuation of the run in the air; each leg kicks downward once in a circular motion; the legs are then brought together for the landing. Landing is the fourth part of broad jumping and the longer the heels can be kept off the ground the longer the jump is. When the heels do land the jumper falls forward, body relaxed and knees bent.

The running hop, step and jump is one of the more complicated events in track and field competition. It begins with a run and a take-off similar to. but more relaxed than, the run which begins a broad jump. At the take-off board the hop is made on one foot and is kept low in order to reduce landing shock. The step is a second leap which lands on the opposite foot and is followed immediately by a full broad jump with the jumper landing on both feet.

Training. — Because jumping strains leg muscles and may tear tendons if the proper technique is not followed, training for jumping events, in large part, consists of jogging, doing calisthenics in order to loosen and tone muscles and concentration on jumping style. Actual jumping for distance or height is kept to a minimum and, under normal circumstances, is attempted no oftener than once a week and never immediately preceding a meet.

For Olympic jumping records *see* OLYMPIC GAMES.

See also TRACK AND FIELD SPORTS.

(H. AR. RN.; D. SR.; E. W. CL.)

JUMPING BEAN, MEXICAN. The popular name of the seeds of certain Mexican shrubs, notably of the genus *Sebastiania.* A small moth. the *Carpocapsa saltitans,* infests the plant, and the movements of its larvae, spinning cocoons within the seeds. give them the familiar jumping movement.

JUMPING HARE, a large leaping South and East African rodent. *Pedetes caffer,* typifying a family by itself, the Pedetidae. The colour of the creature is bright rufous fawn; the eyes are large; and the bristles around the muzzle long. The front limbs are short, the hind ones very long; and although the forefeet have five toes, those of the hind feet have four. The bones of the lower part of the hind leg (tibia and fibula) are united for a great part

of their length.

The jumping hare is found in open or mountainous districts. It is nocturnal, and dwells in composite burrows excavated and tenanted by several families. When feeding it progresses on all four legs, but if frightened takes gigantic leaps on the hind pair alone; the length of such leaps irequently reaches 20 ft. The young generally number three or four and are horn in the summer. It is represented by fossils in the African Lower Miocene. (See RODENTIA.) (J. E. HL.)

JUMPING MOUSE, a small mouselike rodent of subfamily Zapodinae, related to the jerboas (see RODENTIA). They are found in North America and China and are distinguished by their hind limbs and tail, wide iniraorbital foramen in the skull, grooved incisor teeth and usually four cheek-teeth in each jaw. These rodents inhabit grassy meadows and forests, but only rarely are they numerous. When disturbed they start off with great bounds, 8 to 10 ft. in length, which soon diminish. The nest of grass and leaves is built underground or in a clump of shrubs a few inches above the ground. Jumping mice hibernate in the autumn. There may be three litters of three to six young in a season. *Zapus hudsonicus,* the meadow jumping mouse, is found irom Hudson bay to the mountains of North Carolina. west to Kansas. Its rather coarse pelage is yellowish brown with a dark dorsal band. *Napaeozapus* has one less cheek-tooth in each jaw and a white-tipped tail. (J. E. HL.)

JUMPING SHREW, a name for the terrestrial Insectivora (*q.v.*) of the African family Macroscelididae, of which there are a number of species ranging over the African continent, representing the tree shrews of Asia. They are small long-snouted animals, mainly nocturnal, feeding on insects, and with very long metatarsals as an adaptation to their jumping habits. In some the muzzle is much prolonged, whence the name elephant shrews is sometimes applied to the family.

JUNAGADH, a municipality and taluka (subdivision) in Sorath district, Bombay, India. The town (pop., 1951, 62,730) is 57 mi. S.S.W. of Rajkot. JUNAGADH TALUKA (182 sq.mi.) had a population in 1951 of 121,079. The former princely state of that name was much larger than the present subdivision; area 3.33; sq.mi.; pop. (1941) 670.719, about 80% Hindu. It included the ancient Somnath (*q.v.*) and the forest of Gir. the only place in India where lions survive. The ruler (nawab) of Junagadh first entered into engagements with the British in 1807. On Aug. 18. 1947, the Moslem nawab and his government acceded to the new dominion of Pakistan. During Nov. 1–9, however, Indian troops occupied the state, on the grounds that its authorities were oppressing one of its tributaries, Babariawad, that had acceded to India. In a plebiscite held under Indian supervision only 99 votes out of more than 200,000 were cast in favour of accession to Pakistan.

JUNCACEAE (rush family), a family of flowering plants generally considered as belonging to the order Liliales of the class Monocotyledones, containing about 350 species, widely distributed in temperate and cold regions. The family is represented in North America and Europe by two out of the eight genera which comprise the whole family—*Juncus,* rush, and *Luzula,* wood rush. They are generally low, perennial herbs, often in wet or damp habitats, with slender leaves which are grasslike or cylindrical or reduced to membranous sheaths. The small inconspicuous and usually greenish-coloured flowers aye generally more or less crowded in terminal or lateral clusters. the form of the cluster varying widely according to the manner of branching and the length of the individual flower stalks. The flowers are bisexual and regular. with the same number and arrangement of parts as the lily family. from which they differ in the inconspicuous membranous character of the petals and sepals, the absence of honey or fragrance, and the brushlike stigmas—adaptations to wind-pollination as contrasted with insect-pollination. which characterizes the Liliaceae. The Juncaceae are, in fact, a less elaborated group of the same order as the Liliaceae. by many authors considered to be a derivative and reduced form of that much more diversified family. Of little economic importance, a few species are used for weaving chair seats. mats or hats. (FK. J. H.)



GREAT HAIRY WOOD RUSH

JUNCO, a genus of small American finches (Fringillidae), found from the Arctic circle to Guatemala and Costa Rica. They are plain coloured. with ashy gray head and back, usually without streaks (back in some species rufescent or head black), plain grayish below, belly white conspicuous white outer tail feathers, two narrow white wing bars and usually a pink bill. They breed to the north or in mountainous regions. The commonest is the slate-coloured junco or snonbird (J. hyemalis) of Alaska. Canada and the Alleghenies to northern Georgia. The western junco (J. oregnnus). darker head and breast and browner back, lives in the Rockies and coast ranges; the paler white-winged juneo (J. *aikeni*) in the Black hills and nearby Wyoming and Nebraska; the gray-headed junco (J. *caniceps*), with bright reddish back, from Wyoming and Nevada to northern New Mexico and Arizona; other species range from the mountains of southern Arizona southward. (G. F. Ss.)

JUNE, the sixth month in the modern calendar, consisting of 30 days. Ovid makes Juno assert that the name was expressly given in her honour, but also derives it from *iuniores,* as May had derived from *maiores,* which may be explained by the two months being dedicated respectively to youth and age. Others connect the term with the gentile name Junius, or with the consulate of Junius Brutus. In the old Latin calendar June was the fourth month, and is said to have had 30 days; but at the time of the Julian reform of the calendar its days were only 29. To these Caesar added the 30th day. The Anglo-Saxons called June "the dry month," "midsummer month." and, in contradistinction to July, "the earlier mild month." The summer solstice (see SOLSTICE) occurs in June.

JUNEAU, the capital city of Alaska, U.S., since 1906, is on the mainland of Gastineau channel. 873 nautical miles from Seattle. Wash.. and sheltered from the Pacific ocean by a 75-mi.-wide belt of islands. Much of the city is built on the delta of Gold creek. with the precipitous 3,756-ft. Mt. Juneau forming a spectacular backdrop. Discovery of placer gold in 1880 caused a small stampede In 1882 a stamp mill was erected for crushing gold-bearing quartz. Flooding of the great Treadwell mine in 1917 terminated its activities. The Alaska-Juneau mine, world-famous for methods of handling low-grade ore, continued operations until 1944.

In 6j years over $150 000,000 in gold was produced in the

Juneau area.

In the late 1950s combined payrolls of more than 50 federal and territorial agencies, and two local governments constituted the city's chief economic mainstay. The attainment of statehood in 1959 produced no sharp readjustment. Over 1,000 commercial fishing boats operated in the area, supplying salmon to a cold-storage plant and several canneries. In 1953 a Sitka spruce plywood mill was opened, with two other mills producing lumber.

Juneau airport has interstate, local and charter air service. Increasing air travel has reduced passenger steamer service to summer cruise ships. Ferry service connects local roads with the Alaska highway via the Haines cutoff.

The area contains nickel-bearing ores and rich deposits of asbestos, limestone and marble. Water power sites in the immediate vicinity are capable of producing 125,000 h.p., while a project for diverting Yukon river waters to Lynn canal would produce 5,000.000 h.p. The climate is rainy and temperate. Annual rainfall averages about 90 in., although the airport receives 30% less. The January mean temperature is 29.5" F.; the July mean, 56° F. Winter snowfall seldom accumulates much over a foot in depth. The port is ice-free.

For comparative population figures *see* table in ALASKA: *Population.* (J. E. CL.)

JUNEBERRY, the name given in North America to several species of shrubs and small trees of the genus *Amelanchier,* which produce sweet edible fruits; called also serviceberry, sugarberry and shadbush. Botanically the genus belongs to the rose family (Rosaceae) and is closely allied to the apple. The dwarf Juneberry (A. *alnifolia pumila*), found from western Ontario to British Columbia and south to Michigan, New Mexico and California, is a small shrub. sometimes 10 ft. high, bearing thick roundish leaves, coarsely toothed around the blunt outer end, and white floners in terminal clusters which appear very early in the spring. The dark purple, sweet fruit, about one-third inch in diameter, was extensively eaten, both fresh and dried. by explorers and trappers in pioneer days and also by the Indians. A few choice varieties with larger fruits are in cultivation.



ROCHE

JUNEBERRY (AMELANCHIER)

Among closely related species in the eastern United States and Canada are the downy-leaved serviceberry or shadbush (A. *canadensis),* a tree 30 to 40 ft. high. with the leaves white-woolly when young and rather dry tasteless fruit, and the smooth-leaved serviceberry or Juneberry *(A. laevis),* a similar tree. with the foliage purplish bronze or light green when young. and the fruit dark purple, sweet and juicy. They are planted as ornamentals.

JUNG, CARL GUSTAV (1875–1961), Swiss psychologist and psychiatrist, founder of analytic psychology, was born on July 26, 1875. at Basel, the son of a philologist and clergyman. He studied medicine at the University of Basel and continued his psychological studies in Paris under Pierre Janet (*q.v.*). At the University of Zurich he was physician in the psychiatric clinic (1900–09) and lecturer in psychiatry (1905–13).

In 1907 Jung met and thereafter became the foremost disciple of Sigmund Freud (*q.v.*). The association ended in 1912 when Jung set forth his own theory of the libido and the unconscious, resulting in his resignation from the International Psychoanalytic society and his founding a new school with A. Maeder in Zurich. Later he was professor of psychology at the Federal Polytechnical university in Ziirich (1933–41) and professor of medical psychology at the University of Basel (1943). He died at Kiisnacht. Zurich, on June 6, 1961.

The main points in Jung's system, which he termed analytical psychology rather than psychoanalysis, were: (1) His classification of man into introverted and extraverted types, further distinctions resting on the idea that in each person one or more of four primary functions of the mind (*i.e.,* thinking, feeling, sensation and intuition) predominate. (2) His rejection of Freud's theory of the sexual etiology of the psychoneuroses; here, Jung laid stress on analyzing man's immediate conflicts as being more useful in understanding the neuroses than the uncovering of the conflicts of childhood. (3) His emphasis on the will to live rather than the sexual drive, in defining the libido. He drew attention to the possibilities of co-operation between the conscious and the unconscious, the latter being for him that part of the mind which includes both the personal factor (the individual unconscious) and the disposition inherited from ancestors (the collective unconscious).

Jung's works in English translation include: *Psychology of Dementia Praecox* (1909), *The Theory of Psychoanalysis* (1912), *Psychology of the Unconscious* (1916). *Collected Papers on Analytical Psychology* (1916), *Studies in Word Association* (1918), *Psychological Types* (1923), *Contributions to Analytical Psychology* (1928), ***Two*** *Essays on Analytical Psychology* (1928), *The Secret of the Golden Flower,* with Richard Wilhelm (1930), *Modern Man in Search of a Soul* (1933), *Psychology and Religion* (1938). *Integration of the Personality* (1939), *Essays on Contemporary Events* (1947) and *Essays on a Science of Mythology,* with C. Kerenyi (1949).

See Jolan Jacobi, ***Psychology*** of C. *G. Jung* (1942); Edward Glover, *Freud or Jung* (1950).

JUNG, JOHANN HEINRICH (pseudonym HEINRICH STILLING) (1740–1817), German writer, best known for his autobiography, which gives a vivid picture of patriarchal life in an 18th-century pietistic family. He was born at Grund, near Hilchenbach. Westphalia, Sept. 12, 1740. After a time as tailor and teacher like his father, he began to study medicine at Strasbourg where he met Goethe. Goethe was much impressed by him *(see* his *Dichtung und Wahrheit)* and it was he who had published *Heinrich Stillings Jugend* (1777) the first and best part of Jung's autobiography (collected as *Heinrich Stillings Leben, j* vol., 1806). This autobiography, with its gentle piety and astonishing simplicity, came to have a remarkably wide influence, as part of the pietistic tide, with its stress on feeling. as opposed to the rationalism of the Enlightenment. In 1772 Jung-Stilling (as he is usually called) settled at Elberfeld as physician and made a name by successful operations for cataract. In 1778 he began to lecture on economics and allied subjects, first in the Kameralschule at Kaiserslautern (moved to Heidelberg in 1784) and in 1787 at Marburg. It is indicative of his growing fame that in 1803 the electoral prince of Baden granted him a pension so that he could live by writing. In 1806 he settled in Karlsruhe, where he died, April 2. 1817. He was married three times and had a large family. Besides his autobiography and economic textbooks, Jung-Stilling wrote mystical-pietistic works and novels, the best-known of them being *Das Heimweh,* an allegorical novel which was translated into many languages.

A complete 14-volume edition of his works was published in 1835–38. His letters were published in 1905 and a second edition in 1924.

See the life *by* F. W. Bodemann (1868); G. Stecher, *Jung-Stilling als Schriftsteller* (1913); *H.* R. G. Gunther, *Jung-Stilling, Ein Beitrag zur Psychologie des deutschen Pietismus,* 2nd ed. (1948); M. Sporlin, *Jung-Stilling, Wanderer an Gottes Hand* (1950). (M. KL.)

JUNG BAHADUR, SIR, MAHARAJA (1816–1877), prime minister of Nepal, was a grandnephew of Bhimsena Thapa, the famous military minister of Nepal, who from 1804 to 1839 was *de facto* ruler of the state under the rani Tripuri and her successor. Bhimsena's supremacy was threatened by the Kala Pandry, and many of his relations, including Jung Bahadur, went into exile in 1838, thus escaping Bhimsena's fate. The Pandry leaders were in turn assassinated in 1843, and Matabar Singh, uncle of Jung Bahadur, was created prime minister. He appointed his nephew general and chief judge, but shortly afterward he was himself put to death. Fateh Jung thereon formed a ministry, of which Jung Bahadur was made military member. In the following year, 1846, Fateh Jung and 32 other chiefs were assassinated,

and the rani appointed Jung Bahadur sole minister. The rani quickly changed her mind, and planned the death of her new minister, who at once appealed to the maharaja. But the plot failed.

The raja and the rani wisely sought safety in India, and Jung Bahadur firmly established his own position by the removal of all dangerous rivals. In 1850–51 he was in England. The reform of the penal code, and a desultory war with Tibet, occupied his attention until news of the Indian Mutiny reached Nepal. Jung Bahadur resisted all overtures from the rebels, and sent a column to Gorakpur in July 1857. In December he furnished a force oi 8,000 Gurkhas, which reached Lucknow on March 11, 1858, and took part in the siege. The moral support of the Nepalese was exceedingly valuable. Jung Bahadur was made a knight Grand Cross of the Bath, and a tract of country annexed in 1815 was restored to Nepal. He received a visit from the prince of Wales in 1876. On Feb. 25, 1877, he died.

JUNGFRAU, a well-known Swiss mountain (13,642 ft.), admirably seen from Interlaken. It rises on the frontier between the cantons of Bern and of the Valais, and is in the Bernese Oberland. two peaks of which (the Finsteraarhorn, 14,022 ft., and the Aletschhorn, 13.763 ft.) surpass it in height. It was first ascended in 1811 by the Meyer brothers, by the eastern or Valais side. It was not until 1865 that Sir George Young and the Rev. H. B. George made the first ascent from the west or Interlaken side. In 1927 an ascent was made by two guides on the south side from the Rotta. A railway (built to reach the summit), the highest in Europe, was constructed between 1896 and 1912 to the Jungfraujoch (11,401 ft.) from Scheidegg. The line passes by a tunnel (4.4 mi. long) through the Eiger and Mönch to the Jungfrau. A hotel was built in 1925 near the upper terminus of the railway.

JUNGLE, an Anglo-Indian term for a forest, a tangled wilderness. The Hindustani word *jangal* means "waste;" "uncultivated ground," which tends to become covered with trees or long grass.

JUNGLE FOWL, the name usually applied to wild members of the genus *Gallus,* from which domestic fowls are derived. The four species are described in detail under FOWL.

JUNGLE WARFARE, a phrase which came into general use during World War II after the successful incursion of the Japanese army into Malaya in 1941 and 1942. Previously, the only campaign fought in close forest country during modern times had been that of the German Gen. Paul von Lettow-Vorbeck against the British in east Africa during World War I. No major power hut the Japanese had studied such warfare at all, except academically, although the United States army carried out some jungle training in Panamá from 1939.

The Japanese successes in Malaya and Burma showed that the penetration of jungle by troops who were lightly armed and equipped and prepared to live hard was not difficult, and was highly effective against troops depending on ordinary means of supply. The Japanese technique was based on the encirclement of the enemy's positions and the establishment of roadblocks behind them. The defenders were then obliged to concentrate either on clearing the blocks or on fighting their way back to new positions. Only by intelligent anticipation of where the road might be cut could the defense forestall such attacks; but the force with the initiative, not dependent on roads. could always and quickly find some alternative point. The defense of long lines of communication running through jungle would have demanded the use of an astronomical number of men in a wholly unprofitable role.

All this remained true of jungle warfare until the British commander. Maj. Gen. Orde C. Wingate, on his first Burma expedition in 1943, demonstrated the possibilities of substituting air supply for road supply. From then on. land communications lost their importance; supply could be interrupted only by the destruction of air bases or the denial of air routes for transport aircraft. Air superiority thus became as important to jungle warfare as to every other form of ground operation; and the Japanese had already lost it.

Whatever the means of supply, jungle warfare calls for highly specialized techniques and exacts a higher standard of training and leadership at the lowest levels than any other form of fighting. The individual soldier must be tougher, stealthier and more continually alert than his counterpart elsewhere. His encounter with the enemy will be sudden and may be fleeting. He must develop the knowledge and instincts of a native tracker. His equipment must be light and simple, so that he can move without noise or fatigue. He must be able to travel and fight for days without resupply. He is responsible for the maintenance of his own health in conditions where especial assaults will be made upon it.

The difficulties of gaining and disseminating intelligence and of exercising control are greater than usual, and exact a high standard of signals. Unfortunately, the performance of most radio equipment in thick country falls considerably short of its performance elsewhere.

Supply and intelligence are: in fact, the two basic needs of a force engaged in jungle warfare. Provided these can be met, numerical inferiority is not a fatal disability; indeed it is in some ways an advantage. After World War II terrorists in Malaya and Kenya demonstrated against the British what Wingate had shown in 1943–44—that a comparatively small force, lightly equipped, but with these two essential endowments, can elude and occupy the attention of forces many times larger and disposing of all modern means of war. This is especially so when the smaller force enjoys the support of the indigenous population.

On the minor tactics to be pursued in jungle operations, there are several schools of thought. The U.S. forces in the Pacific and the Australians in New Guinea followed methods quite different from those used in the recapture of Burma. For instance, in New Guinea all movement outside a night bivouac was regarded as hostile; in Burma: night bivouacs were regarded as bases from which to make sorties. In Burma, Wingate's tactical teaching differed widely from that of Field Marshal Sir William J. Slim. Wingate trained his troops to move always in single file, as being the least vulnerable formation; to break up into "dispersal groups" if outnumbered, meeting again always at a rendezvous (known to platoon commanders) beyond the enemy positions; and to eschew indiscriminate shooting or retaliatory fire. His principal maxims were: "The answer to noise is silence" and "When in doubt, don't shoot." But Slim employed strategically a device Wingate used tactically: setting up an objective which the enemy must attack, and surrounding the approaches to it with ambushes and other hazards. Thus the classic defeat of the Japanese on the Imphal front in 1944 came about by allowing the Japanese to overreach themselves, by starving them out and by cutting off their retreat. Much the same tactics had been employed during the preceding two years by the Japanese in Arakan, where they held Akyab (which the British felt bound to attack) and commanded every possible approach to it. Every attempt made to capture it was cut into from the landward flank and ended in ignominious withdrawal.

Wingate introduced one other revolutionary element into jungle warfare—an especially intimate offensive air support. It was provided by U.S. bombers and fighters. which were "talked" on to their targets by the troops on the ground, under whose command thty belonged. Hitherto, because of the difficulty of identifying targets, it had been deemed impossible to provide air strikes within 1,200 yd. of troops on the ground.

In the extreme north of Burma the quality of Gen. Joseph W. Stilwell's Chinese troops was not such as to enable him, with his small corps of U.S. liaison officers, to develop new techniques, although he was able to use Maj. Gen. Frank D. Merrill's force effectively in a deep penetration role in the operations which resulted in the capture of Myitkyina.

The accepted principles of war are fully applicable to jungle warfare; only the emphasis varies. Any linear conception of warfare is inapplicable; so are long-range weapons other than the air arm. All fighting is at short range and in conditions of extremely short visibility. It is impossible to bring an unwilling enemy to battle, except by denying him supplies and forcing him to fight for them. It follows that the selection of objectives becomes of greater importance than ever.

See Bernard Fergusson, *The Wild Green Earth (1946)*; Sir William J. Slim, *Defeat* Into Victory (1956); O Charlton, *The Marauders* (1956).

(BD. F.)

JUNÍN, a department in the highlands of central Peru, bounded on the north by Pasco, east by Cuzco, south by Ayacucho and Huancavelica, and west by Lima. Area, 12,492 sq.mi. Pop. (1958 est.) 529,199, plus an estimated 20.000 Indians not counted by the census. The departmental capital is Huancayo (pop. [1958 est.] 28,679); the area of concentrated settlement lies around it and extends northwest to the towns of Jauja and La Oroya. On the eastern slopes around Tarma and around Satipo are zones of pioneer farm settlement that were first developed early in the 20th century, but which continue to suffer from difficult accessibility to markets. The department also includes a thinly settled part of the eastern plains. Its higher part is drained by the headwaters of the Rio Mantaro and the Rio Perené.

Most of the people in Junin make their living from farming and herding. In the higher areas above the upper limit of crops the land is used for the grazing of cattle, sheep and alpaca. The high basins (between 10,000 and 14,000 ft.) are used for wheat, barley and potatoes. Lower on the eastern Andean slopes the crops include coffee, cacao, sugar cane: coca and rice. However, the high cost of transportation limits commercial products to those of high value per unit of weight, such as *aguardiente* or sugar brandy. Mines and smelters produce more income than agriculture even though they employ fewer workers. Copper comes from Morococha, cadmium from Cercapuquio. Copper from Cerro de Pasco is refined at La Oroya. The area is connected with Lima by rail and highway. (P. E. J.)

JUNIOR ACHIEVEMENT is an educational organization of the United States and Canada which offers young people of high school age the opportunity to gain business experience by organizing and operating their own small businesses under the guidance of volunteer advisers from business and industry. The Junior Achievement program was founded by Horace A. Moses of Springfield, Mass., and incorporated in 1926. Its major growth occurred after World War II. In the early 1960s the program operated in more than 250 cities throughout the United States and Canada.

The Junior Achievement company is the basic unit. The boys and girls are its board of directors, labour force and sales staff. In the autumn the youngsters elect a president and other officers, decide on the product the company will make and sell and determine the amount of working capital the firm will need to begin production. They sell capital stock (at 50 cents a share) to parents, friends, teachers and others. No one person can own more than five shares, and every member of the J.A. company must own at least one. Average capitalization is about $100.

When the company has raised its capital, a bank account is opened and raw materials are purchased. The company applies for its J.A. charter, pays rent (usually $3 a month) and buys the small tools it needs. Shop machinery is leased from the Junior Achievement organization by a deposit of capital proportionate to the value of the machinery used.

The company makes its products and sells them. The young businessmen and women decide on the wages they will pay themselves and determine the amount of commissions on sales. Complete books are kept. Average gross sales of a J.A. company are $300. In the spring the companies go out of business. Inventory is sold. all debts are paid, and if the company has been profitable (most of them are) the stockholders receive their investment back along with a liquidation dividend.

Each Junior Achievement company is guided by three adult advisers, and average company membership is 15. The program maintains its national headquarters in New York city. (J. F. L.)

JUNIOR LEAGUES OF AMERICA, THE ASSOCIATION OF THE, is an organization of Junior leagues dedicated to the purpose of the "continued education of the members for intelligent citizen participation in shaping social programs, and participation of the League in activities adapted to community needs."

The nucleus of the association was the Junior League of the City of New York, organized in 1901. The first general conference was held in 1912 with seven existing leagues in attendance. In 1921 the 31 leagues then existing were organized into the present association. The leagues engage in training volunteers for community service in welfare, children's theatre and civic arts programs. Association headquarters were established at the Waldorf-Astoria, New York city. A professional staff was organized to give advice on techniques in the fields of activity. Lecture courses for provisional members and institutes training members for specific work, conducted by the association's field representatives, were also established.

The majority of leagues maintain some type of welfare work. Such projects may be financed by the leagues, or by the community chest and administered by the leagues.

JUNIPER. The junipers, of which there are about 40 species, are aromatic, evergreen bushy shrubs or low columnar trees of the cypress family (Cupressaceae). They occur widespread throughout the cooler regions of the northern hemisphere but attain their maximum development in the Mediterranean region, the North Atlantic islands and the eastern United States. The leaves are usually articulated at the base, spreading, sharp-pointed and needlelike in form, destitute of oil glands and arranged in pairs or in whorls of three. In some forms, however, the leaves are minute and scalelike, closely adhering to the branches, the apex only being free, and furnished with an oil gland on the back. Sometimes the same plant produces both kinds of leaves on different branches, or the young plants produce acicular leaves, while those of the older plants are scalelike. The staminate and carpellate cones are usually produced on separate plants. The mature cone is fleshy, with the succulent scales fused together to form a berrylike structure. The berries are red or purple in colour, varying in size from one-fifth to one-half inch in diameter. They thus differ considerably from the cones of other conifers. The seeds are usually three in number, sometimes as few as one, rarely more than eight, and are marked with large glands containing oil. The genus occurs in a fossil state, four species having been described from Tertiary rocks.

The savin, *Juniperus sabina,* abundant on the mountains of central Europe, is an irregularly spreading much-branched shrub with scalelike glandular leaves and emitting a disagreeable odour when bruised. The plant is poisonous, acting as a powerful local and general stimulant. It was formerly used to stimulate menstruation, to produce sweating and to expel worms.

The Bermuda red cedar, J. *bermudiana,* a tree about 49 or 50 ft. in height, yields a fragrant red wood, which was used for the manufacture of cedar pencils. The tree is still abundant in Bermuda, but the eastern red cedar, *J. virginiana,* of North America is employed instead for pencils and is also used for clothes chests, interior finish, fence posts and telegraph poles. The eastern red cedar, which is native to dry soil from Nova Scotia to North Dakota and south to Georgia and Texas, sometimes attains a height of 100 ft. and a trunk diameter of 3 ft., though usually it is much smaller. The galls produced at the ends of the branches have been used in medicine, and the wood yields cedar camphor and oil of cedarwood. *J. thurifera* is the incense juniper of Spain and Portugal, and *J. phoenicea* from the Mediterranean district also has been burned as incense.

The common juniper, *J. communis,* is a very widely distributed circumpolar plant, occurring in the whole of northern Europe, central and northern Asia to Kamchatka, and east and west North America. It grows at considerable elevations in southern Europe, in the Alps, Apennines, Pyrenees and Sierra Nevada (4,000–8,000 ft.). It also grows in Asia Minor, Iran, and at great elevations on the Himalayas.

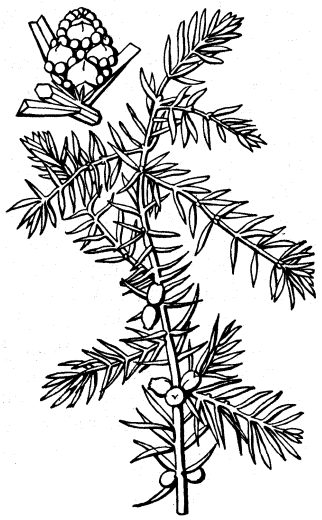
In Great Britain it is usually a shrub with spreading branches, less frequently a low tree.

The *United States Pharmacopoeia* includes oil of juniper as a drug to produce urination. The common juniper is official in the *British Pharmacopoeia.* The wood is very aromatic and is used for ornamental purposes. In Lapland the bark is made into ropes. The fruits are used for flavouring gin (a name derived from *juniper,* through Fr. *genikvre*). *J. oxycedrus,* from the Mediterranean district and Madeira, yields cedar-oil which is official in most of the European pharmacopoeias. This oil is used largely

in microscopical work for "clearing" sections, etc.

Juniperus drupacea of Asia Minor has large and edible fruits; they are known in the east by the name *Izabhel.*

In North America about 15 native species of juniper occur, inclusive of the eastern red cedar and the common juniper. Among these are the Rocky Mountain juniper *(J. scopulorum)*, which extends from the central Rocky mountains northwestward to British Columbia; the California juniper *(J. californica)*, with reddish fruit, eaten by the Indians; the Mexican juniper *(J. mexicana)* of Texas and Mexico. with brown wood; the Sierra juniper *(J. occidentalis)* of the Pacific states; the alligator juniper *(J. pachyphloea)* of the southern Rockies, with a distinctly checkered trunk; the creeping juniper *(J. horizontalis)*, found from Nova Scotia to British Columbia, with prostrate branches; and the rare drooping juniper *(J. flaccida)* of the Mexican border, with weeping branches.



BY COURTESY OF THE ROYAL BOTANIC GARDENS
JUNIPER (JUNIPERUS COMMUNIS). STAMINATE CONE SHOWN IN UPPER LEFT CORNER

Many junipers are extensively grown as ornamentals, especially varieties of the savin, the common juniper and the eastern red cedar. (E. S. HR.)

JUNÍPERO, FATHER: *see* SERRA, JUNÍPERO.

JUNIUS, the pseudonym of a writer who contributed a series of letters to the London *Public Advertiser*, from Jan. 21, 1769, to Jan. 21, 1772. The signature had been already used by him in a letter of Nov. 21, 1768, which he did not include in his collection of the *Letters of Junius* published in 1772. The name was chosen in all probability because he had already signed "Lucius" and "Brutus," and wished to exhaust the name of Lucius Junius Brutus the Roman patriot. Whoever the writer was, he wrote under other pseudonyms before, during and after the period between Jan. 1769 and Jan. 1772. He acknowledged that he had written as "Philo-Junius," and there is evidence that he was identical with "Veteran," "Nemesis" and other anonymous correspondents of the Public *Advertiser.*

There is a marked distinction between the "letters of Junius" and his so-called miscellaneous letters. The second deal with a variety of subjects, some of a purely personal character, as for instance the alleged injustice of Viscount Barrington, the secretary at war, to the officials of his department. But the "letters of Junius" had a definite object—to discredit the ministry of the duke of Grafton. This administration had been formed in Oct. 1768, when the earl of Chatham was compelled by ill health to retire from office, and was a reconstruction of his cabinet of July 1766. Junius fought for the return to power of Chatham, who had recovered and was not on good terms with his successors. He communicated with Chatham, with George Grenville, with Wilkes, all enemies of the duke of Grafton, and also with Henry Sampson Woodfall, printer and part owner of the *Public Advertiser.* This private correspondence has been preserved. It is written in the disguised hand used by Junius.

The letters are of interest on three grounds—their political significance, their style, and the mystery which long surrounded their authorship. As political writings they possess no intrinsic value. Their matter is always invective. Junius began by a general attack on the ministry for their personal immorality or meanness. He then went on to pour acrimonious abuse on Grafton, on the duke of Bedford, on King George III himself in the letter of Dec. 19, 1769, and ended with a most malignant and ignorant assault on Lord Chief Justice Mansfield. The practical effect of the letters was insignificant. They provoked anger and retorts. But the letter to the king aroused indignation, and though Grafton's administration fell in Jan. 1770, it was succeeded by the long-lived cabinet of Lord North. Junius confessed himself beaten, in his private letter to Woodfall of Jan. 19, 1773. He had materially contributed to his own defeat by his brutal violence. He sinned indeed in a large company. The employment of personal abuse had been habitual in English political controversy for generations.

If, however, Junius was doing what others did, he did it better than anybody else—a fact which sufficiently explains his rapid popularity. His superiority lay in his style. At his best Junius attains to a high degree of artificial elegance and vigour. He shows the influence of Bolingbroke, of Swift and above all of Tacitus, who appears to have been his favourite author. The imitation is never slavish. Junius adapts, and does not only repeat. The white heat of his malignity animates the whole.

The pre-established harmony between Junius and his readers accounts for the rapidity of his success, and for the importance attributed to him by Burke and Johnson, far better writers than himself. Before 1772 there appeared at least 12 unauthorized republications of his letters, made by speculative printers. In that year he revised the collection named *"Junius: Stat nominis umbra,"* with a dedication to the English people and a preface. Other independent editions followed in quick succession. Junius himself had been early aware of the advantage he secured by concealment. "The mystery of Junius increases his importance" is his confession in a letter to Wilkes dated Sept. 18, 1771. The calculation was a sound one. For two generations after the appearance of the letter of Jan. 21, 1769, speculations as to the authorship of Junius were rife, and discussion had hardly ceased in 1929. Joseph Parkes, author with Herman Merivale of the *Memoirs of Sir Philip Francis* (1867), gives a list of more than 40 persons who had been supposed to be Junius.

The more plausible of these claims, such as those made for Lord Temple and Lord George Sackville, could not stand the test of examination. Indeed after 1816 the question was not so much "Who wrote Junius?" as "Was Junius Sir Philip Francis, or some undiscoverable man?" In that year John Taylor was led by a careful study of Woodfall's edition of 1812 to publish *The identity of Junius with a distinguished living character established,* in which he claimed the letters for Sir Philip Francis. He had at first been inclined to attribute them to Sir Philip's father, Dr. Francis, the author of translations of Horace and Demosthenes. Taylor applied to Sir Philip, who did not die till 1818, for leave to publish, and received from him answers which to an unwary person might appear to constitute denials of the authorship, but were in fact evasions.

The reasons for believing that Sir Philip Francis (*q.v.*) was Junius are very strong. His evasions were only to be expected. Several of the men he attacked lived nearly as long as himself, the sons of others were conspicuous in society, and King George III survived him. Sir Philip, who had held office, who had been decorated, and who in his later years was ambitious to obtain the governor-generalship of India, dared not confess that he was Junius. The similarity of his handwriting to the disguised hand used by the writer of the letters is very close. If Sir Philip Francis did, as his family maintain, address a copy of verses to a Miss Giles in the handwriting of Junius (and the evidence that he did is weighty) there can be little further question as to the identity of the two. The similarity of Junius and Francis in regard to their opinions, their likes and dislikes, their knowledge and their known movements, amount, apart from the handwriting, almost to proof. It is certain that many felons have been condemned on circumstantial evidence less complete.

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More about Junius, Franciscan Theory Unsound (1868), and C. W. Everett, *The Letters of Junius* (1927), in which a claim is put in for Lord Shelburne. (D. H.; X.)

JUNIUS, FRANCISCUS (FRANÇOIS DU JON) (1589–1677), who prepared the first edition of the Gothic Codex of Ulfilas. was born at Heidelberg, Ger., and brought up at Leiden. In 1617 he became pastor at Hillegondsberg, but in 1620 went to England, where he became librarian to Thomas Howard, earl of Arundel, and tutor to his son. He remained in England 30 years, devoting himself to the study of Anglo-Saxon and afterward of the cognate old Teutonic languages. In 1651 he returned to Holland and for two years lived in Friesland in order to study the old dialect. In 1675 he returned to England and died in the house of his nephew, Isaac Vossius, on Nov. 19, 1677. He was buried at Windsor in St. George's chapel.

JUNKER, (JOHANN) WILHELM (1840–1892), Russian explorer of the Nile-Congo watershed, was born in Moscow of German parents on April 6, 1840. Early abandoning a medical career, he made brief journeys to Iceland (1869) and Tunis (1873–74). In 1875 he went to Egypt and thence to the Sudan, where he explored the lower reaches of the Sobat river and the western tributaries of the White Nile in 1876–78.

In 1879 he returned to the Sudan where, during four years in the equatorial regions, part of the time with Emin Pasha (*q.v.*), he made valuable ethnographical observations in the Azande country and established the identity of the Ueli and Ubangi rivers. Prevented by the Mahdist rising from returning to Europe through the Sudan, Junker left the Albert Nile in Jan. 1886, carrying with him Emin's journals, and reached Zanzibar via Tabora in Dec. 1886. He died at St. Petersburg (Leningrad) on Feb. 13, 1892.

Junker wrote *Reisen in Afrika, 1875–86* (1889–91), English translation by A. H. Keane, Travels in *Africa* (1890–92). (R. L. HL.)

JUNO, the chief Roman and Latin goddess, closely resembling the Greek Hera (*q.v.*) with whom she is universally identified. Her origin, however, is unclear. Some authorities derive her name from the root of *iuvenis,* meaning "marriageable young woman," and others see in her name the same root as that of Jupiter (*q.v.*), of whom she is the female counterpart. Both these aspects are clear in the later development of her worship. She is closely connected with all aspects of the life of women and most particularly the sexual. In her role as female comforter she assumes various epithets: as Pronuba she is bridal attendant; as Interduca she brings the bride to her new home; as Cinxia she is the spirit of the bride's girdle; as Opigena she brings aid to the woman in labour; as Lucina (*q.v.*) she brings the child to light. etc. Individualized. she becomes a female guardian angel: as every man had his genius so every woman had her *iuno;* thus she represents in a sense the female principle of life. Her close connection with women led to associations with the moon (Juno Covella) and to what is probably an erroneous conjecture in both ancient and modern times that she was originally a moon goddess. Thus she became the deity of the Kalends, or day of the new moon, sacred to her, and she is brought into close relationship with Janus (*q.v.*), who was also worshiped on the Kalends.



ALINARI

STATUE OF JUNO SOSPITA. IN THE VATICAN MUSEUM. ROME

As her cult expanded she assumed wider functions and became, like Hera. the principal female divinity of the state. As Sospita, portrayed as an armed deity, she was invoked all over Latium and particularly at Lanuvium — originally as a saviour of women but eventually as saviour of the state. At Rome under the Etruscan kings she appears as Juno Regina, queen of heaven, as wife of Jupiter, as part of the Capitoline triad with Jupiter and Minerva. Under the same title she was worshiped on the Aventine, traditionally having been established there in 392 by Camillus, who brought her cult statue from Veii after its capture. As Juno Moneta, "the warner," she protected the interests of the Roman state; a story in Plutarch (Camillus 27) records that the cackling of her sacred geese saved the Arx on the occasion of the sack of Rome by the Gauls in 390 B.C. A temple of Juno Moneta, which later housed the Roman mint. was built on the Arx in 344 B.C.

Her significant festivals were the Matronalia on March 1 and the Nonae Caprotinae ("Nones of the Wild Fig") on July 7. In the former, matrons met and made offerings at the temple of Juno Lucina on the Esquiline, a cult traditionally introduced by Titus Tatius; in the latter, which took place under a wild fig tree in the Campus Martius, she was worshiped by female slaves in an old fertility rite involving a mock fight and mutual beating (cf. Lupercalia; *q.v.*).

In art Juno is represented in various guises depending upon the epithet concerned. Most frequently, however, she is represented in a manner similar to the Greek Hera, *i.e.,* a standing matron of statuesque proportions and severe beauty, occasionally exhibiting military characteristics. See also ROMAN RELIGION.

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JUNOT, ANDACHE, DUC D'ABRANTES (1771–1813), French general, was born at Bussy-le-Grand (Côte d'Or), on Oct. 23, 1771. He became secretary to Napoleon during the siege of Toulon, accompanied him to Italy as aide-de-camp, became general of brigade during the expedition to Egypt, and, on his return to France fought a duel on Napoleon's behalf, and was made commandant of Paris. He was promoted general of division, married Laure Permon (see JUNOT, LAURE) and became a considerable figure in society. He received various appointments, because of his early devotion to Napoleon, but his uncertain temperament made it dangerous to employ him at court or headquarters. In 1807 he was given command of the force for the invasion of Portugal. Early in November he set out from Salamanca, crossed the mountains of Beira, rallied his wearied forces at Abrantes. and, with 1,500 men, dashed upon Lisbon, but failed to seize the Portuguese fleet, which had just sailed away with the regent and court to Brazil. The whole movement took only a month; it was undoubtedly bold and well-conducted, and Junot was made duc d'Abrantes and invested with the governorship of Portugal. But administration was his weak point. He was not a civil governor but a *sabreur,* brave. truculent and also dissipated and rapacious. After Wellesley encountered him at Vimiera (see PENINSULAR WAR) he was obliged to conclude the so-called convention of Cintra and to withdraw his forces from Portugal. Junot u-as sent back to Spain, where, acting under Masséna (1810–11) he was once more seriously wounded. His last campaign was made in Russia, and he received more than a just share of discredit for it. Napoleon next appointed him to govern Illyria. But Junot's mind had become deranged under the weight of his misfortunes, and on July 29, 1813. at Montbard, he threw himself from a window in a fit of insanity.

JUNOT, LAURE, DUCHESS OF ABRANTES (1783–1834), wife of Andache Junot. was born at Montpellier. She was the daughter of Mme. Permon, to whom during her widowhood the young Bonaparte made an offer of marriage — such at least is the version presented by the daughter in her celebrated memoirs. The Permon family, after various vicissitudes, settled at Paris, and Bonaparte frequented their house a good deal after the downfall of the Jacobin party in Thermidor 1794. Mlle. Permon was married to Junot early in the consulate. The first consul nicknamed her petite *peste,* but treated her and Junot with the utmost generosity, a fact which did not restrain her sarcasms and slanders in her portrayal of him in her *Memoirs.* Her own and her husband's extravagance threatened her with ruin; this perhaps explains why she took some part in the intrigues for bringing back

the Bourbons in 1814. She did not side with Napoleon during the Hundred Days. After 1815 she lived chiefly in Rome, where she compiled her spirited but somewhat spiteful *Mémoires* (18 vol., Paris, 1831–34).

JUNQUEIRO, ABÍLIO MANUEL GUERRA (1850–1923), Portuguese poet of extraordinary verbal ingenuity, the most outstanding of the realist school in Portuguese poetry, and the poet *par excellence* of the revolution of 1910, was born in Freixo de Espada-à-Cinta, Trás-os-Montes, Sept. 15, 1850, the son of a rich farmer. After early schooling in Oporto he entered Coimbra university to read law (1866), and although at first he attended theology lectures with the intention of entering the priesthood, he graduated in law in 1873. At Coimbra he was one of those responsible for founding the review, A *Folha* (1868), edited by the poet João Penha, which became the organ of the movement that established the Parnassian school of poetry in Portugal. It was through these contacts that Guerra Junqueiro lost his romantic sentimentality and acquired his positivist tendencies, and his verse its marmoreal sonorousness. He had hitherto written verses of an ultra-romantic kind, beginning with the collection *Duas Páginas dos Catorze Anos* (1865). Verses he published in *A Folha,* some of which appeared later in A *Morte de Dom João* (1874), the first collection belonging to his realistic, social reformer period, show a completely new outlook, influenced by Victor Hugo's *Les Châtiments.* Before its publication he was already in Lisbon, where he joined a group led by Antero de Quental, the paladin of a revolutionary poetry that gave rise to the movement known as the *Escola Nova,* or "New School," in which he and Guilherme de Azevedo were the outstanding figures.

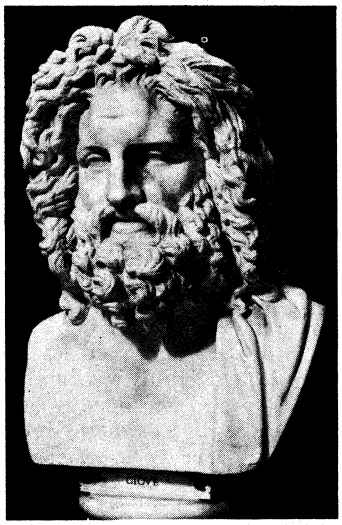
Guerra Junqueiro became secretary-general to the municipality of Angra do Heroismo in the Azores, and later in Viana do Castelo in northern Portugal, where he married, and was elected to parliament; but, disgusted by politicians, he retired to the country, becoming a farmer, but continuing to write. In 1879 he published *A Musa em Ferias,* a collection of poems, followed in 1885 by the anticlerical satire, A *Velhice do Padre Eterno.* In *Os Simples* (1896), a volume influenced by symbolism, his lyrical quality, often overdeclamatory, is at its purest. It was in *Pdtrza,* however that he gave most vigorous expression to his genius for dramatically pointed satire. This poem was inspired by the misfortunes of Portugal, then faced with the British ultimatum of 1890 in connection with its colonial territories in South Africa at a period when political life under the Braganza dynasty was approaching its nadir. Its popularity was immense, and when the republic was established in 1910 Guerra Junqueiro was appointed envoy in Berne. A blend of eloquence and satire gave his verse a popular appeal that made him a hero of the revolution. His genius for words is certainly impressive, and even a poet of the stature of Antero de Quental could regard his *A Morte de Donz João* as "a vibrant echo of the ideas of our age." In his last years he was converted to the Catholicism he had so irreverently attacked, and thus repudiated a part of his work. He died in Lisbon, July 7, 1923.

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JUNTA, a Spanish word originally meaning a meeting (*juntar,* "to join") but also used, and now almost exclusively, in the sense of (1) a committee or (2) an administrative council or board.

The superior governing body of the Inquisition was the *junta suprema* The provincial committees formed to organize resistance to Napoleon's invasion in 1808 were so called. and so was the general committee chosen from among them to represent the nation. In all subsequent civil mars or revolutionary disturbances in Spain or Spanish America, similar bodies, elected or self-chosen, have been known as juntas. The corrupted form "junto" came into use in English in the 17th century. often in a disparaging sense, of a party united for a political purpose, a faction or cabal. It was particularly applied to the advisers of Charles I and to the Whigs who controlled the government in the reign of William III. The name junta is also given to the small group of officials who reorganized British trade unionism after about 1850.

JUPITER (ICPPITER, DIESPITER or IOVIS), the chief Roman and Italian god. The first part of his name (root *diu,* "bright") is etymologically identical with the Greek Zeus (*q.v.*), with whom he is identified. Originally he was a sky-god manifesting himself in numerous ways with various epithets. As Lucetius he was the light-bringer (*cf.* such phrases as *sub Iove,* "under the open sky"); as Jupiter Elicius he was, like Zeus, a rain-god particularly propitiated in time of drought; as Fulgur he was god of the thunderbolt, and all places struck by lightning were revered as sacred areas. The Ides, or days of the full moon, were sacred to him, and as Sky Father he was worshiped at the Vinalia, the festival of the grape harvest (Aug. 19), at which time his priest (*flamen*) cut the first grapes. The Meditrinalia (Oct. 11), when the new wine was first tasted, was probably also sacred to him. As Jupiter Lapis he was *numen* of the *lapides silices,* which were stones, probably Neolithic tools, kept in his temple on the Capitoline (Livy i, 10) and believed to be thunderbolts. They were used in taking oaths, particularly by the *fetiales* (priests of Jupiter Feretrius), who were in charge of the official ceremonies of declaring war or making treaties on behalf of the Roman state; both publicly and privately oaths were taken *per Iovem lapidem.*



ALINARI

SCULPTURED BUST OF JUPITER. IN THE VATICAN MUSEUM, ROME

As Latiaris he is chief god of the Latins worshiped in an ancient shrine on Mt. Alba by the cities of the Latin league, of which Rome was originally an ordinary member. As Rome's position in the league grew, however, its role in the worship on Mt. Alba became more dominant; in historical times the ritual was in charge of the chief Roman magistrate, and the festival itself (the *feriae Latinae,* an annual event of unfixed date) was a religious occasion of the highest importance to the Roman state. The libation was of milk and the principal sacrifice a pure white heifer that had never experienced the yoke.

In Jupiter may undoubtedly be seen not only the great protecting deity of the race, but one, and perhaps the only one, whose worship embodies a distinct moral conception. He is specially concerned with oaths, treaties and leagues, and it was in the presence of his priest that the most ancient and sacred form of marriage *(confarreatio)* took place. The lesser deities, Dius Fidius and Fides (*q.v.*), mere perhaps, originally identical, certainly connected, with him. This connection nith the conscience, with the sense of obligation and right dealing, was never quite lost throughout Roman history. In Virgil's great poem. though Jupiter is in many ways as much Greek as Roman, he is still the great protecting deity who keeps the hero in the path of duty *(pietas)* toward gods, state and family.

The Etruscan kings were responsible for the introduction of the cult of Iuppiter Optimus Maximus (*i.e.,* "the best and greatest of all Jupiters") shortly before the fall of their monarchy. For him they constructed a huge temple on the Capitoline in the Etruscan style, and this became the centre of his worship at Rome. The temple had three cellae for the celebrated Capitoline triad, Jupiter, Juno and Minerva, a purely Etruscan grouping: in Roman cult Jupiter's associates are Mars and Quirinus (*qq.v.*). The dedication festival of the Capitoline temple fell on Sept. 13, on which day the consuls originally succeeded to office, accompanied by the senate and other magistrates and priests. In fulfillment of a vow made by their predecessors, they offered to the great god a white ox, his favourite sacrifice. and, after rendering thanks for the preservation of the state during the past year, made the same

vow as that by which their predecessors had been bound. Then followed the *epulum Iovis* or feast of Jupiter, in which the three deities seem to have been visibly present in the form of their statues, Jupiter having a couch and each goddess a *sella,* and to have shared the meal with senate and magistrates. In later times this day became the central point of the great Roman games (ludi Romani), originally games vowed in honour of the god if he brought a war to a successful issue. When a victorious army returned home the triumphal procession passed to this temple.

Throughout the republic this remained the central Roman cult, and although Augustus' new foundations (Apollo Palatinus and Mars Ultor) were in some sense its rivals, that emperor was far too shrewd to attempt to oust Iuppiter Optimus Maximus from his paramount position; he became the protecting deity of the reigning emperor as representing the state, as he had been the protecting deity of the free republic. His worship spread over the whole empire; a capitol modeled on that of Rome was a feature of numerous important towns (*e.g.,* Ostia), and the fact that the Romans chose the name Jupiter, in almost every case, to indicate the chief deity of the subject peoples, proves that they continued to regard him, so long as his worship existed at all, as the god whom they themselves looked upon as greatest.

See ROMAN RELIGION; ZEUS.

See G. Wissowa, *Religion und Kultus der Romer,* 2nd ed., p. 113 *et seq.* (1912); articles "Iuppiter" in Roscher's *Lexikon* and Pauly-Wissowa, *Real-Encyclopadie der classischen Altertumswissenshaft,* s v.; Platner-Ashby, *Topographical Dictionary,* s.v. (R. B. LD)

JUPITER, in astronomy, the largest of the planets and with the exception of Mars the most interesting of all for telescopic study. It revolves round the sun at a mean distance of about **5.2** times that of the earth, or 483,000,000 mi.; and since its equatorial diameter is about 88,7jo mi. it presents a disk which at opposition attains an apparent diameter of from 44 to 50 seconds of arc. The planet requires **4,333** days (11.86 years) to complete a sidereal revolution; and its synodical period, or the mean interval between successive oppositions, is 399 days. To the naked eye Jupiter shines with a lustre second only to that of Venus among the planets, and under favourable circumstances it is bright enough to cast a shadow. Its albedo is high (viz., 0.51), which means that it reflects 51% of the sunlight falling upon it. Its stellar magnitude at opposition ranges from −2.1 to −2.5. When viewed telescopically the disk of the planet is seen at once to be not circular but considerably flattened at the poles. The amount of this flattening was determined by micrometrical measurements and theoretically, by H. Struve. from the perturbations of the satellites by the equatorial protuberance of the planet. The probable value is not far from $\frac{1}{15.4}$. The mass of the planet, taking that of the earth as the unit, is nearly 320, and since its volume is more than 1,300 times that of the earth its mean density is rather less than one quarter as great, or only 1.3 times that of water.

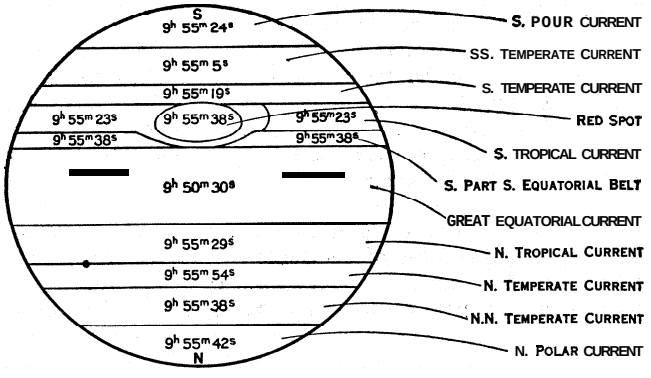
Surface Features: Belts and Zones.—A quite small telescope shows that the disk of the planet is marked by parallel dark streaks or "belts!' separated by bright spaces which are termed "zones." The belts were first detected by Nicolas Zucchi and Daniel Bartoli in May 1630, about 20 years after the discovery of the four large satellites. Modern instruments show the belts to be broken up frequently into irregular markings, particularly at the edges, where dark spots separated by white indentations and rifts are specially liable to occur. Isolated dark spots and brilliantly white areas are also frequently observed on the zones, together with delicate linear markings or wisps, sometimes resembling loops or festoons enclosing white spots and sometimes connecting together dark spots on the belts on opposite sides of the zones. This is especially the case with the equatorial zone. All these markings are subject to changes which may be relatively rapid. Occasionally a belt or portion of a belt will disappear in the course of a few weeks or months while other features develop for a time and then die out.

It is quite evident that there is nothing stable or fixed about Jupiter as seen from the earth, but that what is observed is merely a shell of clouds or vapours which are often in a greatly disturbed condition.

The planet's surface not infrequently displays striking colours. In particular the two belts north and south of the equator are sometimes very red. whereas at other times they may be brown, neutral gray or even bluish. In April 1899 A. Stanley Williams, after a thorough examination of the available material accumulated between the years 1836 and 1898, announced that these belts exhibit a periodic variation in such manner that when one belt attains a maximum of redness the other is colourless or even bluish, and that between the periods of extreme coloration both belts are moderately red. The cycle of changes was found to take place in 12.08 years, which is in close agreement with the period of the planet's revolution, hloreover the phase of minimum redness of a belt was found to occur shortly after the autumnal equinox of the hemisphere in which it is situated, which would seem to indicate a seasonal effect.

It is hard to understand how the variations can be caused by the varying tilt toward the sun of the planet's axis: the inclination of which to the plane of the orbit is only 3° 7′, yet such would appear to be the case. Another point of great interest is Williams' deduction in March 1920 that the equatorial zone also shows a periodic variation in colour in the course of the planet's revolution, assuming a dull orange or tawny hue shortly before the aphelion position is reached.

Rotation.—In 1664 Robert Hooke observed a dark spot in the southern hemisphere, and from its motion J. D. Cassini found a rotation period of 9 hr. 56 min. A few years later Cassini made the important discovery that a spot situated near the equator rotated in a period of about 9 hr. 50 min. or in about 6 min. less than the dark spot discovered by Hooke farther south. It was therefore evident that the visible globe of the planet does not rotate like a solid body, and subsequent observations revealed the fact that in general the rotation periods shown by the markings depend on the latitude in which they are situated. There is, however, no simple relationship between rotation and latitude such as is shown by the sun, although the shortest period is normally that of objects within about ten degrees or so of the equator. Outside this swiftly rotating region, relatively slow and quick rotations are found in irregular order from the equator poleward, and



JUPITER'S MAIN SURFACE CURRENTS AND THEIR ROTATION PERIODS

the arrangement in the northern hemisphere differs greatly from that in the southern.

Special attention was given to the drift of the surface material in different latitudes by A. Stanley Williams, W. F. Denning and others, and for many years this department of Jovian study was followed up assiduously by members of the Jupiter section of the British Astronomical association. Mean values for the rotation periods are given diagrammatically in the figure, an examination of which shows how irregular the arrangement of the "surface currents," as they are commonly called, really is. In general these currents are sharply bounded, though occasionally spots are observed between two of them, especially in the rifts dividing the north and south components of the equatorial belts, which show intermediate periods. The ellipse in the diagram represents the great red spot described below. Although the figures given may be regarded as fairly reliable average values, the periods deduced each year from the observations are found to exhibit variations, and

even in the same latitude those of spots in one longitude will differ from those elsewhere. In 1928 a series of small black spots on the south component of the south equatorial belt rotated in rather more than 9 hr. 59 min.. the longest period yet recorded.

The Red Spot.—Of all planetary markings it is safe to say that none has aroused so much general interest or received so much attention from observers as Jupiter's great red spot. It came into special prominence in 1878 but mas seen actually several years earlier (viz., by W. R. Dawes in 1857) and at various times during the next two decades. After 1878 it was under constant observation and was found to vary greatly in colour, form, intensity and motion. It is situated in the southern hemisphere in approximately latitude −20° and commonly appears as an elliptical shading or an elliptical ring in contact with the northern edge of the south temperate belt, and at various times it has presented curiously pointed ends. It is usually about 30,000 mi. in length and about 7,000 or 8.000 mi. in breadth. In colour it has varied from an intense brick-red to the faintest gray; indeed in some years it has been quite invisible, though. fortunately. its position has still been indicated by the "bay" or "hollow" it has made for itself in the southern part of the south equatorial belt in nhich it is usually seen lying. In 1919 and 1927 when the hollow disappeared the spot regained something of its former intensity. In 1927 it also recovered something of its redness.

The early history of the red spot was carefully investigated by W. F. Denning, who, by means of published drawings and records of observations, either of the spot itself or its hollow, succeeded in carrying knowledge of the object back as far as S. H. Schwabe's drawing of the hollow on Sept. 5, 1831. He also suggested the identity of the present red spot with the object observed by Hooke in 1664 to which reference was made above. But although it seems quite probable that the two objects are one and the same. long gaps in the observations make it impossible to regard identity as more than a very plausible speculation. In any case, however, the well-established identification with the feature shown by Schwabe shows the red spot to be remarkably long-lived in view of the well-known transitoriness of the Jovian markings in general.

The long-enduring character of the red spot indicates that it is in the nature of a high plateau rising above the clouds from the solid surface of the planet below. The large motion of the spot in longitude, however. shows that it must be floating in the atmosphere. The position of markings in longitude upon Jupiter is necessarily uncertain since there ,is no fixed point upon the visible surface which can be used for reference. The best that can be done is to adopt a purely mathematical system of reference and assume a rotation period corresponding to the average rate of motion of the spots. Two systems are called I and II. System I applies to the belt 10° N. and S. of the equator, system II to the rest of the planet. The position of the zero meridian is defined by the following adopted values of the longitude of the central meridian on 1897 July 14.0 G.M.T. = J.D. 2414120.0:

System I 47°.31 System II 96°.58,

as given by A. Marth *(Monthly Notices of the Royal Astronomical Society,* vol. 56, p. 523 [1896]). The adopted daily motions of the zero meridian relative to the vernal equinox of Jupiter and the resulting sidereal periods are:

System I	877°.90	$9^h\ 50^m\ 30^s.003$
System II	870.27	9 55 40.632

The tables of the longitudes of the central meridian of Jupiter published in the ephemerides are based on the mean daily synodic rotation during the period when the planet is observable, namely 877°.95 for system I and 870°.30 for system II.

Marth formulated the rotation period for system II about 1890 as closely representing the motion of the red spot. When Jupiter was in opposition in Dec. 1894. the red spot coincided with the zero meridian. During the next seven years the red spot drifted in a direction opposite to the rotation of the planet. so that by June 1901 it was in longitude 46". Next year the spot started moving irregularly in the opposite direction, and by 1935 had drifted more than twice around the planet relative to the adopted rotation period for system II. After 1938 it again reversed its direction of motion so that by Nov. 1952 it had fallen nearly half a revolution behind the zero meridian.

The South Tropical Disturbance.— There is another object of long-enduring character which calls for mention in connection with the red spot. Like the latter it is situated in the south tropical zone; it is known as the south tropical disturbance, but differences in their respective rates of rotation have many times brought the two objects into conjunction. The disturbance was first seen by P. B. Molesworth on Feb. 28, 1901. It was then a mere dark hump at the southern edge of the south equatorial belt, but it rapidly developed, spread across the zone and became greatly extended in longitude with a bright spot at each end. At times its length has exceeded 180°, and it has frequently displayed much structural detail. It disappeared together with the southern portion of the south equatorial belt and the red spot hollow—probably in consequence of overlying vapours—in 1919, reappeared in 1920, but again became invisible with the objects above mentioned in 1926 and still again since 1940. A peculiar "circulating current" carrying spots across the south tropical region and back again was observed in 1932–33–34. The following points related to the south tropical disturbance and the red spot seem to be of special interest:

1. Earlier in its history the disturbance rotated faster than the red spot by nearly one revolution in two years, but by 1925 its period actually exceeded that of the red spot.

2. It is not known in what way the dark material of the disturbance passes the red spot at conjunction, whether around it or under it.

3. The red spot has shown a very decided attraction for the disturbance, each end of the latter being accelerated on approaching the spot and retarded after passing it.

4. Both the red spot and the disturbance have been accelerated during the transference of the dark material of the latter from one side of the spot to the other.

Speculation as to the Nature of the Red Spot.——Although the red spot has been systematically observed since 1878, there was still no generally accepted explanation in the late 1950s to account for the behaviour of this remarkable object. The principal features to be explained are its great size (average dimensions 7,000 × 30,000 mi.); oval shape; variable colour and intensity; variable rotation period; long life (at least 12½ years and possibly 300 years, covering practically the entire history of the telescope); and the way in which the southern part of the south tropical disturbance dips equatorward in passing it.

The permanent character of the red spot and its obstacle to flow indicate that it is a solid. But it must be a floating solid to account for its variable rotation. B. M. Peek suggested that the variable motion of the red spot is attributable to the rising and sinking of the mass: which is thus assumed to conserve its angular momentum around the axis of rotation of the planet. When the mass rises in the atmosphere so that its distance from the axis of rotation increases, its period of rotation becomes slower, and vice versa. A range in depth of only six miles would be enough to account for all the changes in velocity that have been observed since the rotation period of the spot was first accurately determined. He regards the spot as a floating island composed perhaps of one of the several solid forms of water, or other types of ice. called ice-VI, ice-VII, etc.. that have been produced experimentally in the laboratory. It is conceivable that under the, to us, exceptional conditions of pressure and temperature that naturally prevail on Jupiter. matter in such states may exist in large quantities. Suppose that the red spot is an island of ice-VII floating in the highly compressed gases below the visible surface. Suppose further that on the upper surface of the island, where the pressure is presumably lower, the material is changing phase to ice-VI. A raising or lowering of the level of the spot would be expected to affect the rate of phase change. This change in turn would affect the rate of evaporation of the clouds above the spot. producing changes in its colour and visibility.

This rather attractive hypothesis of Peek and R. Nildt (1939) was criticized by S. L. Hess (1951) on the grounds that a body immersed in a rotating fluid is subject to stresses so that its angular mqmentum is not conserved. He suggested that the changes

in velocity may arise from the vertical wind shear of the surrounding atmosphere. G. P. Ruiper (1950) contended that the red spot is most naturally explained as an atmospheric cloud cap hovering over a floating island. The fluid in which the island floats is under a pressure greater than its critical pressure, so that there is no distinction between the liquid and vapour states. He felt that the variable motion of the spot despite objections is best explained by changes in its elevation.

Jupiter's Atmosphere. — Hypotheses of the origin of the solar system usually start with the assumption that the planets were formed from the same material as the sun. There is strong evidence that the sun consists mainly of the two lightest elements, hydrogen and helium. Planets of small mass such as the earth and Mars would not have sufficient gravitational attraction to retain light elements, and their high mean density indicates that they consist mostly of heavy metallic elements. But planets of large mass such as Jupiter and Saturn should have sufficient gravitational attraction to retain even hydrogen and helium, and their low mean density accords mith this idea.

Direct evidence of the constitution of the atmospheres of the giant planets can be obtained from the absorption markings in their spectra. As early as 1905 6'. M. Slipher had secured good photographs of the spectra of the giant planets in the visible region, and by 1933 their spectra had been photographed in the infra-red as far as λ 10.1 jo by Slipher and T. Dunham, Jr. Although these spectra showed an abundance of absorption bands and lines, the identification of the markings was slow in coming. because of lack of suitable laboratory data. Finally in 1932 Wildt showed that many of the markings agreed in position with those produced by ammonia (NH_3) and methane (CH_4), and identification was later confirmed by the more detailed investigations of Dunham, Slipher and A. Adel. They also showed that the absorption bands in Jupiter corresponded in intensity to those produced by about 30 ft. of ammonia and 0.5 mi. of methane under atmospheric pressure.

Since the observed radiometric surface temperature of Jupiter is —138° C., and since ammonia freezes at —78° C.. the presence of so much gaseous ammonia in the atmosphere might not have been anticipated. The most reasonable explanation is that the ammonia gas is sublimated or evaporated directly from the crystals. Under the surface gravity of Jupiter of 2.65 g, the 30 ft. of ammonia would exert a pressure of 1.5 mm. The vapour tension of solid ammonia exerts this pressure at a temperature of —107° C. Also, if there is considerable hydrogen mixed with the ammonia this condition would lower the mean molecular weight of the gas, and the partial pressure of the ammonia would be diminished in the same proportion. And if hydrogen is very abundant the temperature could be as low as —123° C. and yet the observed amount of ammonia could be supported. Although this temperature is still slightly above that observed, the agreement is probably as close as can be expected under the circumstances.

Although astronomers had long felt confident from cosmological considerations that hydrogen (H_2) of molecular weight 2, and helium (He) of atomic weight 4, must be abundant in Jupiter, direct evidence to that effect was highly desirable. Unfortunately, neither element gives markings in the observable region of the spectrum. The first determination of the mean molecular weight of the gases in the atmosphere of a giant planet was obtained on Nov. 20, 1952, by W. A. Baum and A. D. Code from photometric measures on the occultation of a star by Jupiter. As the star sank into the atmosphere of the planet its light faded principally because of attenuation. oi the rays as they were reiractively spread apart more and more in traversing layers of increasing density in the Jovian stratosphere. The rate of diminution in the light of the star could be calculated from the apparent motion of Jupiter relative to the star, the suriace gravity oi the planet, the temperature of the stratosphere and the mean molecular weight of the gases. The first two are accurately known. It is possible to estimate the third within narrow limits. Thus the only unknown remaining was the mean molecular weight, which could be determined from the observations.

The procedure consisted in calculating theoretical light curves corresponding to different molecular weights and then comparing them with the light curve observed. The best agreement between theory and observation was obtained for a mean molecular weight of 3.3, a value intermediate between Hz (2) and He (4). A pure methane atmosphere corresponding to a molecular weight of 16 for CH_4 gave a light curve completely at variance with the observations. It appears that hydrogen and helium are so abundant in the Jovian atmosphere that by comparison methane and ammonia are minor constituents.

Hydrogen and helium give no visible evidence of their presence in the atmosphere. The cloud belts which give the disk of the planet its characteristic appearance are believed to consist of ammonia cirrus. Wildt suggested that the colours of the cloud belts may be attributable to solutions of metallic sodium in liquid or solid ammonia. Variations in the colour and intensity of the belts are attributed to changes in temperature.

Interior Constitution. — The mean density of Jupiter is 1.35 times that of water. If the outer layers consist mainly of light elements of low density, then it would seem that matter in the deep interior must consist chiefly of heavy elements of high density, to bring the average for the whole planet above the density of water. For this reason, Jupiter was supposed to have a dense central metallic core similar to that of the earth, surrounded by a thick mantle of ice and overlaid by an atmosphere of highly compressed gases thousands of miles deep (Wildt, 1937).

In 1951 W. H. Ramsey proposed an interesting new model of Jupiter on the assumption that the planet consists entirely of hydrogen. According to this model the outer atmosphere is in a violently disturbed state, as shown by the rapid changes in the cloud belts. The pressure rises rapidly below the surface until at a depth of only a few miles the material would probably correspond more to our idea of a thick ocean than an atmosphere. At a depth of 2.000 mi. the pressure would have risen to 200,000 atm. and the .material would consist of solid hydrogen of density 0.3 times that of water. At 5,000 mi., although the pressure would be 800,000 atm., the density would have risen only to 0.4. According to theoretical investigations, however, when the pressure reaches 800,000 atm. the hydrogen is transformed irom a solid into the metallic state, with a sudden increase in density to 1.0. The density continues to rise until at the centre oi the planet under a pressure of 31,500,000 atm. it reaches 3.7. Thus, according to this particular model, Jupiter has a core of metallic hydrogen 38,000 mi. in radius which includes 92% of the planet's mass. The remaining 8% is contained in a mantle of solid hydrogen 5,000 mi. thick surrounding the core. The atmosphere is a thin shell oi negligible mass overlying the mantle. Other models of Jupiter can be built assuming a mixture of hydrogen and helium in different proportions.

Needless to say, any theory of the interior constitution of the giant planets encounters severe difficulties, and authorities are by no means agreed on the subject.

During January, February and March 1955 a source of variable 22.2-mc.-per-second radiation was detected with the large "Mills Cross" antenna of the Carnegie Institution of Washington located near Seneca, Md. The source of emission appeared to correspond with the position of Jupiter in the sky and also showed the same geocentric motion as Jupiter. Continued observations during another year established beyond question that radio emission was coming from Jupiter. This was the first recorded instance of radio waves having been received from another planet in our solar system.

By Feh. 1956 centres of emission had been detected on the planet at about longitudes 40°, zoo" and 320° of system II. Radio emission had been recorded on instruments operating at 18, 22 and 27 mc. per second. The results obtained from the multiple-frequency work indicated that (1) the spectrum is discontinuous; (2) different frequencies may be independent in time of activity; and (3) in general, the lower-frequency events are stronger.

The radio emission had the appearance of short random bursts of static resembling thunderstorm interference on a broadcast receiver. It was conjectured that the bursts were caused by disturbances in the atmosphere of Jupiter similar to earth thunderstorms but on a vastly larger scale.

As of mid-1956 the source of emission could not be identified satisfactorily with any markings that could be seen or photographed on the disk of Jupiter.

The Satellites. — Jupiter is accompanied by 12 known satellites. The four largest were the first bodies in the solar system discovered with the telescope. They are oiten called the Galilean satellites in honour of Galileo Galilei, who observed three of them on Jan. 7, 1610 (Gregorian style calendar), and a fourth on the night of Jan: 13. There seems little doubt, however, that Simon Marius, a Dutch astronomer, also observed the satellites at practically the same time and realized their significance. The iour large satellites can be observed mith a good pair of field glasses, and indeed could be seen by the unaided eye were it not for the glare oi Jupiter.

Marius named thc satellites Io, Europa, Ganymede and Callisto, in order of their increasing distance from the planet, but as he was considered an impostor his names never were widely used, the commoner usage being to designate them as I. II, III and IV. In Sept. 1892 E. E. Barnard discovered a fifth satellite which he decided after some debate to call simply "V." Since the Galilean satellites are numbered in order of increasing distance from Jupiter, this name implies that V is the most distant, whereas actually it is the nearest to the planet. When the next satellite mas discovered in 1904 it was called VI, and the custom has been continued of numbering the satellites in the order of their discovery. Often <'Jupiter" or "J" is used as a prefix

before the Roman numeral designating the satellite, as Jupiter VIII or J IX, etc.

Even in a two-inch telescope the Galilean satellites make interesting objects for study. Since their orbits are nearly edgewise to us they appear to oscillate back and forth with respect to Jupiter in nearly straight lines passing through the planet's equator. They move so rapidly that their configuration is quite different from night to night. Sometimes one or even two of the satellites may be invisible, as happens when a satellite is occulted by the disk of Jupiter or hidden by its shadow. Satellites I, II and III are eclipsed at every revolution but IV occasionally escapes. A satellite may also become invisible, or difficult to see, when in transit across the planet. The whole disk of Jupiter on the average is brighter than the disks of I and II. Thus when I, for example, makes a transit oi Jupiter it shows first near the edge as a small white spot, which gradually fades and finally vanishes briefly at a point on the disk where the reflectivity of the planet equals that of the satellite. But the satellite soon reappears nearer the centre as a dark spot projected against the brighter background of the planet. These changes in visibility are repeated in reverse order as the satellite moves off the disk. Satellites III and IV are of lower reflecting power and appear dark during the entire transit.

The Satellites of *Jupiter*

Name	Discoverer	Date	Distance from Jupiter (miles)	Sidereal period (days)	Diameter (miles)
V	E. E. Barnard	1892	112,000	0.4982	150
I (Io)	Galileo and Marius	1610	262,000	1.7691	2,020
II (Europa)	Galileo and Marius	1610	417,000	3.5512	1,790
III (Ganymede)	Galileo and Marius	1610	666,000	7.1546	3,120
IV (Callisto)	Galileo and Marius	1610	1,170,000	16.6890	2,770
VI	C. D. Perrine	1904	7,124,000	250.62	100
X	S. B. Nicholson	1938	7,200,000	254.21	15
VII	C. D. Perrine	1905	7,300,000	260.07	35
XII*	S. B. Sicholson	1951	13,000,000	631	14
XI*	S. B. Nicholson	1938	14,000,000	692.5	19
VIII*	P. Melotte	1908	14,600,000	738.9	35
I X*	S. B. Sicholson	1914	14,700,000	758	17

*Direction of revolution is retrograde. The orbits of the outer satellites are not even approximately elliptic. Because of perturbations by the sun the elements change continually.

Source: *Handbook of the British Astronomical Association, 1956.* The diameters of the smaller satellites are from Seth B. Nicholson, "The Satellites of Jupiter," the *Griffith Observer* (May 1952). The direction of revolution of Jupiter XII is retrograde according to Nicholson, its discoverer. The diameters of the four large satellites are those given by G. P. Kuiper (ed.), *The Atmospheres of the Earth and Planets,* 2nd ed., p. 308 (Chicago, 1951).

As may be seen from inspection of the table, the satellites fall into three distinct groups. Thus I, II, III, IV and V revolve at an average distance from Jupiter of 500,000 mi. in the same direction the planet rotates. Satellites VI, VII and X also revolve in the same direction as the planet at an average distance of 7,000,000 mi. But satellites VIII, IX, XI and XII revolve in the opposite direction at an average distance of 15,000,000 mi. The orbits of these four outer satellites are so large that the disturbing force of the sun upon them almost equals the whole gravitational attraction of Jupiter. As a result their motions are enormously perturbed, so that their paths are not even approximately closed curves. These satellites may once have been asteroids that were captured by the combined attractions of the sun and Jupiter at a favourable approach to the planet. It is also possible that under suitable conditions a satellite might escape from Jupiter and revolve around the sun in an independent orbit of its own.

With a sufficiently poweriul telescope and favourable observing conditions, the Galilean satellites show suriace markings that are rather easily seen. Observations at the Pic du Midi observatory in 1941 with a 15-in. reiractor revealed markings on the four large satellites as follows dark poles and dark north-south bands on I; bright poles and dark equatorial spots on II; a white polar cap and dark spots on III; and a bright south polar region and light spots surrounding the north pole of IV. A comparison of the positions of the markings showed that all four satellites revolve around Jupiter with their axes of rotation nearly perpendicular to the planes oi their orbits. In each case, the period of revolution of the satellite equals its period of axial rotation. This correspondence agrees with observations made of III in 1927 by E. M. Antoniadi. Hence the Galilean satellites always keep the same face turned toward Jupiter, just as our moon always keeps the same face turned toward the earth.

The first determination of the velocity of light was made from observations of Jupiter's satellites. Ole Roemer, a Danish astronomer working at the Paris observatory about 1675, noted that when the earth was receding from Jupiter the interval between successive eclipses of satellite I increased by an amount proportional to the increase in distance between the planets. But when the earth was approaching Jupiter the interval between eclipses decreased by an amount proportional to the decrease in distance. Roemer correctly interpreted this apparent variation in the periodic motion of I as a consequence of the finite velocity oi light. His observations indicated that light would require 11 minutes to traverse the distance from the earth to the sun. (The modern value is 8 min. 18 sec.) Roemer's conclusion regarding the finite velocity of light was not generally accepted until 1728–29, when James Bradley discovered the aberration of light.

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(R. S. RN.)

JUR, a word used by Dinka and Nuer peoples of the Sudan to describe those of their neighbours who have no cattle. Since the first days of European exploration several quite diiferent peoples in the southern Sudan have been called Jur: (1) The Jo Luo, who live around Wau along the outskirts of Dinka country, irom Aweil as far south as Tonj. They speak a dialect of Shilluk, from which they are traditionally an offshoot, although in build and language they are closer to the Acholi. They are skilled ironworkers and still supply the Dinka with spears. They are frequently brown rather than black. Their name also resembles the Jaluo of Kenya, neighbours and relatives of the Acholi. (2) The Manangeer, who inhabit the swamp area between the Narrows and the Lol river They claim to be descended from the Shilluk, but mostly speak Dinka and have Dinka tribal markings and headdress. The cattle-owning Dinka call them Jur *wir* ("foreigners of the river"), and it is thought that the Jur river is named after them. They are expert fishermen, almost living in their canoes. They do not work iron.

Three other groups of Negroid people near Rumbek speak languages of the Bongo group and are called Jur by the Gok and Agar Dinka: (3) the Beli and the Sofi; (4) the Gberi; and (5) the Lori, who speak a dialect akin to that of the Nyamusa of Amadi.

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(A. J. AL.)

JURA, a *de'partement* of France, on the eastern frontier, formed from the southern portion of the old province of Franche-Comté. It is bounded north by the *de'partement* of Haute-Saône, northeast by Doubs, east by Switzerland, south by Ain, and west by Saône-et-Loire and CBte d'Or. Pop. (1954) 220,202. Area 1,952 sq.mi. In the southeast the high Jura (Crêt Pela 4,905 ft.) runs north to south; parallel to the above, west of the Ain, is the forested Jura plateau; next follow the vine-clad hills beyond which, toward the Saône, is the fertile plain of northern Bresse, called the Finage. The ddpartement stretches across the lower Doubs, but both banks of the Saône are in Côte d'Or. There are many lakes among the mountains. The climate is, on the whole, cold; the temperature is subject to sudden and violent changes, and among the mountains winter sometimes lingers for eight months. The rainfall is much above the average of France.

Jura is an agricultural ddpartement: wheat, oats, maize and barley are the chief cereals, potatoes, tobacco and rape also being grown. Vines are largely grown. Woodlands occupy about a fifth of the area: the oak, hornbeam and beech and, in the mountains, the spruce and fir, are the principal varieties. Natural pasture is abundant on the mountains. The wild boar still survives in the forests. There are salt mines and stone quarries. Peat is also worked. Lons-le-Saunier and Salins have mineral springs. Industries include the manufacture of Gruyère, Septmoncel and other cheeses (made in co-operative cheese factories or *fruitières*), sparkling wines, metal founding and forging, sawmilling, the cutting of precious stones (at Septmoncel and elsewhere), the manufacture of nails, tools and other iron goods, paper, leather, brier pipes, toys and fancy woodenware and basketwork; and clocks, watches, spectacles and measures at Morez.

The ddpartement is served chiefly by the P.L.M. railway, the main line from Paris to Neuchâtel traversing its northern region. The canal from the Rhône to the Rhine, which utilizes the channel of the Doubs over portions of its course, traverses it for 25 mi. Lons-le-Saunier is the chief town of Jura, which embraces three arrondissements named after the towns of Lons-le-Saunier, Dôle and St. Claude, with 32 cantons and 583 communes.

The ddpartement forms the diocese of St. Claude and part of the ecclesiastical province of Lyon, it comes within the region oi the 7th army corps (Besançon) and the educational division (*académie*) of Besançon, where is its court of appeal. Lons-le-Saunier, Dôle, Arbois, Poligny, St. Claude and Salins are the more noteworthy towns. At Baume-les-Messieurs, 8 mi. N.E. of Lons-le-Saunier, there is an ancient abbey with a fine 12th-century church.

JURA, an island of the inner Hebrides, the fourth largest of the group, on the west coast of Argyllshire, Scot. Pop. (1951) 258. On the north it is separated from the island of Scarba by the whirlpool of Corrievreckan, caused by the rush of the tides, on the east from the mainland by the Sound of Jura, and on the south and southwest from Islay by the Sound of Islay. Craig-

house, the chief village, is connected by steamer with W. Loch Tarbert, and at Feolin there is a ferry to Port Askaig in Islay. Its greatest length is about 27 mi., and the breadth varies from 2 mi. to 8 mi. A chain of hills culminating in the Paps of Jura—Beinn-an-Oir (2,571 ft), Beinn Siantaidh and Beinn A' Chaolais—runs the whole length of the island, interrupted only by Loch Tarbert, an arm of the sea which forms an indentation nearly 6 mi. deep and almost cuts the island in tno. Cattle and sheep are raised; oats, barley and potatoes are cultivated along the eastern shore, where most of the inhabitants live, and there is some fishing. Afforestation is carried out by the forestry commission. A ferro-concrete pier was constructed at Craighouse.

JURA, a system of mountain ranges between the Rhine and the Rhône, forming the frontier between France and Switzerland. The Rhine gorge cuts off the Jura from the Swabian and Franconian ranges to the northeast, and the Rhône gorge, the Jura from the Dauphin6 to the south. Its three chief rivers—the Doubs, the Lou6 and the Ain—flow down the western slope which is much longer and half as steep as the eastern. Some geographers extend the name Jura to the Swabian and Franconian ranges between the Danube the Neckar and the Main; but, though these are similar to the range to the south it is most convenient to limit the name of the mountain ridges lying betneen France and Switzerland, and this narrower sense will be adopted here.

The Jura system is 156 mi. long and 38 mi. broad. oblong in shape and raised to an average height of from 1,950 to 2.600 ft. above the surrounding plains. The Juras form essentially a series of ridges parallel to the direction of greatest length of the system. Many transverse gorges or cluses cut across these ridges

Geologically the Jura mountains belong to the Alpine system, and the same forces which built up the latter produced the folds and faults in the former (see ALPS). The rocks of the Juras range from the Permian to the Pliocene. but the Jurassic formation is the most important. The rocks have been folded into a series of parallel anticlines and synclines nith a direction from southwest to northeast, but because of the resistance of the ancient massifs of the central plateau of France on the nest and the Vosges-Black forest on the east the folds are bunched together at the extremities of the range The intensity of folding decreases northward, away from the .Alps. In the east the structure is complicated by block faulting and the beds there are not folded as a general rule. This latter region is known as the Jura tableland (Jura *tabulaire*), while the greater part of the range is known as the folded Jura (Jura *plissé*). In the extreme nest the mountains descend steeply to the plain of the Saône. the district being known as the *région du* vignoble. Countless blocks of gneiss, granite and other crystalline rocks are found on the slopes of the Jura mountains. These erratic blocks are of glacial origin having been transported to their present position by glaciers from the Alps which have also left their mark on the Jura range itself in the shape of striations and moraines.

In considering the topography of the Jura, it may be well to take a brief survey of its outer slopes.

1. The northern face dominates on one side the famous trouke (or trench) of Belfort, one of the great geographical centres of Europe, whence routes run north down the Rhine to the North sea, southeast to the Danube basin and Black sea and southwest into France and so to the Mediterranean basin. It is of great strategical importance. On the other side it overhangs the *trouée* of the Black forest towns on the Rhine (Rhelnfelden. Sackingen. Laufenburg and Waldshut), through which the central plain of Switzerland is easily gained On this north slope two openings offer routes into the interior of the chain—the valley of the Doubs (France) and the valley of the Birse (Switzerland). Belfort is the military, Mulhouse the industrial and Basle the commercial centre of this slope.

2. The eastern and western faces offer many striking parallels. The plains through which flow the Aar and the Sabne have each been the bed of an ancient lake, traces of nhich remain in the lakes of Neuchbtel, Bienne and Morat. Both east and west slopes are pierced by many transverse gorges. cluses, by which access is gained to the great central plateau of Pontarlier, though these are seen more plainly on the east face than on the west; thus the gorges at the exit from which Lons-le-Saunier, Poligny, Arbois and Salins are built balance those of the Suze, of the Val de Ruz, of the Val de Travers and of the Val d'Orbe. Neuchbtel, which commands these eastern gorges, is a great military and industrial centre. just as is Besançon on the west. These easy means of communication account for the dialect of Neuchbtel being Burgundian. Mt. Chasseron (5,286 ft.), the central point of the eastern face. commands the two great railways which join Neuchbtel and Pontarlier. The river Loue, which drains the west face of this ridge, flows into the Doubs south of Dôle, the only important town of the central portion of the Sabne basin. The Chasseron is wholly Swiss, as are the lower summits of Chasseral (5,279 ft.), Mont Suchet (5.220 ft.). Aiguille de Baulmes (5.128 ft.), Dent de Vaulion (4,879 ft.), Weissenstein (4,245 ft.) and Chaumont (3,855 ft.), the two last-named points being probably the best-known points in the Jura, as they are accessible by road from Soleure (Solothurn) and Neuchâtel, respectively. South of the Orbe valley the east face becomes a rocky wall which is crowned by all the highest summits (the first and second Swiss, the rest French) of the chain—Mont Tendre (5,521 ft.), the Dôle (5,511 ft.), the Reculet (5,643 ft.), the Crêt de la Neige (5,653 ft.) and the Grand Crêt d'Eau (5,328 ft.), the uniformity of level being as striking as on the west edge of the Jura, though there the absolute height is far less. The position of the Dôle is similar to that of the Chasseron. as along the sides of it run the great roads of the Col de St. Cergues (3,973 ft.) and the Col de la Faucille (4,341 ft.), the latter leading through the Vallée des Dappes. The height of these roads shows that they are passages across the chain, rather than through natural depressions.

3. The southern face is supported by two great pillars—on the east the Grand Crêt d'Eau and on the west the ridge of Revermont (2.529 ft.) above Bourg en Bresse; between these a huge bastion (the district of Bugey) stretches south. forcing the Rhône to make a long detour. On the two sides of this bastion the plains in which Ambérieu and Culoz stand are the meeting points of the routes which cut through the bastion by means of deep gorges. On the eastern side this great wedge is steep and rugged, ending in the Grand Colombier (5.033 ft.), north of Culoz. and it sinks on the western side to the valley of the Ain. the district of Bresse and the plateau of Dombes. The junction of the Ain and the Surand at Pont d'Ain on the west balances that of the Valserine and the Rhône at Bellegarde on the east.

The Jura thus dominates on the north one of the great highways of Europe, on the east and west divides the valleys of the Saône and the Aar, and stretches out to the south so as nearly to join hands with the great mass of the Dauphiné Alps. It therefore commands the routes from France into Germany, Switzerland and Italy, and hence its enormous historical importance.

The topography of the interior of the range naturally falls into three divisions. each traversed by one of the three great rivers of the Jura—the Doubs. the Loue and the Ain.

1. The *northern* division is marked by the east and west ridge of the Lomont, and the Nont Terrible; the defile of the Doubs from St. Crsanne to St. Hippolyte, and the troue'e of the Black forest towns. It thus bars access to the central plateau from the north. This division falls again into two distinct portions.

(a) The first is the part east of the deep gorge of the *Doubs* below St. Hippolyte. It includes the basin of the river Birse, and the plateau between the Doubs and the Aar, on which, at an average height of 2.600 ft., are situated a number of towns, one of the most striking features of the Jura. These include Le Locle and La Chaux de Fonds (*qq.v.*), and are mainly occupied with watchmaking. an industry well fitted for a mountain district.

(b) *The* part west of the cluse of the Doubs: of this, the district east of the river Dessoubre. isolated in the interior of the range (unlike the Le Locle plateau), is called the Haute Montagne, and is given up to cheesemaking, curing of hams, sawmilling, etc. Besançon is the chief French centre of the watchmaking industry, and is connected with Geneva by a chain of places similarly occupied, which fringe the west plateau of the Jura. The part west of the Dessoubre, or the Moyenne Montagne, a huge

plateau north of the Loue, is more especially devoted to agriculture, while along its north edge metal-working and manufacture of hardware are carried on, particularly at Besançon and Audincourt.

2. The central division in which no deep gorges are found, consists of the basin of which Pontarlier is the centre. through notches in the rim of which routes converge from every direction; hence its immense strategical and commercial importance. The north-east roads run to Morteau and Le Locle, the north-west to Besanqon, the west to Salins. the south-west to Dôle and Lons-le-Saunier, the east to the Swiss plain. The Pontarlier plateau has only slight indentations in it due to erosion by the river Drugeon. East of this plateau is the Fort de Joux, under the walls of which meet the two railways from Neuchâtel, and to the west Salins, the meeting place of the routes from the Col de la Faucille, from Besanqon, and from the French plain.

The Ain rises on the south edge of this plateau. and on a lower shelf which it waters are situated two points of great military importance — Nozeroy and Champagnole. The latter is specially important. since the road leading thence to Geneva traverses one after another the chief valleys which run down into South Jura, and thus commands the routes from the Geneva region. and a branch route along the Orbe river from Jougne.

There are said to be in the central Jura no less than fifteen ridges running parallel to each other, and it is these which force the Loue to the north. and occasion its eccentric course.

3. The *southern division* is the most complicated of the Jura. The lofty ridge which bounds it to the east forces all its drainage to the west. and the result is a number of valleys of erosion, quite distinct from the "cluses" or fissures of the Doubs and the Loue. Another point of interest is the number of roads which intersect it. despite its extreme irregularity. This is due to the great "cluses" of Nantua and Virieu. which traverse it from east to west. The plateaux west of the Ain are cut through by the valleys of the Valouse and of the Surand, and do not possess any considerable towns.

The Ain receives three tributaries from the east:

(a) The Bienne. which flows from the fort of Les Rousses by St. Claude, the industrial centre of the south Jura, famous for wooden toys; Septmoncel, a centre for gem cutting, and Morez, a watch and spectacle making centre.

(*b*) The Oignin. which receives the drainage of the lake of Nantua. a town noted for combs and silk, and which communicates by the "cluse" of the Lac de Silan with the Valserine valley, and so with the Rhone at Bellegarde, and again with the various routes which meet at Les Rousses, while Culoz is easily gained by the Val Romey and the Seran.

(*c*) The Albarine. connected with Culoz by the "cluse" of Virieu. and by the Furan flowing south, with Belley, the capital of the district of Bugey (the old name for the south Jura).

The "cluses" of Nantua and Virieu are now both traversed by important railways; and it is even truer than of old that the keys of the south Jura are Lyons and Geneva.

The range is mentioned by Caesar (Bell. *Gall.* i. 2–3, 6 [1], and 8 [1]), Strabo (iv. 3, 4 and 6. 11), Pliny (iii. 31; iv. 105; xvi. 19;) and Ptolemy (ii. ix. j), its name being a word which appears under many forms (*e.g.*, Joux. Jorat, Jorasse. Juriens), and is a synonym for a wood or forest. The German name is Leberberg, Leber being a provincial word for a hill.

Politically the Jura is French (departments of the Doubs, Jura, Ain and in the north a small portion of Alsace) and Swiss (parts of the cantons of Geneva, Vaud, Neuchâtel, Berne, Soleure and Basle). (J. I. P.)

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JURASSIC SYSTEM, in geology, the succession of rocks deposited during the middle period of the Mesozoic era, succeeding the Triassic, or Trias, and preceding the Cretaceous period. The Jurassic period began about 160,000,000 years ago and lasted about 30,000,000 years. as shown in the accompanying geologic time chart. This article briefly indicates the kinds of life that existed during this period. the faunal realms or provinces and zones having comparable kinds of life. the climate of the period and mountain building and volcanism. and discusses the occurrence of the Jurassic system of rocks in various regions around the world. The sedimentary rocks of the Jurassic are classified largely on the basis of fossils of marine animals. On land, the dinosaurs were the dominant vertebrates and included the huge amphibious *Brontosaurus* and the armoured *Stegosaurus,* which are discussed separately in the article DINOSAURIA. An over-ail view of the fauna of the time will be found in PALAEONTOLOGY, and of the flora, in PALAEOBOTANY. These articles also discuss the classification of fossils and their role in correlating rock strata. The geologic processes referred to in this article are discussed and terms are defined in GEOLOGY.

The Jurassic system is named after the Jura mountains of France, Switzerland and the former German duchy of Swabia, but the constituent formations were first studied and named in England, by William Smith (*q.v.*; two works published 1816, 1817). Smith's names are still used in Britain, but for wider use a classification based on paleontological zones has been devised, principally worked out by Albert Oppel. The zones are grouped into stages, which are of wider application and can be traced all over the world. They are named on a system introduced by Alcide Dessalines d'Orbigny in 1850. Each of the stage names is derived from a place and many of them embody indirectly the old formation names of Smith and other early English and French authors,

Geologic Time Chart

System and Period	Series and Epoch	Distinctive Records of Life	1,000 Years
	CENOZOIC ERA		
Quaternary	Recent	Modern man	11
	Pleistocene	Early man	1,000
Tertiary	Pliocene	Large carnivores	
	Miocene	Whales, apes, grazing forms	
	Oligocene	Large browsing mammals	
	Eocene	Rise of flowering plants	
	Paleocene	First placental mammals	70,000
	MESOZOIC ERA		
Cretaceous		Extinction of dinosaurs	130,000
Jurassic		Dinosaurs' zenith, primitive birds, first small mammals	160,000
Triassic		Appearance of dinosaurs	200,000
	PALEOZOIC ERA		
Permian		Reptiles developed, conifers abundant	235,000
Carboniferous			
Upper (Pennsylvanian)		First reptiles, coal forests	260,000
Lower (Mississippian)		Sharks abundant	285,000
Devonian		Amphibians appeared, fishes abundant	320,000
Silurian		Earliest land plants and animals	350,000
Ordovician		First primitive fishes	400,000
Cambrian		Marine invertebrates	500,000
	PRE-CAMBRIAN TIME		
		Few fossils	3,500,000–4,000,000

with the suffix–ian; *e.g.,* Portlandian, Oxfordian, Bathonian, Bajocian. Hettangian.

Life of the Period. — Marine faunas are universally distributed. The Mollusca are most numerous and of them the ammonites are of greatest value for zoning because of their short vertical and wide horizontal range. their relative disregard of facies and their rapid evolution Reptiles were represented by the large marine saurians and by the crocodiles and pterodactyls or winged reptiles (see PTEROSAUR). There mere also some feathered birds, still toothed like reptiles (Archaeopteryx [*q.v.*], etc.). Fresh-water molluscan faunas occur in the last stage in England (Purbeckian), rather earlier in North America (in the Morrison formation, probably Kimeridgian) and on a lesser scale in the Bathonian stage in England and France.

In the Purbeckian rocks of Purbeck in Dorset is a bed with primitive small mammals, and others occur in a thin bed in the Bathonian (Stonesfield slate, near Oxford).

Faunal Realms and Provinces. — These can be recognized,

more or less independent of latitude, but they changed profoundly during the period. In Early Jurassic (Lias) all the seas of the world seem to have belonged to one realm. In the middle part of the period (Bajocian), Pacific and Boreal (northern) realms were differentiated and the remainder of the seas formed a third or Tethyan realm. The Boreal and Tethyan realms advanced and retreated several times at the expense of each other's territory. For discussion of faunal realms and their significance, see FOSSIL.

Climate of the **Period.**—No physical or biological traces of glaciation have been found anywhere in Jurassic rocks, but both in east Greenland and in the antarctic near the northern tip of Grahamland are abundant plant remains of temperate forest trees, similar or in part identical with those found in the Jurassic of Yorkshire and Sardinia.

Also, the Boreal faunal realm, which had its headquarters in the area occupied by the present Arctic ocean and periodically spread over the northern parts of the surrounding continents, is not characterized by stunting but supported a normal warm-temperate marine molluscan fauna, mhich appears to have been subtropical at times, with large bivalves and gigantic ammonites (*e.g.*, the Portlandian fauna of England, northern France and Greenland). The climate of the Jurassic was therefore probably more uniform than at present, temperate to ti-arm temperate nearly everywhere, and there was probably no glaciation even at the poles.

Mountain Building and Volcanism of the Period.—On the whole the Jurassic was one of the quietest periods, but a mobile belt encircled the Pacific, and in this belt, after prolonged and profound subsidence and deposition, there was at the end of the Jurassic, especially in North America. compression of the geosynclinal sediments (orogeny) with mountain building, erosion and volcanism on a vast scale (the Nevadan orogeny). In the cordilleras of North America and throughout the Andes, from Alaska to Cape Horn, there are great thicknesses of lavas and volcanic ashes as well as injected sheets, sills and dikes of various dates within the Jurassic period. Similar igneous masses probably of Jurassic age are known in the Balkans (Dinaric ranges) of Yugoslavia, Albania and possibly Greece. Jlountain-building movements and erosions marked by thick conglomerates of Jurassic age are most firmly dated in the Canadian Rockies and also in the Crimea.

Development in Europe.— In the Jurassic period the site of the Alps was a geosyncline. Over the rest of Europe shallow warm-temperate seas overspread a shelf north of the Alps. The shelf was composed of the denuded and almost leveled remains of the Hercynian mountain range, which had been thrown up toward the end of the Paleozoic era and then largely eroded down in the Permian and Triassic. It was a typical mobile shelf, on which a network of shallow troughs of subsidence allowed the accumulation of up to about 1,000 m. of shallow-water Jurassic rocks of great variety. In northwest Europe the faunas were of warm-temperate or tropical type, with coral reefs flourishing in the Upper Jurassic as far north as Yorkshire and ammonites of mixed Tethyan and Boreal types, though those of the Boreal realm show no signs of particularly cold-water habitat. In northeast Europe the uppermost Upper Jurassic has the faunas of the Volgian province of the Boreal realm (*i.e.*, in Poland and Russia). South of the Alps. on the Iberian, Italian and Balkan peninsulas, the deposits and faunas are those of the Tethys and Tethyan realm. Lithologically the most characteristic sign of this realm is nodular limestone or nodules of hard cement stone or calcite mudstone set in marl (*fausses brèches, Knollenkalk*), with abundant ammonites, especially Phylloceratidae and Lytoceratidae.

In northwest Europe, especially around the Paris basin, in Lower Saxony and southern England, is the locus *classicus* for stratigraphy, where formations, zones and stages were all first recognized and named by the pioneers. Smith, C. L. von Buch. F. A. Quenstedt. D'Orbigny and Oppel. Northward through England these well-subdivided shallow marine formations pass largely into plant-bearing sandstones, the Deltaic series of Yorkshire and Scotland, which cover most of the Middle Jurassic and recur in borings beneath Denmark. The Lower Jurassic remains in ordinary Lias facies in Yorkshire, Scotland and Denmark. but it too grades into sandstones, though with marine ammonitiferous intercalations, in the Baltic region and especially in Skåne, southern Sweden and Bornholm. The Baltic region was a collecting trough in the Jurassic period as in recent times, receiving the products of denudation of the Scandinavian shield of ancient and crystalline rocks. The sea was shallow but warm temperate, populated by the Boreal fauna with southern admixture. The plains of Poland and European Russia were also overspread by shallow shelf seas, containing the fauna of the Boreal realm; but close beneath lay the rigid Russian platform, forming a stable shelf, so that there is a great contrast with the mobile shelf deposits farther west. The Donets, where a trough developed through the Jurassic, was an exception. Another exception in the west was the Spanish Meseta. which, although composed of folded Paleozoic rocks, behaved as a horst, or uplifted block (see FAULT), and probably remained above the sea in the Jurassic.

The characteristic deposits of the Alpine geosyncline are a thick monotonous series of dark shales, the schistcs *lustrés* or *Bündnerschiefer*, which pass down into the Triassic and up into the Cretaceous. Over the line of central crystalline horsts such as the Aar, and Mont Blanc, more normal and varied deposits were formed, referred to as the Mesozoic sedimentary envelope. As the horsts rose intermittently in anticlinal lines in Jurassic and later times, the envelopes were squeezed and shed off as nappes, of which the principal one forms the range of the High Calcareous Alps The *schistes* lustre's were also squeezed out as a complicated mass of recumbent folds or nappes (see ALPS: Geology and *Structure*). The Pre-Alps beside Lake Geneva are relics of an envelope nappe, and one of their constituents (*Nappe* dc la brdche) consists largely of two vast sheets of breccia, each believed to represent successive submarine slides or slumps. which slid 5 km. southeastward from a rising anticline. In Lias, *i.e.*, Early Jurassic times, there was a ridge of land or shallows, the Vindelician ridge, joining the crystalline horsts of the Black Forest and Bohemian Forest. Against the southern side of this, the Lias of the Alpine geosyncline thins out piecemeal. The margin is also complicated by faulting The western end of the Alpine geosyncline is traceable in northern Corsica. To the east it may have continued into the northern Carpathians, where the Jurassic is, however, of the highly fossiliferous and variable type found in the northern marginal deposits of the Alps, not *schistes* lustre's. The Carpathian outcrops continue south and east and eventually swing west in the Transylvanian Alps. and the facies grades into the Mediterranean type.

Mediterranean Europe.— The Mediterranean is a survival of the Mesozoic Tethys, and the Jurassic deposits of southern Europe which collected in the Tethys have a peculiar facies, consisting mainly of nodular. hard, compact limestones, the nodules set in marl or uniting to form a solid mass with nodular structure, the *fausse brèche* or *Knollenkalk* referred to above. These may be extremely rich in ammonites, almost to the exclusion of other fossils. A special variety of the nodular limestones and marls is bright red and called *ammonitico* rosso. This occurs in three levels, in the Sinemurian, Toarcian (mainly) and Oxfordian.

The Pyrenees.— These mountains are fundamentally different in structure from the Alps and show no evidence of a Jurassic geosyncline. The rocks resemble those of the lower Rhône valley and Montagne Noire regions of southern France. They occur in two bands along the north and south flanks of the central crystalline range, offwhich they slid when the range was uplifted in the Cretaceous and Tertiary, with the formation of complicated crumples. It is uncertain whether any of the central range stood above the sea all through the Jurassic. The greatest developments of Tethyan Jurassic in the peninsula occur in the Cantabrian and Iberian mountains of northeast Spain. in the mountains of Andalusia in the south and in southern Portugal. The northwest European or Atlantic facies is thickly developed in Portugal northwest of the Tagus and in a small area in Asturias in Spain where the succession shows links nith that in Dorset on the south coast of England. Sardinia also has Bajocian sandstone with plant remains like those in the Deltaic series of Yorkshire.

Italian Peninsula and Sicily.— Essentially Tethyan Jurassic extendi down the Apennines and is strongly developed in Sicily,

Table Showing Typical Rock Successions and Subdivisions of System Into Stages for World--wide Correlation

	Stages	Southern England	Russia basin)	Northern Germany (Lower Saxony)	Southern Germany (Swabia)	Jura Mountains	Southern France (Crussol-Ardèche)	Caucasus	India (Kutch)	United States Pacific border (California)	United States Western interior (Wyoming)
Upper Jurassic	Purbeckian	Purbeck Beds limestone, shale	A Lower Ryazan Beds A Upper Volgian greensand, marl ⊖	3 2 1 "Wealden" sandstones Serpulite limestone Münder marls		A Upper Tithonian limestones Purbeck Beds limestones of Mont Salbve, etc.	A Upper Tithonian limestone (Ardèche) Middle and Lower Tithonian A limestones	Tithonian limestones A orogeny	A Umia ammonite beds green oölite A Upper Katrol shales	Knoxville formation and ⊕ A Franciscan formation Nevadan orogeny	Morrison formation (fresh water) sandstones shales
	Portlandian	A Portland Beds limestone, sands	A Lower Volgian greensand, clay	Einbeckhausen limestone					A Katrol sandstones	A slate	
	Kimeridgian	A Rimeridge Clay	A Middle and Lower Kimeridgian clays	A Gigas beds limestone A Kimeridge clays A oölite	Neuburg Beds ζ ε A Malm or White Jura 6 γ β	A Lower Tithonian limestones A limestones with coral reefs	A limestones of Crussol A marly limestones	A A marine shales	A Chari group A	A Sundance formation	
	Oxfordian	A Corallian Beds limestone, sands A Oxford Clay	A Oxfordian clays	A Heersum clays A clays	a	marls					
Middle Jurassic	Callovian	A Kellaways Beds clays A Cornbrash ⊖ limestones	A Callovian clays	A succession near Hildesheim Fullers earth	A ζ	A oolite ironstone and limestone 8	A marls and dolomite	A much volcanic activity	A Patcham limestones	A Amador group ⊕ much volcanic activity	A shales sandstones limestones
	Bathonian	A Great Oölite series limestones, etc.	sands	A Bielefeld succession	Dogger or Brown Jura ε	A oolite limestone and marls	A limestones ⊖	throughout ⊕	Kuar Bet beds		Gypsum Spring formation
	Bajocian	A Inferior Oölite limestones	Bajocian and Toarcian in Donets basin	A clay A succession near Ilanover	A γ A β a		A	A		A	A shales limestone
Lower Jura	Toarcian	A Upper Lias shales, sands		A	A	A clays and oölite ironstone	A ferruginous oölite 8	A		A Dunlap formation (western Nevada)	Nugget sandstone (nonmarine)
	Pliensbachian	A Middle Lias shales, ironstone A		A Lias	A Lias or 6 γ	A Middle and Lower Lias black marls	A	A shales and sandstones with coals ⊕		Dunlap orogeny	
	Sinemurian	A Lower Lias shales		A	A Black Jura β					A	
	Hettangian	A		A	A α	A				A Sunrise formation (western Nevada)	

Legend: A, Ammonite correlations. ⊕ Very thick deposits. ⊖ Thin but significant deposits. ζ through a, Qucnstcdt's classical subdivisions of Smabian Jurassic. ~ Major orngeny. ~ Strong folding. (N.F.H.)

where the Lower Jurassic consists of thick limestones continuous with the Triassic in the northwest of the island but of Liaslike shales in the east. Taormina is a renowned locality for the ammonites of the Domerian stage (= Upper Pliensbachian = hliddle Lias). In the northwest and west the Middle Jurassic and lower part of the Upper Jurassic are condensed and represented by a few feet of beds full of fossils. but the Upper Jurassic swells out again in the nodular Tethyan facies and passes up into similar rock of Cretaceous age.

Balkan Peninsula. — In the Balkan peninsula, especially in Greece, the nhite nodular limestones of Tethyan facies predominate and are usually poor in fossils, but locally the *ammonitico rosso* occurs, especially in the Toarcian, where it contains many rare and remarkable ammonites of the family Nildoceratidae, subfamily Bouleiceratinae, which have been studied and figured by Carl Renz. In the Dinaric ranges some interbedded igneous rocks may be Jurassic, though most are probably Triassic. In the Balkan mountains the facies are mixed and locally very rich in fossils. Another facies common to Greece and Italy, especially, consists of cherts with *Posidonia.* Dobruja in Rumania and the Villany hills in Hungary are places renonned for extremely rich ammonite faunas of the Oxfordian-Kimeridgian and Callovian, respectively. Hungary also has rich Tethyan Lower Lias faunas.

North Africa.--The Jurassic system stretches in a continuous band from the west coast of Morocco through Algeria and Tunisia, cropping out at the surface over large areas in the Middle Atlas and Tellian Atlas ranges and the high plateaus of the Shotts. The facies is mixed Tethyan and northnest European, but the Upper Jurassic leans heavily toward the Tethyan, consisting largely of big thicknesses of nodular limestones which probably accumulated in at least two geosynclines or major deep troughs. The Oxfordian contains *ammonitico rosso* in Algeria and Tunisia. In southeastern Tunisia and the adjoining western part of Libya there is a different facies. indicating overlap onto the edge of the Saharan plateau. Farther west the Saharan plateau has no Jurassic rocks. They are confined to the folded coastal region of the Atlas ranges. known as Barbary, and the boundary is faulted, the faults partly Jurassic.

East Africa. — Shallow-water Jurassic rocks underlie much of Abyssinia and Somaliland. Jubaland, the Kenya coastlands and the coastal region of Tanganyika. where at the extreme top, at Tendaguru, there are thin bone beds of Rimeridgian age containing some of the giant dinosaurs. etc.. of the Morrison formation in North America. The marine series in northeast Kenya. British Somaliland and Madagascar begins with a thin (usually red) basal Toarcian bed containing the remarkable ammonite genus *Bouleiceras*, which also occurs in Arabia, together with a peculiar fauna of brachiopods and pelecypods. This bed oversteps sandstones which are generally without fossils and may cover in different districts the time span Permian–Triassic–Middle Jurassic, or about roo ooo,ooo years. In Abyssinia the first marine transgression was later — Callovian or even Lower Kimeridgian.

Southern Asia and the Middle East. — In Egypt little Jurassic is knonn at the surface, but oil borings have shonn that it exists within the rift fault on both sides of the Gulf of Suez, and Bathonian is exposed on the west side in two places. The best surface outcrop is at Jehel Maghara, an isolated group of hills which rise out of the sand plains of northern Sinai about 50 mi. E. of Ismailia on the Suez canal. The rocks consist of a thick development of the Bajocian and Bathonian, the Upper Bajocian containing a peculiar ammonite genus, *Ermoceras*, which for many years was known from nonhete else but has since been found in Arabia and Algeria.

Arabia consists in the western part of a crystalline massif, over the extensions of which the Jurassic sea spread from the south and east. From the south it spread over the Aden protectorate and part of Yemen. The Jurassic ancestor of the Persian gulf, with similar shallow-water deposits and corals but also many ammonites, extended across all the eastern part of Arabia to beyond the centre, and the Middle Jurassic rocks crop out as a ridge, or cuesta (q v.), the Jebel Tuwaiq. At the base are sandstones with plants as in Yemen. and the first marine layer is the red bed with peculiar Toarcian ammonites, *Bouleiceras, Nejdia,* etc., as in British Somaliland. northeast Kenya and Madagascar. The chief escarpment builder there is a thick Callovian limestone with many corals but no reefs. The Oman Jurassic belongs more with that of the Zagros mountains of Iran.

In Asia Minor the Jurassic is represented only by widely separated small patches of rock chiefly of the age of the European Lower and Middle Lias, near Ankara and in the extreme northeast near Bayburt, but there is also some little-known Middle and Upper Jurassic both near Ankara and near the middle of the north coast.

The Jurassic system in the Crimea contains thick conglomerates and suggests unusual instability during deposition. A great development of the Jurassic has been proved (chiefly by geologists of the Anglo-Persian Oil company and its successors) in the Elburz and Zagros ranges. In the Elburz the Lower Jurassic consists of plant-bearing shales of enormous thickness. and a similar development extends to the Pamirs and connects nith the Angara series of central Asia. The Elburz Middle and Upper Jurassic consist of a thick limestone mass, similar to the Pamir limestone. A similar development occurs on the central Iranian plateau and extends through the mountains of western Pakistan (Baluchistan and Waziristan) to the Pamirs. *Bouleicevas* occurs again in Baluchistan.

In the Caucasus there is a tremendous development of the Jurassic, exposed on the north and south flanks of an anticlinorium, separated by a central ridge of slates which are probably Paleozoic and Triassic. In a vast development of shales are some horizons with ammonite faunas close to their equivalents in northmest Europe, except that many Phylloceratidae and Lytoceratidae are mixed with them. Notable examples are the Lover, Middle and Upper Bajocian, Lower Callovian and Upper Oxfordian. Just as striking is Lower Bathonian in the Elburz. which has a fauna typical of south England and Engelberg in the Alps, and a typical Middle Callovian fauna near Lake Urmia.

Peninsular India is a crystalline shield. which is continued under the Gangetic alluvium, but in Jurassic times the Indian ocean transgressed from the west over Kutch, leaving there an exceptionally full and fossiliferous Jurassic series from Lower Callovian to Tithonian, with wonderful ammonite faunas. Below are the Kuar Bet beds. rich in pelecypods only, but believed to be Upper Bathonian from similar occurrences in the Attock district and Madagascar.

Another example of the Kutch type of Jurassic rocks occurs in the Rajputana desert at Jaisalmer, and some of the same formations are recognizable in the Salt range. The rest of the crystalline shield of peninsular India seems not to have been transgressed by any Jurassic sea. It was formerly thought that Jurassic sediments were represented in the Gondwana series (the plant-bearing continental sandstones and shales from which Indian coal is obtained), which collected in inland drainage basins. mostly in Mesozoic times; but study by L. F. Spath of certain rather obscure ammonites which mark a temporary marine invasion in the lower part of the Upper Gondwana seems to show that the ammonites are Cretaceous and that the Jurassic is represented only by a disconformity between the Lower Gondwana with Triassic vertebrate fossils and the Upper with the Cretaceous ammonites.

Himalayas. — In Jurassic times the Tethys sea stretched from Iran and Baluchistan eastward through the Pamirs and Karakorum mountains, and through the Himalayas and southern Tibet to Yunnan in western China to connect, by a way that is still uncertain, with the Pacific ocean. which covered the Indonesian archipelago and New Guinea and Japan. In the Pamirs the succession is much like that in the Elburz, but farther east there is no indication of a Jurassic geosyncline, only of troughs upon a labile shelf within the great mobile belt out of which the highest mountains on earth later arose *(see* GEOLOGY: *Mountain Structure).* In the Spiti and Niti areas of the Himalayas. the thick black Kyoto limestone of Triassic age has yielded some Lower Jurassic fossils in its top part, and on it locally rests a condensed ironshot bed of Callovian age.

Above this are the Spiti shales (go–rjo m. thick). contain-

ing lines of nodules which may enclose well-preserved ammonites. They are largely of Kimeridgian and Tithonian ages. but the Lower Cretaceous is also represented. and at the base in some places Upper Oxfordian also. No sections have yet yielded a reliable stratigraphical succession. so that the dating of the wealth of remarkable fossils is still mainly conjectural. In the Kiogars the mountain summits consist of white limestone. which is certainly in part and probably all of Tithonian age, resting on and partly incorporated with a sheet of igneous rocks which have all been thrust an unknown distance southwestward out of Tibet. At a lower level occur exotic blocks of various ages. in part Paleozoic, but including red cephalopod limestone of the same age. appearance an'd date as the Adneth Lower Liassic limestone of the eastern Alps. All these thrust Jurassic rocks are of different facies (known as Tibetan) from the Jurassics of the unshifted foreland and suggest that a geosyncline may have existed farther north in Tibet. (*See* also HIMALAYA.j

Northern Asia.—In northern Asia the Arctic ocean with its temperate Boreal fauna overspread southward for long distances over the continent. east of the Urals up the valley of the Oh and up the Lena almost to the heart of the continent. The transgression took place at different times. In the Lena valley and the basin of its tributary the Vilyui river, there is marine Lower Bajocian, and in the valley of the Anabar river farther west of the mouth of the Lena. there is marine Oxfordian and Domerian. the latter with *Amaltheus* and *Phylloceras*. The northeastern peninsula of Asia east of and including the Verkhoyansk arc of mountains was largely submerged in the Jurassic period and received thick deposits, but little is known of them. Probably the Arctic ocean communicated this way with the Pacific near northern Japan.

Eastern Asia.—Japan has a widespread and representative series of marine shale and sandstones and also similar rocks of continental type. The interfingering of the two types affords opportunities for dating. in terms of the universal marine classification. some of the extensive continental formations of the Asiatic mainland, such as the Angara series of central Asia and the coal measures of China.

A representative series of Jurassic ammonites has been collected from Indonesia and the Philippine Islands. The Moluccas are especially rich, but clear sections are lacking and no stratigraphy has been established. In the Moluccas the Cpper Oxfordian family Mayaitidae is common. its genera known elsewhere in Niti, Kutch and Kenya coastlands.

New Guinea, New Caledonia and New Zealand are believed to be on a Jurassic geosyncline (the "3Ns arc") marginal to the continental mass of eastern Australia. The majority of Jurassic stages (except Liassic) are represented by ammonites brought down the Fly, Sepik, Strickland and other rivers as pebbles from still unknown outcrops flanking the Central range. and from around Geelvink bay in the northwest. The most fully represented stage is that of the Spiti shales facies. Some of the stages of the Lias are present on the nest side of New Caledonia. In New Zealand the representation is much fuller, at exposures in both islands.

Australia.—Australia was mainly continental and in the centre and east has extensive lake deposits with plant remains and evidence of some volcanicity. On the west coast there is, above lake deposits. a thin but richly fossiliferous marine Middle Bajocian limestone, and some marine Cpper Jurassic is known in the northwest basin and Dampier Land.

North America.—The only marine Jurassic on the east side of the American continents is in east Greenland. There are also deposits on the arctic slope of northwest Canada and north Alaska and at least two of the Canadian arctic islands. The main North American outcrop then changes to the west coastal region. beginning in south Alaska and continuing in a broad band through the Canadian Rockies and the Pacific coastal mountains of the United States. These deposits are geosynclinal and largely igneous and testify to the greatest tectonic, or faulting and folding, and volcanic activity known in Jurassic times—the Nevadan orogeny at the end of the period and several lesser forerunners earlier in the Jurassic. The Cordilleran geosyncline extended southward through Mexico and Central America. but in eastern Mexico and the Gulf coastal plain of the southern United States the deposits belong to a different province, the ancestral Gulf of Mexico. In the western interior of the United States are widespread stable shelf deposits. especially of the Middle Jurassic (Bajocian and Callovian), richly fossiliferous. The principal outcrops are in Wyoming and the Black hills of Dakota, and at least the Callovian extends under the Great Plains, having been proved in borings in Saskatchewan. The highest Jurassic in the western interior province is the Morrison formation, marls, shales and clays containing a fresh-water and terrestrial fauna—hlollusca and giant dinosaurs. The age is now believed to be Kimeridgian. despite the resemblance of some of its fossils, especially some small mammals, to the Purbeckian. The nearest comparison is with the Tendaguru beds in Tanganyika. In Utah and Colorado the Lower Jurassic is developed as thick sandstones.

South America.—Beginning in the isle of Trinidad the Andes were a geosyncline in the Jurassic. enclosed between the Brazilian shield on the east and a line of volcanic islands or shallows along the present Pacific coast. The geosynclinal deposits pass westward into and interfinger with great thicknesses of lavas and volcanic breccias. The Tithonian is well developed in Argentina, as also is the Bajocian.

Cuba has thick Tithonian passing up into Lower Cretaceous and overlying thin Upper Oxfordian. rich in well-preserved ammonites.

Antarctica.—Some marine Upper Jurassic are in Graham Land and thick plant beds in the adjacent islands, but the geology of the mainland is too little known to say what systems are there.

See **bibliographies arranged regionally in W. J.** Arkell, **Jurassic Geology** *of the World* (1956). (W. J. A.)

JURAT, a name given to the sworn holders of certain offices. Under the *ancien régime* in France, in several towns of the southwest such as Rochelle and Bordeaux: the *jurats* were members of the municipal body.

The title was also borne by officials corresponding to aldermen in the Cinque Ports. but was later chiefly used as a title of office in the Channel Islands. Two bodies were established, consisting each of 12 jurats, for Jersey and the bailiwick of Guernsey respectively. They formed, with the bailiff as presiding judge, the royal court of justice, and were made a constituent part of the legislative bodies.

In English law the word jurat (*juratum*) is applied to that part of an affidavit which contains the names of the parties swearing the affidavit and the person before whom it was sworn, the date, place and other necessary particulars.

JURISDICTION, in general, the exercise of lawful authority, especially by a court or a judge and so the extent or limits within which such authority is exercisable. It has primarily a territorial signification, but where its powers are otherwise limited, it is rather a matter of competence. and in systems of law based on codes this distinction is more clearly evident than it is in English and C.S. law. Thus, a county court in English law has a fixed territorial jurisdiction, but within that jurisdiction is not competent to try any actions but those specifically allotted to it by statute (civil actions). Again, in the United States county-wide courts' jurisdiction is also limited, though it varies widely in the various states. (Some county courts exercise criminal as well as civil jurisdiction and some even administrative functions.)

In international law jurisdiction has a wider meaning, namely, the rights exercisable by a state within the bounds of its sovereignty. (See ARBITRATION, INTERNATIONAL; CONFLICT OF LAWS; and INTERNATIONAL LAW, PUBLIC.)

In many countries. for example, France, jurisdiction is founded also on nationality; so the civil code of the French. commonly called Code *Napoléon,* governs Frenchmen everywhere. Also many states claim criminal jurisdiction over their nationals everywhere. In Great Britain this is confined to a few major crimes.

See also APPEAL; AMERICAN LAW; COURT; ENGLISH LAW: EQUITY, etc.

JURISDICTION, SUMMARY: see SUMMARY JURISDICTION.

JURISDICTION IN PRIZE: see PRIZE COURTS AND PRIZE LAW.

JURISPRUDENCE is the name given to those studies, researches and speculations which aim primarily at answering the plain man's question: What is Law? But because the law is a thing of so many aspects, those inquirers who keep that object foremost do not necessarily come quickest at the answer. Indeed the more promising the method pursued, the farther the goal recedes. Thus at the head of English jurisprudence stands admittedly Sir Henry Maine. He more than others kept his purpose vividly in mind, yet when at last he came to lay aside his pen whole sciences had been generated, and all their paths diverged. Should however the inquirer turn first to what the bookseller's catalogue knows as jurisprudence his expectations will again be defeated. He will certainly come upon a definition, clear, logical and precise, but plain man or philosopher, it will have no meaning for him until he has himself become a master of the law. This perhaps comes nearer to the kind of study the Roman jurists denoted by the name, *"Juris prudentia est divinarum atque humanarum rerum notitia, iusti atque iniusti scientia";* though this promise of connecting the lawyer's daily task with the true inwardness of all things human and divine was hardly fulfilled. The Roman jurists perhaps, marvellous science though they had, lacked the philosophic mind. Whatever the explanation, their work was done when they had given to the practical rules they employed a formal perfection; a perfection, be it added, that is still the envy of civil law and common law alike. Such *elegantia* was for them the last word in jurisprudence. Between these greatly opposing conceptions lie a number of methods which have all in one way or another enriched the study of the subject. There is pure philosophy on the one hand, political theory on the other. There is the study of comparative institutions, the history of moral ideas. These and more border upon or overlap the jurist's field. But jurisprudence has an individuality of its own. The methods of social theory are not those of juristic speculation. There is more than political wisdom enshrined in the thought of Burke, but he does not speak the language of Blackstone. Nor does Savigny speak quite with the voice of Kant. And if such has been the case in the past, how much more is it true to-day. The interrelation of the relevant sciences is now so intricate that no general statement can hope to give an adequate conception of the subject as a whole. Nor will any such statement be even attempted here. It is as a guide to the present position, an indication of the trend of interest, a suggestion of the more hopeful lines of inquiry that this sketch had best be regarded.

HISTORICAL

Plato and **Aristotle.**—Speculation as to the meaning of law rightly dates from the Greeks. Their answers to the question: "What is Law?" thrust upon them by endless political misfortunes, will all be found discussed in the writings of Plato and Aristotle. Mention can only be made of one conception of Aristotle's, of law as a Rule, as an embodiment of Reason whether in the individual or the community: "mind unaffected by impulse" which harmonizes all conflicting elements and secures the well-being of the whole. It would be a mistake to assume that the interest of Greek speculation is now purely historical. In an age of acute specialization there would be far less proportion or balance, were it not for the constant testing of theories in the light of what Plato suggested or Aristotle thought. For the jurist's occasional reading nothing could be more helpful. (The following passages may perhaps be cited. Plato, *Gorgias* 482e–484c, 515–517; *Protagoras; Phaedrus* 260–262c, 273, 277 *seq; Republic* esp. bks. I.–IV. and X., 619b and c; Aristotle, *Ethics* V. esp. 1129b, 14-end; 1131a 25; caps. 6–8 1134–36; *Politics* I. caps. 2 and 3; III. and esp. cap. 16-end; *cf.* E. Barker, *Political Theory of Plato & Aristotle.*)

Mediaeval. — To the mediaeval mind law was the law of God as revealed in the Bible, or rather, the Church. This law was immutable. It was also not a little remote from the workaday world. Princes and rulers had but a limited capacity of interfering with it. Everyday affairs however call for regulation; this therefore had to be effected by means of ordinances. Hence positive law. Such was the great contribution of mediaeval thought to jurisprudence (*cf.* Pollard, *Evolution of Parliament,* cap. xi. and John Dickinson's edition of John of Salisbury). The static character of the law in the minds of the great common lawyers of the 17th century may in part be traced to it; but on the other hand the law-abidingness inherent in English institutions may owe much to it. Again when one hears a modern French lawyer say that his Government has the power but not the right, say, to confiscate the citizen's property without compensatioh, he is appealing probably to a distinction of this mediaeval origin.

The 17th century was the age of the Law of Nature, but this is still a living influence in jurisprudence and as such will be treated in a suitable context.

Modern. — The 19th century is memorable not so much for its direct contributions to jurisprudence, considerable though these were, as for the complete revolution effected in the method of the moral sciences. The leading idea, the explanatory theory was now to come after, not before the evidence; and every phase of human life came to be studied in the same realistic fashion as the natural sciences and in accordance with similar, impersonal standards. With this change of outlook the bounds of knowledge began to extend beyond all expectation. History, which began the century as a complete record of the race, ended it as a mere episode in the light of the antiquity of man as revealed by archaeology and palaeontology. It is not what the Renaissance handed on from the ancients that has made us what we are, but the cave-designers of Altamira or conceivably the tool-workers of Foxhall. But beyond thus carrying our knowledge back into the remote past and filling us with a sense of foreboding as to what may still lurk within our minds, fresh fields were rapidly dibclosed on all sides, for instance, the lives of the simpler peoples, ancient myths and dreams. *The Golden Bough* was an event of the century. Then came psychology, experimental, social and analytical. Thus it comes about that the student to-day is faced in the social sciences with a body of ordered knowledge in relation to which any theory of his must needs be formulated. And the jurist, mindful of Maitland's scorn for those "who elegantly stroll along the high priori road," would be the last to wish it otherwise.

Yet another movement has affected the jurist. This has made him more of a scientist by removing the one time temptation of jurisprudence as an "art." In the 17th century Coke was a leader of the parliamentary party, and provided his followers with their political ideals and their party slogans. In a subsequent age, such was the excellence of the *Commentaries* that Blackstone moulded the social thought of his countrymen for the better part of a century (and not always to their good). In Continental Europe apparently the jurist has always been prompter or critic at the political *première.* In the 19th century all this was altered. The flame of continental nationalism, the spirit of economic discontent could never have emerged from the φροντιστήρια ("chop shops") frequented by Austin, and though Bentham must be credited with many a useful social change, he belonged to an age that was past. The new democratic world found its own ideals; cheaper books and newspapers, intensified electioneering, the growth of clubs and societies, all helped to elbow out the down-at-heels jurist. At the close of the century the school that stood closest to the Benthamite tradition found nothing so alien as the spirit of English law. All this was pure gain to the jurist. To-day he has no political affinities and few social responsibilities. He has the freedom of all the sciences and can pursue truth whithersoever it may lead.

The best historical introduction is to be found in Roscoe Pound's *Jurisprudence,* in H. *E.* Barnes' *History and Prospects of the Social Sciences* (1925), and *Interpretations of Legal History* (1923).

THE MEANING OF LAW

The Problems. — The political sciences put two major problems to the jurist. The one is special and in the main presented by the work of the field anthropologist. "Have the simpler peoples a rule of law?" In the past society has been conceived much on Aristotelian lines. First we find members of a clan taking to a settled mode of life, then for mutual protection neighbouring clans draw together into villages and finally out of **a** closer

union of villages there arises the true political unit, the "city" aiming at the well-being of each and all. *(See* further 34 *Monist* [1924], p. 15–62.) In these post-war days clans have been rushed into statehood if not into actual membership of the League of Nations regardless of the Aristotelian logic. The policy of this is neither here nor there, but the jurist can hardly look upon such peoples as without the law. If this position be accepted, how should we differentiate between these peoples and those others no less backward who continue to live as before? The customs of such a folk may not exhibit any regularity intelligible to us, yet taboos are observed and their behaviour implies order of a kind. They are far removed from the incessant turbulence which Hobbes imagined of people living before the reign of law. The problem here presented is a real one. The relation of taboo to law is an inviting subject of research, but here it must suffice to emphasize the special difficulty of the jurist.

The second problem is of a different order. In social theory law is used in a wider sense than by the practitioner. All social regulatives go to the making of the comprehensive idea to which social science gives the name of law. The jurist finds no difficulty in according the title to the selfsame thing. When Pindar sings of law that is king of all, he understands; when the national anthem swells to the refrain *le Roi, la Loi, la Liberté,* the jurist recognizes that law from observation of the courts and the working of the constitution. His difficulty arises when he tries to understand the relation between law in the practitioner's sense and this larger social meaning. Social science for its part has realized the difficulty; the interrelation of law and custom, or law and morality, has long been pondered and skilfully dealt with (*see* L. T. Hobhouse's *Morals in Evolution).* It is peculiarly a sociological problem, yet social science calls for the jurist's aid.

Apart from extraneous considerations the jurist seeks a significant characteristic to distinguish the two meanings. No merely formal distinction can satisfy. "In tota jurisprudentia," Winkler profoundly observes, "nihil est quod minus legaliter tractari possit quam ipsa principia." The jurist is also precluded from resorting to an *a priori* test. He is an observer of a particular group of social phenomena and he must explain them. Should he light upon emerging values so much the better. Primarily however he is an observer. Many consequences flow from this. For one thing he is concerned with the law as it is administered in the courts, not merely the rules found in practice books. Among the merits of Dicey's studies in the law not the least was this. He never for a moment forgot that the law is something more than the sum of the practitioner's rules. He had the jury constantly in mind, even in describing the rules themselves. Now what happens when a jury comes to the decision of a particular case, an issue of murder, a breach of promise action? Is their verdict an expression of twelve men's "reason"; do they merely apply a general rule to a particular instance? Psychologists look rather to all that animates men acting singly and in a group. Many random influences they say are there; group loyalties and social sentiments, vocational habits of mind and the shock of ideas, repressions and all the factors of the unconscious life called into being by the staging of the trial. The psychologist can be left to study this. What concerns the jurist is that the jury's verdict, however arrived at, is an expression of the law in the wider social sense. In so far as it is arrived at by reference to a rule or standard, that rule or standard is the law as the layman understands it. The principle involved in the jury's decision is often that of the lawyer's practice-book; sometimes it is a qualification of it (as where a jury declares to be manslaughter what counsel must advise is murder); or a complete reversal (as when the jury vindicates "the unwritten law"). In Continental Europe, where the jury is less in evidence, the same larger influences make themselves felt. The law then is essentially an elastic conception.

Definition. — Definition then by differentiation can hardly be the most appropriate form; a centre and circumference formula will prove more suitable. It is proposed to define law for the jurist as *the sum* of *the influences that determine decisions in courts* of *justice.* This will *be* found to satisfy the main conditions expected of a working definition.

(1) The definition holds of all rules, of every kind and form of law the jurist is called upon to consider. The term Influence is preferable to Rule, which Salmond employs, because it avoids the strong intellectualist bias inseparable from Rule. Not every ingredient in a judicial decision is intellectual. "Only the trivial elements of the process are controlled by the abstract laws of logic." It is a more appropriate term for many of the factors contributing to the decision. *(See* further 31 *H.L.R.* 1060–62.) There is no legitimate consideration which enters into a judgment which is not covered by the definition.

(2) It makes no impossible demands upon social theory as to the way law is to be there defined. Nor does it prejudice any of the contending theories as to the metaphysical, moral or other basis of law.

(3) It enables the anthropologist's problem to be answered without recourse to artificial distinctions. The ordinary regulatives of life in a savage community may be baffling; Totem and Taboo for example are two of the problems of the hour in anthropology and psychology alike. But the jurist, however, may see the rudiments of justice wherever something in the nature of a trial takes place. Trial by ordeal is practically universal among the simpler peoples. Matters for the ordeal then are matters of law. Trial by ordeal survived the beginnings of the common law; the law of the king's courts was expounded by the aid of the ordeal until the jury took its place. Apparently a similar process occurred in the case of the civil law. *Legis actio* replaced the ordeal, only this was before the beginning of the historical period. Historically then there is warrant for the definition covering the "law" of the simpler peoples.

(4) It emphasizes the independent character of law in social development. Political history, economic development, cultural progress have each a different story to tell. These factors may have changed *pari passu* and incontestably they have all reacted on the law. But the law has a history of its own and there is only a limited correspondence between the stages of legal development and those of any of the other social factors.

(5) It is in keeping with a widespread movement in jurisprudence for the development of judge-made law, for enlarging the scope of the judge's functions and liberalizing the influences which condition his work. This is much in evidence in the United States.

The following (among other) authorities should be consulted: J. W. Salmond, *Jurisprudence* (1908) and the authors mentioned in the bibliography; E. Picard, ***Le Droit Pur*** (1899); ***C.*** del Vecchio, ***Z Presupposti*** (1905); ***R.*** Pound, *Opera Omnia* (*Outlines of Jurisprudence,* 1914, has a useful bibliography); F. Sornlo, *Juristische grundlehre* (Leipzig, 1917); H. Goitein, ***Primitive Ordeal and Modern Law*** (1924).

SOVEREIGNTY

The most prolific if not the principal rule-making organization in the modern world is the State, but as it happens the theory of the State is the peculiar concern of the political thinker. For forms of government let philosophers contend. When the jurist steps in the whim of Caligula may be as much law as an act of parliament. The supreme need of the lawyer is to be assured of the authenticity of his rules. This topic is traditionally disposed of under the heading of Sovereignty and little need have been said about it but for the stir it caused some hundred years ago. The law had become petrified and reform all round was long overdue. The reformer was found in Jeremy Bentham, a man of extraordinary parts. No wonder he gained disciples and Austin offered him a Boswell's devotion. Now Austin had conceived his idea of law in the army, so at least Mrs. Austin's biography would indicate. Law was a command, the command of the sovereign. For centuries legal sovereignty (*i.e.,* the final authentication of rules to be applied in the English courts) had lain with king, lords and commons. That is still the theory of English law. Now if anything the sovereign chooses to command is law, popular legislation can usher in the Benthamite era. It did; and Austin was all for furthering the good work. He analysed the theory of English law and found the real sovereign to be king, lords and— electors. A little Procrustean perhaps but next morning the

political sovereign (*i.e.* the community [electors] politically organised) arose from his bed as the legal sovereign. No wonder the Germans called Austin 'tendentious.'

The following are among the more important recent discussions of the subject. L. Duguit (Bordeaux) *Law in the Modern State* (1913, transl. F. & H. Laski 1921); H. L. R. vol. XXXI pp. 51–185, F. Gény, Rev. Trim. de Droit Civil no. 4 p. 779–829; H. Laski (Oxford) *Studies in the Problem of Sovereignty* (1917), *Authority in the Modern State* (1919), *A Grammar of Politics* (1925); *H.* Kelsen (Vienna), *Der Soziologische und der juristische Staatsbegriff* (1922), *The Conception of the State of Social Psychology,* in the *Internat. Jl. of Psycho-Analysis* vol. V, *p.* 1 (1924), and *Thdorie Générale de l'état,* in *Revue du Droit Public,* vol. XLIII no. 4, pp. 561–646 (1926); J. Krabbe (Leiden) *The Modern Idea of the State* (The Hague, 1915 transl. G. H. Sabine and W. J. Shepard 1922); F. Somló (Kolozsvár) *Juristische Grundlehre* pp. 251–329; *C.* Schmitt (Bonn), *Soziologie des Souveränitätsbegriffes in Erinnerungsgabe für Max Weber* (edit. *M.* Palyi 1923); and a most valuable essay by John Dickinson (Princeton, U.S.A.) *A Working Theory of Sovereignty* in *Pol. Sc.* Qu. vol. XLII pp. 524–548 (1927) and vol. XLIII pp. 32-63 (1928).

THELEGALORDER

In recent jurisprudence the question is constantly to the fore, What is the function or end of law? The immediate object of the law, as anyone can see, is the solution of social conflicts. But not every conflict. Where then is the line to be drawn? According to Roscoe Pound, the function of the law is so to balance interest as to secure the utmost of each while sacrificing in the general interest the least of any. But the English courts expect the parties to have delimited their interests for themselves, with or without previous governmental aid. With first hand knowledge of the main factors affecting them, the parties stake out their respective claims, and, with reference to the law of the land, formulate the scheme that is to govern their relations. A price fixing agreement is a common modern example. In the absence of such a formula and when the ordinary law is silent, the court may have to find a rule of its own. On the other hand, where social interests have to be weighed (*e.g.,* the validity of contracts in restraint of trade), the court is soon back at its old task of meting out even-handed justice between man and man. The fact is that Roscoe Pound's theory is more truly a theory of legislation and it is in that direction that its practical bearings are so important. All his instances of what is actually going on in legal systems are examples of legislative change. And as a rule a theory of legislation will not serve as a theory of adjudication ("for the wisdom of a law maker is one thing and of a lawyer another"). It may readily be conceded that the policeman on point duty has diminished enormously the number of accidents, but he is hardly the proper person to decide which of two insurance companies is to pay for a collision. And conversely, Dr. Johnson had some original notions as to the proper functions of the lord chancellor, but point duty was not one of them. Of more importance perhaps is it to consider the implication that it is the business of the jurist to ascertain and formulate the "jural postulates" of the period. He is to ascertain and weigh the various claims that emerge from among contending social forces and decide how they are to receive recognition by the community. This task is indeed formidable. One may well hope with O. W. Holmes that "it is finally for science to determine, so far as it can, the relative worth of our different social ends" (Collected Papers, p. 242) and yet doubt whether jurisprudence is that science. Let the judge, the text-writer, the great lawyer be as "creative" as a kind Providence may allow, who is he to act the arbiter of the values of the modem world? The theory may well brave ridicule, indeed for its compelling plea for social enlightenment among lawyers it will outlast many a fashion; still the purely descriptive method of Dicey's Law and Opinion in the *19th* Century seems a much safer guide. There one may see how social conflicts work themselves out and leave a deposit on the law, even though the reader be left in the end with a more chastened view of the jurist's functions. In the meantime the original inquiry has been lost sight of. What after all is the answer to the question first propounded? Hitherto no satisfactory answer has been forthcoming. In the future it may be different, at least if studies like John Dickinson's Administrative *Justice* and *the* Supremacy of Law are any guide. Ultimately the question seems one for practical judgment. Should workmen's compensation be for the Ministry of Health, or for the county courts? Should the latest frontier incident in the Balkans be settled by the League Council or the Permanent Court? Let the *φρόνιμος* decide.

ORIGINS AND PSYCHOLOGICAL BASIS OF LAW

Maine found the origins of law in Themistes, "judgments," from which, he thought, Themis "law," was derived by abstraction. Except that, as we now think, it was the other way round, Themistes were derived from Themis, everything has tended to confirm what can only be described as an intuition of genius. Themis was one with Ge, Mother Earth, a goddess of no merely local or Hellenic significance. Sir Arthur Evans has shown that the Great Mother, whose worship is so richly illustrated in the Minoan cultures, was indeed a universal figure throughout the Neolithic world. Possibly we may go even further. These figures seem strangely to recall the celebrated goddess of Willendorf and the other Aurignacian figures hardly less famous. This of course is but conjecture and it is safer to return to the soil of Greece. It is not without significance that Pythagoras could identify Themis with a cosmic figure, Themis in the world above, Dike (justice) in the world below, Nomos (law) in the world of men. This may be no more than one of the thousand religious fancies of the Greeks. Folklore teaches otherwise. By no means confined to the dream world of ancient Greece is the figure of the Mother in pursuit, never to relent till her fury has exacted her "eye for an eye, a tooth for a tooth." Equally does every mythology know the Mother who releases to new life. On every hand we find ceremonies of rebirth and the Ordeal itself seems to have been just such a rite. Can we doubt then that in this elemental figure we see the primal face of justice and that in man's two-fold attitude towards her is to be found the roots of his need for law? True the nature of the need has had to disguise itself, it has been rationalised away. Aristotle did not deign to cast a glance behind but hastened to identify reason with the law. Reason is so to order one's life that no offence be ever occasioned (honeste vivere, *alterum* non laedere); but if this cannot always be, then readily to tender or accept amends. But it is hardly in this common sense, wide-eyed world that the law flourishes. Only in the twilight of the inner mind can the grievance be nursed to fruition or the black need of revenge swell to a passion for "justice." Two thousand years of reason have failed to light up fully these dark recesses of the mind. Somewhere deep down within us there still lurks a vestige of man's primal need and the phantom figure of the Great Mother must pass to punish or assuage. If it is but rarely that we realise this, it is due to a want of understanding rather than of opportunity. Most days at any rate in the dock of an Assize town will be found some dumb sentient creature wondering why the law whose lash he has so often felt has failed to smooth out the muddle of his life. Nor are traces wholly wanting in the demeanour of those who seek redress in the civil courts. "When I think of the law" writes one of the most distinguished of living judges, "as we know her in the court house and the market, she seems to me a woman sitting by the wayside, beneath whose overshadowing hood every man shall see the countenance of his deserts or needs. The timid and overborne gain heart from her protecting smile. Fair combatants manfully standing to their rights, see her keeping the lists with the stern and discriminating eye of even justice. The wretch who has defied her most sacred commands and has thought to creep through ways where she was not, finds that his path ends with her and beholds beneath her hood the inexorable face of death." (O. W. Holmes, Collected *Legal* Papers p. 27.)

For a criticism of the psychology here relied on see J. Rickman, *International Journal of Psycho-Analysis* vol. vi (1925) p. 92 and *British Journal of Medical Psychology* vol. vii (1927) p. 115.

THE LAW OF NATURE

Theories of the law of nature have varied, but they conform in the main to one or other of two types. On the one hand there is the idea which embodies the reaction against the conventions and artificiality of social life. On the other, the scientific ideal in

accordance with which the development of the law may be regulated. Of the former type was the law Pindar extolled, the law of the strong right arm with Hercules for hero. This was in essence the conception of Hobbes. Rousseau's name on the other hand has always been linked with the Romantics who, equally resenting the "restraints imposed by the weak and the rabble," sigh for the Golden Age. The two types are subtly interlinked, for this conception also flourished at the time when the Roman jurists were perfecting the scientific conception, their most original contribution to the world's stock of moral ideas. These jurists generalized their own *jus gentium* and sought in the fundamental features of similar or universal legal institutions suggestions for the simplification of their own rules and an ideal towards which they might converge. Under the influence of this movement distinctions based on privilege fell away one by one, Quirites and plebeians, Romans and Latins, citizens and colonials and many another, till by the light of the law of nature a man was "a man for a' that" and *civis Romanus* was his boast. This scientific conception has played at all times, the mediaeval period included, a very great role in the development of law; and at no time, perhaps, more significantly than in the 17th and 18th centuries when it gave rise to the modern law of nations. This is not the place to estimate the debt the world owes to Grotius, but the beginnings of international law must always be associated with his name. The idea of the law of nature itself is too vast for adequate treatment here. The reader will find an excellent approach to the subject in Pollock's *Essays in the Law*. Two current phases however are of more than passing interest.

In England, the classic home of justice through juries and legislation by laymen, it is befitting to turn first to a popular movement, which finds expression simply as an impatience with the law. Law is no longer the background of life. Life is something bigger than the law. To suggest that well-being or happiness whether of the individual or society is to be sought in such a direction is to invite polite ridicule. This derisory note, by no means always so light hearted, is well caught in a widely fashionable anthology, "The law may be likened to a whimsical lady. It is an advantage to have a knowledge of her character but her embraces are to be avoided" *(The Week End Book* 16th Imp. 1926, p. 318). Allowing for the graver atmosphere of the House of Commons, we have Sir J. Simon saying: "I am not spending my time in discussing some miserable legal technicality . . . I know . . . that I have been talking law but I am the last person in this House to suppose that law is the whole of life. I have never thought so. . . . There are considerations involved in this whole story which are vastly more important than any merely legal proposition . . . apart from the legal question there is a social question, an industrial question and a human question" (Sir J. Simon on *The General Strike,* 1926, p. 15, 26). No less significant is the feeling that finds expression on the stage. *St. Joan* is surely indicative of its age. It is hard to say whether the play or its popularity is the more remarkable phenomenon. There is no more faithful representation of a trial in the whole of literature, and the audience may be forgiven for believing that they have had revealed to them the last secrets of justice. It may be remembered that in the epilogue the president of the court is brought on to make his avowal as well. This is what he says: "The judges in the blindness and bondage of the law praise thee, for thou hast vindicated the freedom and the vision of the living soul." If this is not of the quintessence of the law of nature English political thought since Wyclif is wholly without meaning.

The other conception of the law of nature also has its modern counterpart. In the words of a notable American judge, one of the great needs of the law to-day is "a philosophy that will mediate between the conflicting claims of stability and progress and supply a principle of growth" (Cardozo J., 37 H.L.R., p. 279). To meet this need a great body of European speculation and controversy has come into being. There is the work of Saleilles, with which for its lucidity and good sense the revival in France is worthily associated. For Saleilles natural law finally spells the comparative method *(cf.* "École Historique et Droit Naturel," 10 *Rev. Trim. de Droit Civil,* i. [1902] p. 80). Then there is Stammler, a name to conjure with abroad. He dissociates himself from traditional *Naturrecht,* though his peculiar cast of mind sets him in the right line of that tradition. When is what purports to be law really law? When can we be certain that what is law is also just? Every jurist must face problems such as these. For Stammler they presented themselves as essentially theoretical questions. A formal criterion of legal validity, characterized by unity and universality was at once his need and his aim. "Our purpose is to find a universally valid formal method by means of which the necessarily changing material of empirically conditioned legal rules may be so worked out, judged and determined that it shall have the quality of objective justice" *(Theory of Justice,* p. 89). Hence the slogan of his school, "natural law with a variable content." Impressive though this may be, one is apt to turn in the end to Oliver Wendell Holmes: "Natural Law" *(Collected Legal Papers,* p. 310).

As law involves a reference to uniformities of human conduct it is tempting to see some connection between this law (and a fortiori the law of nature) and law in the scientist's sense (especially in its more abstract forms). And at no time more so than in the 19th century when ideas borrowed from scientific thinking played so large a part in popular morality. Natural law came to reinforce the authority of social law, behind the social order lay the world order. It was only a step to identifying the two (as in H. H. Bancroft's *Popular Tribunals* [San Francisco 1887] I p. 3—34, a fine "period piece"); B. J. Gilman's *Logical Study of Law* (scientists' use) 34 Mind No. 135 will serve as a sufficient corrective, or even Croce's pithballs *(Philosophy of the Practical* [Ainslie] p. 481 ff.) for a class-room test. MacIver's *Community* is the usual reference for the systematic identification. J. E. G. de Montmorency's *Natural History of Law* presents a more suggestive thesis, but it is best read along with Morris R. Cohen's *The Social Sciences and the Natural Sciences* (in Ogburn and Goldenweisser's *The Social Sciences,* 1927) even though the logic there is perhaps a shade too rigorous and less negative comparisons might be warranted. There are notable contributions to method by recent German writers. *Cf. e.g.* Emil Lask, *Rechtsphilosophie in the Festschrift fur Kuno Fischer;* English (Briinn) *Grundlagen des wirtschaftlichen Denkens;* L. Nelson, *System der philosophischen Rechtslehre;* S. Marck, *Substanz und Funktionsbegriff in der Rechtsphilosophie;* M. Solomon, *Grundlegung zur Rechtsphilosophie.* For the views of F. Kaufmann, C. A. Emge, J. Kraft and others see the *Archiv fur Rechtsphilosophie.*

THE SCOPE OF JURISPRUDENCE

The wide range of topics with which jurisprudence concerns itself will be suggested by the number of matters to which no more than a passing reference can here be made quite as much as by those already dealt with. Of Liberty (F. W. Maitland, *Collected Papers* vol. I p. 1–120); A. Levi, *Contributi* (1914) [s. 35] and of Persons, of Property (*e.g.* Joiion des Langrais, La Saisine, 1925) and of Crime a mere mention alone is possible. And so of Rights, cardinal in jurisprudence and political theory alike. For the rest the reader must content himself with the following bibliography.

BIBLIOGRAPHY.—Besides the works already mentioned see F. Gény, *Méthode d'Interpretation, Science et Technique* (1913); *L'Oeuvre juridique de R. Saleilles* (various writers, 1914); J. Charmont *La Renaissance du Droit naturel* (1909); P. de Tourtoulon, *Philosophy in the Development of Law* (1922), G. Davy, *Le Droit* (1922); G. Renard, *Le Droit* (3 vols. 1925–27), E. Ehrlich *Soziologie des Rechts* (1913); 36 H. L. R. p. 130–145; H. V. Kantorowitz (Gnaeus Flavius) *Lehre vom Richtigen Recht* (1909); A. Merkl, *Die Lehre von der Rechtskraft* (1923); E. Kaufmann, *Kritik des neukantischen Rechtsphilosophie* (1921); *Festgabe fur R. Stammler,* (edit. E. Tatarin-Tarnheyden (1926); W. Haensel, *Kants Lehre vom Widerstandsrecht* (1926) the footnotes to which will serve as an admirable bibliography of modern German jurisprudence. The following articles of Morris R. Cohen, *Int. Jl. of Ethics* vol. XXIV (1914), p. 88, XXV (1915), p. 469, XXVI (1916), p. 347, 29 H. L. R. p. 622, *Philosophical Review* vol. XXV (1916), 761, *Journal of Philosophy* (1925), p. 141; B. N. Cardozo, *The Nature of the Judicial Process* (1921); *The Growth of the Law* (1924); L. B. Register, *Science of Legal Method* (1921); J. B. Ames, *Lectures on Legal History* (1913); W. N. Hohfeld, *Fundamental Legal Conceptions* (edit. W. W. Cook 1920).

The following periodicals should be referred to for their wealth of

material, *Harvard Law Review (H. L. R.)*, *International Journal of Ethics* (Int. Jl. Ethics) *Political Science Quarterly* (Pol. Sc. Qu.), *L'Année Sociologique, Revue de Metaphysique et de Morale, Revue générale du Droit, Logos* (Tiibingen), *Archiv fur Rechtsphilosophie* and the *Zeitschrift* fur *vergleichende Rechtswissenschaft.*

The following bibliographies are useful, *Bibliographie générale des Sciences juridiques* etc. de 1800 à 1925–6 (Grandin, Recueil Sirey, Paris); *Index to Legal Periodicals* (N.Y. annually *in* parts) *The Psychological Index* (Princeton, N.J. annually), *The Readers' Guide to Periodical Literature* (No. 7 for the more popular articles) *International Index to Periodicals (N.Y.).* (H. GOT.)

JURISPRUDENCE, COMPARATIVE. The comparative study of law may be treated in two different ways: it may be directed to a comparison of existing systems of legislation and law, with a view to tracing analogies and contrasts in the treatment of practical problems and taking note of expedients and of possible solutions; or it may aim at discovering the principles regulating the development of legal systems, with a view to explain the origin of institutions and to study the conditions of their life. In the first sense, comparative jurisprudence resolves itself into a study of home and foreign law. In the second, comparative jurisprudence is one of the aspects of so-called sociology, being the study of social evolution in the special domain of law. From this point of view it is, in substance, immaterial whether the legal phenomena subjected to investigation are ancient or modern, are drawn from civilized or from primitive communities. The fact that they are being observed and explained as features of social evolution characterizes the inquiry and forms the distinctive attribute separating these studies from kindred subjects. It is only natural, however, that early periods and primitive conditions rather than recent developments should have attracted investigators in this field. The tendency of all evolutionary investigations is to obtain a view of origins in order to follow up the threads of development from their initial starting-point. Besides, the simpler phenomena of ancient and primitive society afford more convenient material for generalizations as to legal evolution than the extremely complex legal institutions of civilized nations. But there is no determined line of division between ancient and modern comparative jurisprudence in so far as both are aiming at the study of legal development. The law of Islam or, for that matter, the German civil code, may be taken up as a subject of study quite as much as the code of Hammurabi or the marriage customs of Australian tribes.

The **Beginnings of** the Study. — The idea that the legal enactments and customs of different countries should be compared for the purpose of deducing general principles from them is as old as political science itself. It was realized with special vividness in epochs when material could be gathered from different sources and in various forms. The wealth of varieties and the recurrence of certain leading forms led to comparison and to generalizations based on comparison; Aristotle, who lived at the close of a period marked by the growth of free Greek cities, summarized, as it were, their political experience in his *Constitutions* and *Politics.* Another great attempt at comparative observation was made at the close of the pre-revolutionary period of modern Europe. Montesquieu took stock of the analogies and contrasts of law in the commonwealths of his time and tried to show to what extent particular enactments and rules were dependent on certain general currents in the life of societies — on forms of government, on moral conditions corresponding to these, and ultimately on the geographical facts with which various nationalities and states have to reckon in their development.

It is perhaps just worthy of note, in view of the importance folklore and folk customs were to assume, that Blackstone in his comparisons was not averse to instances taken from these sources. Thus he would explain the peculiar custom known as *Borough English* (*q.v.*), under which the youngest instead of the eldest son inherits, by a reference to "the practice of the Tartars among whom, according to Father Duhalde, this custom of descent also prevails." (Blackstone's *Commentaries,* Bk. II, Cap. 6.)

These were, however, only slight beginnings. It was reserved for the 19th century to come forward with connected and far-reaching investigations in this field as in many others, comparative jurisprudence, as here understood, dates from the second half of the century.

19th Century Investigators. — There were many reasons for such a departure. The 19th century was an eminently historical and an eminently scientific age: in the domain of history it may be said that it opened an entirely new vista. Before that time history was conceived as a narrative of memorable events, more or less skilful, more or less sensational, but appealing primarily to the literary sense of the reader; in the 19th century it became an encyclopaedia of reasoned knowledge, a means of understanding social life by observing its phenomena in the past. The historic bent of mind of 19th century thinkers was to a great extent the result of heightened political and cultural self-consciousness. It was the reflection in the world of letters of the tremendous upheaval in the states of Europe and America which took place from the close of the 18th century onwards. As one of the greatest leaders of the movement, Niebuhr, pointed out, the fact of being a witness of such struggles and catastrophes as the American Revolution, the French Revolution, the Napoleonic empire and the national reaction against it, taught every one to appreciate the importance of historical factors, to measure the force not only of logical argument and moral impulse, but also of instinctive habits and traditional customs. It is not a matter of chance that the *historical school* of jurisprudence, Savigny's doctrine of the organic growth of law, was formed and matured while Europe collected its forces after the most violent revolutionary crisis it had ever experienced, and in most intimate connection with the romantic movement, a movement animated by enthusiastic belief in the historicel, traditional life of social groups as opposed to the intellectual conceptions of individualistic radicalism.

On the other hand, the 19th century was a scientific age and especially an age of biological science. Former periods — the 16th and 17th centuries especially — had bequeathed to it high standards of scientific investigation and a conception of the world as ruled by laws and not by capricious interference. But these scientific views had been chiefly applied in the domain of mathematics, astronomy and physics; and though great discoveries had been made in physiology and other branches of biology, the achievements of 19th century students in this respect far surpassed those of the preceding period. The doctrine of transformation which came to occupy the central place in scientific thought was eminently fitted to co-ordinate and suggest investigations of social facts. Though much is expressed in the one name of Darwin, it is perhaps even more significant as a symbol of the tendency of a great epoch, and to this tendency we are indebted for the rise of anthropology and of sociology, of the scientific study of man and of the scientific study of society. Of course it must not be forgotten that the scope of the subject has been immensely widened by growth of knowledge with regard to savage and half-civilized nations. Ethnography and ethnology have come into the field with a wealth of material and it is with their help that the far-reaching generalizations of modern inquirers as to man and society have been achieved.

Influence of Philological Research. — The immediate incitement for the formation of comparative jurisprudence was given by the discoveries of comparative philology, now chiefly associated with the name of Max Miiller, which revealed the profound connection between the different branches of the Indo-European languages, and showed that the development of these languages proceeded on lines which might be studied in a strictly scientific manner, on the basis of comparative observation and with the object of tracing the uniformities of the process. Naturally, students of religion, of folklore and of legal institutions took up the same method and tried to win similar results.

It is interesting to note that one of the leading scholars of the Germanistic revival, Jacob Grimm, a compeer of Savigny in his own line, took up with remarkable success not only the scientific study of German but also that of Germanic mythology and popular law. His *Rechtsalterthiimer* are still unrivalled as a collection of data as to the legal lore of Teutonic tribes. Their basis is undoubtedly narrow; but the method of treatment is already a

comparative one. Grimm takes up the different subjects — property, contract, crime, etc.—and examines them in the light of national, provincial and local customs, sometimes noticing expressly affinities with Roman and Greek law. It would have been well if more of the work of this school had followed this scholarly model, but the results of the new method were too exciting for that. As if the common elements of French, Spanish and Italian constituted the language Cicero spoke, the newly discovered affinities of the Indo-European languages invited the reconstruction of "Aryan" of which, unlike Latin, there is no record. This perhaps might have passed, but when enthusiasts went on to formulate a code of civil law (with a *jus gentium* thrown in) for the hypothetical users of an inferential language it was time to call a halt. Such extravagances, however, must not blind us to the importance of the immediate effects of the new methods, the rare stimulus to research and enquiry at once afforded. For Maine and his contemporaries the triumphs of comparative philology were a thing to emulate. "I should, however, be making a very idle pretension if I held out a prospect of obtaining by the application of the comparative method of jurisprudence any results which in point of interest or trustworthiness are to be placed on a level with those which, for example, have been accomplished in comparative philology" (Maine, *Village Communities*, 1871, p. *8)*.

The comparative study of primitive law assumed a wholly different aspect in the works of Sir Henry Maine. His best personal preparation for the task was that he had come into contact with living legal customs in India. For him the comparison between the legal lore of Rome and that of India did not depend on linguistic roots or on the philological study of the laws of Manu, but was the result of recognizing again and again, in actual modern custom, the rules and institutions of which he had read in Gaius or the Twelve Tables. The sense of historical analogy and evolution had shown itself already in the lectures on *Ancient Law*, which, after all, were mainly a presentment of Roman legal history mapped out by a man of the world, averse to all pedantry. But what appears as the expression of Maine's personal aptitude and intelligent reading in *Ancient Law* gets to be the interpretation of popular legal principles by modern as well as by ancient instances in *Village Communities, The Early History of Institutions, Early Law and Custom.* This breadth of view seemed startling when the lectures appeared, and the original treatment of the subject was hailed on all sides as a most welcome departure in the study of legal customs and institutions. And yet Maine set very definite boundaries to his comparative surveys. He renounced the chronological limitation confining such inquiries to the domain of antiquaries, but he upheld the ethnographical limitation confining them to laws of the same race.

Thus, notwithstanding all diversities in the treatment of particular problems, one leading methodical principle runs through the works of all the above-mentioned exponents of comparative study. It was to proceed on the basis of common origin and on the assumption of a certain common stock of language, religion, material culture and law to start with.

Ethnology and Jurisprudence. — The literary group which started from the discoveries of comparative philology and history was met on the way by what may be called the ethnological school of inquirers. The original impetus was given, in this case, by jurists and historians who took up the study in the field of ancient history, but treated it from the beginning in such a way as to break up the subdivisions of historic races and to direct the inquiry to a state of culture best illustrated by savage customs. The first impulse may be said to have come from J. J. Bachofen *(Mutterrecht*, 1861; *Antiquarische Briefe*, 1880; *Die Sage von Tanaquil*). All the representatives of "Aryan" antiquities were at one in laying stress on the patriarchal and agnatic system of the kindreds in the different "Aryan" nations; even Leist, although dwelling on the importance of cognatic ties, looks to agnatic relationship for the explanation of military organization and political authority. Now, Bachofen discovered in the very tradition of classical antiquity traces of a fundamentally different state of things, the central conception of which was not patriarchal power, but maternity, relationship being traced through mothers, the wife presenting the constant and directing element of the household, while the husband (and perhaps several husbands) joined her from time to time in more or less inconstant unions. Some such a state of society is described by Herodotus in the case of the Lycians, and something of the same nature possibly is noticeable even in later historical times in Sparta (for Herodotus as an anthropologist, *cf.* J. L. Myres in R. R. Marett's *Anthropology and the Classics).* Although chiefly drawing his materials from classical literature, Bachofen included in his *Antiquarian Letters* an interesting study of the marriage customs and systems of relationship of the Malabar Coast in India; they attracted his attention by the contrasts between different layers of legal tradition — the Brahmans living in patriarchal order, while the class next to them, the Nayirs (Nairs), follow rules of matriarchy.

Similar ideas were put forward in a more comprehensive form by J. F. McLennan *(Studies in Ancient History,* 1876). He starts from the wide occurrence of marriage by capture in primitive societies, and groups the tribes of which we have definite knowledge into endogamous and exogamous societies according as they take their wives from among the kindred or outside it. Marriage by capture and by purchase are signs of exogamy, connected with the custom in many tribes of killing female offspring. The development of marriage by capture and purchase is a powerful agent in bringing about patriarchal rule, agnatic relationship, and the formation of clans or *gentes*, but the more primitive forms of relationship appear as variations of systems based on mother-right. These views are supported by ethnological observations and used as a clue to the history of relationship and family law in ancient Greece. In further contributions, published after his death, the peculiarities of exogamous societies are traced back to the even more primitive practice of Totemism (*q.v.*). McLennan's line of inquiry was taken up in a very effective manner not only by anthropologists like E. B. Tylor or scholars like A. Lang, but also in a special manner by students of primitive family law. An interesting monograph in this direction is Robertson Smith's study of *Kinship and Marriage in Early Arabia.*

But perhaps the most decisive influence was exercised by the discoveries of an American, Lewis H. Morgan. In his epoch-making works on *Systems of Consanguinity* (1869) and on *Ancient Society* (1877) he drew attention to the remarkable fact that in the case of a number of tribes — the Red Indians of America, the Australian black fellows, some of the polar races, and several Asiatic tribes, mostly of Turanian race — degrees of relationship are reckoned and distinguished by names, not as ties between individuals, but as ties between entire groups, classes or generations. Instead of a mother and a father a man speaks of fathers and mothers; all the individuals of a certain group are deemed husbands or wives of corresponding individuals of another group; sisters and brothers have to be sought in entire generations, and not among the descendants of a definite and common parent, and so forth. There are variations and types in these forms of organization, and intermediate links may be traced between unions of consanguine people — brothers and sisters of the same blood — on the one hand, and the monogamic marriage prevailing nowadays, on the other. Facts of this kind produce very peculiar and elaborate systems of relationship, which have been copiously illustrated by Morgan in his tables. In his *Ancient Society* he attempted to reduce all the known forms and facts of marriage and kinship arrangements to a comprehensive view of evolution leading up to the Aryan, Semitic and Uralian family, as exhibiting the most modern type of relationship.

To complicate the matter still further the existence of classificatory systems of relationship may or may not be accompanied by an ignorance of the fact of paternity. Many of the simpler peoples see no causal connection between conception and birth. This surprising fact first arose to startle the scientific world in the course of field work by Spencer and Gillen among the Arunta in Australia. It was subsequently confirmed by Rivers for three entirely unconnected peoples and elaborately tested by Malinow-

ski in the case of the Trobriand Islanders *(see* his *Sex in Primitive Societies, Psyche,* vols. iv. and v. and the *I.R.A.I.* 1916). It may therefore now be taken as completely established. For a psychological discussion of the ignorance in question, see a valuable article by Ernest Jones, *"Mother Right and Sexual Ignorance of Savages," International Journal of Psycho-Analysis,* vol. vi., p. 109 (1915).

Totemism and exogamy, sexual ignorance and the classification system have become one of the most difficult topics in anthropology and equally one of the most eagerly canvassed. There is a voluminous literature on the subject; Frazer's *Totemism and Exogamy* heading the list. This great work is a mine of information, and all the principal explanations to account for what after all remain most perplexing phenomena will be found there fully discussed. Students will also refer to his *Folk lore in the Old Testament,* II. vi., and to studies of special peoples that will be found in the I.R.A.I.

Among other works which should be mentioned is Freud's *Totem and Taboo* which offers some highly stimulating psychological reading. The best criticism of it is still that of A. L. Kroeber *(22 American Anthropologist,* 1920, p. 48–55) but unfortunately his note of warning, that henceforth Freud's thesis could never be ignored without stultification, has in some instances passed unheeded, with the result that much patient work has been entirely wasted. On the other hand, some of Freud's followers have not allowed his brilliant suggestions to fructify, but, in their zeal, have reduced them to rigid formulae and spent themselves in elaboration.

Thus there has come about by itself a complete change of perspective in the comparative study of man and society. The right of ethnologists to have their say in regard to legal, political and social development was forcibly illustrated from both ends, as it were. On the one hand, classical antiquity itself proved to be a rather thin layer of human civilization hardly sufficient to conceal the long periods of barbarism and primitive evolution which had gone to its making. On the other hand, unexpected combinations in regard to family, property, social order, were discovered in every corner of the inhabited world, and our trite notions as to the character of laws and institutions were reduced to the rank of variations on themes which recur over and over again, but may be and have been treated in very different ways.

There is no need to speak of the use made of ethnological material in the wider range of anthropological and sociological studies — the works of Westermarck, Tylor and Frazer are in everybody's hands — but attention must be called to the further influence of the ethnological point of view in comparative jurisprudence. An interesting example of the passage from one line of investigation to anoiher, from the historical to the anthropological, is presented in the works of one of the founders of the *Zeitschrift fur Vergleichende Rechtswissenschaft*—Franz Bernhoft. He appears in his earlier books as an exponent of the comparative study of Greek and Roman antiquities, more or less in the style of Leist. Like the latter he was gradually incited to draw India into the range of his observations, but unlike Leist, he ended by fully recognizing the importance of ethnological evidence, and the influence of Bachofen and of the ethnologists made itself felt in Bernhoft's treatment of classical antiquity itself. A somewhat similar process will occur to the minds of English readers in the case of Jane Harrison, Gilbert Murray, Sir Arthur Evans and others.

But, of course, the utmost use was made of ethnological evidence by writers who cut themselves entirely free from the special study of classical or European antiquities. The most characteristic representative of these newer methods of extensive comparison was undoubtedly A. H. Post (1839–95) — the author of many works, in which he ranges over the whole domain of mankind — Hovas, Zulus, Maoris, Tunguses, alternating in a kaleidoscopic fashion with Hindus, Teutons, Jews, Egyptians. The order of his compositions is systematic, not chronological or even ethnographical in the sense of grouping kindred races together. He takes up the different subdivisions of law and traces them through all the various tribes which present any data in regard to them. What he sought was not common origin or a common stock of ideas, but recourse to similar expedients in similar situations; and it is one of the most striking results of ethnology that it can show how peoples entirely cut off from one another and even placed in very different planes of development can resort to analogous solutions in analogous emergencies. Is not the custom of the so-called *Couvade — the* pretended confinement of the husband when a child is born to his wife — a most quaint and seemingly recondite ceremony? Yet we find it practised in the same way by Basques, Californian Indians and some Siberian tribes. They have surely not borrowed from each other, nor have they kept the ceremony as a remnant of the time when they formed one race *(see* Frazer, *Totemism and Exogamy,* iv. 244, de Jong, *Couvade* and Reik, *Probleme der Religionspsychologie).* Again, an inscription from the Cretan town of Gortyn, published in the American *Journal of Archaeology* (2nd series, vol. i., 1897) by Halbherr, tells us that the weapons of a warrior, the wool of a woman, the plough of a peasant, could not be taken from them as pledges. We find a similar idea in the prohibition to take from a knight his weapons, from a villein his plough, in payment of fines, which obtained in mediaeval England and was actually inserted in Magna Carta. The legal conception of pledge has been carefully worked out on a broad basis of evolutionary comparison by J. H. Wigmore *(The Pledge Idea,* in *Primitive and Ancient Legal Institutions,* Boston, 1915). Here also the similarity extends to details, and is certainly not derived from direct borrowing or common origin but from analogies of situations translating themselves into analogies of legal thought. It may be said in a sense that for the ethnological school the less relationship there is between the compared groups the more instructive the comparison turns out to be.

Criticism of Ethnological Theory. — Ethnologists of Post's school have not had it entirely their own way, however. Not only did their natural opponents, the philologists, historians and jurists, reproach them with lack of critical discrimination, with a tendency to throw the most disparate elements into the same pot. In their own ranks a number of conscientious and scientifically trained investigators protested against the manner in which the most intricate problems had been treated, and sought to evolve more definite methodical rules. A very interesting departure was attempted by Dargun in his studies on the origin and development of property and his treatise on mother-right and marriage by capture. His lead was followed by R. Hildebrand in the monograph on law and custom and subsequently by L. T. Hobhouse, whose series of studies *Morals in Evolution, Mind in Evolution* and the *Material Culture* of *the Simpler Peoples* are now the recognized works on the subject.

The principal idea of these inquirers may be stated as follows. We must utilize ethnological as well as historical materials from the whole world, but it is no use doing this indiscriminately. Fruitful comparisons may be instituted mainly in the case of tribes on the same level in their general culture and especially their economic pursuits. Hunting tribes must be primarily compared with other hunters, fishers with fishers, pastoral nations with pastoral nations, agriculturists with agriculturists; nations in transitional stages from one type of culture to the other have to be grouped and examined by themselves. The result would be to establish certain parallel lines in the development of institutions and customs. Another line of criticism was opened up from the side of exact sociological study. Its exponent is Steinmetz, who represents with Wilken the Dutch group of investigators of social phenomena. He takes up a standpoint which severs him entirely from the linguistic and historic school. In a discourse on the *Meaning of Sociology* (p. 10) he says: "One who judges of the social state of the Hindus by the book of Manu takes the ideal notions of one portion of the people for the actual conditions of all its parts." In his sense jurisprudence is a part of ethnology and of the comparative history of culture.

The necessity of employing more stringent standards of criticism and more exact methods is now recognized, and it is characteristic that the late Joseph Kohler of Berlin, principal editor of the *Zeitschrift fur vergleichende Rechtswissenschaft,*

often gives expression to this view. Beginning with studies of procedure and private law in the provinces of Germany where the French law of the Code Napoléon was still applied, he has thrown his whole energy into monographic surveys and investigations in all the departments of historical and ethnological jurisprudence. The code of Hammurabi, the legal customs of the different tribes and provinces of India, the materials supplied by investigators of Australian and American tribes, the history of legal customs of the Mohammedans, and numberless other points of ethnological research, have been treated by him in articles in his *Zeitschrift* and in other publications. Comprehensive attempts have also been made by him at a synthetic treatment of certain sides of the law—like the law of debt in his *Shakespeare vor dem Forum der Jurisprudenz* (1883) or his *Primitive History of Marriage.* Undoubtedly we have not to deal in this case with mere accumulation of material or with remarks on casual analogies. And yet the importance of these works consists mainly in their extensive range of observation. *See* also his *Die Anfange des Rechts und das Recht der primitiven Volker* and for a valuable discussion of Kohler's work, R. Pound's *Interpretations of Legal History* (1923) and *Jurisprudence* in Barnes' *History and Prospects of the Social Sciences* (1925). Now in Kohler's work and that of some of his compeers and followers, J. E. Hitzig, Hellwig, Max Huber, R. Dareste, more exact forms and means of inquiry are employed and the results testify to a distinct heightening of the scientific standard in comparative jurisprudence. Especially conspicuous in this respect are three tendencies: *(a)* the growing disinclination to accept superficial analysis between phenomena belonging to widely different spheres of culture as necessarily produced by identical causes (*e.g.,* Darinsky's review of Kovalevsky's assumptions as to group marriage among the Caucasian tribes, Z. *fur vgl.* ***Rw.*** xiv. 151 *seq.,* or Boas and Goldenweiser in their treatment of Totemism); (b) the selection of definite historical or ethnological territories for monographic inquiries, in the course of which arrangements observed elsewhere are treated as suggestive material for supplying gaps and starting possible explanations: Kohler's own contributions have been mainly of this kind; *(c)* the treatment of selected subjects by an intensive legal analysis, bringing out the principles underlying one or the other rule, its possible differentiation, the means of its application in practice, etc.: Hellwig's monograph on the right of sanctuary in savage communities *(Das Asylrecht der Naturvolker)* may be named in illustration of this analytical tendency.

The collection of ethnological parallels for the case of sociology and comparative jurisprudence has proceeded in a most fruitful manner, and it has now become all the richer for the valuable contributions of archaeology. The spade has revealed traces of cultures unknown to history, and for the most part lacking all written record. The study of social origins has thus taken on an entirely fresh aspect and though it has only postponed the longer the solution of the big questions comparative jurisprudence had hoped to solve, it has added enormously to the fascination of the subject. The comparison, for example, of the condition of life of the simpler peoples and the products of prehistoric cultures has proved most suggestive; few who have read such a work as Sollas' *Ancient Hunters* can have failed to realize this. *(See* also Carveth Read, *The Origin of Man;* G. G. MacCurdy, *Human Origins;* Burkitt's *Prehistory* [for the *Old Stone Age]*; V. Gordon Childe's *Dawn of History* [for the ***New]***).

Assistance from Psychology.—Ethnological studies have to look for guidance to psychology, especially to the psychology of emotional life and of character. Although these branches of psychology have been less investigated than the intellectual processes, they affordmaterial help to the ethnologist and comparative jurist. Steinmetz made an attempt to utilize a psychological analysis of the feelings of revenge in his *Origin of Punishment.* Wundt, too, might be mentioned in this connection, but the wholly new impulse given to the study of psychological questions by Freud and his followers has left all such works far behind; his *Totem and Taboo* has already been referred to. It is much too early yet to estimate the results of a movement of so far reaching a character, but the work of an investigator like W. H. Rivers, at once field anthropologist, physician and psychologist, may be mentioned as among the first fruits of the newer methods. Certainly in the whole of the vast field there is no branch where patient research will so richly reward the investigator. For the literature John Rickman's *Index Psycho-Analyticus,* 1893–1926, a model bibliography, is here invaluable.

Review of Method.—It is desirable, in conclusion, to review the field and to formulate the chief principles of method. It is evident, to begin with, that a scientific comparison of facts must be directed towards two aims—towards establishing and explaining similarity, and towards enumerating and explaining differences. As a matter of fact the same material may be studied from both points of view, though logically these are two distinct processes.

Cause and Effect.—At this initial stage we have already to meet a difficulty and guard against a misconception; we have, namely, to reckon with the *plurality of causes,* and are debarred from assuming that wherever similar phenomena are forthcoming they are always produced by identical causes. Death may be produced by various agents—by sickness, by poison, by a blow. The habit of wearing mourning upon the death of a relation is a widespread habit, and yet it is not always to be ascribed to real or supposed grief and the wish to express it outwardly: savage people are known to go into mourning in order to conceal themselves from the terrible spirit of the dead which would recognize them in their everyday costume (Frazer's *Golden Bough* iii. 31 and General Index). This is certainly a momentous difficulty at the start, but it can be greatly reduced and guarded against in actual investigation. In the example taken we are led to suppose different origin because we are informed as to the motives of the external ceremony, and thus we are taught to look not only to bare facts, but to the psychological environment in which they appear. And it is evident that the greater the complexity of observed phenomena, the more they are made up of different elements welded into one sum, the less probability there is that we have to do with consequences derived from different causes. The recurrence of group-marriage in Australia and among the Red Indians of North America can in no way be explained by the working of entirely different agencies.

Borrowing.—The easiest way of explaining a similarity is by attributing it to a direct *loan.* The process of reception, of the borrowing of one people from another, plays a notable part in the history of institutions and ideas. The Japanese have in our days engrafted many European institutions on their perfectly distinct civilization; the Romans absorbed an enormous amount of Greek and Oriental law in their famous jurisprudence. A check upon explanation by direct loan will, of course, lie in the fact that two societies may be entirely disconnected, so that it comes to be very improbable that one drew its laws from the other. Although migrations of words, legends, beliefs, charms, have been shown by Theodor Benfey and his school to range over much wider areas than might be supposed, still, in the case of law, in so far as it has to regulate material conditions, the limits have perhaps to be drawn rather narrowly. In any case we shall not look to India in order to explain the burning of widows among the negroes of Africa; *suttee* may be the example of this custom which happens to be most familiar to us, but it is certainly not the only root of it on the surface of the earth.

It is much more difficult to make out the share of direct borrowing in the case of peoples who might conceivably have influenced one another. A hard and fast rule cannot be laid down in such cases, and everything depends on the weighing of evidence and sometimes on almost instinctive estimates. The use of a wager for the benefit of the tribunal in the early procedure of the Romans and Greeks, the *sacramentum* and the *πρυτανεία,* with a similar growth of the sum laid down by the parties in proportion to the interests at stake, has been explained by a direct borrowing by the Romans from the Greeks at the time of the Twelve Tables legislation (Hofmann, *Beiträge zur Geschichte des griechischen und römischen Rechts*). No direct proof is available for this hypothesis, and the question in dispute might have lain for ever between this explanation and that based on the analogous

development in the two closely related branches of law. The further study of the legal antiquities of other branches of the "Aryan" race leads one to suppose, however, that we have actually to do with the latter and not with the former eventuality. Why should the popular custom of the *Vzdání* in Bohemia (Kapras, "Das Pfandrecht in altböhmischen Landrecht," *Z. für vgl. Rw.* xvii. 424 *seq.*), regulating the wager of litigation in the case of two parties submitting their dispute to the decision of a public tribunal, turn out to be so similar to the Greek and the Roman process? And the Teutonic Wedde would further countenance the view that we have to do in this case with analogous expediency or, possibly, common origin, not loans.

Disconnected Analogies.—This leads to the consideration of what we may call disconnected analogies. They are instructive in so far as they go back, not to any continuous development, but to the fundamental, psychological and logical unity of human nature. In similar circumstances human beings are likely to solve the same problems in the same way. But while dwelling on considerations which may disprove the assumption of direct loans, we must not omit to mention circumstances that may render such an assumption the best available explanation for certain points of similarity. We mean especially the recurrence of special secondary traits not deducible from the nature of the relations compared. Terminological parallels are especially convincing in such cases. An example of most careful linguistic investigation attended by important results is presented by Thomsen's treatment of the affinities between the languages and cultures of the peoples of northern and eastern Europe in his Uber den *Einfluss* der *germanischen* Sprachen auf die *Finnisch-lappischen* (trans. E. Sievers, 1870), p. 166, seq. (cf. the same writer's Relations between Ancient Russia and Scandinavia and the Origin of *the* Russ*ian* State, p. 127 *seq.*, and Miklosich, "Die Fremdworter in den slavischen Sprachen," Denkschriften der Wiener Akademie, Ph. hist. Klasse, XV.).

The *Diffusionists*.—It is in the light of the foregoing considerations that the claims of the recent Diffusionists, G. Elliott Smith and W. J. Perry, had best be judged. Indeed, had they paid % little more regard to them their original and suggestive theories might have been even more numerous, and there certainly would have been fewer extravagances for their critics to tax them with. For some very temperate criticism, see R. R. Marett, *The Diffusion of Culture*. On the subject of borrowings generally, see Lowie, Primitive Society, and for a psychological discussion of the mechanism of diffusion F. C. Bartlett, Psychology *and* Primitive Culture.

Common Origins.—The next group of analogies is formed by cases which may be reduced to common origin. In addition to what has already been said on the subject in connection with the literature of the historical school, we must point out that in the case of kindred peoples this form of derivation has, of course, to be primarily considered. Inferences in the direction of common origin become more doubtful when we argue, not that certain facts proceed from a common stock of notions embodied in the early culture of a race before it was broken up into several branches, but that they have to be accounted for as instances of a similar treatment of legal problems by different peoples of the same ethnic family. The only thing that can be said in such a case is that, methodically, the customs of kindred nations have the first claim to comparison. But it is by no means useless for the investigator of these problems to inform himself about the aspect of such customs in the life of nations of other descent, and especially of the simpler peoples.

Consecutive Stages.---Organizing thought always seeks to substitute order for chaotic variety. Observations as to disconnected analogies lead to attempts to systematize them from some comprehensive point of view. These attempts may take the shape of a theory of consecutive stages of development. Similar facts appear over and over again in ethnological and antiquarian evidence, because all peoples and tribes, no matter what their race and geographical position, go through the same series of social arrangements. This is the fundamental idea which directed the researches of Maine, McLennan, Morgan, Post, Kohler, although each of these scholars formulated his sequence of stages in a peculiar way. McLennan, for instance, puts the idea referred to in the following words:—

> In short, it is suggested to us, that the history of human society is that of a development following very slowly one general law, and that the variety of forms of life—of domestic and civil institution—is ascribable mainly to the unequal development of the different sections of mankind. . . . The first thing to be done is to inform ourselves of the facts relating to the least developed races. To begin with them is to begin with history at the farthest-back point of time to which, except by argument and inference, we can reach. Their condition, as it may to-day be observed, is truly the most ancient condition of man (**Studies** in Ancient History, 2nd series, 9, 15).

On this basis we might draw up tables of consecutive stages, of which the simplest may be taken from Post:—

> Four types of organization: the tribal, the territorial, the seignorial, and the social. The first has as its basis marriage and relationship by blood; the second, neighbouring occupation of a district; the third, patronage relations between lord and dependants; the fourth, social intercourse and contractual relations between individual personalities (*Grundriss*, i. 14).

It is, however, at the very least, premature to sketch anything like a course of universal development for legal history. We have grave doubts whether the time will ever come for laying down any single course of that kind. The attempts made hitherto have generally led to overstating the value of certain parts of the evidence and to squeezing special traits into a supposed general course of evolution.

Economic Stages and Types.—Another group of thinkers is therefore content to systematize and explain the material from the point of view, not of universal history, but of correspondence to economic stages and types. This is, as we have seen, the leading idea in Dargun's or Hildebrand's investigations. It is needless to go into the question of the right or wrong of particular suggestions made by these writers, but the general trend of study initiated in this direction is certainly promising, if only investigators are very chary of laying down certain combinations as the necessary outcome of certain economic situations. Such combinations or consequences certainly exist; pastoral husbandry, the life of scattered hunting groups, the conditions of agriculturists under feudal rule, certainly contain elements which will recur in divers ethnical surroundings. But we must not forget that different minds and characters will draw different and perhaps opposite conclusions in exactly similar outward conditions. This may happen in identical or similar geographical environment—as in the case of ancient Greeks and Turks on the Balkan peninsula, for instance, or of ancient Greeks and modern Greeks. But even the same historical medium leaves, as a rule, scope for treatment of legal problems on divers lines. Take systems of succession. They exercise the most potent influence on the structure and life of society. Undivided succession, whether in the form of primogeniture or in that of junior right, sacrifices equity and natural affection to the economic efficiency of estates. Equal-partition rules, like gavelkind or *parage*, lead in an exactly opposite direction. And yet both sets of rules co-existed among the agriculturists of feudal England; communities placed in nearly identical historical positions followed one or the other of these rules. The same may be said of types of dwelling and forms of settlement. In other words, it is not enough to start from a given economic condition as if it were bound to regulate with fatalistic precision all the incidents of legal custom and social intercourse. We have to start from actual facts as complex results of many causes, and to try to reduce as much as we can of this material to the action of economic forces in a particular stage or type of development.

Conclusion.—If one turns to a current number of the Zeitschrift one will probably find that the first article deals with some such topic as the Soviet Civil Code, and the last with, say, a biological theory of Totemism. Clearly no one scientific pursuit can embrace such diverse topics, nor would a common origin be even suspected from the opening sentences of this article. The two methods there indicated have indeed diverged. The comparative study of law, narrowing itself to more immediately practical aims, has become a subject all to itself, and the work of Mario Sarfatti

and that of the Institute over which Prof. Edouard Lambert presides amply justify its special recognition. The other method has undergone a more subtle transformation. By almost imperceptible steps comparative jurisprudence passed into juristic ethnography, and then widened out into cultural anthropology. There was little difference of subject matter, hardly any of treatment, only the outlook was broader and the point of view freed from the preoccupations of the jurist. But if the special training of the lawyer is no longer a first requisite in the comprehensive study of social phenomena, that is not to say that the jurist is not concerned for the solution of his own particular problems. In fact, it is precisely from this angle that both jurists and sociologists are coming to discover fresh possibilities for their investigations. Within the realm of the empirical social sciences there is a special pursuit for the jurist: the effort to understand the specific nature of legal institutions and ideas. To add one more to the long list of illustrations this article has already afforded of problems opened up if not solved: the Ordeal, hitherto mholly unintelligible but cardinal in every primitive system of justice, is at last beginning to engage the attention it deserves. After all, it is justice and the law and not social organization or culture that is the primary concern of the jurist. But this is to begin a new chapter. (P. VI.; H. GOT.)

JURJĀNĪ, the name of two Arabic scholars.

1. ABŪ BAKR 'ABDU-L-QĀHIR IBN 'ABDUR-RAḤMĀN UL-JURJĀNĪ (d. 1078), Arabian grammarian, belonged to the Persian school and wrote a famous grammar, the *Kitāb ul-'Awāmil ul-Mi'a* or *Kitab Mi'at 'Āmil,* which was edited by Erpenius (Leiden, 1617), by Baillie (Calcutta. 1803), and by A. Lockett (Calcutta, 1814). Ten Arabic commentaries on this work exist in manuscript, also two Turkish. Another of his grammatical works on which several commentaries have been written is the Kitab *Jumal fin-Nahw.*

2. 'ALĪ IBN MAḤOMMED UL-JURJĀNĪ (1339–1414), Arabian encyclopaedic writer, was born near Astarābād and became professor in Shīrāz. When this city was plundered by Tīmūr (1387) he removed to Samarkand, but returned to Shīrāz in 1405, and remained there until his death. Of his 31 extant works, many being commentaries on other works. one of the best known is the *Ta'rifāt (Definitions),* edited by G. Flügel (1845). (G. W. T.)

JURY. A jury is always a body of local laymen officially summoned to answer questions under oath. This is true even of the coroner's jury which operates outside the judicial system and investigates suspicious deaths. The findings of a coroner's jury, however, have no judicial significance and the coroner's jury has been abolished in many jurisdictions. In general, juries function only in common law and not in equity proceedings.

The Grand Jury. — In the United States juries are of two principal types: grand and petit. The grand jury is summoned from time to time by a court to inquire into the commission of crimes; it is traditionally composed of 23 persons, in many states and in the federal courts. The grand jury's function is to decide whether there is "probable cause" to believe that a person has committed a crime. Should it so decide, an indictment, a formal accusation of crime, is returned and the accused must stand trial before a petit or trial jury whose duty it is to determine the question of guilt "beyond a reasonable doubt." The purely accusatory function of the grand jury is underscored by these facts: (1) an indictment is no evidence of guilt and may be returned by a simple majority of the grand jurors; (2) the accused has no right to offer evidence or even to be present in the grand jury room; and (3) the refusal of one grand jury to indict does not bar indictment by a subsequent grand jury. In practice, grand juries generally rubber-stamp the wishes of prosecutors and this together with the cost of the grand jury has led some states to abolish or seriously to restrict its operation. England abolished the grand jury system in 1933, but in the United States the right to a grand jury indictment for serious crimes, though waivable, is constitutionally safeguarded in many states and by the 5th amendment of the U.S. constitution.

History. — The term jury, in ordinary usage, usually signifies only the distinctive mode of trying issues of fact in civil and criminal cases in countries where the English law prevails. The origin of the petit jury is variously attributed to a Scandinavian institution, to Alfred the Great and to a primitive mode of Anglo-Saxon trial known as compurgation. Magna Carta, the famous charter extracted by the English barons from King John in 1215, while long thought to guarantee trial by jury, had nothing to do with it. The jury's real origin lies in the ancient inquisition of Carolingian kings, dating from the 9th century, whereby groups of disinterested neighbours were required to declare under oath information that was used to establish royal rights. This Frankish institution was carried into the duchy of Normandy and thence to England via the Norman conquest of 1066. It was first employed in England on a grand scale—again solely for the crown's benefit—in 1086.

Until the reign of Henry II (1154–89), however, the use of disinterested neighbours for determining private rights was very occasional. The traditional Anglo-Saxon modes of trial—compurgation, wherein friends of the defendant exonerated him by swearing that he was an honourable man; ordeal, in which the defendant was subjected to various tortures that if successfully endured proved his innocence; and the Norman-introduced trial by battle, in which the contestants fought until one was either killed or surrendered—still prevailed. Henry II, however, sensing the potentialities of judgment by neighbours, made the inquisition the prevailing method of trial in controversies affecting land. Ultimate extension to other types of civil disputes was inevitable.

The development of trial by jury in criminal cases came more slowly but here, too, Henry took a significant step by requiring, in 1166. that 12 men be present at every county court session to present to his justices the names of persons suspected by them of serious crime—the beginning of the grand jury. The persons named were then sent directly to the ordeal, without the possibility of exoneration by compurgation or trial by battle. But it was only the ordeal which finally determined the question of guilt. In 1215, however, Pope Innocent III forbade the participation of priests in ordeals, thus depriving them of their divine nature. King Henry III ordered the substitution of judgment by neighbours for the ordeal in 1219, and by the end of the 13th century the older methods of trial were largely superseded. Not until the mid-14th century, however, did the grand jury become separate from the petit or trial jury.

Originally, in both civil and criminal cases, jurors passed judgment on the basis of what they themselves had heard or knew and the use of witnesses developed only gradually. Indeed, the principle that a verdict must be reached solely on evidence presented in court was not established until the end of the 17th century. In 1367 the size of the petit jury was fixed at twelve. Majority verdicts were occasionally accepted by the judges until the end of the 14th century, but thereafter it was required that verdicts be unanimous. English judges, however, went to extreme lengths to coerce unanimity and it was early established that the jury while deliberating must go without food.

Until the early 17th century, the attaint jury, a body of 24 neighbours sworn to decide whether the petit jury had lied, was the only recourse in civil cases against an unlawful verdict. If the attaint jury did so decide, the petit jury verdict was set aside and the petit jurors forfeited their lands and goods to the king. The attaint jury was also available in criminal cases and a finding adverse to the petit jurors had the same effect on them as in civil cases but did not affect the petit jury verdict. The attaint jury was gradually abandoned because of the reluctance of attaint jurors to impose the forfeiture penalty and, to fill the vacuum, judges in the early 17th century began to declare new trials in civil cases.

In contrast with U.S. practice, new trials were never ordered in serious criminal cases in England after a jury verdict. English judges, however, sometimes fined and imprisoned jurors who acquitted persons they wished to have convicted. But Bushell's case (1670) established the principle that jurors may not be punished for acquitting even in the face of overwhelming evidence of guilt.

United States. — The jury was widely used in both criminal and civil cases throughout the American colonial period and was re-

vered for its service in impeding the enforcement of unpopular British laws Most of the pre-1787 state constitutions safeguarded it for both classes of cases, but the U.S. constitution of 1787 guaranteed it in criminal cases only (art. III) a point repeatedly stressed by opponents of ratification. Indeed, in the state ratification conventions, the absence of a civil jury trial guarantee was thought infinitely more objectionable than the document's failure to mention freedom of speech or of the press, and it was principally reverence for civil jury trial which led to the popular demand for a comprehensive Bill of Rights. The 7th amendment accordingly guaranteed jury trial in all common law cases where the amount involved exceeds $20 and the 6th amendment reaffirmed the right of jury trial in criminal cases. The basic elements of the English common law jury trial thus guaranteed are: (1) that the jury should consist of 12 persons; (2) that the trial should be supervised by a judge with power to instruct as to the law and to comment on the evidence; and (3) that the verdict be unanimous. If a jury cannot agree, the result is a "hung jury" and the case must be retried before another jury. State constitutions likewise guarantee trial by jury. universally in criminal cases and virtually so in civil cases. Many states, indeed, deprive the judge of the right to comment on evidence and generally reduce his status to that of a mere umpire. A number of states allow less than unanimous verdicts in civil cases and a few do so in criminal cases. The jury in civil cases may everywhere be waived in favour of trial by judge alone, and many states allow this in criminal cases also, though often insisting. as do the federal courts, that the judge and prosecutor must first give their consent.

The jury selection process varies markedly from state to state and among the various federal courts. There are various age and property qualifications though the trend is away from the latter. Discrimination in jury selection on account of race, colour or creed, however, is unconstitutional. Educational qualifications are very uncommon. A few states exclude women from jury duty while others allow them to serve or not, as they choose. Most states exempt professional persons of every grade and large classes of government employees. Many other groups, while not exempt, are habitually excused, such as day labourers and small businessmen. Persons summoned to court to serve as jurors are known as veniremen and a group of such persons called for a particular case as a venire (Latin, *venire facius,* ' to make or cause to come"). Veniremen are subject to examination regarding their qualifications before they are selected as jurors. Such examination is knonn as the *voir dire* (Old French, "to say the truth"), and is in most courts, in contrast to the English practice, conducted mainly by counsel Veniremen may be challenged either peremptorily or for cause. A peremptory challenge is one for which no reason need be given and the number of such challenges is strictly limited.

Functions. — The jury deliberates in private and in reporting its verdict normally makes public only its final decision without any of the argument in support of it. Only rarely may the testimony of jurors as to misconduct in the deliberations be used to impeach a verdict. This arrangement has two important consequences; (1) there is only anecdotal and imperfect knowledge of how juries do behave in reaching their decisions, there being a wide spectrum of opinion among judges and lawyers on the point; (2) the jury has so much freedom in fact that it is not easy to say just what the function of the 20th century jury is. The conventional statement is that the jury are triers of issues of fact, taking the law as given to them in the judge's instructions. But the actual operation of the system is more subtle, and the jury performs, to some degree at least. a rule-molding as well as a fact-finding function. To many observers, indeed, a chief merit of the jury is this *de facto* power to temper formal legal rules with the equity and common sense of the layman. The jury also relieves judges of the responsibility for making unpopular decisions. It is a safeguard against judicial bias and corruption, so that the popularity of the jury system at any given moment is probably inversely related to popular confidence in the ability and integrity of the judiciary. Finally, the jury provides civic participation by the citizen.

Criticism. — The jury system is the subject of enthusiastic praise and of vigorous criticism. Critics propose a variety of reforms designed to improve the calibre of jury personnel and to increase the trial judge's control over the jury, such as the use of special verdict procedures and the restoration of the judge's power to comment on the evidence.

The future of the jury system is not easy to predict. It did not survive on those parts of the European continent which experimented with it during the 19th century and in England it is in decline, being virtually nonexistent, in civil cases. It was still widely used in the second half of the 20th century however, in both civil and criminal litigation in the United States.

The jury and the common law are sometimes said to be the two distinctive Anglo-American legal institutions. In the second half of the 20th century, however, it was perhaps fair to say that the jury survived as a distinctively U.S. institution rather than an Anglo-American institution.

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JUS GENTIUM: *see* ROMAN LAW.

JUS PRIMAE NOCTIS ("right of first night"), or *droit du seigneur,* a custom alleged to have existed in medieval Europe giving the lord the right to sleep the first night with the bride of any one of his vassals. This custom is paralleled in various primitive societies; however, practically none of the evidence that we have deals with its actual enforcement in Europe, but only with the redemption dues which were paid under various significant names (*cunnagium, cullage, ius cunni,* etc.) to avoid its enforcement. The one document which appears to present it actually in action (decree of the Seneschal of Guyenne. 1302) has been challenged on several grounds. The question is violently controversial, and has been, especially in France, the subject of remarkable displays of embittered and scabrous learning. With some hesitation, it may be said that the weight of evidence does point to the existence of such a custom, at a very early date, in parts of France and possibly also in a few centres in Italy and Germany, but certainly not elsewhere. This observation refers merely to the existence of a recognized custom; irregular oppression of this particular kind was no doubt frequent enough.

JUS RELICTAE, in Scots law, the wife's common law right in the movable property of her husband, exigible from him or his executors on the dissolution of the marriage by his divorce or death. The right depends upon the husband's domicile being Scottish. The amount of the right is one third where there are children of the husband surviving. and one half where there are no surviving children. The right vests on divorce or by survivance, and is independent of the husband's testamentary provisions; it may, however, be renounced by contract, or be discharged by satisfaction. It is subject to alienation of the husband's movable estate during his lifetime or by its conversion into heritage.

Jus relicti is the statutory right of a husband to a share in his wife's movable estate, in the event of her dying, domiciled in Scotland. *See* the Married Women's Property (Scotland) act, 1881. It is not due to the husband where the marriage is dissolved by the divorce of his wife, but in other respects as regards amount, exclusion, discharge and satisfaction it is subject to the same rules as *jus relictae.*

JUSSERAND, JEAN ADRIEN ANTOINE JULES (1855–1932), French author and diplomatist, was born at Lyons on Feb. 18, 1855. Entering the diplomatic service in 1876, he became in 1878 consul in London. After an interval spent in Tunis he returned to London in 1887 as a member of the French embassy. In 1890 he became French minister at Copenhagen, and in 1902 was transferred to Washington. He remained there until his retirement from the service in 1925, serving his country's interests throughout the difficult war and postwar periods with great tact and ability. A close student of English literature, he produced some very lucid and penetrating studies on comparatively little-known subjects: *Le Théâtre en Angleterre depuis la con-*

quête jusqu'aux prédécesseurs immédiats de Shakespeare (1878); *Le Roman au temps de Shakespeare* (1887; Eng. trans., E. Lee, 1890); *Les Anglais au moyen âge: la vie nomade et les routes d'Angleterre au XIVe siècle* (1884; Eng. trans., *English Wayfaring Life in the Middle Ages*, by L. T. Smith, 1889), and *L'Épopée de Langland* (1893, Eng. trans., *Piers Plowman*, by M. C. R., 1894). His *Histoire littéraire du peuple anglais* (vol. 1, 1895) was completed in three volumes in 1909. In English he wrote *A French Ambassador at the Court of Charles II* (1892), from unpublished papers of the count de Cominges. Other works include *With Americans of Past and Present Days* (1916). *The School for Ambassadors, and other Essays* (1924). He died July 18, 1932.

JUSSIEU, the name of a French family distinguished for its botanists. The more eminent members, all systematists, are:

ANTOINE DE JUSSIEU (1686–1758), born at Lyons on July 6, 1686, studied medicine at the University of Montpellier and traveled with his brother Bernard through Spain, Portugal and southern France. In 1708 he went to Paris, where he became director of the Jardin des Plantes. He edited J. P. Tournefort's *Institutiones rei herbariae* (3 vol., 1719), and J. Barrelier's *Plantae per Galliam, Hispaniam, et Italiam observatae,* etc. (1714). He died at Paris on April 22, 1758.

BERNARD DE JUSSIEU (1699–1777), younger brother of the above, was born at Lyons on Aug. 17, 1699. He studied medicine at Montpellier, but in 1722, became subdemonstrator of plants in the Jardin du Roi at Paris, arranging the plants in groups that appeared "natural" to him. This work formed the starting point for the famous classification system of his nephew Antoine Laurent. In 1725 Bernard brought out a new edition of Tournefort's *Histoire des plantes qui naissent aux environs de Paris* (2 vol.) Long before Abraham Trembley (1710–84) published his *Histoire des polypes d'eau douce,* Jussieu maintained that these organisms were animals, and not the flowers of marine plants, then the current notion. He died at Paris on Nov. 6, 1777.

JOSEPH DE JUSSIEU (1704–1779), brother of Antoine and Bernard, was born at Lyons on Sept. 3, 1704. Educated for the medical profession, he accompanied C. M. de la Condamine to Peru, in the expedition for measuring an arc of meridian, and remained in South America for 36 years. He introduced the common garden heliotrope, *Heliotropium peruvianum,* into Europe. He died at Paris on April 11, 1779.

ANTOINE LAURENT DE JUSSIEU (1748–1836), nephew of the preceding, was born at Lyons on April 12, 1748. He studied medicine and botany in Paris. and in 1789 issued his *Genera plantarum secundum ordines naturales disposita, juxta methodum in horto regio Parisiensi exaratam,* which formed the basis of modern classification. When the Revolution broke out, he was installed in charge of the hospitals of Paris. From 1770 to 1826 he aas professor of botany at the Museum d'Histoire Naturelle. He produced nearly 60 memoirs on botanical topics. He died at Paris on Sept. 17, 1836.

ADRIEN LAURENT HENRI DE JUSSIEU (1797–1853), son of Antoine Laurent, was born at Paris on Dec. 23, 1797. He displayed the qualities of his family in his thesis for the M.D., *De Euphorbiacearum generibus medicisque earundem viribus tentamen* (1824). He made valuable contributions to botanical literature on the *Rutaceae, Meliaceae* and *Malpighiaceae,* and wrote *Botanique,* which reached nine editions, and was often translated. He died at Paris on June 29, 1853.

JUSTICE, a term used both in the abstract, for the quality of being or doing what is just, *i.e.,* right in law and equity, and in the concrete for an officer deputed by the Sovereign to administer justice and do right by way of judgment. It has long been the official title of the judges of two of the English superior courts of common law, and it is now extended to all the judges in the supreme court of judicature—a judge in the high court of justice being styled Mr. Justice, and in the court of appeal Lord Justice. The president of the King's bench division of the high court is styled Lord Chief Justice (*q.v.*). The word is also applied, and perhaps more usually, to certain subordinate magistrates who administer justice in minor matters, and who are usually called *justices of the peace* (*q.v.*)

JUSTICE, DEPARTMENT OF: *see* GOVERNMENT DEPARTMENTS.

JUSTICE OF THE PEACE, in England, a magistrate appointed by special commission under the great seal to keep the peace within the jurisdiction for which he is appointed. The title is commonly abbreviated to J.P. and is used after the name. The justices of the peace perform without any other reward than the dignity they acquire from their office a large amount of work indispensable to the administration of the law, including the initiatory stages of all criminal proceedings. Although usually not professional lawyers (and therefore unversed in the rules of evidence), for the most part they discharge their multifarious duties with becoming good sense and impartiality. For centuries they were necessarily chosen mainly from the landed gentry; but at the present day both sexes and all classes of the community are represented on the magisterial bench irrespective of social status or political bias, it being recognized—at least in theory—that capacity duly to administer justice rather than creed, position or party influence should regulate selection and appointment. In great centres of population, where the judicial business of justices is heavy, it has been found necessary to appoint paid justices or stipendiary magistrates to do the work, and an extension of the system to the country districts has been often advocated. Where a borough council desire the appointment of a stipendiary magistrate they may present a petition for the same to the secretary of State and it is thereupon lawful for the king to appoint to that office a barrister of seven years' standing. He is by virtue of his office a justice for the borough, and receives a yearly salary, payable in four equal quarterly instalments. On a vacancy, application must again be made as for a first appointment. There may be more than one stipendiary magistrate for a borough.

The commission of the peace assigns to justices the duty of keeping and causing to be kept all ordinances and statutes for the conservation of the peace, and for the quiet rule and governance of the people. Justices for counties are appointed by the Crown on the advice of the lord chancellor, usually with the recommendation of the lord lieutenant of the county. Justices for boroughs having municipal corporations and separate commissions of the peace are appointed by the Crown, the lord chancellor either adopting the recommendation of the town council, the local advisory committee, or acting independently. Justices cannot act as such until they have taken the oath of allegiance and the judicial oath. A justice for a borough, while acting as such, must reside in or within seven miles of the borough or occupy a house or other property in the borough, but he need not be a burgess. The mayor of a borough is *ex officio* a justice during his years of office and during the succeeding year. As mayor he takes precedence over all borough justices and is entitled to take the chair at all their meetings. But, except when dealing with business relating to the borough, he has not precedence over justices acting in or for the county in which the borough or any part thereof is situated, nor has he precedence over a stipendiary magistrate engaged in administering justice (45/46 Vict. ch. 50, s. 155). The chairman of a county council is *ex officio* a justice of the peace for the county, and the chairman of an urban or rural district council for the county in which the district is situated. The Criminal Justice Act, 1925 (s. 31) empowers the issue of process by justices throughout England and Wales without endorsement. But English warrants for indictable offences in other parts of Great Britain must be "'backed" or endorsed by a justice of the jurisdiction in which they are to be executed. A justice acting partially and corruptly may be proceeded against by a criminal information, and a justice improperly refusing to act may be compelled to do so by the high court of justice. An action will lie against a justice for any act done by him in excess of his jurisdiction, and for any act within his jurisdiction which has been done wrongfully and maliciously and without reasonable or probable cause. But no action can be brought against a justice for a wrongful conviction until it has been quashed. The Justices of the Peace Act 1906, abolished the property qualification for county justices. It also removed the necessity for residence within the county, substituting therefor the same residential qualification as for borough magistrates, viz.,

"within seven miles thereof." The same act removed the disqualification of solicitors to be county justices and added to the existing power to remove other justices from the commission of the peace the power to exclude *ex officio* justices.

The justices for every petty sessional division of a county or for a borough having a separate commission of the peace must appoint a fit person to be their salaried clerk. He must be either a barrister of not less than 14 years' standing, or a sollcitor of the supreme court, or have served for not less than seven years as a clerk to a police or stipendiary magistrate, or have been attached to a metropolitan police court. The multifarious and constantly increasing duties and enhanced powers of justices embrace some portion of every important branch of the criminal law and include a considerable number of matters more particularly relating to the civil law.

In the United States, the justices of the peace usually are elected, although sometimes they are appointed by executive authority. The justices of the peace are the lowest of the state courts, and their limitation in civil matters generally is about $200, and in criminal matters they may try only misdemeanors. They are not courts of record. Ordinarily in criminal cases they may not impose a jail sentence, if the person tried prefers to pay the fine imposed.

JUSTICIAR. Unlike all other officers of the central administration in the 12th century the justiciar was not a household official. The justiciarship originated in the king's need for a responsible subordinate who could take as wide a view of the royal needs as the king himself. A man of unquestionable loyalty, with a specialist's knowledge of the details of administration, was necessary to act as regent when the king was abroad, and at other times to take charge of such matters as the king could not arrange himself. Such a man from the nature of his office could not be a member of the king's household. He was in a position superior to that of any household officer.

William I. had appointed men to hold authority while he was in Normandy, but their office had always ended on his return to England. Ranulf Flambard, chaplain to William II., was the first man to hold a position analogous to that of the 12th century justiciars. He was responsible for the collection of William II.'s revenue, and is known to have interested himself in the administration of justice all over the country. In the reign of Henry I. increasing specialisation in the administration meant more and better trained officials. Richard and Ralf Basset, father and son, were successively styled Justiciarius, with the implication that they held some authoritative position among the royal judges, but they never held the position of supremacy in the administration which belonged to the justiciar at the end of the century. That was held in the reign of Henry I. by Roger, bishop of Salisbury, who is styled, and who styles himself, Justiciarius and Procurator *Anglie*. The fall of Roger owing to King Stephen's jealousy. and the anarchy of Stephen's reign broke the normal development of the administrative offices.

Although at the beginning of his reign Henry II. appointed justiciars, apparently to fill the place once held by Roger, their position was very different. He appointed two justiciars instead of one, and kept them busy with routine work, not at first trusting them with control, even when he was abroad. The Chancellor, Thomas Becket, was the chief minister in the earlier years of the reign, and it was not till after his appointment to the archbishopric and consequent quarrel with Henry that the justiciar became the greatest man in the kingdom after the king. His supremacy was firmly established during the long official career of Richard de Lucy (1153–79) followed by that of Ranulf de Glanvil (1180–89). Head of the whole administration, the justiciar found his labours constantly increasing. The volume of judicial work was growing greater every year owing to the popularity of Henry II.'s reforms. The justiciar presided over the bench of judges at Westminster, organised the judicial circuits, heard difficult pleas, gave his advice to judges on innumerable points of law and himself went round the country to see that the administration was properly conducted. Such work kept him fully occupied when the king was in England. It is not remarkable that although in theory he should have presided over the sessions of the Exchequer (*q.v.*), he was seldom able to be present. When the king was abroad, in addition to his ordinary routine duties, the justiciar had to raise such money as the king needed, and to see that peace was maintained. All the justiciars of the second half of the twelfth century on occasion raised forces and took the field either against rebels (*e.g.*, Count John in 1194) or to preserve the peace of the Marches. Under Richard I. the office grew in importance, since the king was continuously out of the country and it fell to successive justiciars to raise his ransom and the large sums for his war with France. John was interested in English administration and his justiciar, Geoffrey Fitz Peter, had less responsibility than his immediate predecessors. He was able to concentrate more on his judicial work.

The office became extremely important during the minority of Henry III. Hubert de Burgh was not a trained lawyer as Geoffrey Fitz Peter had been, and he was mainly concerned and interested in affairs of state. He was the ruler of the country as no justiciar had ever been before, but he was the last of the great justiciars. His fall (1232) was due to Henry's weariness of his domination, to royal jealousy of the supreme great official. The day of the great officer of state governing all departments and controlling all was past. One of the leading judges was appointed justiciar, but his work was mainly judicial and only lasted till 1234, when the barons secured the fall of the Poitevins. whose support had enabled Henry to rid himself of Hubert de Burgh. During the period of Henry's personal rule no justiciar was appointed. Henry distrusted the great official chancellor, treasurer and justiciar alike. When the barons took control in 1258 the office was re-established for a time. But the baronial justiciars were temporary, paid, and overworked officials, whose work lay in the administration of justice and the supervision of the routine of government. The office came to an end in 1261. In Sicily and Scotland, countries closely connected with England, similar officials existed in the 12th century. In Scotland there were two justiciars, one for the country to the north and another for that to the south of the Forth.

(D. M. S.)

JUSTICIARY, HIGH COURT OF, in Scotland, the supreme criminal court, consisting of the lord justice-general, the lord justice-clerk and rr lords commissioners of justiciary. (See the Criminal Procedure [Scotland] Act, 1887.) Three judges form a quorum, but sometimes five judges sit. When so constituted the high court has power to suspend and to quash the proceedings in the inferior criminal courts on the ground of incompetency or irregularity. The high court has also a statutory jurisdiction to entertain stated cases on points of law from inferior criminal courts. The sittings of the circuit courts of justiciary for the trial of indictments with a jury are presided over by a single judge, but are deemed to be sittings of the high court of justiciary. No other civil criminal court has power to pronounce sentence of death or of penal servitude. Until 1926 the sentences of this court were pronounced for doom and were not subject to suspension or review in any form. A single judge had power, however, instead of deciding a point of difficulty to report it to the high court in Edinburgh for decision if he saw fit. Since the Criminal Appeal (Scotland) Act, 1926, sentences of the justiciary court and of the sheriff and jury court are subject to appeal. In either case the appeal lies to the high court of justiciary then sitting as a court of appeal under that act, with a quorum of three judges and with jurisdiction to entertain an appeal on questions of fact and of law. Appeal from this court does not lie to the House of Lords, either at common law or under the act of 1926.

JUSTIFICATION, in law, the showing by a defendant in an action of sufficient legal reason why he did what he was called upon to answer. The word is employed particularly in actions for defamation (see LIBEL AND SLANDER).

JUSTIN I, east Roman emperor from 518 to 527; born in 450 in Asia. He rose to be commander of the imperial guards of Anastasius. On the latter's death in 518 Justin succeeded in securing his own election. Being ignorant even of the rudiments of letters, Justin entrusted the administration of state almost entirely to his quaestor Proclus and to his nephew Justinian. He effected

in 519 a reconciliation of the Eastern and Western Churches after a schism of thirty-five years. (*See* HORMISDAS.) In 522 Justin ceded to Theodoric the right of naming the consuls. On April 1, 527, enfeebled by an incurable wound, he assumed Justinian as his colleague; on Aug. 1, he died.

See E. Gibbon, *Decline and Fall of the Roman Empire* (ed. Bury, 1896), iv. 206–209.

JUSTIN II (d. 578), east Roman emperor (565–578), was the nephew and successor of Justinian I. As master of the palace, and as husband of Sophia, the niece of the late empress Theodora, he secured a peaceful election. The first few days of his reign—when he paid his uncle's debts, administered justice in person and proclaimed religious toleration—gave bright promise, but in the face of the lawless aristocracy and defiant governors of provinces he effected few subsequent reforms. The most important event of his reign was the invasion of Italy by the Lombards (*q.v.*), who, entering in 568, under Alboin, in a few years made themselves masters of nearly the entire country. Justin's attention was distracted from Italy toward the north and east frontiers. After refusing, with his usual hauteur, to pay the Avars tribute, he fought several unsuccessful campaigns against them. In 572 his overtures to the Turks and protection of the Christian Armenians led to a war with Persia. After two disastrous campaigns, in which his enemies overran Syria, Justin bought a precarious peace by payment of a yearly tribute. The temporary fits of insanity into which he fell warned him to name a colleague. Passing over his own relatives, he raised, on the advice of Sophia, the general Tiberius (*q.v.*) to be Caesar in December j74 and withdrew for his remaining years into retirement.

See E. Gibbon, *Decline and Fall of the Roman Empire* (ed. Bury, 1896), v. 2–17; G. Finlay, *History of Greece* (ed. 1877), i. 291–297; J. Bury, *The Later Roman Empire* (1889), ii. 67–79; N. H. Baynes, *Camb. Med. Hist.*, ii. 263–275. (M. C.)

JUSTIN (MARCUS JUNIANUS JUSTINUS) (probably 3rd century A.D.), Roman historian, was the author of an epitome of the Historiae *Philippicae* et *totius* mundi *origines* et terrae *situs* written in the time of Augustus by Pompeius Trogus (*q.v.*). The work of Trogus is lost; only the prologi, or tables of contents, have survived. The main theme of Trogus was the history of Macedon and the Hellenistic monarchies, with Parthia; and Justin preserves material which has proved increasingly valuable to students of the Hellenistic world. Although his account is abbreviated. it is elegant. and he allows full space for Trogus' report of a speech of Mithridates (38, 4–7). The book was much used in the middle ages. Of Justin's personal history nothing is known.

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JUSTINIAN I. (483–565). Flavius Anicius Iustinianus, surnamed the Great, the most famous of all the emperors of the Eastern Roman Empire, was by birth a barbarian, native of a place called Tauresium in Illyricum[1], and was born, most probably, on May 11, 483, probably of Slavonic parentage. His own name was originally Uprauda[2]. Iustinianus was a Roman name which he took from his uncle Justin I., who adopted him, and to whom his advancement in life was due. Of his early life we know nothing, except that he went to Constantinople while still a young man, and received there an excellent education, though it is alleged that he always spoke Greek with a barbarian accent. When Justin ascended the throne in 518, Justinian became at once a person of the first consequence, guiding, especially in church matters, the policy of his aged, childless and ignorant uncle, and soon coming to be regarded as his destined successor. On Justin's death in 527, having been a few months earlier associated with him as co-emperor, Justinian succeeded without opposition to the throne. About 523 he had married the famous Theodora (*q.v.*), who, as empress regnant, was closely associated in all his actions till her death in 547.

Justinian's reign was filled with great events, both at home and abroad, both in peace and in war. They may be classed under four heads: (1) his legal reforms; (2) his administration of the empire; (3) his ecclesiastical policy; and (4) his wars and foreign policy generally.

1. **Consolidation of** Law.—It is as a legislator and codifier of the law that Justinian's name is most familiar to the modern world. He found the law of the Roman empire in a state of great confusion. It consisted of two masses, which were usually distinguished as old law (ius *vetus*) and new law (*ius* novum). The first of these comprised: (i.) all such of the statutes (leges) passed under the republic and early empire as had not become obsolete; (ii.) the decrees of the senate (*senatus consulta*) passed at the end of the republic and during the first two centuries of the empire; (iii.) the writings of the jurists, and more particularly of those to whom the right of declaring the law with authority (ius *respondendi*) had been committed by the emperors. As these jurists had, in their commentaries upon the leges, *senatus consulta* and edicts of the magistrates, practically incorporated all that was of importance in those documents, the books of the jurists may substantially be taken as including (i.) and (ii.). These writings were, of course, very numerous. Many of them had become exceedingly scarce—many had been altogether lost. Some were of doubtful authenticity. They were so costly that even the public libraries had nothing approaching to a complete collection. Moreover, as was natural, they contained many discrepancies and contradictions. A remedy had been attempted to be applied to this evil by a law of the emperors Theodosius II. and Valentinian III., which gave special weight to the writings of five eminent jurists (Papinian, Paulus, Ulpian, Modestinus, Gaius); but it was very far from removing it.

The new law (ius novum), which consisted of the ordinances of the emperors promulgated during the middle and later empires (*edicta, rescripta, mandata,* decreta, usually called by the general name of constitutiones), was in a condition not much better. These ordinances or constitutions were extremely numerous. No complete collection of them existed, for the earlier Codices did not include all the constitutions; there were others which it was necessary to obtain separately, but many whereof it must have been impossible for a private person to procure. In this branch too of the law there existed some, though a less formidable, uncertainty; for there were constitutions which practically, if not formally, repealed or superseded others without expressly mentioning them. It was therefore clearly necessary to collect so much of the law, both New and Old, as was regarded as binding into a reasonable corpus and to purge away the contradictions and inconsistencies of it.

Immediately after his accession, Justinian appointed a commission to deal with the imperial constitutions (*ius* novum), this being the easier part of the problem. The commissioners, ten in number, were directed to go through all the constitutions of which copies existed, to select such as were of practical value, to cut these down by retrenching all unnecessary matter, and gather them, arranged in order of date, into one volume, getting rid of any contradictions by omitting one or other of the conflicting passages[3]. These law commissioners completed their task in fourteen months, distributing the constitutions which they "retained" into ten books, in general conformity with the order of the Perpetual Edict enacted by Hadrian. By this means the bulk of the statute law was immensely reduced, its obscurities and internal discrepancies in great measure removed, its provisions adapted, by the abrogation of what was obsolete, to the circumstances of Justinian's own time. This Codex *constitutionum* was formally

[1]It is commonly identified with the modern Kiistendil, but Skoplye (the former Usküb) has also been suggested. *See* Tozer, *Highlands of European Turkey,* ii. 370.

[2]The name Uprauda is said to be derived from the word *prauda,* which in Old Slavic means *jus, justitia,* the prefix being simply a breathing frequently attached to Slavonic names.

[3]*See,* for an account of the instructions given to the commission, the constitution *Haec quae,* prefixed to the revised *Codex* in the *Corpus iuris civilis.*

promulgated in 529, all imperial ordinances not included in it being repealed at one stroke.

The success of this first experiment encouraged the emperor to attempt the more difficult enterprise of simplifying and digesting the old'law. Before entering on this, however, he wisely took the preliminary step of settling the more important of the legal questions as to which the older jurists had been divided in opinion. This was accomplished by a series of constitutions known as the "Fifty Decisions" *(Quinquuginta decisiones)*, along with which there were published other ordinances amending the law in a variety of points, in which old and now inconvenient rules had been suffered to subsist. Then in December 530 a new commission was appointed, consisting of sixteen eminent lawyers, under the presidency of the famous Tribonian, who had already served on the previous commission. They were to procure and peruse all the writings of all the authorized jurists (those who had enjoyed the *ius respondendi)*; were to extract from these writings whatever was of the most permanent and substantial value, with power to change the expressions of the author wherever conciseness or clearness would be thereby promoted, or wherever such a change was needed in order to adapt his language to the condition of the law as it stood in Justinian's time; were to avoid repetitions and contradictions by giving only one statement of the law upon each point; were to insert nothing at variance with any provision contained in the *Codex constitutionum;* and were to distribute the results of their labours into fifty books, subdividing each book into titles, and following the order of the Perpetual Edict[4].

The commissioners presented their selection of extracts to the emperor in *533,* and he published it as an imperial statute on December 16th of that year, with two prefatory constitutions (those known as *Omnem reipublicae* and *Dedit nobis).* It is the Latin volume which we now call the *Digest (Digesta)* or *Pandects* (Πάνδεκται). The extracts comprised in it are 9,123 in number, taken from thirty-nine authors, and are of greatly varying length, mostly only a few lines long. The worst thing about the *Digest* is its highly unscientific arrangement. The order of the Perpetual Edict, which appears to have been taken as a sort of model for the general scheme of books and titles, was doubtless convenient to the Roman lawyers from their familiarity with it, but was in itself rather accidental and historical than logical. The disposition of the extracts inside each title was still less rational; it has been shown by a modern jurist to have been the result of the way in which the committees of the commissioners worked through the books they had to peruse. In enacting the *Digest* as a law book, Justinian repealed all the other law contained in the treatises of the jurists (that *ius vetus* which has been already mentioned), and directed that those treatises should never be cited in future even by way of illustration; and he of course at the same time abrogated all the older statutes which had formed a part of the *ius vetus.* This was a necessary incident of his scheme of reform. But he went too far, and indeed attempted what was impossible, when he forbade all commentaries upon the *Digest.* He was obliged to allow a Greek translation to be made of it, but directed this translation to be exactly literal.

These two great enterprises had substantially despatched Justinian's work; however, he, or rather Tribonian, conceived that an outline of the elementary manual law was needed to take the place of the now obsolete *Commentarii* of Gaius. The result was the publication, shortly before the *Digest,* of the *Institutes of Justinian,* a work which nevertheless, both in matter and style, owes much to the work of Gaius.

In the four years and a half which elapsed between the publication of the *Codex* and that of the *Digest,* many important changes had been made in the law, notably by the publication of the "Fifty Decisions." It was therefore natural that the idea should present itself of revising the *Codex,* so as to contain in one volume the whole Statute Law. Accordingly, another commission was appointed, consisting of Tribonian with four other coadjutors, full power being given them not only to incorporate the new constitutions with the *Codex* and make in it the requisite changes, but also to revise the *Codex* generally. This work was completed in a few months; and in November *534* the revised *Codex (Codex repetitae paelectionis)* was promulgated with the force of law, prefaced by a constitution *(Cordi nobis)* which sets forth its history, and declares it to be alone authoritative. It is this revised *Codex* which has come down to the modern world.

The constitutions contained in it number *4,652,* the earliest dating from Hadrian, the latest being of course Justinian's own. A few thus belong to the period to which the greater part of the *Digest* belongs, *i.e.,* the so-called classical period of Roman law down to the time of Alexander Severus (244); but the great majority are later, and belong to one or other of the four great eras of imperial legislation, the eras of Diocletian, of Constantine, of Theodosius II. and of Justinian himself. Although this *Codex* is said to have the same general order as that of the *Digest,* viz., the order of the Perpetual Edict, there are considerable differences of arrangement between the two. It is divided into twelve books. Its contents, although of course of the utmost practical importance to the lawyers of that time, and of much value still, historical as well as legal, are far less interesting and scientifically admirable than the extracts preserved in the *Digest.*

Between 534 and *565* Justinian issued a great number of ordinances, dealing with all sorts of subjects and seriously altering the law on many points—the majority appearing before the death of Tribonian, which happened in 545. These ordinances are called, by way of distinction, new constitutions, *Novellae constitutiones post codicem* (νεαραὶ διατάξεις), *Novels.* Although the emperor had stated in publishing the *Codex* that all further statutes (if any) would be officially collected, this promise does not seem to have been redeemed. The three collections of the Novels which we possess are apparently private collections, nor do we even know how many such constitutions were promulgated. One of the three contains 168 (together with *13* Edicts), but some of these are by the emperors Justin II. and Tiberius II. Another, the so-called *Epitome of Julian,* contains 125 Novels in Latin; and the third, the *Liber authenticarum* or *vulgata versio,* has 134, also in Latin. This last was the collection first known and chiefly used in the West during the middle ages; and of its 134 only *97* have been written on by the *glossatores* or mediaeval commentators; these therefore alone have been received as binding in those countries which recognize and obey the Roman law,—according to the maxim *Quicquid non agnoscit glossa, nec agnoscit curia.* And, whereas Justinian's constitutions contained in the *Codex* were all issued in Latin, the rest of the book being in that tongue, these Novels were nearly all published in Greek, Latin translations being of course made for the use of the western provinces. They may be found printed in any edition of the *Corpus iuris civilis.*

This *Corpus iuris* consists of the four books described above: (1) *Codex constitutionum;* (2) *Digesta* or *Pandectae;* (3) *Institutiones;* (4) *Novellae.*

From what has been already stated, the reader will perceive that Justinian did not, according to a strict use of terms, codify the Roman law. By a codification we understand the reduction of the whole pre-existing body of law to a new form, the re-stating it in a series of propositions, scientifically ordered, which may or may not contain some new substance, but are at any rate new in form. What he did do was something quite different. It was not codification but consolidation. He gave to posterity not one code but two digests or collections of extracts, which are new only to this extent that they are arranged in a new order, and that here and there their words have been modified in order to bring one extract into harmony with some other. Except for this, the matter is old in expression as well as in substance.

Thus regarded, Justinian's work may appear to entitle him and Tribonian to much less credit than they have usually received for it. But let it be observed, first, that to reduce the huge and confused mass of pre-existing law into the compass of these two collections was an immense practical benefit to the empire; secondly, that, whereas the work which he undertook was accomplished in seven years, the infinitely more difficult task of codification might probably have been left unfinished at Tribonian's death, or even at Justinian's own, and been abandoned by his successor; thirdly, that in the extracts preserved in the *Digest* we have the opinions

[4] *See* the Constitution Deo *auctor (Cod.* i. 17, 1).

of the greatest legal luminaries given in their own admirably concise language, while in the extracts of which the Codex is composed we find valuable historical evidence bearing on the administration and social condition of the later empire; fourthly, that Justinian's age was quite unequal in intellect to so vast an undertaking as the fusing upon scientific principles into one new organic whole of the entire law of the empire.

To the merits of the work as actually performed some reference has already been made. The chief defect of the Digest is in point of scientific arrangement, a matter about which the Roman lawyers cared very little. There are some repetitions and some inconsistencies, but not more than may fairly be allowed for in a compilation of such magnitude executed so rapidly. Tribonian has been blamed for the insertions the compilers made in the sentences of the old jurists (the so-called Emblemata Triboniani); but it was a part of Justinian's plan that such insertions should be made, so as to adapt those sentences to the law as settled in the emperor's time. On Justinian's own laws, contained in the Codex and in his Novels, a less favourable judgment must be pronounced. They, and especially the latter, are diffuse and often lax in expression, needlessly prolix, and pompously rhetorical. The policy of many, particularly of those which deal with ecclesiastical matters, may also be condemned; yet some gratitude is due to the legislator who put the law of intestate succession on that plain and rational footing whereon it has ever since continued to stand. It is somewhat remarkable that, although Justinian is so much more familiar to us by his legislation than by anything else, this sphere of his imperial labour is hardly referred to by any of the contemporary historians, and then only with censure. Procopius complains that he and Tribonian were always repealing old laws and enacting new ones, and accuses them of venal motives for doing so.

The *Corpus* Iuris of Justinian continued to be, with naturally a few additions in the ordinances of succeeding emperors, the chief law-book of the Roman world till a new system was prepared by Leo the Isaurian, which we know as the Basilica. It is of course written in Greek, and consists of parts of the substance of the Codex and the Digest, thrown together and often altered in expression, together with some matter from the *Novels* and imperial ordinances posterior to Justinian. In the western provinces, the law as settled by Justinian held its ground; but copies of the Corpus Iuris were extremely rare, nor did the study of it revive until the end of the 11th century.

The best edition of the *Digest* is that of Mommsen (Berlin 1868–70), and of the *Codex* that of Kruger (Berlin 1875–77).

2. Financial Administration.— In his financial administration of the empire Justinian is represented to us as being at once rapacious and extravagant. His unwearied activity and inordinate vanity led him to undertake a great many costly public works, many of them unremunerative. The money needed for these, for his wars, and for buying off the barbarians who threatened the frontiers, had to be obtained by increasing the burdens of the people. They suffered, not only from the regular taxes, which were seldom remitted even after bad seasons, but also from monopolies and even confiscations. Fiscal severities were no doubt one cause of the insurrections which now and then broke out, and in the gravest of which (532) thirty thousand persons are said to have perished in the capital. It is not always easy to discover, putting together the trustworthy evidence of Justinian's own laws and the angry complaints of Procopius, what was the nature and justification of the changes made in the civil administration. But the general conclusion seems to be that these changes were always in the direction of further centralization, of bringing all offices more directly under the control of the Crown, and in some cases limiting the powers and appropriating the funds of local municipalities. Financial necessities compelled retrenchment, so that a certain number of offices including the useless and expensive Consulship, were suppressed altogether.

In a bureaucratic despotism the greatest merit of a sovereign is to choose capable and honest ministers. Justinian's selections were usually capable, but not so often honest. Even the great Tribonian labours under the reproach of corruption, while the fact that Justinian maintained John of Cappadocia in power long after his greed, his unscrupulousness, and the excesses of his private life had excited the anger of the whole empire, reflects little credit on his own principles of government and sense of duty to his subjects. The department of administration in which he seems to have felt most personal interest was that of public works. He spent immense sums on buildings of all sorts, especially churches. Of these works only two remain perfect, the celebrated St. Sophia in Constantinople, and the church of SS Sergius and Bacchus, now commonly called Little St. Sophia, which stands about half a mile from the great church, and is in its way a very delicate and beautiful piece of work.

3. Ecclesiastical Policy.—Justinian's ecclesiastical policy was complex and varying. For many years before the accession of his uncle Justin, the Eastern world had been vexed by the struggles of the Monophysite party, who recognized only one nature in Christ, against the view which then and ever since has maintained itself as orthodox, that the divine and human natures coexisted in Him. The latter doctrine had tricmphed at the council of Chalcedon, but Egypt, a great part of Syria and Asia Minor, and a considerable minority even in Constantinople clung to Monophysitism. One of Justinian's first public acts was to put an end to this schism by inducing Justin to make the then patriarch declare his full adhesion to the creed of Chalcedon. When he himself came to the throne he endeavoured to persuade the Monophysites to come in by summoning some of their leaders to a conference. This failing, he ejected suspected prelates, and occasionally persecuted them.

Not long afterwards, his attention having been called to the spread of Origenistic opinions in Syria, he issued an edict condemning fourteen propositions drawn from the writings of the great Alexandrian, and caused a synod to be held which renewed the condemnation of the impugned doctrines and anathematized Origen himself. Still later, he was induced by the machinations of some of the prelates who haunted his court, and by the influence of Theodora, herself much interested in theological questions, and more than suspected of Monophysitism, to raise a needless, mischievous, and protracted controversy. The Monophysites sometimes alleged that they could not accept the decrees of the council of Chalcedon because that council had not condemned, but (as they argued) virtually approved, three writers tainted with Nestorian principles, Theodore of Mopsuestia, Theodoret, and Ibas, bishop of Edessa. It was represented to the emperor, who was still pursued by the desire to bring back the schismatics, that a great step would have been taken towards reconciliation if a condemnation of these teachers, or rather of such of their books as were complained of, could be brought about, since then the Chalcedonian party would be purged from any appearance of sympathy with the errors of Nestorius.

Not stopping to reflect that in the angry and suspicious state of men's minds he was sure to lose as much in one direction as he would gain in the other, Justinian put forth an edict exposing and denouncing the errors contained in the writings of Theodore generally, in the treatise of Theodoret against Cyril of Alexandria, and in a letter of Bishop Ibas (a letter whose authenticity was doubted, but which passed under his name) to the Persian bishop Maris. This edict was circulated through the Christian world to be subscribed by the bishops. The four Eastern patriarchs, and the great majority of the Eastern prelates generally, subscribed. Among the Western bishops, who were less disposed to Monophysitism and subservience, the edict was earnestly resisted. Long disputes and negotiations followed, the end of which was that Justinian summoned a general council of the church, that which we reckon the Fifth, which condemned the impugned writings, and anathematized several other heretical authors. Its decrees were received in the East but long contested in the Western Church, where a schism arose that lasted for seventy years. This is the controversy known as that of the Three Chapters (Tria *capitula*, τρία κεφάλαια), apparently from the three propositions or condemnations contained in Justinian's original edict, one relating to Theodore's writings and person, the second to the incriminated treatise of Theodoret (whose person was not attacked), the third to the letter (if genuine) of Ibas. (See Hefele, Conciliengeschichte, ii. 777.)

At the very end of his long career of theological discussion, Justinian himself lapsed into heresy, by accepting the doctrine that the earthly body of Christ was incorruptible, insensible to the weaknesses of the flesh, a doctrine which went by the name of Aphthartodocetism. According to his usual practice, he issued an edict enforcing this view, and requiring all patriarchs, metropolitans, and bishops to subscribe to it. Some refused at once, and were deprived of their sees. Others submitted or temporized; but before there had been time enough for the matter to be carried through, the emperor died.

As no preceding sovereign had been so much interested in church affairs, so none seems to have shown so much activity as a persecutor both of pagans and of heretics. He renewed with additional stringency the laws against both these classes. The former embraced a large part of the rural population in certain secluded districts, such as parts of Asia Minor and Peloponnesus; and we are told that the efforts directed against them resulted in the forcible baptism of 70,000 persons in Asia Minor alone. At Athens, the philosophers who taught in the schools hallowed by memories of Plato still openly professed what passed for Paganism, though it was really a body of moral doctrine, strongly tinged with mysticism, in which there was far more of Christianity and of the speculative metaphysics of the East than of the old Olympian religion. Justinian, partly from religious motives, partly because he discountenanced all rivals to the imperial university of Constantinople, closed these Athenian schools (529).

Heresy proved more obstinate. The severities directed against the Montanists of Phrygia led to a furious war, in which most of the sectaries perished, while the doctrine was not extinguished. Harsh laws provoked the Samaritans to a revolt, from whose effects Palestine had not recovered when conquered by the Arabs in the following century. The Nestorians and the Eutychian Monophysites were not threatened with such severe civil penalties, although their worship was interdicted, and their bishops were sometimes banished; but this vexatious treatment was quite enough to keep them disaffected, and the rapidity of the Mohammedan conquests may be partly traced to that alienation of the bulk of the 'Egyptian and a large part of the Syrian population which dates from Justinian's persecutions.

4. Foreign **Wars.**—Justinian was engaged in three great foreign wars, two of them of his own seeking, the third a legacy which nearly every emperor had come into for three centuries, the secular strife of Rome and Persia. When Justinian came to the throne, his troops were maintaining an unequal struggle on the Euphrates against the armies of Kavadh I. (*q.v.*). After some campaigns, in which the skill of Belisarius obtained considerable successes, a peace was concluded in 533 with Chosroes I. *(see* KHOSRAU). This lasted till 539, nhen Chosroes declared war. The emperor was too much occupied in the West to be able adequately to defend his eastern frontier. Chosroes advanced into Syria with little resistance, and in 540 captured Antioch. The war continued with varying fortunes for four years more in this quarter; while in the meantime an even fiercer struggle had begun in the mountainous region inhabited by the Lazi at the south-eastern corner of the Black Sea. *(See* COLCHIS.)

When after two-and-twenty years of fighting no substantial advantage had been gained by either party, Chosroes agreed in 562 to a peace which left Lazica to the Romans, but under the dishonourable condition of their paying 30,000 pieces of gold annually to the Persian king. Thus no result of permanent importance flowed from these Persian wars, except that they greatly weakened the Roman Empire, increased Justinian's financial embarrassments, and prevented him from prosecuting aith sufficient vigour his enterprises in the West. *(See* further PERSIA: *History: The Sassanian Empire, c. A.D. 224–651.*)

These enterprises had begun in 533 with an attack on the Vandals, in Africa. Belisarius landed without opposition, and destroyed the barbarian power in two engagements. North Africa from beyond the strait of Gibraltar to the Syrtes became again a Roman province, although the Moorish tribes of the interior maintained a species of independence; and part of southern Spain **was** also recovered for the empire. The ease with which so important a conquest had been effected encouraged Justinian to attack the Ostrogoths of Italy. Justinian began the war in 535, taking as his pretext the murder of Queen Amalasuntha, daughter of Theodoric, who had placed herself under his protection, and alleging that the Ostrogothic kingdom had always owned a species of allegiance to the emperor at Constantinople, a claim for which there was some foundation. For the Italian campaign see BELISARIUS.

The imperial administration was established through Italy, but its rapacity soon began to excite discontent, and the kernel of the Gothic nation had not submitted. After two short and unfortunate reigns, the crown had been bestowed on Totila or Baduila, a warrior of distinguished abilities, who by degrees drove the imperial generals and governors out of Italy. Belisarius was sent against him, but with forces too small for the gravity of the situation. He moved from place to place during several years, but saw city after city captured by or open its gates to Totila, till only Ravenna, Otranto and Ancona remained. Justinian was occupied by the ecclesiastical controversy of the Three Chapters, and had not the money to fit out a proper army and fleet. It was not until 552 that re-conquest was attempted In that year a powerful army was despatched under Narses. Under him the Goths were completely defeated at Taginae and the Mons Lactarius, and Italy was annexed. *(See* NARSES.) But it was an Italy terribly impoverished and depopulated, whose possession carried little strength with it. Justinian's policy both in the Vandalic and in the Gothic War stands condemned by the result. The resources of the state, which might better have been spent in defending the frontiers of the empire, were consumed in the conquest of two countries which had suffered too much to be of any substantial value, and which could not be permanently retained. However, Justinian must have been almost preternaturally wise to have foreseen this: his conduct was in the circumstances only what might have been expected from an ambitious prince who perceived an opportunity of recovering territories that had formerly belonged to the empire, and over which its rights were conceived to be only suspended.

Besides these three great foreign wars, Justinian's reign was troubled by a constant succession of border inroads, especially on the northern frontier. Immense damage was inflicted by Slavonic and Hunnish marauders; and on one occasion the capital was itself in danger.

5. Personal Character. — Regarding Justinian's personal character and capacities a great diversity of opinion has existed among historians. The difficulty of arriving at a fair conclusion is increased by the fact that Procopius, our principal contemporary authority, speaks with a very different voice in his secret memoirs (the *Anecdota)* from that which he has used in his published history, and that some of the accusations contained in the former work are so rancorous and improbable that a certain measure of discredit attaches to everything which it contains.

The truth seems to be that Justinian was not a great ruler in the higher sense of the word, that is to say, a man of large views, deep insight, a capacity for forming just such plans as the circumstances needed, and carrying them out by a skilful adaptation of means to ends. But he was a man of considerable abilities, wonderful activity of mind and admirable industry. He was interested in many things, and threw himself with ardour into whatever he took up; he contrived schemes quickly, and pushed them on with an energy which usually made them succeed when no long time was needed, for, if a project was delayed, there was a risk of his tiring of it and dropping it. Although vain and full of self-confidence, he was easily led by those who knew how to get at him.

Justinian was quick rather than strong or profound; his policy does not strike one as the result of deliberate and well-considered views, but dictated by the hopes and fancies of the moment. His activity was in so far a misfortune as it led him to attempt too many things at once, and engage in undertakings so costly that oppression became necessary to provide the funds for them. Even his devotion to work, which excites our admiration, in the centre of a luxurious court, was to a great extent unprofitable, for it was mainly given to theological controversies which neither he nor any one else could settle.

Still, after making all deductions, it is plain that the man who accomplished so much, and kept the whole world so occupied, as Justinian did during the thirty-eight years of his reign, must have possessed no common abilities. He was affable and easy of approach to all his subjects, with a pleasant address; nor does he seem to have been, like his wife, either cruel or revengeful. We hear several times of his sparing those who had conspired against him. But he was not scrupulous in the means he employed, and he was willing to maintain in power detestable ministers if only they served him efficiently and filled his coffers. His chief passion, after that for his own fame and glory, seems to have been for theology; it was in this field that his literary powers exerted themselves, and his taste also, for among his numerous buildings the churches are those on which he spent most thought and money. Considering that his legal reforms are those by which his name is mainly known to posterity, it is curious that we should have hardly any information as to his legal knowledge, or the share which he took in those reforms.

In person he was somewhat above the middle height, well-shaped, with plenty of fresh colour in his cheeks, and an extraordinary power of doing without food and sleep. Two mosaic figures of him exist at Ravenna, one in the apse of the church of S. Vitale, the other in the church of S. Apollinare in Urbe; but of course one cannot be sure how far in such a material the portrait Eairly represents the original. His only child by his marriage with Theodora died in infancy, and he did not remarry. The throne passed to his nephew Justin II on his death Nov. 14, 565.

AUTHORITIES.—For the life of Justinian the chief authorities are Procopius (*Historiae, De aedificiis, Anecdota)* and (from A.D. 552) the *History* of Agathias; the Chronicle of Johannes Malalas is also of value. Occasional reference must be made to the writings of Jordanes and Marcellinus, and even to the late compilation of Cedrenus.

See also Gibbon (ed. Bury 1923); Bury, *Later Roman Empire*, vol. ii.; Grupe, *Kaiser Justinian* (Leipzig 1923). The best general account of Justinian's reign in all its aspects is probably Diehl, *Justinien et la civilisation byzantine* (1901). (J. BRY.; X.)

JUSTINIAN II., RHINOTMETUS (669–711), East Roman emperor 685–695 and 704–711, succeeded his father Constantine IV., at the age of sixteen. His reign was unhappy both at home and abroad. After a successful invasion he made a truce with the Arabs, which admitted them to the joint possession of Armenia, Iberia and Cyprus, while by removing 12,000 Christian Mardaites from their native Lebanon, he gave the Arabs a command over Asia Minor of which they took advantage in 692 by conquering all Armenia. In 689 Justinian was defeated by the Bulgarians, but settled many Slavs in Asia Minor. Meanwhile the bitter dissensions caused in the Church by the emperor, his bloody persecution of the Manichaeans, and the rapacity with which, through his creatures Stephanus and Theodatus, he extorted the means of gratifying his sumptuous tastes and his mania for erecting costly buildings, drove his subjects into rebellion. In 695 they rose under Leontius, and, after cutting off the emperor's nose (whence his surname), banished him to Cherson in the Crimea. Leontius, after a reign of three years, was in turn dethroned and imprisoned by Tiberius Absimarus, who next assumed the purple. Justinian meanwhile had escaped from Cherson and married Theodora, sister of Busirus, khan of the Khazars. Compelled, however, by the intrigues of Tiberius, to quit his new home, he fled to Terbelis, king of the Bulgarians. With an army of 15,000 horsemen Justinian suddenly pounced upon Constantinople, slew his rivals Leontius and Tiberius, with thousands of their partisans, and once more ascended the throne in 704. His second reign was marked by an unsuccessful war against Terbelis, by Arab victories in Asia Minor, by devzstating expeditions sent against his own cities of Ravenna and Cherson, where he inflicted horrible punishment upon the disaffected nobles and refugees, and by the same cruel rapacity towards his subjects. Conspiracies again broke out: Bardanes, surnamed Philippicus, assumed the purple, and Justinian, the last of the house of Heraclius, was assassinated in Asia Minor, December 711.

See E. Gibbon, *Decline and Fall of the Roman Empire* (ed. Bury, 1896), v. 179–183; *J. B.* Bury, *The Later Roman Empire* (1889), ii. 320–330, 358–367; F. Görres, in *Byzantinische-Zeitschrift*, 1908, p. 432; E. W. Brooks, in *Cambridge Medzaeval History* II. (1913), pp. 406-414.

JUSTIN MARTYR (b. *c.* A.D. 100), Christian apologist, was born, of pagan parents, *c.* 100 at Flavia Neapolis (anc. *Shechem*), now Nablus, in Palestinian Syria (Samaria). A thorough study of the philosophy of Peripatetics and Pythagoreans, Stoics and Platonists, brought home to Justin the conviction that true knowledge was not to be found in them. On the other hand, he came to look upon the Old Testament prophets as approved by their antiquity, sanctity, mystery and prophecies to be interpreters of the truth. To this must be added the deep impression produced upon him by the life and death of Christ. His conversion apparently took place at Ephesus. After his conversion he retained his philosopher's cloak (Euseb., *Hist. Eccl.* iv. 11. 8), the distinctive badge of the wandering professional teacher of philosophy, and went about from place to place discussing the truths of Christianity in the hope of bringing educated Pagans, as he himself had been brought, through philosophy to Christ. In Rome he gave lectures in a class-room of his own, though not without opposition from his fellow-teachers. Among his opponents was the Cynic Crescentius *(Apol.* ii. 13). Eusebius (*Hist. Eccl* iv. 16 7–8) concludes somewhat hastily, from the statement of Justin and his disciple Tatian (*Orat.* ad *Graec.* 19), that the accusation of Justin before the authorities, which led to his death, was due to Crescentius. But we know, from the undoubtedly genuine *Acta SS. Justini* et *sociorum*, that Justin suffered the death of a martyr under the prefect Rusticus between 163 and 167.

To form an opinion of Justin as a Christian and theologian, we must turn to his *Apology* and to the *Dialogue* with the Jew Trypho, for the authenticity of all other extant works attributed to him is disputed with good reason. The *Apology* was written in Rome about 150. In the first part Justin defends his fellow-believers against the charge of atheism and hostility to the state. He then demonstrates the truth of his religion from the effects of the new faith, and from the excellence of its moral teaching, and concludes with a comparison of Christian and Pagan doctrines, in which the latter are set down as the work of demons. As the main support of his proof of the truth of Christianity appears his demonstration that the prophecies of the old dispensation have found their fulfilment in Christianity. A third part shows, from the practices of their religious worship, that the Christians had in truth dedicated themselves to God. The whole closes with an appeal to the princes, with a reference to the edict issued by Hadrian in favour of the Christians. In the so-called *Second Apology*, Justin takes occasion from the trial of a Christian recently held in Rome to argue that the innocence of the Christians was proved by the very persecutions.

Even as a Christian Justin always remained a philosopher. By his conscious recognition of the Greek philosophy as a preparation for the truths of the Christian religion, he appears as the first and most distinguished in the long list of those who have endeavoured to reconcile Christian with non-Christian culture. In the *Dialogue* with the Jew Trypho, where he had to deal with the Judaism that believed in a Messiah, he was far better able to do justice to Christianity as a revelation; and the arguments of this work are much more completely in harmony with primitive Christian theology than those of the *Apology*.

Justin is a valuable authority for the life of the Christian Church in the middle of the 2nd century. The *Apology* contains a few paragraphs (61 *seq.)*, which give a vivid description of the public worship of the Church and its method of celebrating the sacraments (Baptism and the Eucharist). His works are also of great value for the history of the New Testament writings. He knows of no canon of the New Testament, *i.e.*, no fixed and inclusive collection of the apostolic writings. His sources for the teachings of Jesus are the "Memoirs of the Apostles," by which are probably to be understood the Synoptic Gospels (without the Gospel according to St. John), which, according to his account, were read along with the prophetic writings at the public services.

Both the *Apology* and the *Dialogue* are preserved in but a single ms. (cod. Paris, 450, A.D. 1364).

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(1742) are superseded by J. C. T. Otto, *Justini philosophi et martyris opera quae feruntur omnia,* 3rd ed., 5 vol. (Jena, 1876–81). This edition contains besides the *Apologies* (vol. i) and the *Dialogue* (vol. ii) other writings now admitted to be spurious. For a handy edition of the *Apology, see* G. Krüger, *Die Apologien Justins des Märtyrers,* 3rd ed. (Tubingen, 1904). There is a good German translation with a comprehensive commentary by H. Veil (1894). For English translations consult the "Oxiord Library of the Fathers" and the "Ante-Nicene Library." *See* also J. Donaldson, *A Critical History of Christian Literature and Doctrine,* vol ii (1866); T. M. Wehofer, *Die Apologie Justins des Philosophen und Märtyrers in litterarhistorischer Beziehung zum ersten Male untersucht* (1897); A. L. Feder, *Justins des Märtyrers Lehre von Jesus Christus* (1906). On the spurious writings consult A. Marnack, *Diodor von Tarsus. Vier pseudo-justinische Schriften als Eigentum Diodors nachgewiesen* (1901); Goodenough, *The Theology of Justin Martyr* (1923).

JUSTO, AGÚSTÍN PEDRO (1876–1943). Argentine president. was born in Concepción del Uruguay, province of Entre Rios. Arg., on Feb. 26. 1876. After studying at military academies. he became professor of military science at the Officers Training school in 1903. Later he taught civil engineering at the University of Buenos Xires and mathematics at the San Martin Military college. During the 1920s, having risen to the rank of general, he held the portfolios of war. agriculture and public works. For a brief period, after the revolution against the Radical president Hipólito Irigoyen in 1930, Justo served as army commander in chief. The climax of his political career was his election to the presidency on Nov. 8. 1931, on a conservative coalition ticket. He raised the state of siege declared by his predecessor. Gen. Jose F. Criburu. who had been president de *facto.* Though more moderate than Criburu. Justo was a virtual dictator. During the early part of his presidency, his country was weakened by the revolution which had aided in his rise to power and by the world economic depression. From 1932 to 1938 he developed public works. notably roads and improvements in military establishments: signed the Roca-Runciman treaty (1933), which protected Argentine cattle raisers in the British market; and brought about improved relations with neighbouring countries. He led the National Democratic party. formed by the conservatives, and nominated his successors, Roberto M. Ortiz as president and Ramón Castillo as vice-president. He remained a party leader after his term of office, and opposed Castillo's neutrality position in World War II. In Aug. 1942, after Brazil declared war on the axis powers, he flew to that country in his capacity as an honorary general of the Brazilian army, a rank that had been given him when he was president. and offered his services. His plan to contest control of the presidential election with Castillo was cut short by his death in Buenos Aires on Jan. 10, 1943.

JUSTUS, SAINT (d. 627), fourth archbishop of Canterbury and first bishop of Rochester, was born in Rome. In 601, with Laurentius, Mellitus and others, he was sent by Pope Gregory I to strengthen the mission of St. Xugustine in Kent. He was consecrated by Augustine as bishop of Rochester when the see was established in 1604. Shortly afterward. Aethelbert. king of Kent, granted him lands around Rochester. The fact that part of the land granted has ever since been known as Priestfield gives some credence to the belief that Justus may have been a secular priest rather than a monk. Justus joined with Mellitus and Laurentius in urging conformity on bishops and abbots in the north. At Aethelbert's death in 1616, Justus fled with Mellitus to Gaul in the wake of hostility to Christianity. but they returned the next year when Eadbald, the new king, who had been converted by Laurentius, recalled Justus to his bishopric. He became archbishop of Canterbury in 624 on the death of Mellitus. the third archbishop. Justus received the pallium and a letter from Pope Boniface IV, giving him the power to consecrate bishops, which he exercised in consecrating Romanus as his successor to the bishopric of Rochester. The most important event of Justus' archiepiscopacy was the conversion of the kingdom of Northumbria by Paulinus, whom Justus consecrated as bishop and sent with Ethelburga, sister of the king of Kent, who had married Ednin, the heathen king of Xorthumbria. Justus probably died on Nov. 10, 627. He was buried at Canterbury in St. Peter's porch, St. hugustine's. with the three archbishops who had preceded him, Augustine, Laurentius and Mellitus.

The chief sources on Tustus are the Venerable Bede's *Historia Ecclesiastica* and the *Anglo-Saxon Chronicle.*

JUSTUS (JODOCUS) **OF GHENT** (JOOS VAN WASSENHOVE) (*c.*1440–*c.*1480/85), a Flemish painter whom G. Vasari and F. Guicciardini called Giusto da Guanto and who has been identified with Joos van Wassenhove, a member of the painters' guild at Antwerp in 1460 and at Ghent in 1464. His name is not mentioned in the records of the guilds after 1469, and it is supposed that he then emigrated to Italy. To his early period in Flanders two pictures have been ascribed: the altarpiece at St. Bavo in Ghent representing the "Crucifixion" and the "Adoration of the Magi" at the Metropolitan museum, New York. In 1474 Justus of Ghent was in Italy, where he painted the "Communion of the Apostles," described by Vasari and now in the Palazzo Ducale at Urbino.

This is the only absolutely authenticated picture by the master. It nas painted for the brotherhood of Corpus Christi at the bidding of Federigo da Montefeltro, duke of Urbino, who was introduced into the picture. Vespasiano de Bisticci, his librarian, states that the duke sent to the Netherlands for a capable artist to paint a series of "ancient worthies" for a library recently erected in his palace because he knew no one in Italy who understood how to paint in oil colours. On the basis of stylistic similarities. it is generally accepted that this Flemish artist may be identified with Joos van Wassenhove. Although largely tempered by contact with Italian art and artists, the style and execution of the portraits still give evidence of the Flemish origin and training of their author. Furthermore, they are closely related to both the Ghent "Crucifixion" by Joos and the "Communion of the Apostles" by Giusto da Guanto. There are 28 portraits of "worthies," of which 14 have been reinstated in the palace at Urbino (from the Barberini palace at Rome) and another 14 are at the Louvre in Paris. Some of them, and sometimes even the whole group, have been tentatively ascribed to artists who are supposed to have worked at Urbino at the time; *i.e.,* the Italian painter Melozzo da Forli and the Spanish painter Pedro Berruguete.

To Justus are also ascribed the "Portrait of Federigo da Montefeltro and his son Guidobaldo" at Urbino and the "Lecture" at Windsor castle. The seven "Liberal Arts," which decorated the ducal palace at Urbino, and of which two are now in the National gallery, London, and another two were once at Berlin hut were destroyed in World War II. are ascribed to Justus by some critics and by others to Melozzo da Forli. They seem to recall Melozzo in their design, but are Flemish in their colour and execution. Justus brought his northern traditions to Italy and there combined them with those of the Italian school. His development was gradual and his later works are difficult to distinguish from those of Italian masters.

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JUTA, JAN (1897–), muralist, designer and craftsman in glass, metal and wood, was born in Cape Town, U. of S.Af., on Sept. 1, 1897. The son of Sir Henry Hubert Juta (1857–1930), South African jurist and legislator, he was educated at Christ Church college, Oxford, and studied art at the Slade school in London and at the Bellas Artes, Madrid.

Juta did his first mural painting in 1924 and went to the U.S. in 1926. Paintings and decorations by him appeared in the Royal Institute of Architects and in South Africa house, London; in the city hall, Pretoria; and in the steamships "Queen Mary" and "Queen Elizabeth." His works also were acquired by private owners in New York city, Washington, D.C., and Chicago, Ill. He served with the United Nations secretariat from 1947 to 1954.

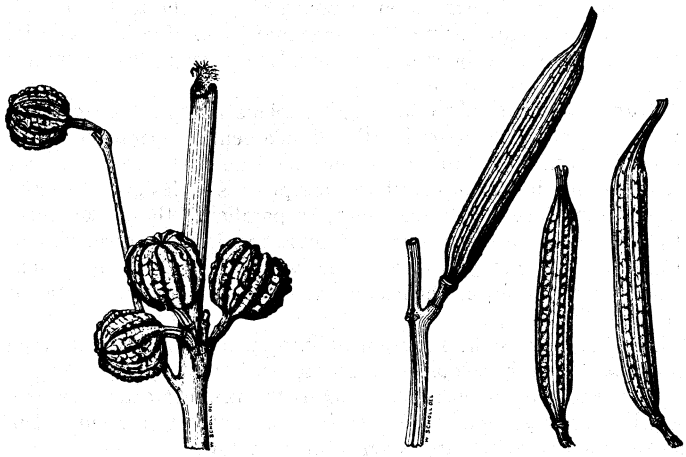
Juta wrote and illustrated regional and travel books, including an account of his boyhood in South Africa, *Look* Out for the Ostriches (1949).

JUTE is the name of both a plant and of the fibre derived from it. Among the basic raw materials classed as fibres, jute is second only to cotton in world consumption. Its primary use

is in fabrics for packaging the wide range of agricultural and industrial commodities that require bags, sacks, packs andwrappings. Wherever bulky, strong fabrics and twines are required, jute is almost universally accepted because of its low unit price.

The earliest references to jute were made under the name of *pat,* a term still widely used in modern times in the Indo-Pakistan jute trade. The name jute appears to be derived from *jhot* or *jhout* (Sansk *jhat),* the vernacular name by which the substance is known in Orissa state. India.

Botany of the Plant. — The fibre is obtained from two species of *Corchorus* (family Tiliaceae), *C. capsularis* (white jute) and



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FIG. 1 — SEED PODS OF (A) CORCHORUS CAPSULARIS AND (B) CORCHORUS OLITORIUS

C. olitorius (tossa and *daisee).* These species of *Corchorus* have been grown in Bengal from very remote times for economic purposes, although it has not been confirmed that the genus originated in India. The two species cultivated for jute fibre are similar; they differ in shape of seed pod and slightly in growth habit and fibre characteristics. They are annual plants from 6 to 15 ft. high, with a cylindrical stalk about as thick as a man's finger; when closely spaced for fibre production, the plants branch near the top only. The light green leaves are 4 to 6 in. long and about 2 in. broad and taper to a point; the edges are serrated; the two teeth at the base of the leaf are drawn out into long, bristlelike points. Small yellow flowers are borne singly or in clusters opposite or to one side of the leaves.

The capsules. or seed pods. in the case of C. *capsularis* are globular, rough and ribbed, while in C. *olitorius* they are slender, quill-like cylinders (about two inches long), ribbed but otherwise smooth. These differences may be noted in fig. 1, in which (A) and (B) show the capsules of *C. capsularis* and *C. olitorius,* respectively. Fig. 2 represents a flowering top of C. *capsularis.*



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FIG. 2.— TOP OF THE JUTE PLANT CORCHORUS CAPSULARIS

Commercial fibre consists of strands of overlapping fibre cells, which average about 2 mm. (0.08 in.) in length and 20μ (.0008 in.) in diameter and are held together by natural plant gums. These strands surround the woody central part of the stem and are found just under the bark; they are embedded in non-fibrous tissues.

The strands nearest the bark generally run the full length of the stem; other strands become progressively shorter. The fibre filaments appear to be parallel. but a fine network is apparent on close examination.

The name jute is also applied to several other fibres, which are used as jute substitutes; these include Bimli or Bimlipatam jute, *Hibiscus cannabinus* and *H. sabdariffa;* Java jute, *H. sabdariffa;* Tientsin or China jute. *Abutilon theophrasti (avicennae);* Congo jute. *Grena lobata;* and broom jute. *Sida rhombifolia.*

Cultivation and Cropping; Production. — Both species of jute are cultivated in Pakistan and India, mostly on small farms and mainly for their fibre but also for the leaf, which is used as a potherb. These two countries are the world's principal producers of jute. Pakistan production is in the province of East Bengal. Indian production is mainly in West Bengal, Bihar, Assam, Orissa, Uttar Pradesh and Tripura. Attempts have been made to grow jute in the Americas, Africa and other tropical and subtropical areas. The plant has grown well in some of these areas, but the established cheap production of the fibre in Pakistan and India discouraged extensive production elsewhere. One of the most successful endeavours to grow jute outside India and Pakistan was started in Brazil in 1930.

The successful cultivation of the plant demands a fertile, well-drained soil and a hot. moist climate. with at least three or four inches of rain per month. Too much rain at the beginning of the season is detrimental to growth, and a very dry season is disastrous. The climate and soil of the eastern and northern parts of East Bengal are ideal for the growth of the plant.

The seed is sown broadcast. Planting rates average about 12 lb. per acre for white jute and about 8 lb. per acre for *tossa* and *daisee.* Fields are hand-weeded as many as three times and while being weeded are thinned to a uniform stand of about three plants per square foot. The time of sowing extends from March to June, and the harvesting. which depends on the time of sowing and on the weather. is done irom the first of July to the middle of October. The crop is said to be ready for harvesting when the flowers begin to fade. If it is cut before then. the fibre is weak; if left until the seed is ripe, the fibre is strong but is coarser and lacks the characteristic lustre. Many cultivators leave the bundles of cut stems in the field for a few days to allow shedding of leaves. The yield per acre naturally depends on the soil, rainfall, farming practices, etc., however, 1,200 lb. of fibre is considered a good average yield.

After partition in 1947 gave Pakistan about 70% of the jute acreage, India made concerted efforts to increase jute production in adapted areas. Pakistan, on the other hand, regulated its acreage in order to avoid overproduction (see *Jute Industry: History,* below).

Retting.—To release the fibre for stripping, the stems are retted. Retting is usually carried out in pools or streams. The bundles of stems are placed in the water and weighted down so that they are submerged but do not touch the bottom. They are left there from ten days to a month, depending on the type and temperature of the water and the maturity of the plants. Bacterial action breaks down the tissues surrounding the fibres.

Retting is a critical step in the production of good-quality fibre. If the stems are taken irom the nater too soon, the fibre is difficult to remove and cannot be well cleaned; if they are retted too long, the fibre is weakened and of poor quality.

Stripping.--When regular examination indicates that the fibre can be stripped satisfactorily, the bundles are taken, one or a few at a time, to the bank or to water two to three feet deep for stripping. Several methods of stripping are employed. The stripper's commonest practice is to stand in the water holding a small bundle of stems (about ten plants) in one hand and to beat the root ends nith a paddle to loosen the fibre. He then breaks the stems over his knee about a foot from the root end and shakes out the short sections of stem. Next he grasps the loosened portion of the fibres and jerks the strands off the remainder of the stems.

The fibre is washed, to remove foreign matter. by swishing it across the surface of the water. It is then wrung out and hung on poles or lines to dry.

Grading and Baling. — The dried fibre then moves through a series of middlemen to the baling centres, nhere it is sorted. graded and baled. The characteristics of good-quality jute are strength, cleanliness. length. softness, lustre, uniformity. lou percentage of

"root" (unseparated barky fibres at the base), a uniform whitish-yellow colour for white jute and a golden-bronze to gray-white colour for tossa and daisee.

The first grading is usually done at the kutcha baling centres. There the jute is sorted as tops, middles, bottoms and cross (X) and so marked along with the species (white, tossa or *daisee*) and the area from which it came. The source is as descriptive of quality as the grade itself. After grading, the jute is put into low-compression *kutcha* bales, which weigh from 275 to 325 lb. The jute moves in these *kutcha* bales either to spinning mills in India or Pakistan or to export balers.

Jute for export, and a certain amount of that going to the Indian and Pakistani jute mills, is regraded to make a much closer separation of qualities. For some jute this is the first grading; such jute does not move through kutcha baling centres. Before grading. the barky portion of the root ends are cut off and sold separately as butts or cuttings. The cut jute is graded according to the balers' own copyrighted standards, which total from 30 to 70 per baler. The "marks" of each baler roughly correspond to an official standard for *pucca* assortment. These standards are shown in the table.

Standards for Pucca Assortment

White jute*	*Tossa**	*Daisee**
Superior Dacca Dundee† Firsts Dundee† Lightnings Dundee† Hearts Mill Reds L. J. A.† Reds (Mill Firsts) L.J.A.† Firsts (Mill Lightnings) L.J.A. Lightnings (Mill Hearts) L.J.A.† Hearts	Dacca or Jat *tossa* (2, 3, 4, 5, 6) Hard District Eastern or Semi-Jat *tossa* (2, 3, 4) Crack or Short Group *tossa* (2, 3, 4) Dundee, Grade or Long Group *tossa* (2, 3, 4) Outport *tossa* (2, 3, 4)	Crack or Short Group *daisee* (2, 3, 4) Grade or Long Group *daisee* (2, 3, 4) Outport *daisee* (2, 3, 4)

*The ten standards for white jute are listed in descending order of quality; the standards for *tossa* and *daisee* are listed in descending order or groups of qualities.
†The following synonyms are used by the trade in white jute standards. "Dundee" is also "Crack"; "L.J.A." is also "Shipment," "Export," "Outport" or "Grade."

In these grades jute is hydraulically pressed into standard 400 lb. *pucca* bales (48 X 20 × 18 in.). (E. G. N.)

JUTE INDUSTRY

History. — At the time jute became known to the west in the 18th century, it was in common use in Bengal, where it was spun and woven by hand into a variety of cloths and other articles. Scattered importations of the fibre were made into England. western Europe and America, but it was not until the 19th century was well advanced that serious attention was given to jute as a raw material. In the early stages, progress was retarded because any attempt to combine it with the other bast fibres then in use—hemp and flax—was regarded as an adulteration of those fibres. Thus jute was considered an inferior fibre: and its special attributes were not recognized.

In 1832 experiments were made at Dundee, Scot., which are usually regarded as the first practical efforts to utilize jute as a raw material in the western world. Further impetus was given by a decision of the Netherlands government, about 1838, to replace flax with jute in the manufacture of coffee bags for the East Indies. Thereafter the production of jute goods expanded in and around Dundee and spread to other centres on the European continent and in the United States.

Meanwhile the obvious attractions of the industry in India had not been overlooked. The first power-driven jute mill was started near Calcutta in 1854; but for 20 years thereafter progress was slow, the first important stage of growth taking place in the decade following 1872. Before the outbreak of World War I in 1914, however. the Calcutta industry had expanded until it absorbed more of the jute crop than all the other manufacturing centres of the world together. The bulk of the Indian output took the form of hessian (burlap) and sacking, the two basic types of jute cloth used for commodity transportation.

The partition of India in 1947 affected the jute industry vitally. While the greater part of the lands previously generally used for jute cultivation were in East Pakistan, the entire manufacturing capacity stayed in India, and immediately became dependent on Pakistan for a large proportion of its raw material. Jute played a prominent role, therefore, in the development of trade relations between the two countries. After partition Pakistan started to build up a jute manufacturing industry, creating a new demand for the fibre and additional competition in the sale of jute products. Other countries found the goal of self-sufficiency in jute goods attractive. and jute manufacture is now widely spread throughout the world.

New factors affecting the world jute industry after World War II caused rapid fluctuations in prices, at times to levels high enough to threaten serious loss of markets to competing methods and materials. This brought about a recognition of the fact that jute is only one of many commodities that may be used in the essential function of packaging and that its place among them depends upon a competitive price level.

Manufacturing Process. — This explanation is intended to be general enough to describe the fundamental operations used throughout the world for converting raw jute fibre into yarn. Essentially the jute yarn manufacturing process is designed to separate the individual fibre filaments; to parallelize these filaments; to blend them for uniformity of colour, strength and quality; and to twist them into yarns which derive their strength in tension partly from the fibres themselves and partly from the frictional forces between them.

The first step is the selection of jute by kind, mark and grade based on strength, colour, cleanliness, texture and price. This is an involved and skilled decision, fixing the product characteristics which are not generally alterable by subsequent treatment. The succeeding operations are given in order below.

Precarding.—This comprises bale opening, blending, application of oil and water and softening. Pucca bales (see Grading and Baling, above) are so highly compressed that the jute bundles of which they are composed require loosening by various manual and mechanical bending or kneading actions. The liquid to be added is usually sprayed on while the jute passes either through the softener or the hackle. The softener is a machine of consecutive pairs of fluted rollers which knead the liquid into the fibre as it passes between them. The hackle is a machine which accomplishes similar results by working the jute through moving pins. The action of the hackle also overlaps the jute from bundle to bundle to develop a continuous band of material called a sliver, the weight of which bears a predetermined relationship to its length. The softened bundles, or the hackled sliver, as the case may be, are set aside in a warm, damp atmosphere to complete the permeation of the fibre by the liquids.

Carding.—The breaker card consists of a large cylinder bearing on its surface an array of steel pins. This is accompanied by similar but smaller pinned cylinders so arranged that. as they rotate, the pins interact at predetermined relative speeds. The meshy interlace of the fibre structure, preserved up to this point, is worked around these cylinders, which break it down into smaller and more uniform units. The shortening of the fibres is primarily a result of the reduction of the mesh structure by the pins, and is not achieved to any great extent by direct cutting action on the jute. The card is designed to remove as much as possible of the undesirable plant material which the fibre carries, without undue wastage of the fibre.

Hackle sliver is fed directly into the breaker card; but, when bundles of jute from the softener are used, the necessary relationship between length and weight must be established by careful uniform spreading of the bundles on the feed sheet. The fibre leaves the breaker in the form of sliver, which, for transfer to the next process, is put into narrow rolls (laps), piles or cans. A complete carding operation involves the passage of the jute through a second (finisher) card, differing in certain features of construction from the breaker card, in order to effect the degree of cleaning that may be required.

Drafting. — The sliver from the card is passed through two or more drafting (drawing) machines, each of which consists of a moving bed of pins, or a pressure device, through which the sliver is drawn by a pair of rollers. Drafting straightens the fibres and

reduces the sliver size. In this operation there is a recombining (doubling) of the slivers which contributes to the evenness of the product.

Roving.—The roving machine consists of a drafting mechanism combined with a mechanism which inserts a slight twist into the sliver and winds the resulting soft, weak rove on a bobbin in a tensionless condition.

Spinning.—All spinning machines are supplied with either sliver or rove which must be drafted to size at the point of twisting. Rove is handled without pins and is reduced in size between the two pairs of rollers of appropriately different surface speeds. When sliver is employed in the spinning frame it is drafted either through pins or through various pressure devices. The twist is inserted by high-speed rotating members which have incorporated with them means of winding the yarn onto bobbins.

The count or size of jute yarn and rove is the weight in pounds of a "spyndle," which is a length of 14,400 yd. Individual jute fibres are about 200,000 yd per pound in size, which indicates that there is an average of 111 fibres in a cross section of eight-pound yarn, a size largely used in weaving hessian.

For jute all the operations through spinning are unique in the textile industry, and both imagination and experience on the part of the operator are required for good results. Once the yarn has been spun, further operations, such as weaving, knitting, twisting, cording. laying. braiding and sewing, are similar to such operations with yarn of any other fibre. A unit of equipment for spinning jute is usually based upon one breaker card with a capacity from 600 to 1,200 lb. per hour. From 30 to 60 people would be needed to operate the system, and about 45,000 sq.ft. of space to house it.

A jute farmer can, and sometimes does, conduct all the work from sowing of seed to the making of some crude cord ior his own use. but most jute articles in modern commerce may involve the labour of as many as 100 different persons, from the farmer at his planting to the ultimate consumer.

Utilization.— Jute is of world-wide and varied use in products performing functions in all walks of agricultural, commercial, household and industrial life. Millions of persons use jute prayer rugs, for example; other millions use jute-backed carpets laid over jute cushions. Jute fabric coverings protect countless commodities in transit in packages closed and tied with jute twine. Few persons are aware that jute serves unseen in insulated cables which conduct electric current for communications and power. Mining safety is aided by jute brattice cloth partitions and slow-burning jute fuse yarn. Weather-resistant. strong wrappings are made by laminating scrim—a wide-mesh fine-yarn jute fabric—between layers of heavy paper. A type of jute scrim is also used by plasterers. Decorators make draperies and designers fashion sports clothes from dyed burlap. Tailors use jute interlining—woven from high-grade fine yarns—as construction material for men's suit coats and overcoats. Jute is also braided into soles for shoes (in Latin-American countries). Shipping tags and book covers are strengthened by jute fibre in the paper stock.

Most jute, however. is made into fabrics, usually of the plain (over-and-under) weave, and the usage, rather than the construction, becomes the basis of names, such as bagging and sacking. Jute fabrics range in texture from fine hessian, with 16 yarns or more per inch, to heavy bagging (for wrapping cotton bales) with a one-inch or larger mesh and yarns about the size of a man's finger.

Hessian (burlap) and sacking (a heavier fabric) are the standard wrapping and bag materials. Hessian cloth is usually made into bags in the consuming countries, whereas sacking is cut and sewed into bags before export from India.

Vegetables, fruits and small grains are shipped and stored in burlap bags, as are flour, sugar, fine seeds and milled animal feeds; bags for the latter must be provided with liners of closer materials. Silk and flax fibres are baled with a protective burlap covering. Sand-filled burlap bags are built into dikes and levees, and troop trenches are lined with them. Bags of jute sacking convey fibres, grains, vegetable products, ores and minerals. Burlap and sacking bags and wrappers may be used over and over again until they are finally shredded for their fibre content.

Exceptionally wide hessian forms a base for linoleum and the foundation for tufted and hooked rugs. Tarpaulin, a heavy-warp plain jute fabric, provides temporary covering for weather protection.

Jute webbing, a closely woven, narrow fabric having great strength and little stretch, confines the springs and cushion material in upholstered furniture. Jute rove and yarn are sold to manufacturers for processing into other products. Electric cable manufacturers use them as a filler and a covering for sensitive wires. The woven carpet industry—a principal consumer—uses jute yarns as backing for rugs and carpets faced with other fibres. Jute backing yarns add weight and stiffness and maintain a firm bond for the pile throughout the life of the rug.

Jute rove is made into square braided piston rod packing and pressure valve stem packings. Oakum, for calking water and soil pipes and window frames, is made from treated jute fibre.

Jute tying or wrapping twines are made in many sizes for a wide variety of uses ranging from fine sewing to coarse bundling. With it, for example, paper mills band bundles of paper; printers tie bundles of books, magazines and newspapers; nurserymen bind trees and shrubs; gardeners fasten vines and bunch vegetables; and packers hang meats for curing.

Furniture makers confine springs with the twines and use weltcord in cushion edges. Jute rope is manufactured in sizes up to $1\frac{1}{2}$ in. in diameter. In wartime, jute rope proved a vital supplement to abaca and sisal fibres.

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(*G.* F. Q.)

JUTERBOG or GÜTERBOG, a town in the district of Potsdam, Germany. On the Nuthe, it is 39 mi. S.W. of Berlin at the junction of the main lines of railway from Berlin to Dresden and Leipzig. The population, mainly Protestant, was 15,912 in 1950. The centre of an agricultural and forested area, it manufactures paper products, stationery and furniture and has canneries. A gunnery practice ground and military manoeuvre area was established nearby to the northwest.

Juterbog was chartered in 1174 and belonged in the later middle ages to the archbishopric of Magdeburg, passing to electoral Saxony in 1648 and to Prussia in 1815. The town is surrounded by a mediaeval wall with three 11th-century gateways. The Protestant church of St. Nicholas (14th century) is remarkable for its three fine aisles, and there are examples of late Romanesque and late Gothic in the Jakobikirche and the Monchenkirche. Jiiterbog also has an old town hall.

A treaty over the succession to the duchy of Julich was made in March 1611 between Saxony and Brandenburg at Juterbog, and during the Thirty Years' War the Swedish forces defeated the Imperialists there in Nov. 1644. Two miles southwest oi the town is the battlefield of Dennewitz, the site during the Napoleonic wars of the battle of Juterbog, in which the Prussians on Sept. 6, 1813, defeated the French.

JUTES, the third of the Teutonic nations which invaded Britain in the 11th century, called by Bede Iutae or Iuti (see BRITAIN: Anglo-Saxon). They settled in Kent and the Isle of Wight, together with the adjacent parts of Hampshire. In the latter case the national name is said to have survived until Bede's own time, in the New forest indeed apparently very much later. In Kent, however, it seems to have soon passed out of use! though there is good reason for believing that the inhabitants of that

kingdom were of a different nationality from their neighbours (*see* KENT, KINGDOM OF). With regard to the origin of the Jutes, Bede only says that Angulus (Angel) lay between the territories of the Saxons and the Iutae—a statement which points to their identity with the Iuti or Jyder of later times, *i.e.*, the inhabitants of Jutland. Some recent writers have preferred to identify the Jutes with a tribe called Eucii mentioned in a letter from Theodberht to Justinian (Mon. *Germ. Hist. Epist.* iii. p. 132 *seq.*), and settled apparently in the neighbourhood of the Franks. But these people may themselves have come from Jutland.

See Bede, *Hist. Eccles.* i. *15.* iv. 16. (H. M. C.)

JUTICALPA, capital of the department of Olancho, Honduras, and the centre of an important agricultural and potentially valuable mining section. Pop. (1950) 3,205. It lies at an altitude of 2,700 ft., 130 mi. E.N.E. of Tegucigalpa, capital of Honduras, with which it is connected by road. It has an airfield and is served by regular domestic flights. Mule trails lead north to Olanchito, which is connected by rail with the Caribbean ports of Puerto Castilla, La Ceiba, etc.

The surrounding region produces sugar cane, cereals, cattle and numerous subsistence crops, and the natives pan gold in the local streams. (J. W. MW.)

JUTLAND (Danish Gylland), the Chersonese or Cimbric peninsula of ancient geography, a projection of northern Europe, forming the continental portion of the kingdom of Denmark and including, in its larger sense, the German province of Schleswig-Holstein. Politically, Jutland ends southwards at the narrowest part of the peninsula (36 m.), in lat. 54° 50′ N., and includes several small islands. Its physical features, etc., are treated under DENMARK.

JUTLAND, BATTLE OF. Called by the Germans the battle of the Skagerrak, this battle was fought in the North Sea between the British Grand Fleet, under Admiral Sir J. R. Jellicoe, and the German High Seas Fleet, under Admiral Reinhard Scheer, on May 31, 1916. The main action took place about 75 mi. from the Danish coast in the neighbourhood of lat. 57° N. long. 6° E. The encounter is memorable as being the only occasion throughout the World War on which the rival battle fleets met, also for the fact that it left the British fleet undisputed master of the German one up to the day of the latter's surrender. As a test of modern naval material it was prolific in lessons for both sides.

I. INTRODUCTORY

The movements of the fleets and squadrons were necessarily

TABLE I. *British* Grand Fleet

Unit	Ships	Commander
SCAPA FLOW		
Fleet Flagship and attached ships	Iron Duke 1 Destroyer 1 Flotilla Leader 1 Light Cruiser	Admiral Sir John Jellicoe.
First Battle Squadron		
6th Division	Marlborough, Revenge, Hercules, Agincourt	Vice-Admiral Sir C. Burney.
5th Division	Colossus, Collingwood, Neptune, St. Vincent	Rear-Admiral Gaunt.
Attached	1 Light Cruiser	
Fourth Battle Squadron		
4th Division	Benbow, Bellerophon, Temeraire, Vanguard	Vice-Admiral Sir D. Sturdee.
3rd Division	Royal Oak, Superb, Canada and fleet flagship (Iron Duke)	Rear-Admiral A. L. Duff.
Third Cattle Cruiser Squadron, attached	Invincible, Indomitable, Inflexible 2 Light Cruisers	Rear-Admiral Hood.
Second Cruiser Squadron, also attached	Minotaur, Hampshire, Cochrane, Shannon	Rear-Admiral Heath.
Fourth Light Cruiser Squadron	5 Light Cruisers	Commodore Le Mesurier.
Fourth Flotilla	2 Flotilla Leaders and 17 Destroyers	Captain C. J. Wintour.
Eleventh Flotilla (part)	1 Light Cruiser and 4 Destroyers	Commodore Hawksley.
Twelfth Flotilla	2 Flotilla Leaders and 14 Destroyers	Captain Stirling.
INVERGORDON		
Second Battle Squadron		
1st Division	King George V., Ajax, Centurion, Erin	Vice-Admiral Sir M. Jerram.
2nd Division	Orion, Monarch, Conqueror, Thunderer	Rear-Admiral Leveson.
Attached	1 Light Cruiser	
First Cruiser Squadron	Defence, Warrior, Duke of Edinburgh, Black Prince	Rear-Admiral Sir R. Arbuthnot.
Eleventh Flotilla (part)	1 Flotilla Leader and 10 Destroyers	Commander Sullivan.
ROSYTH		
Battle Cruiser Fleet Flagship	Lion	Vice-Admiral Sir D. Beatty.
Fifth Battle Squadron	Barham, Valiant, Warspite, Malaya	Rear-Admiral Evan-Thomas.
First Battle Cruiser Squadron	Princess Royal, Queen Mary, Tiger	Rear-Admiral Brock.
Second Rattle Cruiser Squadron	New Zealand, Indefatigable	Rear-Admiral Pakenham.
First Light Cruiser Squadron	4 Light Cruisers	Commodore Alexander-Sinclair.
Second Light Cruiser Squadron	4 Light Cruisers	Commodore Goodenough.
Third Light Cruiser Squadron	4 Light Cruisers	Rear-Admiral Napier,
First Flotilla (part)	1 Light Cruiser and 9 Destroyers	Captain Roper.
Thirteenth Flotilla	1 Light Cruiser and 10 Destroyers	Captain Farie.
Ninth Flotilla (part)	4 Destroyers	Commander Goldsmith,
Tenth Flotilla (part)	4 Destroyers	Commander Hodgson.
Attached	Engadine, Seaplane Carrier	Lieut.-Commander Robinson.

governed to a large extent by highly technical considerations, and the battle is not an easy one for the layman to follow without a painstaking study of its successive phases and the motives which produced them. Moreover, in order to obtain a true perspective of events it is necessary to keep in mind the following fundamental facts:—

(a) The Allied cause rested absolutely on the retention by Britain of that sea supremacy of which the Grand Fleet was the fulcrum.

(b) By the date of Jutland Germany's surface navy had already been rendered largely immobile and her mercantile marine had been swept off the seas.

(c) It was the definite policy of the British naval command to bring the German main fleet to action and annihilate it if possible, but there was no intention to gamble with the Allied fortunes by seeking an engagement in waters where mines, submarines and shore defences would give the enemy a definite advantage, nor under conditions where the outcome would be largely dependent on chance, such as a fleet action at night.

(d) It was the definite policy of the German High Command not to risk a decisive action until, by a process of attrition, the British forces might have become so weakened as to give good prospects of success.

(e) It was to pursue this policy of attrition that Scheer set out prior to Jutland, his object being to lure the British fleet out in the hope of falling on a section of it before it could be supported; but the last thing he intended or desired was to meet a united Grand Fleet.

The order of events can be conveniently summarised as follows:—

1. The German plan to entice the British fleet to sea while submarines were lying in wait for it, and in the hope of concentrating the High Seas Fleet on a detached part of it.
2. The sailing of the rival forces, neither realising the full significance of the coming impact.
3. The first contact and battle-cruiser action on the run south to the High Seas Fleet.
4. Beatty's run north leading the High Seas Fleet up to the Grand Fleet.
5. Jellicoe's main engagement with his combined Grand Fleet against the combined High Seas Fleet.
6. The German fleet's break through the British destroyer flotillas at night, and the failure to send intelligence to Jellicoe which resulted in the escape of the enemy next day.

Situation Before the Battle.—Admiral Jellicoe has summarised the causes which led up to Jutland as follows:—

1. The pressure of the British blockade had led to insistent calls for action by the German fleet.
2. Scheer, who had assumed command of the High Seas Fleet in Jan. 1916, was chafing under his enforced inactivity.
3. A strong protest from President Wilson had caused the withdrawal of German submarines from the trade routes and thereby rendered them available for enterprises of a military character.
4. Scheer may have been led to believe that the steps announced in England to prevent a recurrence of such episodes as the Lowestoft raid indicated that some division of the Grand Fleet was intended.

While Scheer was planning a new attack on the east coast of England, certain changes had, in fact, been made in the distribution of the British forces. Jellicoe, with the main part of the Grand Fleet, was still at Scapa Flow awaiting the completion of the outer defences of the Firth of Forth before transferring his base to the more southerly harbour, but he had detached the 5th Battle Squadron of four fast "Queen Elizabeths," "Barham," "Valiant," "Warspite" and "Malaya," to replace the 3rd Battle-Cruiser Squadron of three "Invincibles," which were at Scapa for gunnery practice, and sent them to reinforce Beatty's Battle-Cruiser Fleet at Rosyth. A third force, consisting of the 2nd Battle Squadron, 1st Cruiser Squadron and a destroyer flotilla, was based on Invergordon.

THEFORCESENGAGED

The Grand Fleet.—Immediately prior to the battle of Jutland the distribution and composition of the British forces which took part in the action was as in table on p. 218.

At Harwich were five light cruisers and about 20 torpedo craft under Commodore Tyrwhitt, and at Sheerness was the 3rd Battle Squadron consisting of the "King Edward" and the "Dreadnought" flying the flag of Admiral Bradford. These two commands, however, took no part in the battle.

The High Seas Fleet.—The main German forces, in preparation for Admiral Scheer's project, had been concentrated in the Jade Basin. They were organized as in Table II.

Attached to the High Seas Fleet were sixteen U boats and ten "L" class airships, but these took no part in the action.

The Table on p. 220 is a summary of the principal armament of the capital ships of the rival fleets.

THE GERMAN PLAN

An order issued to the High Seas Fleet on May 18 ran as follows:—

The bombardment of Sunderland by our cruisers is intended to compel the enemy to send out forces against us. For the attack on the advancing enemy the High Seas Fleet forces to be south of the Dogger Bank, and the U boats to be stationed for attack off the East Coast of England. The enemy's ports of sortie will be closed by mines.

This order may be taken as defining the strategy of the enemy on the above date.

In preparation for the execution of this scheme the U boats

TABLE II. *German High Seas Fleet*

Unit	Ships	Commander
Fleet Flagship	Friedrich der Grosse	Vice-Admiral Scheer.
First Battle Squadron		
1st Division	Ostfriesland, Thuringen, Helgoland, Oldenburg	Vice-Admiral Schmidt.
2nd Division	Posen, Rheinland, Nassau, Westfalen	Rear-Admiral Engelhardt.
Second Battle Squadron		
3rd Division	Deutschland, Hessen, Pommern	Rear-Admiral Mauve.
4th Division	Hannover, Schlesien, Schleswig-Holstein	Rear-Admiral F. von D. zu Lichtenfels.
Third Battle Squadron		
5th Division	Konig, Grosser Kurfürst, Kronprinz, Markgraf	Rear-Admiral Behncke.
6th Division	Kaiser, Kaiserin, Prinzregent Luitpold	Rear-Admiral Nordmann.
Destroyer Flotillas	3rd, 5th, 7th and half 1st Flotillas	Commodore Michelsen.
Scouting Forces		
First Scouting Group Flagship	Liitzow	Vice-Admiral Hipper.
Battle Cruisers	Seydlitz, Moltke, Derfflinger, Von der Tann	
Second Scouting Group	6 Light Cruisers	Rear-Admiral Boedicker.
Fourth Scouting Group	5 Light Cruisers	Commodore von Reuter.
Destroyer Flotillas	2nd, 6th and 9th Flotillas	Commodore Heinrich.

TABLE III. *Comparison of British and German Capital Ships at Jutland and* **Their** *Main Armaments*

BRITISH						GERMAN			
No. of each class		Total Turret Guns				No. of each class		Total Turret Guns	
		15 in.	14 in.	13·5 in.	12 in.			12 in.	11 in.
2	Revenge	16	..	..	..	4	Konig	40	..
4	Barham	32	..	..	..	4	Kaiser	40	..
1	Canada	..	10	..	..	4	Thuringen	48	..
1	Erin	..	..	10	..	4	Westfalen	48	..
1	Agincourt	..	..	..	14	4	Deutschland*	..	16
3	Iron Duke	..	..	30	..	2	Preussen*	..	8
3	King George V.	..	..	30	..				
4	Orion	..	..	40	..				
2	Colossus	..	..	..	20		(*Pre-Dreadnought type)		
1	Neptune	..	..	..	10				
3	St. Vincent	..	..	..	30				
3	Bellerophon	..	..	..	30				
28	Battleships	48	10	110	104	22	Battleships	176	24
1	Tiger	..	..	8	..	2	Derfflinger	16	..
3	Lion	..	..	24	..	1	Seydlitz	..	10
2	Indefatigable	..	..	..	16	1	Moltke	..	10
3	Invincible	..	..	..	24	1	Von der Tann	..	8
9	Battle-Cruisers	..	..	32	40	5	Battle Cruisers	16	28
37	Capital Ships	48	10	142	144	27	Capital Ships	192	52
				Total Turret Guns	344			Total Turret Guns	244

To sum up: the British Fleet consisted of 37 capital ships, 8 armoured cruisers, 26 light cruisers and 80 flotilla leaders and destroyers. The German Fleet consisted of 27 capital ships, 11 light cruisers, 63 flotilla leaders and destroyers.

had already set out in order to be in their appointed stations by May 23, while some six or eight Flanders submarines had gone north to reconnoitre between Norway and the Firth of Forth. From that date to June 1 was the period during which it was intended to bring off the bombardment. But the weather continued to be unfavourable for airship reconnaissance. Scheer would not risk an advance on the English coast without ample warning of

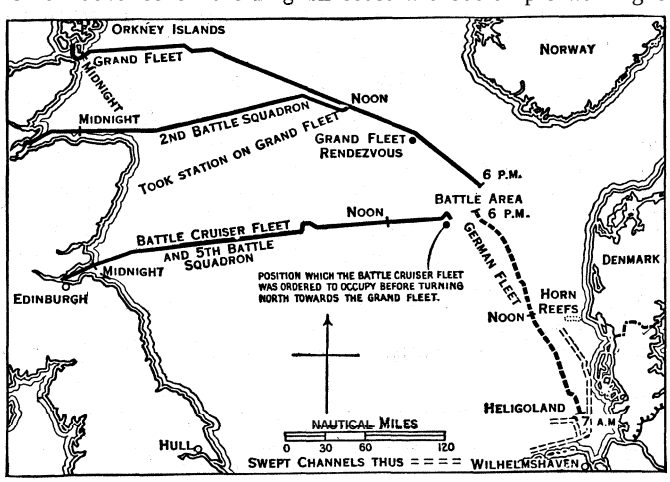


FIG. 1.— APPROACH OF RIVAL FLEETS

the approach of the British fleet; meanwhile the limit of endurance of his submarines was nearly spent.

On May 30, when he could wait no longer, he abandoned the bombarding plan and ordered Hipper, with the scouting force to sail next day and to demonstrate off the southwest coast of Norway. This he anticipated would soon be known to the British Admiralty, and he hoped, by following the scouting force with the battle fleet, but keeping out of sight until the enemy appeared, that he might fall on a detached portion of the Grand Fleet, which would probably be sent out to protect the cruiser patrol and shipping to the northward. But events turned out otherwise.

II. THE PRELIMINARY ACTIONS

The Grand Fleet Sails.—The British Naval Intelligence Dept. was already aware both of the movement of German submarines and that there was a "certain liveliness" in the Jade Roads, and Jellicoe was warned that a large operation on the part of the enemy appeared to be imminent. At 5.40 P.M. on May 30 the commander-in-chief and the admiral commanding the Battle Cruiser Fleet were sent orders to proceed to the predetermined rendezvous eastward of the Long Forties (about 60 m. east of the Scottish coast) in readiness for eventualities. A warning was also sent to the Harwich Forces and 3rd Battle Squadron at the Nore. By 10.30 P.M. the three sections of the Grand Fleet had left their respective bases at Scapa Flow, Invergordon and Rosyth and were heading out across the North Sea. The main battle fleet made for a rendezvous in lat. 57° 45' N. long. 4° 15' E. where the forces under Admiral Jerram from Invergordon would meet him at 2 P.M. next day. Beatty, with the Rosyth force, was making for a point 69 m. S.S.E. of the battle fleet's position (see fig. 1). These dispositions would enable the battle fleet to intercept an enemy trying to attack the 10th Cruiser Squadron on the northern patrol, while the Rosyth force would guard against a raid.

When the British fleet put to sea 13 hostile submarines were lying off the coast; also U-67 was south of the Dogger Bank; and U-75, having laid the mines, which afterward sank the "Hampshire" with Kitchener on board, was on her way home. The German submarines made a few ineffective attacks; but in the main the under-water craft, as usual, proved unable to prevent free movement of the fleet.

To Jellicoe the position was by no means clear when he set out. The evidence pointed to another cruiser raid being afoot, but a misleading telegram sent from the Admiralty during the forenoon of May 31 informed him that directional wireless signals placed the German fleet flagship in the Jade river, thereby leaving him with the impression that there was no reason for undue haste; he, therefore, regulated his speed so as to economise his destroyers' fuel consumption.

First Contact.—Hipper, with the scouting force left the Jade at 2 A.M. on May 31 and steamed northward, keeping well out of sight on the Danish coast. Scheer followed 50 m. astern with the battle fleet. During the early morning the German commander-in-chief received wireless reports from his U boats, but these proved vague and misleading, so much so that far from gleaning that a combined advance was being made by the British forces, he alludes to "our hope of meeting with separate enemy divisions," as being "likely to be fulfilled." (See Germany's ***High*** Seas ***Fleet in the World War,*** Scheer.)

At 2 P.M. Beatty, having arrived at his rendezvous, prepared to turn north in accordance with his instructions. Then followed one of those seemingly trivial events which are sometimes destined to have momentous issues. A stray merchant steamer attracted the attention of Commodore Alexander-Sinclair in the "Galatea," on the eastern wing of the light cruiser screen. He stood on to the E.S.E. to examine her. Simultaneously the "Elbing," on the west-

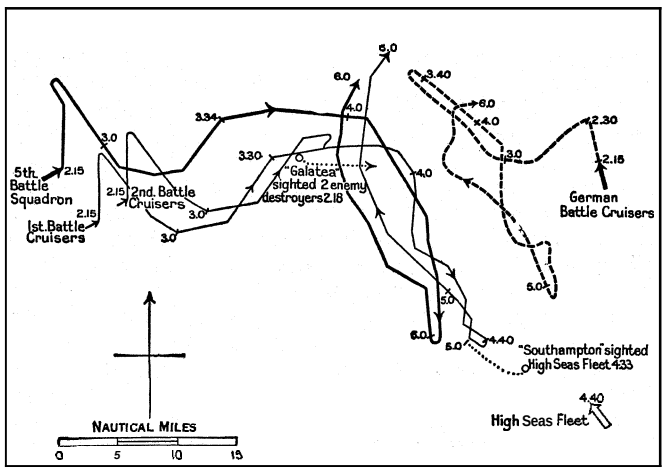


FIG. 2.—FIRST CONTACT OF OPPOSING FLEETS AND THE BATTLE CRUISER ACTION

ern wing of the German scouting force, sighted the same steamer and detached a destroyer to investigate. Another instant and the rival warships had seen each other. At 2.20, just as Beatty had turned to the northward, "Galatea" hoisted the signal "enemy in sight." (See fig. 2.) The result was to hasten a meeting which otherwise would, most probably, have occurred farther North and therefore nearer the British battle fleet. Beatty at once set out to cut off the line of retreat of the enemy's light cruisers towards Horn Reefs, but finding that they were apparently following the "Galatea" to the northwest, he hauled round more to the northward. He had been steering northeast for some 10 minutes when the heavy smoke of Hipper's five battle cruisers was sighted on his starboard bow, whereupon he turned back to the east.

Owing to the greater visibility to the westward, Hipper had already sighted the six British battle cruisers, and now realised that they were heading to cross his stern and cut off his line of retreat, and that he must hasten to fall back on the battle fleet. Beatty, knowing nothing of the greater forces to the south, could only regard this as a golden opportunity for getting to grips with the enemy. There followed a hot running fight to the southward between the opposing battle cruisers (see fig. 2). The 5th Battle Squadron under Rear-Xdm. Evan-Thomas had, unfortunately, been stationed by Beatty 5 miles on the opposite bearing to that on which the enemy was sighted. A further delay in bringing this powerful force into action was caused through ineffective signalling in the "Lion." The result of this division of forces was that the British battle cruisers suffered heavily instead of the German squadron being annihilated.

THE BATTLE CRUISER ACTION

At 3.34 P.M. Beatty formed the battle cruisers into single line, increased to 25 knots and made for the enemy. About this time the "Engadine" sent up a seaplane which reported Hipper's course south. This is noteworthy as being the only occasion on which a British aircraft was used throughout the operations, and the report failed to reach the battle cruiser's flagship. At 3.45 however, the enemy could be made out distinctly from the "Lion," and Beatty formed his ships on a line bearing north-west to clear the smoke and bring their guns to bear, while he turned to E.S.E. At about 3.48 fire was opened almost simultaneously on both sides at a range of approximately 16,000 yards.

The British battle cruisers were at considerable disadvantage, for they showed up well against the western sky, while visibility to the eastward was poor for observing their fire. German accounts agree that the British firing during this part of the action was somewhat ragged, while they pay high tribute to that of the 5th Battle Squadron as it eventually got into range. The better protection of the enemy's battle cruisers and the better shell with which the heavy guns of his fleet generally were provided stood him in good stead, while confusion in the interpretation of the "Lion's" signals for distribution of fire added to the disadvantages of the British battle cruisers.

The range was rapidly decreasing as the courses of the rival forces converged. A few minutes after 4 P.M. the "Lion" was heavily hit by a shell from the "Liitzow" which plunged into her midship turret and killed nearly the whole of the gun's crew. But for the presence of mind and devotion to duty of Major F. J. W. Harvey, R.M.L.I. (awarded a posthumous V.C.), who when mortally wounded saw to the flooding of the magazine, the flagship would doubtless have been destroyed. Up to this time, owing to a misunderstanding, the "Derfflinger" had been left unfired at, but was now engaged by the "Queen Mary." In the rear of the line the "Von der Tann" and "Indefatigable" were fighting a furious duel when a salvo of three shells from the former crashed into the vitals of the British ship; she fell out of the line sinking by the stern; at 4.06 P.M. another salvo hit her and with a rending explosion she turned over and sank with her 57 officers and 960 men. Now came a moment's respite; both sides, finding the fighting too hot, decided to open the range, and soon the German shells were falling short and their fire ceased.

Meanwhile Evan-Thomas, by cutting corners, had manoeuvred the 5th Battle Squadron into range, and shortly after 4 o'clock the "Barham" opened fire on the "Von der Tann" at about 19,000 yards. In spite of the poor visibility the battleships' firing was very accurate, and Hipper had to take to zig-zagging to dodge the great 15 in. salvoes. Nothing but the poor quality of the British shells, which burst without penetrating the enemy's armour, could have saved his rear ships from destruction. The van of the German line was not long out of action.

At 4.10 Hipper turned inwards two points while Beatty, having established sufficient overlap, started to press his way to the eastward again. The effect was to close the range rapidly and the engagement was fiercely renewed.

The "Lion" seems to have been still enveloped in the smoke of her burnt-out turret, and practically invisible, with the result that she was left in peace while the "Seydlitz" concentrated her guns with those of the "Derfflinger" on the "Queen Mary." The latter was fighting gallantly when at 4.26, a salvo crashed into her forward, a red flame shot up and an explosion rent her asunder. In another instant only a great pall of smoke marked the grave of the "Queen Mary" and her 57 officers and 1,209 men.

About this time a subsidiary battle was being fought between the lines. The 13th Destroyer Flotilla, having attained a suitable position, was launched to attack. At the same moment a German flotilla advanced into the arena making for the 5th Battle Squadron. The two flotillas met; the enemy destroyers fired twelve torpedoes at long range and hastily retired before the superior gun-fire of the British craft. Evan-Thomas swung his Battle Squadron away two points and safely avoided the torpedoes. Part of the British flotilla chased the fleeing enemy towards the van of the German battle cruisers, while Commander Bingham in the "Nestor," followed by the "Nicator," pursued those making for the rear. When within 5,000 yd. of the "Liitzow," the two destroyers fired their torpedoes, but Hipper adopted the same dodging tactics and swung his ships away while the torpedoes ran clear or fell short of their mark. The gallant pair of destroyers pressed on and fired more torpedoes at a range of only 3,500 yd. under a hail of shell from the enemy's secondary armament. The "Nicator" escaped, but the light cruiser "Regensburg" appeared suddenly from behind the battle cruisers and crippled the "Nestor" with two shots in her boiler The "Nomad," another destroyer, was also hit arid left helpless between the lines. Another small force of British destroyers had accounted for two of their opponents, "V.27" and "V.29," when at 4.43 P.M. the "Lion" ran up the destroyers' general recall. Events suddenly took a new and dramatic turn. To Hipper, screly pressed ahead and astern, came welcome and timely relief. The German battle fleet was in sight.

German Battle Fleet in Sight.—The head of the German

battle fleet was first sighted by the "Southampton" in which was Commodore Goodenough leading his 2nd Light Cruiser Squadron about two miles ahead of the "Lion." At 4 33 he made the signal "battleships southeast." Holding boldly to his course he was soon able to identify the High Seas Battle Fleet in full array. Mindful of the extreme importance of his information, he sent a wireless message direct to Jellicoe. Within ten minutes of this signal being dispatched the commander-in-chief had quickened the pulse of his own great command with the signal "enemy battle fleet is coming north."

Goodenough stood down to within 13,000 yd. of the enemy so that he could identify him in detail before turning north under a hail of shell fire An admirable piece of cruiser work had not only galvanised many and far distant forces into activity, but it had crystallised the whole position for the British commands. Beatty also held his course until the German battle fleet was in sight, then, at 4.40, he turned 16 points in succession and started to run north, assuming the rôle of the pursued instead of that of pursuer. To Scheer it seemed as if his opportunity to fall on a detached part of the British fleet had come, but Beatty was happy in the knowledge that if the enemy was not frightened off prematurely he would be confronted with the whole Grand Fleet

Hipper, it so happened, was too occupied with the British destroyers' attacks to take advantage of the target presented by the British battle cruisers as they wheeled in succession round the same point. By 4.50 Beatty with his line now reduced to four ships had straightened up on a northerly course and was re-engaging his late enemy. Hipper had just resumed his southerly course, after turning away from the British destroyers, when a torpedo hit the "Seydlitz" tearing a huge hole under water and putting a 15 cm. gun out of action. The ship's stout construction saved her, however, and she kept her place in the line. By 5 P.M. Hipper, too, had turned 16 points to the northward and taken up his station ahead of the battle fleet Meanwhile the 5th Battle Squadron could not see the "Lion's" flag signal to turn about. Evan-Thomas saw Beatty turn, but was intent on hanging to the rear of the enemy's battle cruisers, who were still on a southerly course, with the result that the two British squadrons passed each other at high speed The "Lion" now repeated the signal to turn, direct to the 5th Battle Squadron, but before it could be obeyed, that squadron found itself under the guns of the German battle fleet.

Evan-Thomas turned 16 points at practically the same instant as Hipper, but in the process the "Barham" received a heavy shell which cost her casualties and the use of her wireless gear. The rear battleship of the line, the "Malaya," was a target for at least a whole division of enemy battle ships and suffered even more severely. ("Barham" lost 26 killed and 37 wounded, "Malaya" 63 killed and 33 wounded.) For some 20 min., she was straddled again and again and received serious damage below the waterline, but held on and eventually the whole squadron forged ahead and got clear. A plucky attempt by the destroyers "Onslow" and "Moresby" to attack the enemy battle cruisers just as they had turned north was defeated by the German light scouting group, but the "Moresby" stood on to within 8,000 yd. of the enemy's battle fleet and fired a torpedo at the third ship of the line; it did not take effect, but both destroyers escaped miraculously under a very hot fire. Scheer continued to hasten north after the apparently hard-pressed British squadrons. As he did so the motionless "Nestor" and "Nomad" came drifting down between the lines. They scorned surrender and fired their last torpedoes at the oncoming battleships but without effect. A moment later they were overwhelmed in a storm of shell. The undaunted "Nestors" gave three cheers for their sinking ship and sang a verse of "God Save the King" before the crews took to boats and Carley rafts, from which they were chivalrously rescued by enemy destroyers

Once the 5th Battle Squadron had shaken off the German battle fleet the firing slackened. At 5.40 P.M. Hipper's squadron reappeared out of the mist and there was a temporary burst of firing from the British battle cruisers and the leading battleships, but Beatty was intent on joining his commander-in-chief and was reserving his forces for the greater issues impending.

III. THE MAIN ACTION

Meeting of the Battle Fleets.—Coming down from the north-west was Jellicoe in the "Iron Duke," at the head of a centre division of his six lines of battleships, each in single line ahead at manoeuvring distance apart. Directly ahead of him was the 4th Light Cruiser Squadron which with the destroyer flotillas was acting as an anti-submarine screen. Further ahead and spread for scouting were the 1st and 2nd Cruiser Squadrons. Twenty-one miles to the eastward were Hood's three ships of the 3rd Battle Cruiser Squadron, with two light cruisers and four destroyers.

Up to 2.45, the fleet had been steaming at economical speed, but, with the arrival of wireless messages indicating the presence of an enemy to the southward, the commander-in-chief increased to 17 knots and ten minutes later to 18 knots. Course was shaped southeast by south for Horn Reefs as previously arranged. At 3.59, as soon as he learnt that the enemy's battle cruisers had been sighted, Jellicoe increased to 20 knots and then sent Hood on to Beatty's support, so that when the report was received that the enemy's battle fleet was coming north there was nothing better to be done at the moment than to stand on as he was doing. The battle fleet was closed up in cruising formation, and it would have been useless, indeed dangerous. to deploy into line of battle until it was known on what bearing the enemy would be met. The leaders of divisions were already disposed at right angles to the most likely line of bearing on which to sight the enemy in order that they might wheel their ships into line with a minimum of delay. So the rival battle fleets approached, charging towards each other at a rate of nearly 40 knots, but as yet out of sight.

When in due course contact was made it did not come about quite as Jellicoe expected. The "Iron Duke" and "Lion" had communicated their respective positions from time to time, but zig-zagging and many other alterations of course had caused both flagships to be out in their reckoning. The "Iron Duke" was in fact some $4\frac{1}{2}$ m. ahead (ie., to the southeastward) and the "Lion" $6\frac{3}{4}$ m. to the westward of their estimated positions as they approached each other. The reports of the enemy received by the commander-in-chief were therefore somewhat perplexing, and by the time it became evident that the German Battle Fleet would be met on a starboard bow bearing instead of right ahead it was too late to alter his dispositions. Hood, also, was thrown out in his calculations. Steering as he thought to join Beatty he found himself on the opposite side, *i.e.*, to eastward of the enemy It was at this juncture that fighting broke out with renewed vigour.

At 5.40 the Battle Cruiser Fleet converging on the 1st Scouting Group, from the westward, saw the "Lutzow" and her consorts emerging from the mist. Fire was opened at a range of about 14,000 yards. This apparently disconcerted Hipper, who turned away to the eastward. Hardly had he done so before he heard the guns of the 3rd Battle Cruiser Squadron engaging his 2nd Scouting Group. The trap was closing in on him, but as yet he was unaware of the far greater menace to the northward; but he seems to have sensed danger and at 6.34, hotly pursued by Beatty, he turned southeast only to see his light cruisers being attacked by four British destroyers. These latter he took to be the forerunners of the British Battle Fleet and, now thoroughly alarmed, he doubled right back to southwest to seek the cover of his own battleships. In fact what he had seen were Hood's light forces. These had been hotly engaged with Boedicker's 2nd Scouting Group. In the initial skirmish the "Chester" was badly mauled by the German light cruisers, but they in turn suddenly found themselves overwhelmed by the fire of the three "Invincibles." The "Wiesbaden" was reduced to a wreck and the "Pillau" and "Frankfurt" were badly damaged and only escaped by using their torpedoes, which forced Hood to turn away and break off the pursuit.

The destroyers which Hipper had seen were part of the 4th flotilla. Led by the "Shark," they gallantly went for the "Regensburg" and nine or ten enemy torpedo craft which seemed to be preparing to attack the 3rd Battle-Cruiser Squadron. In the

course of this encounter the "Shark" was severely battered and eventually sank, fighting to the last under her mortally wounded captain, Commander Loftus Jones. Hood avoided this attack by turning his squadron sharply to starboard; and almost at the same instant he sighted the "Lion" racing up from the westward. He turned to meet her and then swung his squadron into station ahead of the Battle Cruiser Fleet and led the line on a south-easterly course. Jellicoe was left in doubt until the very last minute as to the exact position of the enemy. Somewhere to the southward was the High Seas Fleet, but between him and his adversary were battle cruisers, cruisers and destroyers belching smoke and gun fire and obscuring his view. Beatty, hot on the heels of his own particular quarry again, had lost sight of the enemy battle fleet and at the moment could not answer the commander-in-chief's urgent enquiry. Nine minutes the latter waited, then at 6.10 repeated his question "Where is enemy's battle fleet?" The first definite information came from the "Barham," now rapidly closing with the 5th Battle Squadron from the southwest. She reported "Enemy's battle fleet S.S.E." At 6.14 the "Lion," having regained touch, reported it too, bearing S.S.W. from her.

The Deployment (see fig. 3.).—Within a minute of the "Lion's" report, Jellicoe had ordered the fleet to deploy on the port or easterly column. The manoeuvre was a vital one and the commander-in-chief made a masterly decision. Had he followed his natural inclination to deploy to starboard, *i.e.*, on the side toward the enemy, the ships on that wing would have found themselves at grave disadvantage; the enemy would have been able to concentrate his fire on them while they would have been masking the other columns until each could turn up in rear in succession. Moreover, the head of the British line would have had to make a sharp turn to port at once to prevent the enemy crossing the "T." It is not too much to say that had Jellicoe made a wrong decision at this moment irretrievable disaster might have followed. As it was the Grand Fleet was placed at the outset in a position of overwhelming tactical advantage.

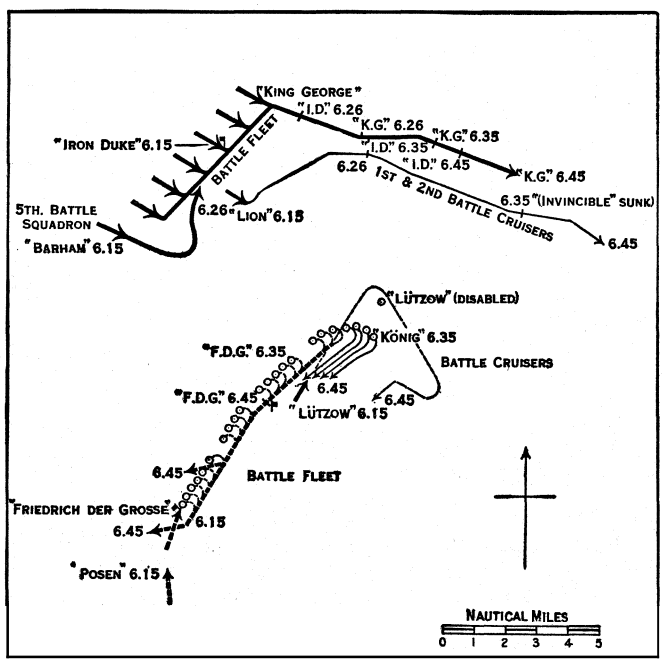


FIG. 3.— DEPLOYMENTOF BRITISH BATTLE FLEET AND FIRST RETIREMENT OF THE GERMAN FLEET

The deployment, it will be seen, developed in the form of an obtuse-angled "L," one arm of which steadily lengthened to envelop the head of the enemy's line, while, during the process, the British ships could give each other the maximum of support. The battle cruisers hurried to their station at the head of the line, the 5th Battle Squadron slipped into place astern, cruisers and destroyers automatically took up their pre-arranged positions. The whole was a magnificent piece of fleet work, the culmination of fine organization and training and a clear indication of a high standard of leadership on the part of the flag officers commanding the several divisions and squadrons.

But now a tragedy occurred in the foreground of this impressive scene. Up to the moment of deployment Rear-Admiral Arbuthnot in the "Defence" with his 1st Cruiser Squadron had been scouting ahead of the battle fleet, but on contact being made, it became his duty to engage the enemy's cruisers. Boedicker's 2nd Scouting Group was faintly visible to the southward and, followed by the "Warrior," Arbuthnot turned to pursue them. He was about to deliver a *coup* de *grâce* to the now blazing and disabled "Wiesbaden," when out of the mist came both the British and German battle cruisers hotly engaged. Holding on tenaciously, close across the bows of the "Lion," the two cruisers soon found themselves in a hurricane of fire as Hipper endeavoured to cover the stricken "Wiesbaden." Two great salvoes hit the "Defence" in quick succession and at 6.19 Arbuthnot and his flagship disappeared in a sheet of flame. The "Warrior" limped away, and was only saved for the time being by the battleship "Warspite" performing an involuntary circle round her, owing to the sudden jamming of the latter's steering gear. Clear of the fighting, the sea-plane carrier "Engadine" made a brave effort to tow her home, but the "Warrior" had to be abandoned at 7 A.M. the following morning and eventually sank.

As the cloud of smoke over the spot where the "Defence" had gone down rolled away, the full measure of his peril was revealed to Scheer. The High Seas Fleet was heading into the crook of the rapidly extending arm of the whole combined British Battle Fleet. It seemed to Jellicoe a glorious opportunity to fall on his enemy and crush him. The signal was actually hoisted for the Grand Fleet to close, when the commander-in-chief realised that his line had not yet straightened out. and the battle cruisers were not yet clear of his van; to turn to S.S.E. by subdivisions, as he wished, was not practicable at the moment. He had to cancel the signal and hold on on a course which nevertheless sharply converged with that of the enemy battle fleet The Grand Fleet deployed on a course southeast at 6.15. The deployment (excluding the 5th B.S.) was completed by about 6.40. The German Battle Fleet approached on a northeasterly course. At 6.27, the "König," leading battleship, turned east, the remainder following in succession (see fig. 3).

Now yet another misfortune befell the British. Proudly leading the long line of capital ships, was Hood in the "Invincible." Having closed to a bare 9,000 yd. she was furiously engaging the "Derfflinger," hitting her again and again with well directed salvoes, when the "Konig," leading the van of the enemy battle fleet, came to the rescue of the battle cruiser. Once again the plunging shell sought the vitals of the lightly armoured British ship; the "Invincible" was torn asunder, her stem and stern rising high out of the water before she disappeared (6 34). With her went Hood, who had so finely upheld the traditions of his historic name, and his splendid crew of over a thousand officers and men. The British battle cruisers had indeed suffered heavily. Valuable as their work had been in bringing about the main action, they were clearly unsuited for "in-fighting." From now onwards they rightly confined themselves to harassing the van of the enemy when opportunity served, leaving the battleships to take the shock of closer contact. But close contact was the last thing Scheer was seeking. He was in a trap and needed all his wits to escape impending disaster.

The possibility of such a situation had not been overlooked by the German commander-in-chief, and he had practised his command in a manoeuvre known as the Gefechtskehrtwendung, which was really an "emergency retirement." In this the destroyers dashed out, fired their torpedoes "into the brown," and put up a smoke screen while each big ship did a right-about turn and retreated precipitately. This manoeuvre he ordered when at 6.3 j he found battleship after battleship of the Grand Fleet concentrating on the head of his line. It was not unattended with risk, but it was boldly ordered and skilfully executed. (See fig. 3.) In less than three minutes the evasive Germans had disappeared for the first time. The destroyer attack had not been pressed home,

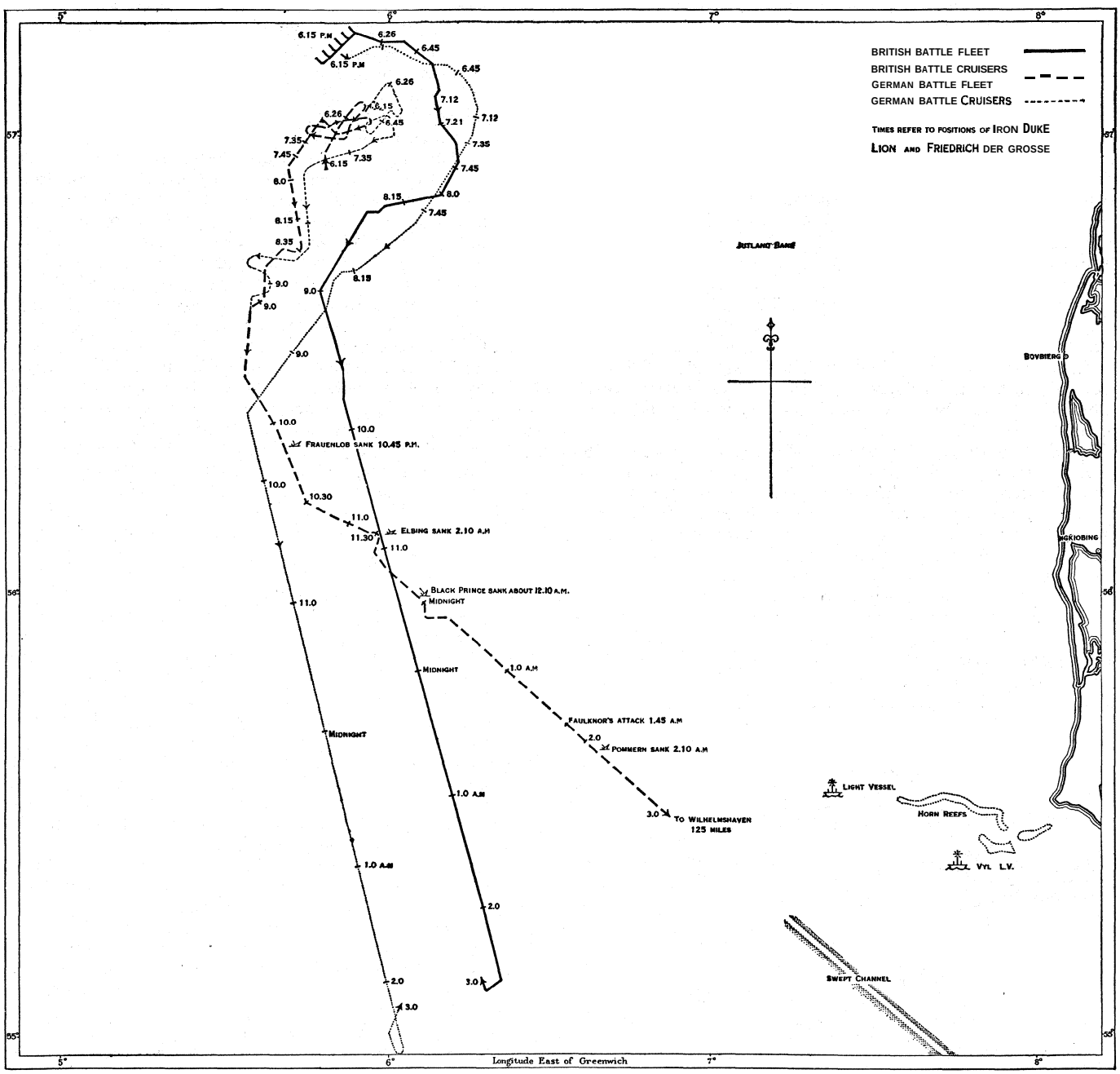


FIG. 4.— COURSE OF MAIN ACTION AND ESCAPE OF GERMAN FLEET (6.15 P.M. TO 3.00 A.M.)

and, although some of the British battleship divisions swung away momentarily to avoid the torpedoes, the course of the fleet as a whole was not deflected. Burney's flagship, the "Marlborough," was hit by a torpedo, but the damage was not so great as to force her to leave the line. The German light cruiser "Wiesbaden," now the only enemy in sight, came under a heavy fire and in ten minutes, a blazing wreck, she sank from sight.

Jellicoe, too, had foreseen the problem which now confronted him, and he had not been alone in seeking, for some time past, a satisfactory solution; it was agreed by the highest tactical authorities that to follow directly in the path of an enemy's battle fleet in a position where it could obtain the maximum advantage from torpedoes and mines, was sheer foolhardiness. He had been informed by the Naval Intelligence Dept. that the German capital ships were known to carry mines. In fact, he had already summed up the situation when he wrote "Nothing but ample time and superior speed can be an answer, and this means that unless the meeting takes place fairly early in the day, it is most difficult, if not impossible, to fight the action to a finish." In point of fact, so little was the Grand Fleet superior to the High Seas Fleet in speed that even had Jellicoe pursued it directly it is doubtful whether he would have caught up with it before nightfall. It was now 6.40. There remained little more than two hours' daylight. The enemy was out of sight somewhere to the south and west, but another advantage which the deployment to port had given was the overlap to the eastward which the Grand Fleet had secured. (*See* fig. 4.) Jellicoe was therefore in a position to work his way steadily between the High Seas Fleet and its possible lines of retreat to the German coast, and this he proceeded to do. At 6.44 he turned his divisions southeast. Simultaneously Goodenough turned south and led his Light Cruiser Squadron to look for the enemy. By 7 he was able to report the hostile battle fleet bearing S.S.W.

Five minutes before this Jellicoe had altered course to south, and now, knowing that he was again in a position of considerable tactical advantage, he ordered a turn of "3 points to starboard together" to close more rapidly. About this time a number of reports of submarines were being made to the com-

mander-in-chief. The "Lion" had just reported sighting one, the "King George V.," leading the battle fleet, sent a warning that a submarine was just ahead of the "Iron Duke," then the "Duke of Edinburgh" reported one "2 points from right ahead." It is now known that there were no submarines in the vicinity, but these reports could not well be ignored, so Jellicoe took the best course possible and turned directly towards the supposed

ron at the northward end of the line was seen to open fire. The "Marlborough's" gunnery efficiency had not been impaired by her underwater injuries, and she discharged salvo after salvo at the "Konig" as the head of the enemy battle fleet came into sight. The rest of the squadron took up the engagement and soon the leading German ships were smothered in shell at a range of less than 9,000 yards. At 7.13 the "Iron Duke" came

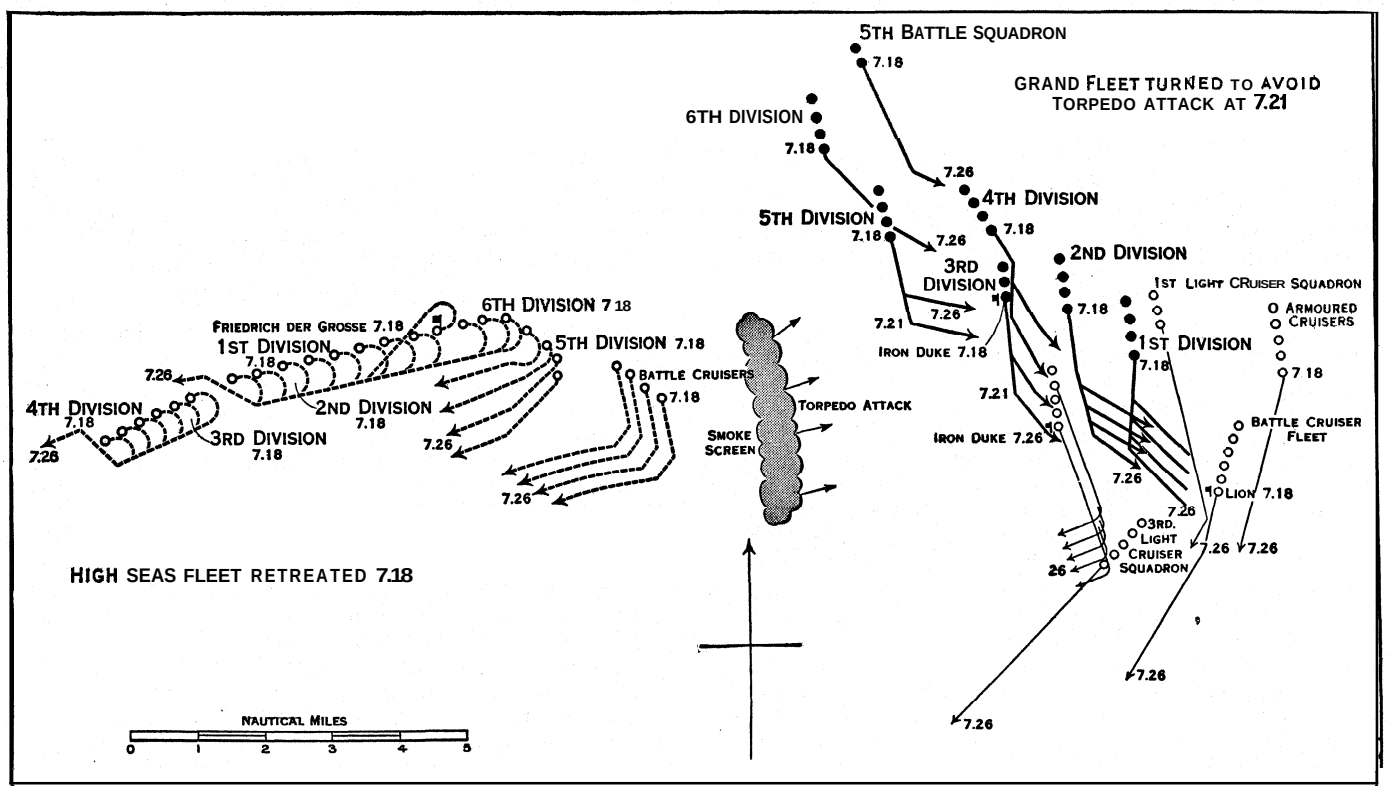


FIG. 5.—SECOND RETIREMENT OF GERMAN FLEET (7.18 P.M. TO 7.26 P.M.)

menace. Incidentally this brought the course of the fleet back to south and re-formed the divisions into line ahead, the leaders being disposed quarterly. Hardly was the turn completed before the enemy reappeared out of the mist.

THE BATTLE FLEETS RE-ENGAGE

Having extricated his fleet from one trap it seems incredible that Scheer should have deliberately walked into another *(see* fig. 5). In his official despatch he says: "It was as yet too early to assume night cruising order. The enemy could have compelled us to fight before dark, he could have prevented our exercising our initiative, and finally, he could have cut off our return to the German Bight." If ever there was a man who wanted to avoid decisive action it was the man who penned those words, yet in the next paragraph of his despatch he makes the illogical statement: "There was only one way of avoiding this: to deal the enemy a second blow by again advancing regardless of the consequences, and to bring all the destroyers to attack." The manner in which the High Seas Fleet renewed the action was such that its course was practically at right angles to that of the Grand Fleet, whose battleships were stretched across his bows so that they could concentrate on the leading German ships, while those in rear trailed astern out of action. The evidence goes to show that Scheer hoped to pass astern of the British line and thence make his way to the eastward, possibly engaging a detached force en route. If he had succeeded, he could then have made for home, fighting a rearguard action.

But Jellicoe had forestalled him. The British Battle Fleet was fair across his path and, in the low visibility prevailing, its commander-in-chief had not risked dividing his forces. First some enemy light cruisers appeared to the southwest of the "Iron Duke." A few minutes later. at 7.12, the 1st Battle Squad-

into action again. Once more the Grand Fleet was in a position of overwhelming tactical advantage and ship after ship joined her fire and picked out a battleship or battle-cruiser target as occasion offered. Meanwhile a small force of enemy destroyers had developed an attack which caused Sturdee to swing his 4th Division away two points to avoid their torpedoes. Directly the attack had expended itself, he turned back to the course of the fleet, approximately south, which brought him into line astern of the 3rd Division led by the "Iron Duke."

Jellicoe had been holding steadily on his course across the head of the enemy, but seeing his rear divisions in some danger of segregation he ordered them to form astern of him, while the "King George" was directed to lead the van into line ahead. And now the full fire-effect of the British battleships was rapidly developing, and Scheer saw that his leading ships were in danger of annihilation; another "right-about turn" was imperative. But the enemy seemed right on top and half round him. Drastic measures were necessary to get clear. The German battle cruisers would have to be sacrificed, if need be, to save the battle fleet. He made a signal to them which, read literally, meant "charge the enemy; ram; ships are to attack without regard to consequences." At the same time the destroyers, once again, were launched *en masse* to attack.

The "Lützow" had been completely disabled in the first contact of the main engagement, and was still ablaze and out of action. Hipper had not yet been able to get on board another battle cruiser, but Capt. Hartog, in the "Derfflinger" with the remaining three, led off gallantly on what the Germans have called a "death ride." To make matters worse, the British battle cruisers which had been working round on the outer arc of the circle, so to speak, were now coming into action again. So the enemy's 1st Scouting Group became the centre of a perfect

hurricane of fire. The "Derfflinger" had two turrets shattered to bits and was being hit again and again, the "Seydlitz," "Moltke" and "Von der Tann" were also suffering severely when the welcome signal came permitting them to withdraw. By 7.20 the German Battle Fleet had repeated its former tactics and was retreating pell-mell to the westward behind a dense smoke screen put up by its destroyers. The latter pressed on to attack with more determination this time. There was no other enemy in sight so Jellicoe was free to concentrate his attention on this one. A heavy fire was opened on the oncoming torpedo craft which made them loose their torpedoes at long range. At 7.21 the British commander-in-chief swung his ships away in two quick successive turns of two points each before the torpedoes could reach the line. The result was that this attack was completely foiled. A second and third attack were countered by Commodore Le Mesurier's 4th Light Cruiser Squadron which, crossing from its station on the disengaged bow, drove furiously at the enemy. One German destroyer, "S.35," was sunk and several badly damaged. Jellicoe was, for the time being, in complete ignorance of what his main enemy was doing, but directly the torpedo attack had spent itself he, at 7.35, swung the fleet back five points to starboard and steered S. by W. *(See* fig. 4.)

Beatty had by now worked his way round to the starboard bow of the Battle Fleet and was heading southwest. At 7.40 he signalled to the commander-in-chief to say that the enemy was about 10 m. N.W. by W. But the "Lion" was quite out of sight from the fleet flagship, and her own position, as she gave it, was obviously wrong. Jellicoe, however, turned southwest, on the same course as his battle cruisers. At 7.45 Beatty again reported the position of the enemy, this time adding that the latter's course was about southwest. This signal was made to the "Minotaur" by searchlight, passed by her to the "King George V.," who passed it on to the "Iron Duke," where it did not arrive till 7.59. Jellicoe promptly turned the battle fleet west by divisions, and increased to 17 knots to regain touch with the enemy. Hardly had he done so before a wireless message came to hand from Beatty saying: "Submit van of battleships follow battle cruisers. We can then cut off whole of the enemy's battle fleet." The commander-in-chief ordered Admiral Jerram, at the head of the line, to comply with this request, but, owing to the unavoidable delay in cyphering, transmitting and decyphering the message, the "Lion" had by then lost sight of the enemy; moreover, the battle cruisers were not in sight from the "King George V." In point of fact, the battle fleet was already steering straight for the enemy.

Although he had twice butted his head into trouble and twice withdrawn it considerably battered, Scheer was loath to be forced further to the westward and away from home. So, at 7.53, he hauled round and made his way tentatively to the southward. *(See* fig. 4.) Jerram had been somewhat at a loss as to how he was to carry out his orders, but hearing gunfire on the port bow, he turned his division towards it, and at 8.21 was heading W.S.W. The firing came from Rear-Adml. Napier's 3rd Light Cruiser Squadron, which was engaging the 4th Scouting Group at the head of the High Seas Fleet. After a sharp conflict the enemy turned away and disappeared. Meanwhile, Beatty, who was also steering west, had again sighted the German battle cruisers and beyond them the pre-Dreadnought battleships steering south. He thereupon turned in succession to W.S.W. and opened fire. An attempt by hostile destroyers to attack the British battle cruisers was frustrated by Le Mesurier's Light Cruiser Squadron. Beatty held on his course and was beginning to inflict severe punishment on the sorely stricken enemy battle cruisers; but they could stand no more, and, running out of action to the westward, sought cover behind the old ships of Admiral Mauve's 2nd Battle Squadron.

Meanwhile Jellicoe had good reason to be satisfied with the situation. His battle cruisers had made contact, he was between the German fleet and its own coast, and he seemed on the point of renewing the engagement. At 8.28 he turned by divisions to southwest and stood down on a converging course expecting momentarily to meet his adversary. But Scheer foresaw the impending collision, indeed his headmost ships were already in the track of the oncoming storm. He had no intention of suffering again from its full blast, and by 8.35 he had turned hastily to the westward and disappeared before the British battle fleet came in sight. So the firing died away; and now the mists of night rolled down between the rival forces. It was past 9.00 before Jellicoe was fully informed as to the situation; then he received a message from the "Lion" reporting that at 8.40 the enemy's battle cruisers and pre-Dreadnought battleships bore from that ship N. 34° W. 10 to 11 m. and were steering southwest. Beatty at the same time made his position and gave his course also as southwest.

By this time it was an hour after sunset and growing darker every moment. The hazards of a fleet action at night were unthinkable to a wise commander. It only remained for Jellicoe to maintain his position between the enemy and the German coast until he could fight to a finish the next day. He therefore set about making his dispositions for the dark hours.

IV. EVENTS OF THE NIGHT

There were three potential lines of retreat for the High Seas Fleet. *(See* fig. 1.) The northerly one led to Horn Reefs, and thence down the swept channel inshore of the Amrun Bank minefield to the mouth of the Jade; the second would be reached by a southerly course to a swept channel which led eastward close to Heligoland; lastly, there was the swept channel which led from the vicinity of the Ems river parallel to the coast to the entrance into the Jade. *(See* fig. 1.)

Jellicoe's Dispositions. — At 9.17 Jellicoe ordered the fleet to take up night cruising stations. This meant that the battle fleet were to close up into three parallel columns with the 5th Battle Squadron, now consisting of three ships only, on the port quarter. The "Warspite" after her involuntary circle at 6.20 P.M. continued to have trouble with her steering gear. At 7.00 she withdrew from the action and at 8.50 was ordered back to Rosyth. She had been badly hit in the earlier fighting. Beatty had already anticipated his commander-in-chief's wishes and having taken station ahead and placed the 1st and 3rd Light Cruiser Squadrons to the southward and westward of him, assumed the course and speed of the fleet; this was south at 17 knots. Five miles astern of the battle fleet Jellicoe massed his destroyer flotillas. This had the following advantages: —

(a) It covered the rear of the fleet from attacks by hostile flotillas.
(*b*) It increased the chances of intercepting the enemy should he endeavour to make to the eastward, and of obstructing his passage by torpedo attacks.
(c) It kept the Grand Fleet destroyers clear of their own battleships and therefore minimised the chances of disastrous mistakes in the dark.

The value of these dispositions was to some extent diminished by the difficulty of communicating their purport to commanding officers. especially those of the innumerable destroyers, but, in effect, the British fleet ploughing through the night presented a living wall of steel barring the enemy's passage home.

Scheer's **Return.**—Scheer also prepared for the night. His 1st Battle Squadron led the line and was followed by the 3rd Battle Squadron; then came the older ships of the 2nd Battle Squadron and lastly the three sorely wounded battle cruisers. The "Liitzow" was limping along to the northward sinking deeper and deeper by the bows. At 2 A.M. she had to be abandoned and was afterwards sunk with a torpedo. The light cruisers of the 2nd and 4th Scouting Groups were stationed near the head of the battle fleet, while in advance of all were the majority of the German destroyers groping like antennae into the darkness. About 9.30 Scheer started to feel his way to the eastward, the van of his line turning S.S.E.$\frac{1}{4}$E., a course which headed for Horn Reefs. Shortly after 10.00 his advanced light cruisers came into contact with the right wing of the flotillas bringing up the rear of the Grand Fleet. A sharp fight took place in which the "Castor," leading the 11th flotilla, was severely handled. The near-by destroyers would probably have retaliated with more effect had they not been deceived by the enemy making part of the British challenge for the day. This be appears to have

picked up through indiscreet flashing signalling between the 'Zion" and "Princess Royal," about half an hour previously.

The High Seas Fleet recoiled slightly after this brief encounter, but even the rival forces continued to converge and now Goodenough's light cruisers once more came into the forefront of the scene. He had been keeping in touch with the "Marlborough's" division, but owing to the under-water injuries of the flagship, the latter was lagging nearly three miles astern of its proper station. The "Castor's" engagement had put the "Southampton" and her consorts on the alert, and they were well prepared when, about 10.30, they suddenly found themselves abreast the 4th Scouting Group. A fierce contest ensued. The "Southampton" was the most vigorously assaulted. Her upper deck became a shambles and she was blazing like a haystack from cordite fires, but in the midst of this holocaust she fired a torpedo which sunk the "Frauenlob" with all hands. At the end of a quarter of an hour the enemy had had enough and drew off into the darkness. The German light cruisers had already reported the presence of enemy light forces and the order stationing the British destroyer flotillas astern had been intercepted and translated to Scheer by a shore wireless station. From these reports he probably realised that the British Battle Fleet had drawn ahead. In any case he was determined to force his way to the eastward. At 10.30 he turned back to S.E.½E. heading direct for Horn Reefs Light Vessel.

The British Destxoyers in **Action.**—The rest of the story of that night is one of sudden encounters with an enemy fighting desperately to get home while British destroyers gallantly threw themselves in his path whenever opportunity served. The German fleet was frequently in a state of much confusion, the "Elbing" was rammed by the "Posen" and later had to be sunk to prevent capture. The "Rostock" was torpedoed by the 4th Flotilla and also had to be sunk. On the British side the destroyers suffered severely. About 11.30 the "Tipperary" was so badly damaged by gunfire that she sank the next morning. The "Spitfire" met the great battleship "Nassau" nearly end on, tore twenty feet from the latter's plating and carried it off on her forecastle. She was badly damaged but had done good execution with her small gun armament, putting out the big ship's searchlights and causing a number of casualties.

The shock of this conflict again caused the German fleet to waver and the leading battleships turned away nearly eight points to the westward, but Scheer was adamant in his determination to break through at all costs while darkness gave hope of escape. He forced his van back, and by 11.34 the "Westfalen" was again leading the line to the south-eastward. In another encounter a few moments later the "Broke's" steering gear was disabled and she and the "Contest" rammed the "Sparrowhawk," and the latter had to be sunk the next day. Between midnight and 12.30 A.M. the "Fortune" and "Ardent" were sunk and the "Porpoise" disabled by gunfire, and the "Turbulent" was rammed and sunk with all hands. The armoured cruiser "Black Prince," which had got separated from the fleet, was making her way to the southward when she fell in with the German battle fleet. Under the glare of their search lights she was sunk by overwhelming fire at point-blank range. Again and again the British light craft attacked, but from now onwards the enemy held his course; and the tragedy of that night was that no accurate information of the German battle fleet was vouchsafed to Admiral Jellicoe.

Admiralty Messages.—Two reports, based on intercepted wireless messages, were sent to Jellicoe by the Admiralty. One, despatched at 9.58, received in the "Iron Duke" about 10.23, but not deciphered and read until 11, gave an obviously wrong position of the rear ships of the enemy battle fleet at 9 P.M. A second message, dispatched at 10.41, received at 11.05, and read about 11.30, stated that the German battle fleet had been ordered home at 9.14, battle cruisers in rear, course S.S.E.¾E., 16 knots. This latter was a summary of several intercepted signals but most unfortunately it omitted the fact that Scheer, at 9.06, had made an urgent call for airship reconnaissance off Horn Reefs at daylight, clearly indicating his intended line of retreat. The second Admiralty message referred to the enemy's movements at 9.14, but at 11.38 Goodenough's report was received saying: "Have engaged enemy cruisers at 10.15 bearing W.S.W.," and about the same time the "Birmingham" also reported from astern: "Battle cruisers probably hostile in sight northeast course south" (11.30). These reports came from ships which had actually sighted the enemy long after the time referred to in the Admiralty messages. They indicated that he had not yet turned home. The "Birmingham," unfortunately, sighted the German heavy ships at a moment when they had turned away from our torpedo attacks, his report therefore was misleading, but other ships might have saved the situation.

At 11.35 the "Valiant," last ship but one of the 5th Battle Squadron, noted what appeared to be "two German cruisers with at least two funnels and a crane amidships, apparently steering to the eastward at a high speed." These details make it certain that the ships were battleships and should have been recognized as such. The "Malaya," the last ship of the squadron, had a clearer view and noted at 11.40 "enemy big ships, three points abaft the starboard beam, steering the same way as ours." By the flash of an explosion the leading ship was seen to have "two masts, two funnels and a conspicuous crane (apparently "Westfalen" class)." It was obvious that the enemy's main fleet had closed in from the westward and was edging its way across the wake of the 5th Battle Squadron, yet for some inconceivable reason the captains of these two ships neglected to report what they had seen. Had they done so it would have greatly increased the chances of an overwhelming victory next day. The courage and self-sacrifices of the British destroyers did not provide the one thing lacking, *i.e.,* information. Before the curtain of darkness had lifted, Scheer had hacked his way through the light forces and passed to the eastward.

Scheer was not yet out of the wood, however. About 1.45, just as a faint grey light was heralding the approaching dawn, Captain Stirling, in the "Faulkner" with his fine 34 knot 12th Flotilla, sighted large ships on his starboard bow, steering a southeasterly course. Even as he manoeuvred to attack he thought to send a wireless report to his commander-in-chief. The attack, carried out with the greatest dash and gallantry, resulted in the battleship "Pommern" being sunk without a trace. Again Captain Stirling made his wireless message, but neither of his reports reached the "Iron Duke." About 2.25 in the growing light, the "Champion" with three destroyers sighted the enemy. One of the latter, the "Moresby," broke off at once and made a plucky attack which sank the German destroyer "V4," but the "Champion" turned to the eastward and made no report.

At 2.39 A.M. Jellicoe turned north. He had been left with the impression that the enemy had been following him south and now, with daylight rapidly returning, he was anxious to get in touch with a view to renewing the engagement. It had been his intention to close Horn Reefs at dawn, but the night fighting had scattered his flotillas and he deemed it imprudent to thrust into enemy waters until he could collect a destroyer screen. A signal from the Admiralty, despatched at 1.48 A.M. but not received in the "Iron Duke" until 2.40 informed the commander-in-chief that enemy submarines were apparently coming out from German ports. The battle fleet formed single line on the northerly course so as to be ready for emergency in the early morning haze, and so, retracing his path, Jellicoe expected momentarily to fall in with his destroyer flotillas and possibly the damaged "Lützow." Tyrwhitt's Harwich Force had, at last, been ordered to sea, and by 3.50 A.M. he was under way, much too late to be of service. From 3.15 A.M. Zeppelins began to be sighted and at 3.42 A.M. the British battle fleet had turned expectantly towards the sound of guns, but found that it was only some of their own cruisers engaging one of the enemy airships. It was obvious, however, that by now the position of the British fleet must be known to the German command. The hope of meeting the enemy which had been growing fainter was finally shattered by an Admiralty message received at 4.15 A.M. saying that at 2.30 A.M. the High Seas Fleet was only 16 m. from Horn Reefs steering S.E.b.S. at 16 knots.

Beatty was still clinging to the idea that the enemy was to the south-westward, and asked permission to sweep in that direction; but at 4 30 A M , having re-formed into cruising formation, Jellicoe regretfully made the signal "Enemy fleet has returned to harbour." Scheer reached Horn Reefs Light Vessel about 3 A.M. There he lingered for a short space receiving reports from his airships and taking stock of the condition of his fleet. At 3.30 A.M he was informed that the "Lützow" had had to be sunk. The rest of the 1st Scouting Group was in no condition for serious action, the battleships which had been in the van had also suffered considerably, and he had only three light cruisers serviceable; moreover the visibility was such that he could not rely on airship reconnaissance. Indeed many of the reports which he received from this source have since been proved to be very inaccurate. A policy of discretion was obviously dictated. and he gave the order for the whole fleet to return to harbour. On the nay in. the battleship "Ostfriesland" struck a mine laid in the channel by the British destroyer "Abdiel" but got home.

Results.—The broad effects of Jutland are a matter of history, but they may be summarised as follows:

1. The High Seas Fleet after "consistently refusing action and manoeuvring with the sole object of returning safely to its base." as Jellicoe has put it, left the Grand fleet in undisputed possession of the arena.

2. Although the German High Command must have realised that the Grand Fleet as a "fleet in being," was the fulcrum of the whole Allied cause, the High Seas Fleet only once left the Heligoland Bight after Jutland; this mas on Aug. 19 of the same year. On this occasion Scheer was warned by airship reconnaissance that the British Battle Fleet was advancing to meet him, whereupon he returned to his base.

3. In Nov. 1918 Scheer ordered the High Seas Fleet to sea "to break the blockade." It was to have been a final bid for victory, but inaction had only served to crystallise the memories of Jutland; the crews refused to weigh anchor. This mutinous outbreak at Wilhelmshaven widened the fissure which shortly afterwards engulfed the nhole German cause.

4. The full fruits of Jellicoe's domination of the German Fleet at Jutland were yielded on Nov. 21, 1918, when Beatty received the surrender of the greater part of the High Seas Fleet.

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JUVAINI, 'ALA UD-DIN 'ATA-MALIK (1226–1283), Persian historian of the Mongol conquests, was born in 1226 in the district of Juvain (now Jaghatai) to the northwest of Nishapur. His grandfather had been a high court official under the Khmarizm shahs, the antagonists of Genghis Khan in his invasion of the west. His father entered the service of the Mongols and rose to be deputy to their governor in western Asia. He twice visited Mongolia and on the second journey was accompanied by his son. In 12 52–53 the latter was again in Mongolia. at the court of the great khan in Karakorum, and it was during this stay in eastern Asia that he began work on his history of the Mongols.

On Juvaini's return to the west he was attached to the staff of the great khan's brother Hulagu, conqueror of Baghdad and founder of a Mongol dynasty in Persia. Juvaini accompanied Hulagu on his campaign against the Ismailians or Assassins of Alamut in northwestern Persia (1256) and also in his march on Baghdad, which resulted in the overthrow of the Abbasid caliphate (1258). In 1260 he was appointed by Hulagu to the governorship of all of the caliph's former territories, a post which he held until 1282, when he was dismissed by Hulagu's son Abaqa. He was reinstated by Abaqa's successor but died within the year in Arran, March 6, 1283.

Juvaini's *Ta'rikh-i-Jahan-Gusha* (Mohammed Qazvini (ed.), 3 vol., 1912–37; Eng. trans. by J. A. Boyle, *Juvaini, 'Alā al-Din 'Ata Malik. History of the World-Conqueror,* 2 vol. (1958) is famous in the east both as a literary masterpiece and as the chief authority on the Mongol invasions. (J. A. BL.)

JUVENAL (DECIMUS JUNIUS JUVENALIS) (*c* A D. 60—after 128) the famous Roman satirist and poet, was perhaps born at Aquinum in central Italy Reliable information about his life is slight, though various medieval manuscripts of his works have a *Life* of the author prefixed to them Many of the statements they contain are improbable; most of the rest seem to be deductions from passages in his works, and not derived from any independent source. The material available consists of 13 of these *Lives,* an inscription from Aquinum nhich may or may not be relevant, three poems addressed to Juvenal by Martial, an allusion, almost certainly to him in Sidonius Apollinaris and another in John Malalas. The least unreliable of the *Lives* states that Juvenal was the son or ward of a wealthy freedman (it is impossible to tell if this is true or not if it is, the rancour with which he attacks the whole class in his satires is surprising); that until middle age he practised declamation (which is not improbable); that he published his satires late in life. when they met with great success; and that an actor of the time, annoyed at a passage really aimed at Paris, Domitian's favourite, had the poet banished under the form of a military appointment to Egypt, where he died an octogenarian. The only independent tradition in all this is the reference to his exile The idea of military service in Egypt of all places, being used as a cloak for exile does not sound particularly convincing, but the tradition is persistent. The story of military service recalls an inscription found at Aquinum, recording the dedication of an offering to Ceres by a Iunius Iuvenalis, a member of a cohort of Dalmatians. *duovir quinquennalis* (a census officer) and *flamen Divi Vespasiani* (priest of the divine Vespasian). On the question whether this is or is not the poet. opinions differ flatly. Juvenal certainly does not write like a soldier, nor like a man who has held important offices in a country town.

From the poems of Martial addressed to Juvenal it may be deduced that Juvenal was in Rome in 92 and in 101 or 102. In the seventh epigram, Martial addresses Juvenal as *facundus* ("eloquent"). which. in the absence of any references to his verse, may mean that Juvenal practised declamation or that he had a forensic practice Sidonius' reference and the reference in Malalas have no further value other than to show that the tradition of his exile was prevalent in the 5th and 6th centuries.

The *Satires* were published at intervals. grouped in books as now, but they were not necessarily written in that order or even at about the same times. Repeatedly there are references to the life (public. literary and private) of Domitian's reign as if it belonged to the present, while the first book was certainly not published until the beginning of Trajan's reign. Juvenal would not be the only man of letters of the period who shunned publication until that tyranny was overpast.

Contents of the Satires.—The first book contains satires 1–5, and belongs to the first years of the 2nd century. It cannot be earlier than 100. and has been dated ten or more years later. Satire 1 is a general introduction. "Why do I write satire?" he asks; "say rather. how could I help it?" His program is given in the famous lines

Quidquid agunt homines, votum, timor, ira, voluptas,
Gaudia, discursus, nostri farrago libelli est

("Our little book is the motley tale of all man's life: his vows, his fears. his anger, his pleasures, joys and journeyings to and fro"). The second satire is an attack on passive male homosexuals. The third is a description of Rome, imitated by Samuel Johnson in his poem on London. Among the many pictures it contains of the discomforts and dangers of the capital, two incidents in Juvenal's best style stand out, a street accident and a nocturnal "hold-up." The remaining two satires are slighter; the fourth tells the story of Domitian's turbot, with a picture of the ghastly crew that surrounded him; the fifth recounts the indignities of the poor at the rich man's table.

Book ii contains only the famous sixth satire of nearly 700 lines, directed against the female sex. The theme is "Why marry, as

long as there is still rope to hang oneself with?", illustrated by portraits of every variety of female horror from Messalina to the bluestocking. The allusion to a comet boding disaster to Parthia can be related to Trajan's eastern campaign, and gives 116 as the earliest possible date of the satire.

The third book, satires 7–9, was published early in the reign of Hadrian, though the eighth was probably written earlier. The seventh satire hails the dawn of better days, but laments that literature (unless one is a writer of pantomime) is still an unprofitable profession and rhetoric is in the same plight. The eighth is on the theme *stemmata quid faciunt?* ("Of what avail an ancestral pedigree?"). A man should rely on the distinction of personal virtue, not on the fame of his ancestors. The ninth is a satire in dialogue form in which' a catamite complains of the troubles of his profession.

The fourth book cannot be exactly dated. It contains the famous 10th satire the 11th and the 12th. In the 10th, imitated by Johnson as the *Vanity of Human Wishes,* the various objects of ambition and desire are recounted, with examples of the disasters that have befallen those who have achieved them. The 11th is an invitation to dinner, contrasting Juvenal's simplicity with the fashionable luxury; here he states directly what the abatement of his former tremendous energy and indignation suggest, that he is growing old: *Nostra bibat vernum contracta cuticula solem* ("Let my shriveled skin drink in the spring sunshine"). The 12th, prompted by a thank offering for a friend's escape from shipwreck, is concerned with false and true friendship and with greed.

The fifth book, satires 13–16, can be dated soon after 127. The work is now on a lower level, its tone gentler and its grip less powerful. The 13th satire consoles a friend cheated of some money. The outstanding poem in the book is the 14th, on the power of parental example for good and ill. The 15th is concerned with cruelty and fanaticism in Egypt. Of the last satire, only a fragment of 60 lines has survived, which has as its theme the Roman army and its privileges.

From the change of tone discernible from the 10th satire onward, the increasing prolixity and tendency to abstraction. Otto Ribbeck sought to deduce a double authorship of the *Satires,* but this theory has not gained acceptance.

Influence, Style and Character.—Juvenal had a decisive influence in the history of satire. Before him the satire in Latin literature had been true to its name, a sort of hotchpotch. The term covered equally the mixed verse and prose extravaganza of Petronius and the easy conversational *sermones* of Horace. But Juvenal mas the outstanding (as he was the first) example of a truly great tragic satirist. He carried the rhetorical form of satire to the utmost limits of excellence. He was the first in whose work there shons no negligence, but rather an excess of elaboration. His diction is full, even to excess, of meaning. point and emphasis. Juvenal might seek to affiliate his work to Horace, but his real prototype is the poet Lucilius (*q.v.*); with his moralist temper and rhetorical training, Juvenal turned the easy going Latin *satura* into a fixed verse form restricted, practically speaking, to the note of denunciation.

There is little humour in Juvenal. and what there is, is grim; there is less kindliness, though the helpless and dependent. the "homesick boy from the Sabine highlands," are sometimes treated more gently than the rest of the world.

Juvenal's most remarkable gift. apart from the blazing indignation with which all his work is suffused, and the terrific power and violence with which it is expressed, is his gift of presentation The satires are studded with unforgettably vivid single sketches of various kinds: historical vignettes like that of Sejanus, characters hit off in a line or elaborately drawn. and everyday scenes that set the Rome of his day alive; perhaps it would be truer to say, the Rome of his earlier days, for in the characteristic temper of the satirist Juvenal fails to do justice to the improvements, at any rate in public life, that followed the bad times of Domitian.

Juvenal leaves a mixed impression, both as a poet and as a man In neither capacity is it easy to feel affection for him, or to refuse him respect. His verse is powerful and well-constructed. true Silver Age Latin in its epigrammatic force and point, if often overstrained. It is superb rhetoric nearly always; only seldom, true poetry. Yet Pope himself never enriched a language with so many crisp, clean-cut phrases of the sort that pass inevitably into common use: *nam quis custodiet ipsos Custodes?* ("For who will 'guard the guards themselves?"); *Mens sana in. corpore sano* ("A healthy mind in a healthy body"); *Propter vitam vivendi perdere causas* ("To save one's life, yet lose the worth of life"); *Hoc volo, sic iubeo* ("This is my will, such my order"); *Quis tulerit Gracchos de seditione querentes?* ("Who could bear complaints of revolution from the Gracchi?"); *Nemo repente fuit turpissimus* ("None at one step has reached the depths of infamy"); *Maxima debetur puero reverentia* ("To youth is due the greatest reverence"); *Panem et circenses* ("Bread and circuses"). These are but a few. As the style, so the man; he is harsh but undeniably strong. Swinburne said that Juvenal knew what he hated, and that was tyranny and democracy; but this seems unduly limited. He hated nearly everything he saw, impartially; not only the vice and cruelty of his age, but its luxury, its art, its poetry, even its philosophy. He is a sort of Cato, cut off from public life and forced to express his combative nature in literature. What seem to be his most surprising lapses of judgment, his habit, for example, of placing at the head of a list of appalling crimes what is at worst an error of taste, all this results from his intensely Roman feeling, his hatred of any degeneration from the old Roman standard of manliness and self-respect. He could only see the evil effects of Greek influence, and they blinded him to its humanizing value.

Juvenal is discursive and little concerned with careful planning or preserving due proportion between the parts of his satires; but he has a rich vocabulary and is masterly in his varied use of the hexameter. He had great influence in the middle ages and has been the model for many later satirists.

(W. Y. S.; J. P. P.; G. B. A. F.)

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JUVENILE COURT: *see* **CHILDREN'S COURT.**

JUVENILE DELINQUENCY. The number of delinquent children appearing before juvenile courts increased rapidly during World War II and reached a record in 1946. Subsequently there was a rapid decline until 1948, then another rise which between 1948 and 1951 averaged 17%. This increase was not confined to urban areas but was, in fact, sharpest in the less densely populated jurisdictions.

Statistics on delinquency must be interpreted in the light of fluctuations in the child population. Thus, the percentage of increase in delinquency cases between 1948 and 1951 was more than three times as great as the increase (5%) in the number of children of juvenile court age in the total population. Boys are most frequently brought to the juvenile court because of stealing or malicious mischief; girls because of running away or sexual offenses.

FBI records for 1951 showed that children under 18 are arrested for a substantial proportion of serious crimes committed; *e.g.,* 24% of all auto thefts. 19% of all burglaries.

Most children coming before the juvenile court are between 15 and 17 years of age. About 35% have been there before on one or more occasions. Almost half of those adjudged delinquent are, in later years, convicted of crimes as adults.

Delinquency has social and psychological causes. Most chronic delinquents come from "underprivileged" neighbourhoods which tolerate open and impulsive expressions of hostility to a much greater extent than do more favoured communities. Unusually strong family influences are required to counteract lessons learned on the streets. Many delinquents simply do not learn to control

hostile impulses; their behaviour is in accord with their immediate environment. They are relatively free from anxiety until the larger community attempts to impose its standards upon them.

Other delinquent children are almost compelled to delinquent acts to satisfy psychological needs. Not consciously aware of the nature or extent of their needs, they have usually suffered emotional deprivations during the growth process. They may also have had one or more particularly distressing experiences with resulting psychological damage. Such children are often responsible for the more serious types of delinquencies.

In most individual delinquents, behaviour can be explained by psychological and sociological factors, although one usually predominates. A child from a middle or an upper class neighbourhood may be encouraged in delinquent tendencies by a general weakening of social controls. Children from underprivileged areas may also suffer from psychological as well as social maladjustments. Research has made it apparent that there is no single cause of delinquency in general or in respect to the individual child. A multiplicity of external and internal factors come together to influence the behaviour of the individual child.

Efforts to prevent juvenile delinquency are concerned with furthering the healthy development of children and treating behaviour disorders in their earliest stages. Slum clearance programs, religious and character building activities, public health facilities, family life education, measures to improve the public schools, recreational services, and economic assistance programs tend to develop and maintain the social and emotional well-being of children and prevent delinquency as well as other similar social ills. Other programs are conducted to aid children whose behaviour presents certain problems but who have not yet become delinquent or, at least, have not been in conflict with the law. Included in this category are child guidance clinics, family service agencies, public and voluntary child welfare agencies, group treatment services, and special services and clinics operated as part of the public school system. Such agencies attempt to locate predelinquent children and offer them treatment. They are not, of course, available in every community.

For the most effective control all agencies, institutions, and services connected must work together. To meet this need for coordination, most states established state planning bodies for children and youth. Comparable co-ordinating councils often cooperate on a city-wide or county-wide basis.

Handling delinquent children is primarily the responsibility of four official agencies—the police, the detention centre, the juvenile court, and the institution or training school. Ideally these agencies make full use of all other community resources in furthering the rehabilitation process.

In 1951 alone, 1,000,000 children had contact with the police because of delinquency. About 250,000 of these children were taken to the juvenile court, and an additional 100,000 were brought to the court by parents, teachers and others. Approximately half the cases brought before the juvenile court were dismissed. About 95,000 children were placed in their own homes under the supervision of a probation officer, and 30,000 were committed to institutions. Lack of funds and an acute shortage of qualified personnel were major obstacles in the 1950s to a maximum development of the treatment agencies. After 1940 there was a growing trend toward central responsibility for the overall development of such services in a single state agency.

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Great Britain.— The attitude towards the juvenile offender changed very considerably in Great Britain after about 1911 when it was first recognized that to prevent and to cure delinquency in young children it mas necessary to understand its underlying causes. Up to that time the main object of any legislation and treatment was in the nature of deterrence, and it was thought that if the conditions under which juvenile offenders lived were strict enough, then it would at least deter them and others from committing similar offences. Subsequent legislation tended to introduce a much greater measure of leniency, and, in particular, the avoidance of a lifelong stigma resulting from some misbehaviour in early life. World War I caused setbacks, but, after the war was over, and until the beginning of World War II, considerable progress was made. For example, the old idea of "closed" institutions was abandoned and greater freedom introduced. One immediate consequence of this was the recognition that if there were no walls and bars behind which one could hold delinquent children, it was necessary to substitute some other compelling form of retention, and this was provided by the introduction of various activities that provided major interests. Similarly, in the courts themselves, as will appear later, measures were taken to avoid the suggestion that the child appearing before the court was an ordinary criminal. World War II destroyed much of the work that had been done in the previous 20 years. The standard of morality throughout the world dropped considerably, and indeed the deterioration of standards of behaviour may be regarded as an inevitable corollary of war. During the occupation of France, for example, children were encouraged to tell lies so that they should not give away vital information to the enemy, and for some years after the war it was very difficult to'explain to a child that whereas for five years it had been a commendable thing to lie, it was now a rather grave moral offence. This problem was found in most of the belligerent countries. The second dangerous result of the war was that unavoidable shortages led to various underground methods of obtaining goods in short supply. These matters were important because they lay at the ,root of the resulting problem of juvenile delinquency which necessitated the statement to young delinquents of what was to them an entirely new set of morals. The laxity in home life also took its toll. It has been said that one of the major causes of juvenile delinquency is the unhappy home, and it is significant that in Great Britain in 1913 there were about 500 divorces, whereas in 1949 there were more than 40,000. Those figures indicate disturbed conditions resulting from many causes, including, in many cases, the absence of the father on war service.

After 1945, although financial stringency in some cases handicapped the attempts that were made, there was considerable progress in the treatment of young delinquents. The probation system was expanded and in most cities and counties in Great Britain a "children's officer" was appointed to co-ordinate the many youth services that were working for the prevention of crime and the rehabilitation of young offenders after their discharge from residential training. Lack of proper housing is another major cause of juvenile delinquency, since it makes reasonable home life impossible, and the exigencies of the postwar years led to the building of multiple flats often lacking good recreational facilities.

It must not be imagined, however, that most children are juvenile delinquents. Comparative figures for Great Britain show that in 1941 43,000 children (a peak figure) were found guilty in juvenile courts. The number fluctuated a little thereafter, but in 1949 there were very nearly as many offenders, and by 1951 there were 47,473 indictable offences committed by juveniles under 17. It is important to bear in mind, however, the relationship between the figure of 43,000 and the total number of children in the community. Even in the peak year of 1941 only 12 children in every 1,000 were found guilty in juvenile courts, which means that 986 in every 1,000 did not get into trouble, or at least were not caught.

The treatment of juveniles who commit offences against the state was largely in the hands of private individuals until about 1854 when, in Great Britain, the Reformatory Schools act was passed, to be followed shortly by the Industrial Schools act in 1857. This made schools for delinquent children the responsibility of the home office, and in 1858 there were 45 reformatories in England and Scotland, housing about 1,900 boys and 370 girls. Between then and 1914 there was a considerable increase in the number of reformatories and industrial schools, and in 1914 there were 223 schools containing more than 25,000 children. The Children's act of 1908 (which came to be known as the Children's charter) created a special department, the Children's branch. In 1927 the committee inquiring into the treatment of young offenders published a report on which was based the Children and Young Persons act'of 1933, and by 1938 there were 104 schools in England

and Wales, containing 7,268 boys and 1,496 girls. It should be noted that after 1920 schools in Scotland were administered by a separate department. In 1952 the approved schools (England and Wales) numbered 93 for boys and 39 for girls. The number of boys in these schools (Feb. 28, 1953) was 7,866 and the number of girls, 1,492. About one quarter of the schools were owned and managed by local authorities and the remainder were under the control of voluntary managers. There was, of course, close liaison between managers and the home office, and there were various associations of managers and people in charge of approved schools that met in a central advisory committee to discuss their mutual difficulties and problems.

The most marked development was in the attitude towards children who commit offences against the law. Until the age of eight a child was ruled as without criminal responsibility. After that age children appearing before juvenile courts were handled under the ordinary processes of probation (*q.v.*) or committed by the magistrates to a period of training in an approved school. The schools were divided into three categories. Children between the ages of 8 and 13 were committed to junior schools, those between the ages of 13 and 1j to intermediate schools and those between 15 and 17 to senior schools. The juvenile court itself underwent a good deal of change. An attempt was made to remove from the child the stigma of "conviction"; indeed the words "conviction" and "sentence" were no longer used in practice, and in almost every case the juvenile court was held in premises quite separate from the ordinary court in which adult offenders appeared. The press was not permitted to give either the names of children appearing before these courts or any particulars that might lead to the easy identification of the child in question. It is interesting to note that in New Zealand this had been the practice as early as 192j under the provisions of the Child Welfare act, and, as in Great Britain, convictions against juvenile offenders were not entered. Similarly, in Australia special courts for the trial of juvenile offenders were established in many states. and in general it may be said that the object of juvenile courts has been to avoid, as far as possible, the unpleasant surroundings of the ordinary police court. It became the practice in many courts to insist that police officers not appear in uniform, though there was a strong body of opinion in Great Britain that this precaution was unnecessary.

The probation system became the most usual way of dealing with the juvenile first offender. Under the Probation of Offenders act of 1904, amended by the Criminal Justice Administration acts of 1914 and 192j, young delinquents could be dealt with as follows: (1) the charge could be dismissed; (2) the offender could be discharged conditionally on entering into a recognizance; (3) there could be added to the recognizance a condition that the offender be placed under the supervision of a probation officer. In addition the court could order a condition of residence. Another method of dealing with the juvenile delinquent was to commit him or her to an approved school. In Great Britain the name "approved school" was adopted in the hope that it might remove many of the unpleasant associations of the old establishments. The only reason they were called "approved" schools was that they were "approved" by the home secretary, whose inspectors were responsible for seeing that certain rules were observed by the managers and by the staffs of the schools under his charge. Managers of approved schools were required to hold meetings about once a month and to satisfy themselves not only that the rules were being observed, but also that the spirit of the children's training was being kept alive. A constant review of each boy or girl was made, and as soon as it became apparent that a child would, upon his return home. lead an honest and industrious life, the managers discharged him on licence. To provide the necessary control, the act stated that every person leaving an approved school must remain under the supervision of the managers (a) until reaching the age of 18 if discharged at the age of 1j or younger; or (b) if over 1j, for a period of three years or until attaining the age of 21, whichever be the shorter period. During this period the school was empowered to assist the child in any way considered necessary (by grants of money for tools. or maintenance), and at the same time the managers could recall a child to the schoo! for further training if it appeared that he was not making satisfactory progress. It should be noted this could be done without further reference to a court. but, if done, the facts were reported to the home office, All children in approved schools were given full-time education up to the age of 15. Thereafter work was supplied in the various training departments, which in the case of boys included building, engineering, carpentry, shoemaking, farming, gardening, etc. Girls also were trained. (C. A. JE.)

Europe.—Unlike many other European countries, Norway, after World War II, experienced a decrease in crime below the prewar rate. Under the German occupation there was more crime, but afterward there was a progressive decline. Figures supplied by the Norwegian ministry of social affairs showed that in 1950 there were 1,187 offenders under 21 convicted of crime, as against 1,900 in 1946 and 1,799 in 1939. In Finland, which adopted in 1943 the Scandinavian system of substituting for punishment the re-educating of young offenders, there was also a decrease in juvenile crime. The Finnish ministry of social affairs gave the total of offenders between the ages of 15 and 17 years sentenced to imprisonment as 47j in 1950, as against 1,222 in 1946. In Sweden the total convictions for juveniles in 1948 was less than half of the average number for the years 1941–45. The Swedish Penal Code commission in 1952 promoted a bill to abolish prison sentences in the case of young persons under the age of 18 years. In Austria there was a steady reduction in juvenile crime after 1948, In 1951 5,603 young persons were convicted, as compared with 5,695 in 1950, 6,161 in 1949 and 7,645 in 1948. During the German occupation of the Netherlands there was a high incidence of crime by young people, but an improvement was noticeable afterwards, although not to the prewar figures. The number of young persons under the age of 17 convicted in the Netherlands was 3,058 in 1949, 6,740 in 1943 and 2,809 in 1939. Revision of the Greek penal code provided the opportunity in 1951 to fix the age of criminal responsibility at 12 years. Minors between 12 and 17 years might at the direction of the court be sent to the male correction establishment at Kifissia or at Ptychia in Corfu. The period of training was limited so that no youth should remain at the establishment beyond his 21st birthday, but he could be released on parole earlier if he made satisfactory progress.

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(G. J. M. J.)

JUVENTAS (Lat. for "youth," later JUVENTUS), in Roman cult the tutelary goddess of young men. See HEBE.

JUXON, WILLIAM (1582–1663), archbishop of Canterbury and lord high treasurer, was the last in the medieval tradition of clerical state service. Born probably at Chichester. he was educated at Merchant Taylors' school, London, and St. John's college. Oxford. He studied law at Oxford. but took orders, and held various preferments. In 1621 he succeeded his friend William Laud as president of St. John's college, and later was vice-chancellor of the university. He became chaplain in ordinary to Charles I. was made dean of Worcester in 1627, and in 1632 was nominated bishop of Hereford. He never took up these episcopal duties. as in Oct. 1633 he was consecrated bishop of London in succession to Laud. Two and a half years later Charles. at Laud's suggestion, appointed Juxon lord high treasurer of England, a post last held by a cleric in Henry VII's reign. He resigned the treasurership in May 1641. During the Civil War his advice was often sought by the king, who chose him to minister alone to him on the

scaffold. Juxon mas deprived of his bishopric in 1649 and retired to his own residence at Little Compton, then in Gloucestershire. At the restoration of Charles II in 1660 he became archbishop of Canterbury. He died on June 4, 1663. Juxon aided the work of restoring St. Paul's cathedral, rebuilt the great hall at Lambeth palace and was a benefactor to his college at Oxford.

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JYVASKYLA, a town in Keski-Suomi (Central Finland) county, Fin., situated on Lake Jyvasjarvi. Pop. (1960) 39,628. It is a centre of traffic by rail, motor coach. ship and air; the airport is situated at Luonetjarvi, about 12 mi. N. of town. The town is also an important industrial centre, with numerous factories manufacturing paper. plywood and matches. Jyvaskyla is the home of the Pedagogical Institute of Jyvaskyla, which in 1934 replaced the oldest teachers' college in Finland, founded at Jyvaskyla in 1863; the lyceum, the first Finnish-language secondary school in the country, founded in 1858; and several other schools and institutions. It was granted town rights in 1837. (E. S. KU.)

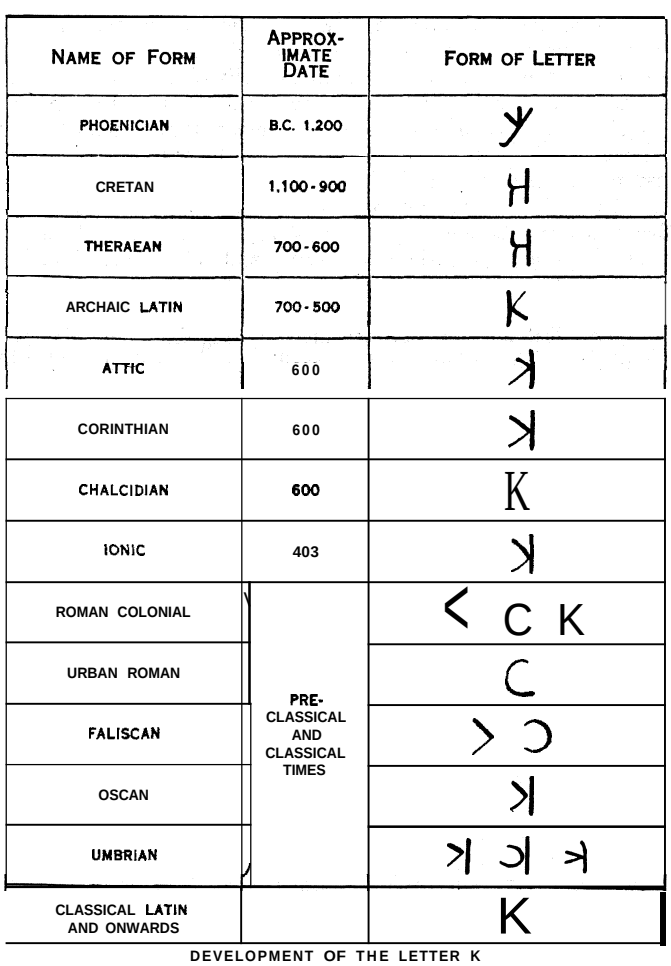
K THIS letter, corresponding to Semitic 𐤊 (*kaph*), Greek Κ, K (*kappa*), has changed its shape less perhaps than any other in the history of the alphabet. In chemistry. K is the symbol for potassium (*kalium*). The Semitic form may derive from an earlier sign representing a bent hand. Early Greek forms from the island of Thera ⱪ, ⱪ, have some resemblance to the Semitic. The Chalcidic, Etruscan and Latin forms were identical K, and the letter has retained its shape until modern times. The minuscule form *k* is but a slight adaptation of the majuscule with the point of junction of three strokes lowered and the lower transverse stroke consequently much shortened and moved to the right. The round form ꝁ also appears in handwriting.

The sound represented by the letter throughout its known history until the present day has been the unvoiced velar stop. Its function in the Latin alphabet was usurped by the letter C which, taken over as representing the voiced velar, came under Etruscan influence to represent the unvoiced sound as well. Later the letter G was adapted from C to represent the voiced velar and C stood for the unvoiced only. K now fell into disuse except in official formulas or initials such as in the word *Kalendae*, and as a rare variant spelling in *Karthago* and a very few other words.

In late Latin and the early Romance period the unvoiced velar, represented by C. became palatalized before front vowels, and in the 11th century K was reintroduced as a substitute for C to represent the velar before front vowels, since C did duty for both the velar and palatal in such cases and confusion was thus liable to arise. Thus the English word *cyng* for example began to be spelt *kyng*, later *king*.

In modern English orthography *k* is combined with *c* to represent the unvoiced velar, when the sound is final, *e.g., thick, stock, buck*. This is mainly limited to monosyllables, but *attack*, had*dock, hillock, mattock* and several other words of similar type form a small class of exceptions. For an account of the Germanic consonant shifts involving K, according to Grimm's law, *see* GERMANIC LANGUAGES. *See* also ALPHABET.

(B. F. C. A.; J. W.P.)



DEVELOPMENT OF THE LETTER K

K-2 or MT. GODWIN AUSTEN, second highest mountain in the world ranking after Mt. Everest, is a 28,250-ft. high peak of the Karakoram range in northeast Kashmir (area of Kashmir held by Pakistan). During the first half of the 20th century a number of attempts were made to reach the summit. This was accomplished for the first time in July 1954 by two members of an Italian expedition led by Ardito Desio.

KA (more correctly KOI), an ancient Egyptian conception designating a spiritual part of a human being or of a god, as were *bai* "soul"; *ikh* "(shining) spirit"; *ran* "name"; etc. There is still controversy about Ka, chiefly for lack of an Egyptian definition; the usual translation "double" is incorrect. Written by a hieroglyph of uplifted arms, it seems originally to have designated the protecting divine spirit of a person, and later the personified sum of physical and intellectual qualities constituting an "individuality." It was therefore outwardly identical with the person to whom it belonged and whom it thus also represented. It survived the death of the body and could reside in a picture or statue of a person. (J. CY.)

KAABA (KABAH, CAABA, KAABEH), the sacred shrine of Islam. containing the "black stone," in the middle of the great mosque at Mecca (*q.v.*).

KABABISH': *see* ARAB.

KABARDINO-BALKAR AUTONOMOUS SOVIET SOCIALIST REPUBLIC (KABARDINO-BALKARSKAYA AVTONOMNAYA SOVETSKAYA SOTSIALISTICHESKAYA RESPUBLIKA), in the Russian Soviet Federated Socialist Republic of the U.S.S.R., lies on the northern flank of the Greater Caucasus range. Pop. (1959) 420.115. Area 4.826 sq.mi. It can be divided into three main relief regions. First, in the south is the Greater Caucasus, the crest of which forms the boundary. This is the highest part of the Caucasus. with Mt. Elbrus. 18.481 ft., its highest summit, and Mts. Shkhara, 17.063 ft., Dykh-Tau, 17.054 ft., Koshtan-Tau, 16,876 ft., and Dzhangi-Tau. 16,565 ft. There are many. often extensive glaciers, from which rise swift-flowing rivers. Below the ice fields are alpine meadows, and below these coniferous forest, chiefly pine, giving way lower still to deciduous forests of beech, with oak, alder. hornbeam. maple, ash and poplar. Secondly, north of the main range are four roughly parallel foothill ranges, each lower to the north, and cut into blocks by the deep gorges of the rivers. These ranges are in deciduous forest, with meadows occupying the wider parts of the valleys. In the north and northeast is the third region, the level Kabardinian plain. Across the plain the Terek river system converges like a giant fan. The largest tributaries are the Cherek, Chegem, Baksan and Malka. The plain west of the Terek is known as Great Kabarda, that to the east, Little Kabarda. The natural vegetation is meadow and feather grass steppe, developed on rich black earth soils, but most of the area is now under the plow. The climate, in general continental, is much varied by relief. The Kabardinian plain is dry. with about 19 in. of rain a year. Summers are hot, with a July average temperature of 75" F.. while the January average is 24°. In the mountains rainfall is higher, up to 30 in. a year and more, and summers are short and cool and winters more severe.

In 1959, 166.053 (40% of the population) were classified as urban and 254.062 rural. The chief towns are the administrative centre of Nalchik (87,000), Prokhladny. Dokshukino and the mining centre of Tyrnyauz. In addition, there are four urban districts. Most of the rural population is concentrated in the Kabardinian plain and in the main valleys. The Kabardinians,

who figure largely in the works of M. Y. Lermontov (*q.v.*), are a Caucasian nationality. related to the Cherkess or Circassian ethnic group. Their language is Japhetic and their religion usually Muslim. The 1959 census recorded 204,000 in the entire U.S.S.R. The Balkars are a smaller group (42,000 in the U.S.S.R. in 1959), who were dispersed for a time during and after World War II for alleged collaboration with the Germans. They are Turkic and closely related to the neighbouring Karachai. The Kabardinians, living mostly in the plain, allied themselves with the Russians as early as 1557 and Kabardia formed part of the Terek Cossack district. A Russian fortress was established at Terek town, on the river, and another, in 1818, at Nalchik. Many of the Russians now living in the republic are of Cossack descent. The Balkars of the high mountains were more fiercely independent and put up a prolonged resistance to Russian incursion. The area was organized as the Kabardinian autonomous oblast in 1921 and extended in 1922 through amalgamation with Balkaria to form the Kabardino-Balkar autonomous oblast which was constituted as a republic in 1936. After World War II a great effort was made in education. with the help of the Soviet central government. and centred in the state university and pedagogic institute in Nalchik.

Mining occupies a large place in the economy. A wide range of minerals has been found there. but not all are as yet exploited. Tyrnyauz, in the Baksan valley. is one of the main centres of molybdenum and tungsten mining in the U.S.S.R. In the same area gold, tin, andalusite. arsenic and antimony are also found. Ugolny is the focus of a small coal-mining industry, while the Nalchik district provides a range of building materials. Rich mineral deposits were discovered also in the Malka valley, including gold, chromium and nickel. In the extreme northeast of the republic is a small oil field. Engineering is concentrated in Nalchik. which makes oil-drilling equipment, and in Prokhladny. Nalchik also has timber working, furniture making. textile, clothing and shoe industries. Timber cutting is mainly in the Cherek valley. Cement, bricks. glass and chinaware are made in the neighbourhood of Nalchik. In all the towns, except Tyrnyauz. the processing of agricultural products is carried on. particularly fruit canning and preserving and jam making. meat packing and flour milling. Power from a hydroelectric plant on the Baksan, built in 1936, supplies the republic and is transmitted as far as Grozny.

Arable farming is almost entirely concentrated in the Kabardinian plain. Because of the dryness. irrigation is usually necessary and there are a number of projects. supplying water to about 140.000 ac.. mostly in Little Kabarda and the lower Baksan valley. Winter wheat, maize (corn), sunflowers and hemp are the main crops. Orchards and gardens are widespread, producing apricots. peaches. pears and apples. and some small vineyards have been established. In the mountains. with their extensive pastures, stock rearing is important. particularly sheep and cattle. In minter the animals move down to steppe pastures on the north Caucasian plains. Pigs are kept in considerable numbers near the largest settlements, while the breeding of Kabardinian horses is still carried on. The main Rostov-Baku railway crosses the northern part of the republic through Prokhladny. whence a branch line runs to Ordzhonikidze. with a feeder to Nalchik. A main road runs southeast from Pyatigorsk to Nalchik and other roads mainly follow the valleys. (R. A. F.)

KABIR (1398?–1518), one of the most remarkable figures in the religious history of India. was born in the family of a Moslem weaver of Benares. presumably in 1398. A thoroughgoing eclectic, the inspirer of a new sect of religion and a mystic poet of a high order. he preached, in the medieval period of stress and tension, the equality before God of all men—whether Hindus or Moslems, whether of high caste or of low. Early in his career he came under the spell of the Hindu ascetic Ramananda. who symbolized for young Kabir the spirit of revolt against orthodox exclusivism and abstruse philosophizing.

Hindus during the 14th and 15th centuries lived under the perpetual shadow of persecution, and religious exploitation of the masses by pandit and mullah had become the order of the day. It was against this background that Kabir. a ruthless critic of externalism and formalism in religion, taught his religion of love, which aimed at an emotional integration of the soul with God. This "simple union" (*sahaja-yoga*) could be achieved by any aspirant, regardless of caste. creed or sex, not through idolatry and caste practices, or ritual and austerities, but through ardent personal devotion.

Kabir died at Maghar in 1518 at the age of 120. His songs, nhich are written in popular, unsophisticated Hindi, continue to move the masses of Hindus and Moslems in northern India even to this day.

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KABUKI THEATRE, a popular form of Japanese drama, has remained the chief theatrical outlet of the entire country for almost three centuries. In the late 16th century. when kabuki originated. there was a verb *kabuku* in current usage, which applied to anything unusual or curious. This word also had vaguely indecent overtones and probably because of the notorious conduct of the performers was particularly suited to the new dramatic form. Kabuki is written in modern times with three ideographs arbitrarily assigned to the sounds—ka meaning song, bu meaning dance and ki meaning skill. ability or trick. This rather clearly describes the amalgam of dramatic and musical arts which compose the kabuki theatre.

The creation of the kabuki art form is said to date from 1586, when a certain woman. O Kuni. performed in dried river beds parodies of Buddhist prayers. She assembled around her a troupe of men who danced as women and women who danced as men. O Kuni's kabuki was the first dramatic amusement of any importance designed for the tastes of the common man; the older nō dramas of the 15th century and their ancillary comic interludes, kyōgen, had been for many years the special province of the nobility. Because of its frivolous nature and the immorality which inevitably accrued to O Kuni's kabuki (or woman's kabuki, as it was later called), the government banned it in 1629. Young boys with long forelocks of hair and dressed as women then performed the programs. This was known as wakashū kabuki. and it too, for similar reasons, was soon suppressed. Immediately, older men took over the parts—so irrepressible were the theatrical desires of the people—and it is this form of all-men entertainment (yarō kabuki) which has endured through the centuries down to the present day. With mature men performing all the roles, including those of women, the plays grew in stature and the acting improved in subtlety. Eventually, by the Genroku era (1673–1735, in its broadest sense), kabuki was an established art form and a serious. dramatic presentation of genuinely affecting situations. Kabuki thereafter continued to exert a strong hold over the average man and woman of Japan. Kabuki's position became so strong that there emerged a tradition of hereditary acting families, who worked! and still work. within a strict and disciplined hierarchy.,

When the commoners in Japan begin to rise economically and socially, kabuki. the people's theatre. afforded a vivid commentary on the life of the day. Actual events were transferred to the stage. The great play cycle *Chushingura* ("Treasury of Royal Retainers") composed in 1748 in 12 long acts by three of the period's leading playwrights, Takeda Izumo. Namiki Senryii (or Sōsuke) and Miyoshi Shōraku, for example, was a more or less faithful dramatization of the famous incident of 1701 in which 47 lordless knights (*rōnin*) waited patiently for a year before wreaking their revenge, against the man who had enforced the suicide of their lord. Similarly, nearly all the "lovers' double suicide" plays of the great playwright Chikamatsu Monzaemon (1653–1725), who wrote both for kabuki and the puppet theatre, were based on actual suicide pacts made by some commoner with his beloved.

Most playwrights during the early years of kabuki preferred to write for the puppet theatre, but the kabuki actors were quick to take over their plays. During the Tokugawa era, kabuki also failed to produce any great playwrights, although a number of remarkable actors continued to appear in steady succession. Some of these actors are immortalized in numerous wood-block prints. notably those of Sharaku. In the middle of the 19th century. at about the time the first encroachment from the west was felt,

Japan produced a great kabuki playwright, Mokuami Kawatake (1816–1893). He created a new type of play, that of the domestic drama which reflected the lives of special, everyday people of his time—thieves, beggars, masseurs and fireman. Under his influence, the kabuki stage, while retaining the repertoire of the past, shifted into a kind of neorealism. Mokuami was fortunate in having a pair of magnificent actors, Danjūro IX and Kikugoro V, at his disposal. They brought to kabuki an intelligence, diligence and perspicacity which had been absent for some time. Older plays were given fresh interpretations. Some of the traditional illogicalities and anachronisms which characterized the classical plays were clarified and adjusted to meet the demands of the audiences of the new Japan. By this time, kabuki included a vast repertoire of approximately 500 plays, whose themes ranged through history, domestic tragedy, comedy, pageantry and pure dance.

Kabuki is a spectacle in which the arts of dance, music, mime, decor and costuming are elaborately blended and set forth in a blazing flamboyance of style and stylization. The Kabuki Za (theatre) in Tokyo, only one of many in the country, seats nearly 3,000 persons. The stage is 90 ft. wide, although the proscenium is only 25 ft. high. The most striking feature of a kabuki theatre is the *hanamichi,* a passageway which runs for 45 ft. (at the Tokyo Kabuki Za) from the stage to the back of the theatre through the audience. On this, many climactic actions and important entries and exits take place. The *hanamichi* may serve, for example, as a forest or mountainous road, as an inlet of water, or sometimes as a street or ceremonial path to the inner courtyards of palaces. Its value in giving a three-dimensional, stereoscopic effect to the theatre and in bringing the audience closer to the actors has been admired and copied in the west. The west, particularly, has claimed that kabuki is the most perfect and complete theatre form still extant anywhere. The preservation of its traditions since its inception, despite a number of vicissitudes and eclectic tendencies in certain respects (see *Kabuki Dances* below) is unique in the history of world theatre.

During World War II, the Japanese government unsuccessfully tried to use kabuki as a propaganda weapon to incite passionate patriotism and to inculcate the virtues of self-sacrifice and loyalty. On the other hand, after the war the occupation authorities, misunderstanding the aesthetic value of this art, banned many plays and for a time hampered the theatre in general. Most of the greatest actors in the grand manner died in the decade following the war. The death of Kichiemon in 1954 at the age of 69 was a final blow to grand kabuki. A new kabuki evolved, molded by younger actors and the tastes of the new audiences, disillusioned by the war and sensitive to the pressures of the outside world. New plays were being written in the second half of the 20th century which, though the situations might be old, were characterized by more reality and modernity than classical kabuki ever permitted. Many of the modem kabuki actors, for financial reasons, appeared in motion pictures or even in modern plays. Although the flavour of antiquity was leaving kabuki, this internationally celebrated art promised to continue, in fragmentary form at least, for generations to come.

Kabuki Dances.—Dance occupies such an important place in kabuki that foreigners frequently refer to this classical form of Japanese theatre as "kabuki dances." The particular style of dancing most characteristic of kabuki consists of restrained, flowing movements for the female roles and bombastic, exaggerated posturings for the men. On occasion, dancers stand stock still, often crossing one eye to add dramatic emphasis, in order to create climactic pauses and to punctuate the broad rhythm of the dance. Sometimes even in straight dramas the acting becomes so stylized and removed from the conventions of ordinary daily actions that it appears more as dancing. Because of the intimate relation between acting and dancing in kabuki. and also since virtually all actors are dancers, it is easy to blend the two. Few opportunities to insert a dance of some sort into any item of the program are missed. Kabuki is an eclectic and acquisitive art, and therefore a wide variety of dances can be assimilated without difficulty. Aside from those dances and dance dramas which are purely kabuki, the spectator can see, to cite a few examples, priestesses performing temple dances, holy men enacting ceremonial dances of longevity, peasants who dance at harvest or planting time, nobles entertaining their lords with court dances or lovers dancing for one another to exhibit their grace. And in some plays, folk dances which have long since disappeared from the actual lives of the people may still be seen on the stage. Each dance, either group or solo, has its own characteristics of movement and style. The patterns can change from a simple, slow moving around the stage to complicated and acrobatic leaps or spins. Nearly all dances are identifiable by an object with which the dancer must dance. It may be a branch of flowers, a cherry blossom baton, a magic wand, a hand towel, a small drum, various masks or even a special hat gaily decorated with flowers. Although certain tense or even tragic moments in the drama may occasion a dance, most dances in kabuki are of a bright and cheerful nature. The gaily lit stage and the gaudy costumes add to this panorama of kabuki dances.

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KABUL, a province of Afghanistan, including the whole of the plain called Koh Daman and Bagram to the Hindu Kush northward, with the Kohistan or hill country adjoining. Eastward it extends to the border of Jalalabad at Jagdalak; southward it includes the Logar district, and extends to the border of Ghazni; northwestward it includes the Paghman hills and the valley of the upper Kabul river, and so to the Koh-i-Baba. Roughly it embraces a territory of about 40,000 sq.mi., chiefly mountainous. The climate is good and bracing. Thunderstorms with lightning and heavy rains are common in spring. Wheat and barley are the staple products of the arable tracts; grasses are also much cultivated and there are plenty of fruits especially in Koh Daman. This is one of the most beautiful valleys north of the city of Kabul from which it is separated by a low ridge. The valley played an important role in the ancient history of the country. It was a seat of culture in pre-Islamic days and contained flourishing towns such as Alexandria and Caucasum, Houpian, Cartana and Cadrusi.

The valley of Panjsher, north of the city of Kabul. is one of the loveliest in the country. Paghman, picturesquely set in the lap of the range of the same name about 16 mi. W. of Kabul, is known for its banks and other modern buildings and is a popular summer resort. It contains the summer residence and gardens of the king. Pop. (1954) 1,519,632. (K. S. AD.)

KABUL, the capital of Afghanistan and its largest city, is 6,000 ft. above sea level and 181 mi. from Peshawar. Pop. (1954) 209,478. It lies in and outside a triangular gorge between two high and steep mountain ranges, the Asmai 6,720 ft. and Sherdarwaza 7,166 ft. which, running respectively southeast and northwest, nearly meet a little to the west of the old town, leaving between the two ranges a narrow entrance traversed by the Kabul river and the roads from Ghazni and Paghman. On the hills are the remnants of a long mud wall, with round towers at short intervals. It was probably built by the Kabul Shahis, early in the Moslem invasion. Mentioned in the Vidas as an important town and transport centre, the city owes its age-old pre-eminence to its strategic position. It commands all the passes from the north through the Hindu Kush, and from the south through Kandahar and Gardez, and it controls the main approaches, through the Khyber pass, to Pakistan and India.

Kabul, formerly a walled city, is now a contrast of narrow and widened streets, a densely packed mass of flat-roofed houses interrupted by bazaars and magnificent modern buildings. A large portion of the old city has been rebuilt and is being extended in all directions. The city is divided into four prominent parts: (1) the old oriental city, in a shallow depression at the foot of Sherdarwaza hill; (2) Sherpur or Shahr Nau (new city) extending northwest to Kolola-Pushta and Wazirabad; (3) Naway Kabul (new Kabul) which includes Darul Aman (in the Chardeh valley), Shershah Maina, Ghaznawi Maina; and (4) Shah-i-Shahid, the

eastern part.

Kabul contains many interesting buildings and a number of gardens. These buildings include Minar-i-Nejat, erected in 1929 to commemorate the deliverance of the country from Bacha-Saqau ("Brigand Ring"); Chaman-i-Huzuri (royal lawn). where Afghan independence day is celebrated each year; Tapa-i-Maranjan (royal cemetery); Minar-i-Istaqlal (column of independence) erected in 1919, after the termination of the Third Afghan War; the Arg (royal citadel); the palace of Dilkusha, the Salam-Khana (audience hall); and the Darul Aman palace, housing the parliament and the ministries of finance and public works and the University of Kabul. Opposite the secretariat (in Darul Aman) is the Kabul museum (1879), rich in archaeological finds. On the top of a rocky hill at the end of the Sherdarwaza range stands the ruined fort of Bala Hissar (high fort), now the seat of the military college founded by the late king, blohammad Nadir Shah. Formerly the greatest ornament of the city was the large, arcaded and roofed bazaar, Chahar Chatta, the remains of which were pulled down in 1949 in accordance with the municipal plans for making new roads.

Baber's garden, containing his tomb, is a popular resort lying near the western extremity of the old city at the base of the Sherdarwaza hill. It is laid out in beautiful terraces; a clear stream waters the flower beds; two chinar trees. souvenirs of the Mogul days, stand as sentinels to match the grave. Chihil Sutoon, partly reconstructed in 1956, lies beyond the garden of Baber on the same road. 4 rock stands in the middle about 100 ft. above the surrounding ground and from it there is a magnificent view of the Chardeh valley and the surrounding hills. A highway flanked by poplars leads to the secretariat garden. The Gulbagh (flower garden), divided into two parts by the Kabul river, lies on the southern extremity of the Chardeh valley. The Chardeh valley also contains other public buildings: the medical department of the University of Kabul, the teachers' training college, the government poultry and dairy farms, and a large silo and bakery.

When Alexandria-Kapisa, on the bank of the Ghorband river about 40 mi. north of the city, ceased to exist, Kabul became the principal city of the area, a centre of trade and commerce, which grew until it became the capital of Afghanistan.

Kabul was invaded by Arabs in 656 but it was many years before the Moslems effected any lasting settlement. Kabul first became a capital when Baber made himself master of it in 1504 and he kept it as his headquarters until his invasion of India in 1526. From the time of Baber (Babur; *q.v.*) to that of Nadir Shah, Kabul was the capital of the Kabul province of the Mogul empire. In 1738 it surrendered to Nadir Shah. On the murder of Nadir Shah in 1747, Ahmad Shah Abdali, the founder of modern Afghanistan, became king. After his death in 1773, his son, Timur Shah, transferred the capital from Kandahar to Kabul. During the First and Second Afghan Wars, it was occupied by the British from 1839 to 1842 and from 1879 to 1880. (*See* also AFGHANISTAN; *History.*)

After the accession of Abdur Rahman Khan in 1880 the city underwent great changes. A fortified cantonment at Sherpur (one side of which was represented by the historic Bemaru ridge) took the place of the British earthworks. The amir effected many improvements. He erected a new palace and a durbar hall, built a bridge across the river, laid out Baber's garden and constructed many other public buildings, a factory for the manufacture of small arms and ammunition, as well as hospitals, dispensaries, bazaars, etc.

Kabul is an important centre of industry and commerce. It has match! leather and tanning factories and cotton spinning and woolen mills. A hydroelectric plant, at Sarobi, supplies electricity to the city. A large part of the foreign trade of the country passes through Kabul via the Khyber pass. (K. S. AD.; X.)

KABUL RIVER, Afghanistan, is 316 mi. in length. The Kabul (ancient *Kophes*), which is the most important river in Afghanistan, rises at the foot of the Unai pass leading over the Sanglakh range, an offshoot of the Hindu Kush toward Bamian and Afghan Turkestan. Its basin forms the province of Kabul, which includes all northern Afghanistan between the Hindu Kush and the Safed Koh ranges. From its source to the city of Kabul the course of the river is only 45 mi., and this part of it is often exhausted in summer for purposes of irrigation. Half a mile east of Kabul it is joined by the Logar, a much larger river, which rises beyond Ghazni among the slopes of the Gul Koh (14,200 ft.) and drains the rich and picturesque valleys of Logar and Wardak. Below the confluence the Kabul becomes a rapid stream with a great volume of water and gradually absorbs the whole drainage of the Hindu Kush. About 40 mi. below Kabul the Panjshir river joins it: 1j mi. farther the Tagao; 20 mi. from the Tagao junction the united streams of Xlingar and Xlishang (rivers of Kafiristan): and 20 mi, below that, at Balabagh, the Surkhab from the Safed Roh. Two or three miles below Jalalabad it is joined by the Kunar, the river of Chitral. Thenceforward it passes by deep gorges through the Mohmand hills, curving northward until it emerges into the Peshawar plain at Michni. Soon afterward it receives the Sn-at river from the north and the Bara river from the south, and after a further course of 40 mi. falls into the Indus at Attock. From Jalalabad downward the river is navigable by boats or rafts of inflated skins, and is considerably used for purposes of commerce.

KABYLES, a confederation of tribes in northeastern Xlgeria and northwestern Tunisia, are Berbers (*q.v.*) who acquired their name from the Arabs (Arabic *gabilat,* pl. *gabail*). From the location of their territories two main divisions are recognized, namely Great Kabylia in the Jurjura and Babor mountains east of Algiers where Berber is spoken, and Lesser Kabylia in the coastal mountains between Bougie and Bizerte. where Arabic is spoken. They represent a conglomerate survival of several of the more ancient North African race elements. the major one of which is central Mediterranean with a slight Negroid accretion. and contain only a minimum of Arab blood. They are notable for their European-like features and frequent blondism; they show great variety of head form, with dense straight or navy black hair in most cases. characteristically brunet pigmentation and lips on the thin side of medium.

The Kabyles are Sunni Muslims of the Malekite rite, looking to Morocco as the nearer centre of their religion. They are predominantly arboricultural; olives and figs are their basic products, both for local consumption and external trading, and they have relatively few livestock. There is close occupation of the available productive land and Great Kabylia is the most densely populated native region of Algeria. The larger villages usually consist of several kin groups of related patrilineal joint families. smaller villages of one such kin group living on the same unit of land (see KINSHIP). The kin are divided into sofs or moieties, which are paired for all political and ritual activities, and the village council or *jemaa* has an important social and political influence. The Kabyle dwelling, most often a single-story composition around a courtyard, usually has a ridged roof of curved tiles.

Emigration, temporary and permanent, is a pronounced feature of Kabyle economy. Many of the agricultural workers around Algiers. in the vineyards around Philippeville and Bone. and in the cereal-growing lands north of Constantine. are Kabyles. In main urban centres of Algeria there are many Kabyle craftsmen, and since World War I there has been a veritable exodus of men to the mines and factories of France. Hard-working and frugal, they send back to their families large sums of money every year.

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KACHARI, a more or less Hinduized tribe in Assam belonging to the Bodo (*q.v.*) group; divided into clans. formerly exogamous and perhaps originally totemistic. which include that of Swarga-aroi ("Heaven-folk") as the socially superior clan and the Basumati-aroi ("earth-folk") as another. The sons inherit their

fathers' clans and the daughters those of their mothers. The religion. generally animistic, includes traces of phallicism, menhirs and T-shaped posts being erected. at any rate up to relatively recent times. while the euphorbia, a cactuslike tree exuding a milky juice, is reverenced as a sacred tree. Bachelor's houses are built for the young men and this institution, under Hindu influence. becomes the village *nāmghar* or prayer house Both burial and cremation are practised. *See* also ASSAM: *History*.

See Soppitt, *Account* of the Kachari Tribe, etc. (1901); Endle, The *Kacharis* (1911)

KACHHI (KACH, KAJ, KEJ) or KACH GANDEV (GANDAVA), the easternmost subdivision of Kalat district, in the Kalat division of West Pakistan Pop (1951) 133,796 in an area of 5,330 sq mi ; Lehri tehsil (c 1 000 sq mi., pop. 26.440) was transferred to Sibi in 1955 A triangular alluvial plain, it is driven like a wedge northnard between the Mari and Bugti hills to the east and the Kirthar and central Brahui ranges to the west. The principal rivers, Nari. Bolan and Mula. and numerous hill torrents are dissipated across the plain in innumerable natural channels; and although the rainfall is only about 3 in a year, through flood irrigation the area is the most fertile in Baluchistan The autumn joaar (Indian millet) harvest is the most important of the three annual crops.

In good years there is also excellent grazing both for the famous indigenous breeds of horses and cattle and for the thousands of camels, sheep and goats brought down in the winter by the Brahui tribesmen Scorching winds blow in summer.

KACHIN, a term (derived from the Burmese words for sour and bitter) applied to a group of tribes occupying northeast Burma and contiguous areas of India and China. Included under the term are the Jingphaw (also styled Chingpaw and, in Assam, Singpho), Atzi, Maru, Lashi. Nung and Lisu. Though each of these tribes possesses its own language, law and religion, there has been considerable intermixture, spatially as well as in marriage and the imitation of custom and ritual.

Lineage names are often duplicated in neighbouring tribes, e g , among the Jingphaw-speaking Gauri and the Atzi Jingphaw, the language of the dominant group, is the lingua franca from the Dihing valley in India to the northern Shan states The Jingphaw practise ultimogeniture and regard the north triangle (between the Mali and Nmai branches of the upper Irrawaddy) as the Uma Ga (youngest son land) from which the tribe fanned out to the south after its arrival in Burma.

There is a marked division in the pattern of political authority. In some areas an aristocratic system (kumjying *kumsa*) prevails, hereditary chiefs (du ni) receiving nkawn dues from their dependents (*zaw*). Elsewhere there is a democratic (*kumlao*) system, each village being ruled by a headman (*akyiwa:* ideally elected but now often hereditary) who receives no nkawn dues Mercenaries by long tradition. the Kachin tribes have a distinguished military record and provide a large proportion of the men of the Burma army.

See also BURMA.

See E R Leach, Political Systems of Highland Burma (1954), which gives a complete list of important works on the Kachin. (H N. C S)

KACHIN STATE (Jingphaw Mungdan), the northernmost state of the Union of Burma. It was among those created under the new constitution of 1947 and comprises the civil districts of Myitkyina and Bhamo. It is bounded on the northwest by India, on the north by Tibet and on the east by China. The state capital is Myitkyina. which is a small railhead town on the right bank of the upper Irrawaddy Other towns of the state are Bhamo and Mogaung.

The population of the sparsely settled though vast mountainous hinterland is predominantly Kachin (see KACHIN), whereas that of the densely populated railway "corridor" and southern valleys is mainly Shan and Burmese. The state is represented in the Union government by a minister, who maintains a small secretariat in Rangoon.

Principal products of the state are timber. bamboo. jade and sugar cane Pop. (1956 est.) 501,000. (H. N. C. S.)

KADDISH (Aramaic QADDISH), the sanctification of the Name of God, a doxology (hymn of praise) recited in the synagogue service. The nucleus of the prayer is the phrase, "Glorified and sanctified be God's great name throughout the world which He has created according to His will. May He establish His kingdom in your lifetime and during your days." The congregation responds: "May His great name be blessed forever to all eternity." The main idea of the prayer goes back to ancient times and is reflected in the Lord's Prayer of Christians.

Originally the Kaddish was recited in the rabbinical academies at the conclusion of public study or after the sermon of the preacher. In the course of time it became a regular feature of the synagogue service. The prayer expresses, in addition to the praise of God, the plea for the speedy realization of the messianic age; and since the resurrection of the dead is associated with the coming of the Messiah, Kaddish became in the course of time the prayer of mourners. It is recited by the mourners on the death of parents daily for 11 months, and on the anniversaries of the parents' deaths.

There are longer and shorter forms of the Kaddish.

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(J. M. RL.)

KADU, a small tribe of uncertain origin which once occupied the area round the Maingthon hill in Upper Burma. Though a few settlements remain in the area between the Katha and Chindwin civil districts, by 1954 the tribe was dispersed and almost completely assimilated into the surrounding Burmese, the process having been accelerated by extensive recruitment of Kadu into forestry work in the past.

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KADUNA, the capital town of Northern Region, Nigeria, Africa, is centrally situated in the region and lies at 2,110 ft. in savanna country on the Kaduna river, a principal tributary of the Niger. Pop. (1953) 6,095 (African population only). Kaduna has no long history. The site was chosen by Lord Lugard for the capital of Nigeria, and building began in 1913. The Northern government moved in from the old capital Zungeru in 1917. Rigid control of building has given Kaduna a modern spaciousness possessed only in limited areas by other Nigerian towns. The main street, King George's way, runs south-north for 2 mi. to Lugard hall, the seat of the legislature, a concrete building in simplified Moslem style. Government house, the governor's residence, lies west of the town. All Northern government departments are in Kaduna, which is also the headquarters of the northern military subdistrict and contains the Northern Police Training college.

Kaduna is a main junction of the Nigerian railway system where the main line from Kano in the north branches to Lagos and to Port Harcourt. The town is connected by road to all the principal centres of the Northern Region and to the main roads to the south. The airport. 5 mi. from the town, is used by local services to the chief touns of Nigeria and thus connects with international airlines.

The town was at first solely an administrative capital but has been developed as an industrial and commercial centre. The most notable enterprise is the cotton mill, with a floor area of 4.j ac. under one roof; other industries include a mineral water (soft drink) factory and furniture making.

The Kaduna river, subject to seasonal flooding, provides ample water for industry. and an industrial and commercial suburb, Kaduna South, has been established on the south bank, linked to Kaduna North by rail and road bridges. (W. H. I.)

KAEMPFER, ENGELBERT (1651–1716), German traveler. "the Humboldt of the 17th century." an invaluable source on contemporary Persia and also on Japan, was born on Sept. 16, 1651, at Lemgo in Westphalia. He studied medicine and natural sciences at the universities of Danzig. Cracow and Konigsberg, and then went to Uppsala, where he joined a Swedish trade mission to Russia and Persia. From there he voyaged to Batavia, where in 1690 he joined a Dutch trade mission to Japan. He stayed for two

years and succeeded in seeing more of the country and collecting more information than any European before him. In 1694 he returned to Europe and after being granted an M.D. at Leiden settled near his native city. Kaempfer died on Nov. 2, 1716, at Lieme (Westphalia).

Only one of his works, the *Amoenitatum exoticarum* . . . (1712). was published during his lifetime. After his death Sir Hans Sloane purchased most of his manuscripts and arranged the publication of *The History of Japan* (1727); this work was also translated into French and Dutch. From a manuscript that had remained at Lemgo, *Geschichte und Beschreibung von Japan* was published (1777–79). The last work to be published was *Icones selectae plantarum* . . . (1791). His manuscripts, many still unpublished, are in the British museum, London.

See Allgemeine Deutsche Biographie, 15, **pp.** *62–64* (1882).

(K. A. S.)

KAESŎNG or SONG-DO, (Japanese pronunciation, Kaijo), the capital of the Koryo dynasty ruling Korea for five centuries before 1392, is just south of the 38th parallel, 45 mi. N.W. of Seoul. It was a centre for scholars and landlords and for the commercial production of the medical herb ginseng, an important export to China.

During the Korean war when Kaesbng was overrun by the North Korean forces, many temples, tombs and palace remains were destroyed. In 1951 it was chosen as the site of the first truce talks. The city was, reportedly, later rebuilt as an important military supply base.

Pop. (1956 est.) 200,000. (S. McC.)

KAFFA, a province in southwestern Ethiopia, lying roughly within 6° to 9° S. and 35° to 37° E. Area 18.918 sq.mi. Pop. (1951 est.) 1,200,000. It is a beautiful country, consisting of broken tableland deeply scored by mountain torrents and densely wooded. The general elevation is about 8.000 ft., while several peaks are higher than 10.000 ft. From the western slopes of the plateau descend headstreams of the Sobat. The principal river: however, is the Omo, the chief feeder of Lake Rudolf. Kaffa proper is the native home of the coffee plant (whence the name). which grows in profusion on the mountain sides. The capital is Jimma.

Kaffa proper was until relatively recently an independent kingdom; the Ethiopians had penetrated into it and partly Christianized it some centuries ago. and it mas later overrun by the Moslem invaders under Mohammed Cran in the early 16th century. The last independent king was taken prisoner by the Ethiopians in 1897 when Menelik conquered the country and devastated it. two-thirds of the population being killed or transported. the remainder being reduced to a state of serfdom. The natives of Kaffa are known as Kafecho, a branch of the Hamitic people, copper in colour, and speaking a language of their own difiering widely from Amharic or Galla. They are in part pagan and in part profess a debased form of Christianity. (C. F. R.: X.)

KAFFIR BREAD, the popular name for a species of *Encephalartos* (*E. caffer*), one of the Cycadaceae *(see* GYMNOSPERMS), a native of southern Africa. so called from the mealy foodstuff which is found at the apex of the stem. It is a tree reaching nearly 20 ft. in height. with very stiff, spreading pinnate leaves 3 to 4 ft. long and recurving at the tip. The species of *Encephalartos,* which are natives of tropical and southern Africa, form handsome greenhouse and conservatory plants.

KAFFRARIA, the name given to the eastern part, or Transkeian territories. of the Cape of Good Hope province. South Africa. Kaffraria. *i.e.,* the land of the Kafirs. is no longer an official designation. It used to comprise the districts later known as Kingwilliamstown and East London. which formed British Kaffraria, annexed to Cape Colony in 1865. and the territory between the Drakensberg and the coast, from the Kei river to the borders of Satal, known as Kaffraria proper. Although fallen into disuse as a geographical term, it was used to indicate the Transkeian territories of the Cape provinces comprising the four administrative divisions of Transkei. Pondoland. Tembuland and Griqualand East. incorporated into Cape Colony at various periods between 1879 and 1594. They have a total area of 16.329 sq.mi. Much of the land is held by the natives under tribal tenure. (See CAPE OF GOOD HOPE: SOUTH AFRICA. UNION OF.)

Towns, Communication and Administration. — The chief town is Kokstad (*q.v.*), pop. (1960) 7,984 (2,177 white). the capital of Griqualand East. Umtata. pop. 12.287 (3.439 white), on the river of the same name. capital of Tembuland, is seat of the chief magistracy of native territories, and of the Anglican bishopric of Raffraria. Port St. John is the chief town in Pondoland, and the only harbour of the country. Butterworth is the chief town in Transkei. A railway, the first link in the direct Cape-Xatal line. runs through Indwe to Maclear, an agricultural centre in Griqualand East. Another railway parallel but south of that described also traverses Kaffraria. Starting from Amabele. a station on the main line from East London to the north. it goes via Butterworth (132 mi. from East London) to Umtata (234 mi.).

The Cape administrative and judicial system is in force, save as modified by Union legislation. A "Native Territories Penal Code" came into operation on Jan. 1, 1887. The natives are under the jurisdiction of chief magistrate of the Transkeian territories at Umtata with subordinate magistrates in the territories. In civil affairs the tribal organization and native laws are maintained. No chief, however, exercises criminal jurisdiction. After 1898 certain provisions of the Glen Grey act were applied to Kaffraria.

Purely native affairs are dealt with by the United Transkeian Territories general council established in 1931. District councils were established in 1895 in the districts of Butterworth, Indutywa, Nqamakwe and Tsomo, and the four were united into the Transkeian general council which. when four Pondoland districts were included, became the United Transkeian territories general council. A district council consists of a resident magistrate. and six members. two nominated by the governor general and four either nominated or elected by local headmen or taxpayers. Each district council nominates members to the general council. The general and district councils are advisory bodies. and allow the people to express their views on local affairs under the supervision of the ministry of native affairs. Among the subjects discussed are native marriage and inheritance laws, education, stock diseases, etc. The responsibility for action rests with the white magistrates and the higher authorities. The district councils are also executive organs of the general council, and are made responsible for road maintenance, cattle dipping, etc. The general council's revenue is derived from all quitrents collected in the districts. and from a local tax of 10*s.* payable in respect of every hut, according to the number of wives. The system was gradually extended to other districts as the natives have progressed and become able to profit by it. Twenty-three districts are included, and comprise the whole of the Transkei and Tembuland, eastern Pondoland and almost the whole of Griqualand East.

Religion. — Numbers of Protestant missionary societies have churches and educational establishments in Kaffraria. The Griquas profess Christianity and have their own churches and ministers. The Anglican diocese of St. John's, Kaffraria, was founded in 1873.

Griqualand East (area 6,326 sq.mi.) (*q.v.*).

Tembuland (area, 3,392 sq.mi.), which lies southwest of Griqualand East and comprises the districts of Tembuland Proper, Emigrant Tembuland and Bomvanaland, takes its name from the Tembu nation, called sometimes Tambookies, one of the most powerful of the Kaffir groups. The chief town is Umtata.

Transkei (area. 2.592 sq.mi.) comprises the districts of Fingoland. the Idutywa Reserve and Gcalekaland. this last being named from the Gcaleka nation. who claim to be the senior branch of the Xosa family, principal royal line of the Kaffir tribes. They form the chief element of the population. Pop. (1960) 284,113. Some prosperous missionary stations are there. Even more advanced in all social respects are the Fingo, who give their name to the district of Fingoland and form the bulk of the population in the Idutywa Reserve. The majority profess Christianity. The industrial institution of Blythswood, 20 mi. N.W. of Butterworth, is a branch of Lovedale and is largely supported by the Fingo.

Pondoland (area, 3,919 sq.mi.) is bounded east by the sea, north by Natal, west by Griqualand East and south by Tembuland. In Pondoland the primitive organization of the natives has been little altered and the influence of the chiefs is very great. Land is held almost wholly in tribal tenure. though a number of whites possess farms which had been acquired before annexation of the country.

See CAPE OF GOOD HOPE: Bibliography.

KAFIR, one of the principal grain-producing types of the cereal grass *Sorghum vulgare,* extensively cultivated in tropical and subtropical countries where the grain, made into bread, forms an important article of diet. In the warmer parts of the U.S. this, as well as other types of sorghum, is important. Kafir originally came from Africa, where many varieties are grown and where it is generally known as durra. Closely related strains commonly grown in the U.S. are Milo, Feterita, Pearl Millet and Hegari. *See* SORGHUM.

KAFIRISTAN (NURISTAN), a region of Afghanistan. Very little of this country was known with accuracy and nothing at first hand until Sir William Lockhart headed a mission to examine the passes of the Hindu Kush range in 1885–1886. He penetrated into the upper Bashgal valley, but after a few days was compelled to return. In 1889 Sir William Robertson was sent to Kafiristan. He only remained a few days, but a year later he revisited the country, staying among the Kafirs for nearly a year, and was able to study the people. His observations are the most trustworthy foundations of our knowledge.

Kafiristan is the name given to the tract between Chitral and Afghan territory. Its pagan mountaineers maintained independence until 1895, when they were finally subdued by Abdur Rahman, the amir of Kabul. who also compelled them to accept the religion of Islam. The territory is included between 34° 30' and 36° N., and from about ;o° to 71° 30' E. Its greatest extent is from east to west at 35° 10′ K.; its greatest breadth is probably about 71° E. The total area approximates to 5,000 sq.mi. Along the north the boundary is the province of Badakhshan, on the northeast the Lutkho valley of Chitral. Chitral and lower Chitral enclose it to the east, and the Kunar valley on the southeast. Afghanistan proper supplies the south limit. The ranges above the Nijrao and Pansher valleys of Afghanistan wall it in upon the west. The northern frontier is split by the narrow Minjan valley of Badakhshan. which seems to rise in the very heart of Kafiristan.

The mountain ranges of metamorphic rock. which separate the main drainage valleys, are all high. rugged and difficult. During the winter Kafiristan becomes a number of isolated communities. with few means of intercommunication. In the whole land there is probably nothing in the shape of a plain. Every variety of mountain scenery can be found: silent peaks, mighty pine forests: wooded slopes and grazing grounds; or wild vine and pomegranate thickets bordering sparkling streams. The lower hillsides are covered with the wild olive and evergreen oaks. Many kinds of fruit trees—walnuts, mulberries, apricots and apples—grow near the villages or by the wayside, as well as splendid horse chestnuts and other shade trees. Higher in elevation. and from 4.000 to 8.000 ft., are the dense pine and cedar forests. Above this altitude the slopes become dreary, the juniper, cedar and wild rhubarb gradually giving place to scanty willow patches, tamarisk and stunted birches. Over 13,000 ft. there are merely mosses and rough grass. Familiar wildflowers blossom at different heights. The rivers teem with fish. Immense numbers of red-legged partridges live in the lower valleys, as well as pigeons and doves. Gorgeously plumaged pheasants are plentiful. Of wild animals the chief are the *markhor* (a goat) and the *oorial* (a sheep). In the winter the former are recklessly slaughtered by hunters. being either brought to bay by trained hounds. or trapped in pits, or caught floundering in the snowdrifts; but in the summer immense herds move on the higher slopes. The *ibex* is very rare. Bears and leopards are fairly common, as well as the smaller hill creatures.

History.—Sir Henry Yule thought the present Kafiristan was part of that pagan country stretching between Kashmir and Kabul which medieval Asiatics referred to vaguely as *Bilaur,* a name to be found in Marco Polo as *Bolor.* The first distinct mention of the Kafirs as a separate people appears in the history of Timur. On his march to the invasion of India the people at Andarab appealed to Timur for help against the Kator and the Siah-Posh Kafirs, to which he endeavoured to respond. He caused an inscription to be carved in the defiles of Kator to commemorate his invasion and to explain its route. Inside the Kafir country on the Najil or Alishang river there is a fort still called Timur's castle. and in the Kalam fort there is said to be a stone engraved to report that as the farthest point of his advance. In the *Memoirs* of Baber there is mention of the Kafirs raiding into Panjhir and of their taste for drinking, every man having a leathern wine bottle slung round his neck. The *Ain-i-Akbari* makes occasional mention of the Kafirs, probably on the authority of the famous *Memoirs.*

After Robertson's sojourn in the country and the visit of several Kafirs to India with him in 1892 an increasing intimacy continued, especially with the people of the eastern valleys, until 189 j. when by the terms of an agreement entered into between the government of India and the ruler of Afghanistan the whole of the Kafir territory was recognized so far as Great Britain was concerned as within the Afghan sphere. The amir Abdur Rahman at once set about enforcing his authority. and the conversion of the population to Islam, amid scenes of cruel and fierce fighting. Since then the converted Kafirs have been a common sight in Kabul while in the high valley the old people have bitterly cherished their lost religion.

KAFIRS: *see* XOSA.

KAFKA, FRANZ (1883–1924), German-Jewish novelist and story writer, was born in Prague on July 1, 1883, and took his degree in law in the German university of Prague. In 1908 he obtained an official post. first in the Assecurazioni Generali and then in the Workmen's Accident Insurance company in Prague. His friendship with Max Brod (his future biographer and exegesist) dated from his university days. In 1912 he met Fraulein F. B to whom he became engaged. but with whom he broke finally in 1917. In Jan. 1913 he published a volume of tales under the title *Betrachtung,* and in May 1913 *Der Heizer,* the opening part of his novel *Amerika.* He obtained the Fontane prize in 1915 and published *Ein Landarzt* in 1919. In 1917 he developed serious lung trouble and was granted a prolonged leave of absence from his post, to which he was only able to return subsequently for short periods. undergoing treatment in various establishments until his death on June 3. 1924, in the Kierling sanatorium near Vienna. During the last year of his life his friendship with Dora Dymant, an eastern Jewess. and with Robert Klopstock, his doctor, did much to mitigate his sufferings and to bring some happiness into an existence which had been shadowed by the deadening monotony of his official labours thwarting his creative powers, and by the conflict with his father. a dominating and violent man who was completely out of sympathy with his son's literary aims. Kafka himself mas so diffident about the value of his writings that he left written instructions for Max Brod to destroy all his manuscripts unread. Fortunately Brod. who had earlier warned Kafka that he could not undertake such a commission, disregarded his friend's injunction and published the three unfinished novels: *Amerika, Der Prozess* and *Das Schloss,* together with many tales and sketches. some extracts from the diaries and a selection from the letters. He thus saved a unique body of work for posterity.

Kafka's genius is marked by supreme originality, although the influence of Soren Kierkegaard on his thought is discernible. His tragic vision of life is presented with the vividness of a profoundly disturbing nightmare in which painful. grotesque and fantastic details all assume a terrifying reality. His style, harmonious, lucid and serene, is in striking contrast with the subject matter of his novels and tales. These deal with the predicament of man in an incomprehensible and apparently hostile universe, hopelessly and helplessly attempting to come to terms with a remote and absolute power whose manifestations remain ambiguous throughout. Kafka's technique, a strange and intimate fusion between symbolism and realism. shot through with irony, can perhaps be best studied in *Das Schloss,* which is at the same time a savage satire on bureaucracy, a pitiless indictment of the homelessness of the

Jews among humanity and a metaphysical representation of the isolation of man in the universe.

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KAGERA, a river of east equatorial Africa, the most remote headstream of the Nile (*q.v.*) and the largest tributary of Lake Victoria. It has two main branches, the Niavarongo (Nyawarongo) and the Ruvuvu, which are fed by many streams rising in the high country to the east of Lakes Kivu and Tanganyika. The most remote of these, the Luvironza, joins the Ruvuvu. The basin is mountainous, with many lakes and swamps, and lies principally in Ruanda-Urundi at a height of more than 4,000 ft. above sea level. It has a temperate climate. The lower portion of the Kagera, where it flows eastward to Lake Victoria, is navigable for about 90 mi. from the lake. There are other navigable reaches but they are separated by rapids. The principal towns in the basin are connected by good roads.

See H. E. Hurst, *The Nile* (1952), *The Lake Plateau Basin of the Nile,* pt. 2 (1927). (H. E. HT.)

KAGOSHIMA, Japanese prefecture in southernmost Kyushu, includes the Amami Islands, Tanegashima, Yakushima and other offshore islands. Kagoshima is the most agricultural Japanese prefecture and produces mainly subsistence crops (dry grains and sweet potatoes) on dry fields. Retarding factors are its rough topography. volcanic ash soil and relative isolation from markets. Forestry. based on rich interior forests, and coastal fishing are also important. Industry is limited to foodstuffs processing. wood working and traditional handicrafts, such as bamboo and Satsuma pottery. Two volcanic peaks, Mt. Sakurajima in Kagoshima bay and Mt. Kirishima in the interior, attract many tourists. Pop. (1960) 1,963,104; area 3,529 sq.mi. (J. D. EE.)

KAGOSHIMA, largest city and capital of Kagoshima prefecture, Japan, is on the west coast of Kagoshima bay within sight of the towering cone of Mt. Sakurajima, an active volcano. Kagoshima won its greatest fame as the feudal period castle town of the powerful Shimazu clan. It was the birthplace of such famous Restoration leaders as Saigo Takamori and Okubo Toshimichi. Once the leading Kyushu city. it is strictly an administrative and commercial centre for a poor agricultural and fishing hinterland. Kagoshima's port handles coastal shipping and provides steamer service to such offshore islands as Tanegashima and Yakushima. Pop. (1960) 296,003. (J. D. EE.)

KAGU (Rhynochetos *jubatus*), a bird inhabiting New Caledonia, now nearing extinction. It is about the size of a bittern. gray above. white below, with a loose crest on the head and with orange-red bill and feet. It seems to be a near ally of the sun bittern and the crane (*qq.v.*) but its exact affinities are very uncertain. It forms a family of its own, the Rhynochetidae. The kagu is barely able to fly and after predatory animals were introduced on New Caledonia its numbers diminished greatly.

KAHN, GUSTAVE (1859–1936), French poet, was born at Metz on Dec. 21, 1859. He was educated in Paris at the École des Chartes and the École des Langues Orientales, and began to contribute to obscure Parisian reviews. After four years spent in Africa he returned to Paris in 1885 and founded (1886) a weekly review, La *Vogue,* in which many of his early poems appeared. In the autumn of the same year he founded, with Jean Moréas and Paul Adam, a short-lived periodical. Le *Symboliste,* in which they preached the doctrine of Stéphane Mallarmé. In 1888 he became one of the editors of the *Revue indépendante.* He contributed poetry and criticism to the French and Belgian reviews favourable to the extreme symbolists and, with Catulle Mendès, he arranged at the Odéon, the Théâtre Antoine and the Théâtre Sarah Bernhardt, matinees for the production of the plays of the younger poets. He died in Paris. Oct. 5, 1936.

Kahn claimed to be the earliest writer of vers libre (free verse) and explained his methods and the history of the movement in a preface to his Premiers *poèmes* (1897). Whether he can justly be said to be the first vers libriste or not, he broke quite definitely with the dominating tradition of the alexandrine and sought to make rhythm dependent on the movement of the poet's thought, rather than on accepted rules of prosody. He was the leader of the revolt against the Parnassians. Other books are Le Livre d'images (1897); Les *Fleurs* de la passion (1900); some novels, a good example of which is L'adultkre *sentimentale* (1902); and a valuable contribution to the history of modern French verse in *Symbolistes et décadents* (1902).

KAIETEUR FALLS, on the Potaro river, British Guiana, are probably the highest falls in the world on a perennial river. There is a sheer drop of 741 ft. over the edge of a sandstone plateau, in which the falls have eroded a 5-mi.-long gorge descending another 81 ft. At the top of the falls the river is 300–350 ft. nide. The falls were discovered by C. Barrington Brown, a geologist, in 1870. The area has been designated a national park. The falls are usually visited by chartered aircraft from Georgetown, but a road and river expedition taking seven to nine days is possible. (G. LN.)

K'AI-FENG, one of the oldest cities of China, was formerly the capital of Honan province. Pop. (1953) 299,100. It is situated on the south bank of the Yellow river about 150 mi. east of where the river emerges from the narrow gorges and about the same distance west of the Grand canal. K'ai-feng faces the Yellow river corridor in the west leading to Wei Ho valley, China's early heartland, and to central Asia beyond. Its significance as a gate city for western influences is shown by the large Moslem element in its population and the location of an early Jewish colony which Chinese records indicate built a synagogue there in A.D. 1183 and renovated in 1488. The colony persisted almost down to the 20th century. K'ai-feng's position halfway between the Shantung and the Honan hills also placed it on the natural route between the Hopeh plain and the Yangtze valley. Its nodal situation favoured its choice as the capital of China for about 200 years during the Five Dynasties (A.D. 907–960) and the Northern Sung (960–1126) when it was known as Pien-liang. Later, K'ai-feng was the centre of imperial road systems and on the main highway running from Peking to Hankow and Kuei-lin in the south.

While often endangered by Yellow river floods, its position on the upper part of the river levee is bolstered by dikes, and it lies west of where most of the historic levee-breaches have occurred. The importance of K'ai-feng diminished with the silting of former waterway connections with southeast Kiangsu, and with the development of the two north-south railroads that bypass it to the east and west, although it is advantageously connected to these by the east-west Lung-hai line terminating at the port of Lien-yun. Its eclipse was hastened by the rise of Chengchow, provincial capital since 1955, as the industrial and transportation hub of Honan. Japanese forces held the city 1938–45. It mas occupied by Communist Chinese forces in 1948. It is the seat of Honan Medical college and has a provincial library and a museum. Its industries include textile and flour mills, oil-pressing plants and match and machinery works. (H. J. Ws.)

KAILAS RANGE, elevation 22,027 ft., is one of the highest mountain ranges in western Tibet, from which three large rivers in India, the Indus. Sutlej and Brahmaputra (*qq.v.*) take their rise. Mt. Kailas is known as Kang (or Gang) Rimpoche to the Tibetans, Siva's paradise to the Hindus; it is also identified in Buddhist cosmography with Mt. Sumeru. the cosmic centre around which the world rotates. To the south of the Kailas range lies Lake Rlanasarowar, generally recognized as the highest body of fresh water in the world. Mt. Kailas with its majestic snowy peaks and Lake Manasarowar with its crystal clear turquoise water are holy places to the Tibetans and Indians alike. In 1949 an Indian delegation made a special pilgrimage to spray some of Gandhi's ashes into the placid sacred fold of the Manasarowar lake. (T.-L. S.)

KAIRA, a town and district of India, in Gujarat state. The town is 20 mi. S.W. of Ahmedabad and 7 mi. from Mehmadabad railway station. Pop. (1951) 7,714. Its antiquity is proved by the evidence that copperplate grants were known as early as

the 5th century. Early in the 18th century it passed to the Babi family, with whom it remained until 1763 when it was taken by the Marathas; it was handed over to the British in 1803.

THE DISTRICT OF KAIRA has an area of 2,621 sq mi.; pop. (1961) 1,974,351. Except for a small corner of hilly ground near its northern boundary and in the southeast and south, where the land along the Mahi is furrowed into deep ravines, the district forms one unbroken plain, sloping gently toward the southwest. The north and northeast portions are dotted with patches of rich riceland, broken by untilled tracts of low brushwood. The centre of the district is very fertile and highly cultivated, with clusters of trees. To the west this belt of rich vegetation passes into a bare though well-cultivated tract of riceland, growing more barren and open till it reaches the maritime belt, along the Gulf of Cambay. Antelope, gazelle and many game birds are common. The chief rivers are the Mahi on the soulheast and south and the Sabarmati on the western boundary. The Mahi, because of its deeply cut bed and sandbanks, is impracticable for either navigation or irrigation; but the waters of the Sabarmati are largely utilized for the latter purpose, as are those of a smaller stream, the Khari. A number of former Gujarat states were incorporated in the district in 1949. The principal crops are cotton, millets, rice and pulse; the industries include cotton, printing, dyeing and glass manufacture.

KAISER, GEORG (1878–1945), the leading figure of German Expressionist drama, was born at Magdeburg, Nov. 25. 1878. He went to Argentina as a clerk, but ill-health forced him to return to Germany. During his long convalescence he wrote his first plays, mainly satirical comedies which attracted little attention His first real success was *Die Burger von Calais* (1914), in which he revealed his outstanding gift for constructing a close-knit drama. expressed in trenchant and impassioned language. This was followed by a series of plays, mainly on social themes, which established his position as a leader of the Expressionist movement: *Von Morgens bis Mitternachts* (1916; Eng trans, *From Morn to Midnight,* 1920), *Die Koralle* (1917; Eng. trans., *The Coral,* 1931), *Gas I* and *II* (1918 and 1920; Eng. trans., 1931), *Hölle, Weg, Erde* (1919), *Nebeneinander* (1923), *Zweimal Oliver* (1926). The last of this series of plays was *Der Szlbersee* (1933). In all he showed man in deadly conflict with the modern world of money and machines. His later plays are more intimate, embodying a deep experience of love: *Oktobertag* (1928. Eng. trans., *The Phantom Lover,* 1928), *Der Gartner von Toulouse* (1938), *Alain und Elise* (1940) and others In 1938. after the Nazis had banned his plays. Kaiser went into exile in Switzerland where he continued his amazing output until his death at Ascona, June 4, 1945. His last work was a mythological trilogy, *Zweimal Amphitryon, Pygmalion* and *Bellerophon* (publ. 1948). Besides about 60 plays, Kaiser wrote two novels—Es ist *genug* (1932) and *Villa Aurea* (1940; Eng. trans., *A Villa in Sicily,* 1939)—and some poetry.

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KAISERSLAUTERN, town in Rhineland-Palatinate. Germany, on the Waldlauter, in the district of Westrich. 41 mi. W. of Mannheim. Pop. (1960 est.) 88,162. Kaiserslautern takes its name from the emperor (Kaiser) Frederick I, who built a castle there about 1152, although it appears to have been a royal residence in Carolingian times. It was an imperial city until 1357, when it passed to the palatinate. It was one of the early stations of the Reformation. and in 1849 was the centre of revolutionary spirit in the palatinate. The house of correction was built on the site of Frederick Barbarossa's castle, which was demolished by the French in 1713. Kaiserslautern became one of the most important industrial tonns in the palatinate.

KAJANUS, ROBERT (1856–1933), Finnish conductor and composer. was born at Helsinki. Dec. 2, 1856. He studied at Leipzig and in Paris under Johann Svendsen. His great achievement was the founding of the Helsinki municipal orchestra. which stimulated the musical life of the city and. by its concert tours, introduced the works of Finnish composers into other countries. Kajanus also did pioneer work in the discovery of Finnish folk music. drawing largely on it himself for inspiration in his compositions and opening up a rich field for others. His works include two "Finnish Rhapsodies" and a symphony, *Aino.*

KAKAPO, the Maori name for a bird often called the ground parrot or owl parrot. This bird *(Strigops habroptilus)* is a flightless parrot inhabiting New Zealand. Nocturnal in habit, it feeds on twigs, leaves, roots and fruits. It is about the size of a raven, of a green colour, barred and freckled with dark brown and light yellow. The powerful beak and elongated face feathers give it the appearance of an owl. The keel of the sternum is much reduced. It constitutes the subfamily Strigopinae, and lives in burrows in the mountains. It is faced with possible extinction.

KAKWA: *see* BARI.

KALA AZAW, from the Hindu meaning "black fever," a highly fatal infectious disease, leishmaniasis of the deep organs of the body, caused by the parasitic microorganism *Leishmania donovani,* and endemic in various parts of Asia, Africa, the Mediterranean area and South America. *See* LEISHMANIASIS.

KALAHANDI, formerly a princely state of India in the Eastern States agency (area 3,559 sq.mi.; pop.. 1941, 597,940); from 1949 a district of southwest Orissa, formed by the consolidation with the southern subdivision of Sambalpur district and the Chhattisgarh states. Area 5,099 sq.mi. Pop. (1961) 1,009,490.

KALAHARI DESERT, a region of South Africa, lying mainly between 20° and 28° S. and 19" and 24° E. and covering fully 275,000 sq.mi. The greater part of this territory forms the western portion of the Bechuanaland protectorate, but it extends south into that part of Bechuanaland annexed to the Cape of Good Hope province, South Africa, arid west into South-West Africa. The Orange river marks its southern limit; westward it reaches to the foot of the Nama and Damara hills. eastward to the cultivable parts of Bechuanaland, northward and northwestward to the valley of the Okavango and the bed of Lake Ngami. The Kalahari, part of the immense inner tableland of South Africa, has an average elevation of 2.690 to 4,000 ft. with a general slope from east to west and a dip northward to Ngami. The surface soil is mainly red sand. On the eastern border the country is characterized by the presence of long, shifting sand dunes with a sparse grass cover. There are also, especially along the river beds, extensive mud flats. After heavy rain these become pans or lakes. A tough, sunbleached grass, growing knee-high in tufts at spaces of about 15 in., covers the dunes and gives the general colour of the landscape. Considerable parts of the Kalahari, however, chiefly in the west and north, are covered with dense scrub, and there are occasional patches of forest. Next to the lack of surface water the chief characteristics of the desert are a ground cover of sparsely spaced, wiry and tough grass in which low shrub and scattered thorn trees with tall palms are interspersed.

In the south the drainage is toward the Orange. The Molopo and the Kuruman. which in their upper course in eastern Bechuanaland are perennial streams, lose their water by evaporation and percolation on their way westward through the Kalahari. The Molopo, a very imposing river on the map, is dry in its lower stretches. *(See* BECHUANALAND.)

The Kalahari was first crossed to Lake Ngami by David Livingstone, accompanied by William C. Oswell, in 1849. In 1878–79 a party of Boers, with about 300 wagons, trekked from the Transvaal across the Kalahari to Ngami and thence to the hinterland of Angola. Many of the party perished of thirst and malaria, and in all about 250 persons and 9,000 cattle died.

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KALAKH (CALAH, modern NIMRUD), an Assyrian city situated in the angle formed by the confluence of the Tigris and the upper Zab 19 mi. S. of Mosul. The city was the artificial creation of Shalmaneser I, as Agade to the south was of Sargon. It was later abandoned for many centuries and subsequently occupied by Assur-nasir-pal. The city was the headquarters of the army in

Assyria and as such played an important part in the military revolts which at various times upset the empire. The excavations which have been made on this site, although mostly carried on before the time of scientific archaeology. have produced particularly valuable results in the way of statues and inscriptions although comparatively few tablets have been found, apparently because many of these were transferred in ancient times to Nineveh. The most important objects from the site are the ninged lions now in the British museum, the black obelisk of Shalmaneser, in the same collection and a series of great winged bulls. The most important buildings fall into six groups. First, south of the stage tower lies the northwest palace, originally built by Assur-nasir-pal, and restored by Sargon. It is a wonderfully complete Assyrian building measuring about 350 ft. square and including a central court. 129 by 90 ft.. surrounded as in most oriental buildings by a series of large rooms. Second, in the interior of the mound, toward its southern end, the palace of Shalmaneser III, rebuilt by Tiglath-Pileser III, there was found together with several other things a series of slabs showing the victorious passages of arms of the rebuilder of the palace. In the southwest corner of the platform an uncompleted building of Esar-Haddon was found. This was made from the material taken from Tiglath-Pileser's buildings. Between this building and the northwest palace there nas a small palace dating from about 60 years after the time of Assur-nasir-pal. The southeast palace was built by Assur-etil-ilanion; it dates from the end of the 7th century B C. and was probably used as was the other building as a harem. A temple called E-zida, dedicated to Nebo, was found near the southeast palace. while two small temples of Assur-nasir-pal were found opposite this on the northwest corner. There were other buildings on the east side but these were all found to be ruined because the mound had been used as a cemetery and in later times as an underground granary. Kalakh was never a city of first-rate importance. All the cities of Assyria lay within a day's journey of one another, and were overshadowed by Nineveh, but Kalakh oned its importance partly to the action of Shalmaneser and later simply to its official position as the military headquarters of a military power.

KALAMATA or KALÁMAI (officially Καλάμαι, from an ancient town near the site). chief town of the modern Greek department of Messenia on the Nedon, about 1 mi. from the sea, seat of a court. Population (1951) 37,781. On a hill behind the town is a medieval castle, but no ancient remains have been discovered; some identify the site nith classical Pharae.

During the middle ages it was for a time a fief of the Villehardouins; in 1685 it was captured by the Venetians; in 1770, and again in 1821, it was the revolutionary headquarters in the Morea; in 1825 it was sacked by Ibrahim Pasha. The harbour, though recently improved, offers little shelter; vessels are served by lighters; in the winter months the fishing craft take shelter in the haven of Armyro. The silk industry was formerly important; the local olives are noted; and the Messenian plain produces currants and other fruit crops.

KALAMAZOO, a city of Michigan, U.S., the seat of Kalamazoo county, is located midway between Detroit and Chicago, about 70 mi S W. of Lansing and 30 mi. E. of Lake Michigan on the Kalamazoo river at its confluence uith Portage creek. The river was easily forded at that point and English and American fur traders maintained a post near the ford before the first settler, Titus Bronson, built his cabin in 1829. The growth of the town was stimulated when a government land office was established in 1834. Incorporated as a village in 1843, Kalamazoo subsequently became the largest village in the nation until its incorporation as a city in 1884. Paper manufacturing, begun in 1867, became the city's largest industry. Modern industries are diversified, the chief products being, besides paper products, pharmaceuticals, fishing tackle, taxicabs, machine tools, auto trailers, musical instruments, ventilating systems and truck transmissions. Kalamazoo celery, first grown by the city's numerous Dutch settlers, attained nationwide fame. Educational facilities of the metropolitan area include Kalamazoo college, a coeducational college chartered in 1833 and related to the Baptist Church; Western Michigan university, founded in 1903; and Nazareth college, a Roman Catholic college for women, established in 1924. The city has a civic theatre: an art centre, a symphony orchestra, a library and a museum. Several parks and a municipal skating rink provide recreational facilities. Kalamazoo was selected in 1957 by the United States Information agency as the typical American city and was portrayed in exhibits shown in Great Britain and Germany. Since 1918 the city has had a council-manager form of government.

Pop. (1960) city 82.089; standard metropolitan statistical area (Kalamazoo county) 169.712. (For comparative population figures see table in MICHIGAN: Population.) Part of the increase in the population of the city between 1950 and 1960 is the result of annexations in the mid-1950s which more than doubled its area. The name Kalamazoo is an Indian term, said to mean "boiling pot," from the bubbling springs Indians discovered in the river there. (W. F. Du.)

KALAT, a town, a district and a division of West Pakistan. The town is 88 mi. S. of Quetta. Pop. (1951) 2,009. A *miri* or citadel dominates the town and contains the palace of the khan. Kalat was headquarters of the Baluch confederacy and the British agent subordinate to the Baluchistan commissioner, and, from 1952 to 1955, of the Baluchistan states union.

KALAT DISTRICT had at the end of 1955 an area of 30.799 sq.mi., which at the 1951 census was occupied by a population of 282,-945. During the 19th and 20th centuries the area under the khan's governance was progressively reduced, and in 1955 further areas (Saruna, and Lehri tehsil in eastern Kachhi) were transferred to other districts. The history of Kalat is bound up with that of Baluchistan as a whole (see BALUCHISTAN). It is split up into four main subdivisions, Kalat Niabat, Sarawan, Jhalawan and Kachhi. Khuzdar (Hozdar), the former capital, is about 50 mi. S. of Kalat. In spite of the rugged and barren nature of the mountain districts of Kalat, the main routes through them are comparatively easy. Some of the valleys about Kalat are strikingly picturesque, in spite of the great preponderance of mountain wilderness (often. however, the pasturage of sheep) in the Sarawan lowlands almost equally with the Jhalawan highlands. This prosperity explains the importance of the province, anciently called Turan (or Tubaran), in the eyes of medieval Arab geographers. The khans of Kalat belong to the Ahmadzai branch of the Mirwari clan, which originally emigrated from Oman to the Kolwa valley of Makran and took Kalat about the 15th century.

KALAT DIVISION (98,975 sq.mi.; pop., 1951. 589,214) comprises, in addition to Kalat state, the district or agency of Chagai and the princely states of Kharan, Makran and Las Bela.

KALB, JOHANN ("BARON DE KALB") (1721-1780), German soldier in the American Revolution, was born in Hiittendorf, near Bayreuth. on June 29, 1721. He was of peasant parentage, and left home when he was 16 to become a butler. In 1743 he was a lieutenant in a German regiment in the French service, calling himself at this time Jean de Kalb. He served with the French in the War of the Austrian Succession, becoming captain in 1747 and major in 1756; in the Seven Years' War he was in the corps of the comte de Broglie, rendering great assistance to the French after Rossbach (Nov. 1757) and showing great bravery at Bergen (April 1759). As secret agent, appointed by Choiseul, he visited America in 1768–69 to enquire into the feeling of the colonists toward Great Britain. Late in 1775 he received permission to volunteer in the army of the American colonies, in which the rank of major general was promised to him by Silas Deane. After many delays he sailed with 11 other officers on the ship fitted out by Lafayette, and arrived at Philadelphia in July 1777. His commission from Deane was disallowed, but the Continental Congress granted him the rank of major general (dating from Sept. 15, 1777), and in October he joined the army, where his growing admiration for Washington soon led him to view with disfavour de Broglie's scheme for putting a European officer in chief command. Early in 1778, as second in command to Lafayette for the proposed expedition against Canada, he accompanied Lafayette to Albany before the expedition was abandoned. In April 1780 he was sent from Morristown, N.J., to relieve Charleston, but on arriving at Petersburg, Va., he learned that Charleston had al-

ready fallen. In his camp at Buffalo Ford and Deep river! Gen. Horatio Gates joined him on July 25; and next day Gates led the army by the short and desolate road directly towards Camden, S.C. On Xug. 11–13, when Kalb advised an immediate attack on Lord Rawdon, Gates hesitated, and it was not until after Cornwallis had occupied Camden (on Aug. 14) that he decided upon action. In the battle, which took place near Camden early in the morning of Aug. **16,** the American left and centre gave way in disorder and Gates fled from the field, but Kalb, unhorsed and fighting fiercely at the head of his right wing, was wounded 11 times before he was taken prisoner. He was sent to Camden, where he received the kindest attention, but died on Aug. **19, 1780** There, in **182**j, Lafayette laid the cornerstone of a monument to him. In **1887** a statue of him by Ephraim Keyser was dedicated in Annapolis. Md.

KALE, a cultivated variety of cabbage **(*Brassica oleracea* var. *acephala*).** which includes several forms. Common or Scotch and Buda kale are among the hardiest of the esculents. The plant consists of a stout central stem, which grows to a height of about 2 ft. The large thickset leaves used for edible purposes are green. purplish or light red in colour. **See** CABBAGE.

KALEDPN, ALEXEI (1861–1918), Russian general! was born in **1861,** and entered the army in **1882.** For several years he served in the artillery and in **1889** was appointed on the general staff. When World War I broke out in 1914 he was at the head of the 12th cavalry division, with which he distinguished himself in the Galician campaigns of 1914–1j. Later in 191j he commanded the XII corps, and in the beginning of **1916** the VIII army. With this army, in **1916,** he carried out the great offensive campaign of Lutsk. In May **1917,** being out of sympathy with the policy of the provisional government, he resigned his post as an army commander and later in the same year was elected Xtaman of the Don. His popularity among the Cossacks survived the conflict between Kornilov and Kerensky. After the Bolsheviks' seizure of power, his influence over the Cossacks kept them at first from supporting the Revolution. Finally, unable to save them from Bolshevism. Kaledin shot himself, Feb. 11, 1918.

KALEIDOSCOPE, an instrument which produces a symmetrical set of images, by the to and fro reflections in a pair of plane mirrors meeting one another at an angle, which is an even submultiple of 360°. It was invented by Sir David Brewster, and patented by him in **1817.** An attempt was made to discount the invention as being merely the same as the multiple mirrors of Kircher, Harris, Wood, Bradley and others; but none of these writers had described an arrangement that produced the beautifully symmetrical patterns that resulted from Brewster's design.

Essentially the instrument consists of two flat pieces of glass, with the edge of one surface meeting the other surface in a clean line; and with their planes inclined to one another at some such angle as $30° \left(\frac{360}{12}\right)$, or $22\frac{1}{2}° \left(\frac{360}{16}\right)$. The eye of the observer is applied at one end, close to the line of intersection of these glasses, and near the opposite end is placed any suitable object in the angular space between the mirrors. The backs of the glasses are blacked to cut off any reflection from them; or, preferably, the inner surfaces of the glasses may be silvered, or metal mirrors may be substituted. The mirrors are usually mounted in a tube, and they are cut somewhat tapering at the eye end, so that their line of intersection may conveniently be brought towards the centre of the tube, and the eye thus be able to look through an aperture central with the tube. The objects usually supplied are a number of pieces of coloured glass, mounted in a cell between a disc of clear glass, which is close to the end of the mirrors, and an outer disc of ground glass. On rotating this cell the pieces of glass fall about and form an infinite variety of patterns. Much more delightful effects are produced by a further device of Brewster. He mounted a convex lens of short focal length (two or three inches) in a sliding tube, which could then be adjusted to throw the image of any natural object in the plane of the ends of the mirrors.

The field of view is limited by the edges of the mirrors opposite to the eye. If, as is usually the case, the object is at a little distance from the end, unless the eye can be placed absolutely in the plane of the mirror, the edge of the mirror will cut the object and the image in different lines, and they will not appear to be perfectly symmetrical. A plane object, *e.g.,* a drawing, which is placed close against the far edges of the mirrors, or a solid object which is placed actually within the angle of the mirrors, and nearer the eye than the ends of the mirrors, will form a symmetrical pattern, independently of the position of the eye. Or if the eye could be placed in the line of intersection of the mirrors, so that it is in the plane of both mirrors, the pattern would always be symmetrical, even if the object is beyond the far end of the mirrors. In actual practice, the eye is arranged to be placed as close as possible to the angle of the mirrors, and the objects are also kept close to the ends of the mirrors. The pattern will then not be quite perfect, but will be sufficiently symmetrical to satisfy an ordinary observer, whose attention has not been specially directed to the want of symmetry.

From the remarks in the last paragraph, it is obvious that it is possible to form a perfectly symmetrical picture of a solid object, which can be seen in relief by the two eyes simultaneously. It is only necessary that the object shall be placed within the far ends of the mirrors, and if the latter are of sufficient size, it can be viewed by both eyes and appear symmetrical, even though the eyes are not close to the angle of the mirrors. A bunched-up handkerchief, or a coloured piece of silk, lighted strongly from one side. yields most beautiful designs, which look like exquisite exotic flowers.

The kaleidoscope is frequently used by designers to enable them to realise the effects that can be produced by symmetrical designs. In this case the mirrors are usually set up in a vertical plane, and supported a little above a table, on which any object can be placed.

Attempts have often been made to project kaleidoscopic patterns, but usually with indifferent success. If a pair of mirrors are merely interposed between the condenser and the projecting lens, it will be found impossible to illuminate the images formed by the successive reflections. A piece of ground glass placed immediately after the condenser will help to make the lighting more even, but at a great sacrifice of light. As many beams of light as there are reflected images are required, one beam being focussed upon each of the images of the projecting lens. This can be obtained by interposing a second pair of mirrors between the arc and the condenser, these mirrors making the same angle with one another as the front pair. The lines of intersection of each pair of mirrors and the axis of the condenser should all be coincident. A group of images of the arc arranged round a circle, will then be formed, and the condenser should focus these on the centres of the set of images of the projecting lens. **(R.** S. CL.)

KALERGIS, DIMITRI (DEMETRIOS) **(180%–1**867), Greek statesman, a Cretan by birth, studied medicine at Paris and on the outbreak of the War of Greek Independence went to the Morea and joined the insurgents. He fought under Karaiskakis, and was taken prisoner by the Turks before Athens; later he acted as aide de camp to the French philhellene Colonel Fabvier and to Count Capo d'Istria, president of Greece. In **1843,** as commander of a cavalry division, he was the prime mover in the insurrection which forced King Otto to dismiss his Bavarian ministers. He was appointed military commandant of Athens and aide de camp to the king, but after the fall of the hfavrocordato ministry in **1845** was forced to go into exile, and spent several years in London, where he became an intimate of Prince Louis Napoleon. In **1848** he descended on the Greek coast, in the hope of revolutionizing the kingdom. He was captured, but soon released and, after a stay in the island of Zante, went to Paris (1853). At the instance of the Western Powers he was recalled on the outbreak of the Crimean War and appointed minister of war in the reconstituted Mavrocordato cabinet **(1854).** He was, however, disliked by King Otto and his consort, and in October **1855** was forced to resign. In **1861** he was appointed minister plenipotentiary in Paris, in which capacity he took an important part in the negotiations which followed the fall of the Bavarian dynasty and led to the accession of Prince George of Denmark

to the Greek throne.

KALEVALA, the name of the Finnish national epic compiled by the scholar Elias Lonnrot (*q.v.*) from old Finnish ballads, lyrical songs and incantations memorized and handed down by word of mouth by the bards and ordinary people for generations. The word Kalevala is a poetical name for Finland in the epic and means "land qf heroes," the dwelling place of the poem's chief characters, called the "sons of Kaleva." Among the chief characters is the old and wise Vainamoinen of supernatural origin, a more powerful seer than all the others, leader of the inhabitants of Kalevala and an incomparable singer and player of the kantele, the Finnish harplike stringed instrument. The others are the skilled smith Ilmarinen who is said to be one of those who forged the "lids of heaven" when the world was created; Lemminkainen, the carefree adventurer-warrior and charmer of women; and Louhi, the female ruler of Pohjola, a land in the north, the counterpower of Kalevala. The most important secondary episode deals with Kullervo, the mighty hero, the Hamlet of the *Kalevala* forced by fate to be a slave from his childhood, and his resulting tragic destiny.

Among the main themes of the poem are the adventurous journeys of Vainamoinen, Ilmarinen and Lemminkäinen to Pohjola to woo the daughter of Louhi, famed for her beauty. In this connection is the episode of the forging of the miraculous Sampo, bringer of happiness and prosperity, by Ilmarinen as a special task, and its recovery for the people of Kalevala. The Sampo can be taken as the symbol of man's spiritual and material advancement.

The *Kalevala* depicts the conditions and ideas of the pre-Christian period, although the last canto seems to predict paganism giving way for Christianity: the maid Marjatta gives birth to a son who is baptized king of Karelia; Vainamoinen makes way for him: departing from Finland forever, leaving behind his instrument and his songs.

The poem is written in octosyllabic trochees and dactyls, the so-called Kalevala metre; it uses alliteration, parallelism and repetition. It has been the subject matter and source of inspiration for many outstanding works of art, among them the paintings of Akseli Gallén-Kallela and the compositions of Jean Sibelius. The poem has been translated into 20 languages, including English (W. F. Kirby, 1907); German (A. Schiefner, 1852; rev. ed. by M. Buber, 1921); Russian (L. P. Bielski, 1889); Hungarian (B. Vikár, 1909); French (J. L. Perret, 1931); Rumanian (I. Vesper, 1959); Italian (P. E. Pavolini, 1910); and Japanese (K. Morimoto, 1937). Longfellow borrowed the metre of his *Hiawatha* from a German translation of the *Kalevala* in the original metre and imitates the style and matter of the Finnish epic very closely.

The first edition of the *Kalevala*, published by Lönnrot in 1835, contained 32 cantos. In 1849 an enlarged edition of 50 cantos was published. The treasure of folk songs in the *Kalevala* was published, with poems collected later, in a scholarly work, *Suomen Kansan Vanhat Runot,* 33 vol. (1908–48).

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KALGAN (CHANG-CHIA-K'OU, former WAN-CH'UAN), an important Chinese depot and gateway to Mongolia, as its Mongolian name (halga: gate) signifies, in Hopeh province on the Inner Mongolian fringe where the Great Wall crosses the Yang Ho, a headstream of the Yung-ting Ho flowing past Peking. The city has Mongol and Chinese sections; pop. (1953) 229,300. It lies at an altitude of 2,800 ft. on the extremity of a rich loess plain. Under the Ming and Manchu dynasties Kalgan was a centre of great commercial and military importance and had been formerly included within the metropolitan province of Hopeh. In 1914 Kalgan became the capital of the administrative district of Chahar which in 1928 was raised to provincial status. It became connected to Peking by a railroad in 1909. From Kalgan as many as 100,000 camels were used in carrying tea to Siberia; an estimated 1,200,000 camels and 300,000 bullock wagons were employed in the inland caravan trade. Kalgan has been long the market centre for Mongolia's wool and for the fur trade and has numerous fur-processing plants. Hides and skins from Mongolia also are collected for export southeastward on the railroad.

After 1933 the Japanese began their infiltration into Chahar and at the outbreak of war in 1937, captured Kalgan. After World War II the city was held briefly by the Chinese Nationalists and in 1947 had a population of 151,000. It was captured by the Chinese Communists in 1948 and in 1950 was made the capital of the Inner Mongolian autonomous region. However, in the reorganization of Nov. 1952, Chahar was absorbed into an enlarged Hopeh province. Kalgan has both rail and highway connections westward with the important heavy industry complexes of Paotou in Inner Mongolia and Tatung and T'ai-yuan in Shansi province. The railroad also connects with the Trans-Mongolian line to Ulan Bator, while the extension west of Paotou leads to Lanchow in Kansu. A bus service links Kalgan with Silinhot, capital of the Silingol league in Inner Mongolia. Situated in the Hopeh cotton-growing region, the city is a rising textile centre with a cotton mill having 95,000 spindles and 2,400 looms. Kalgan is connected to the Hopeh high-tension electric grid which is supplied mainly by thermal plants and also in part by the Kwanting hydroelectric station at the Yungting river dam. (H. J. Ws.)

KALGOORLIE, second largest town in Western Australia, in lat. 30° 40′ S., 121° 22′ E., adjoined by Boulder, and situated about 380 mi. E.N.E. of Perth, and 25 mi. E.N.E. of Coolgardie. Pop. (1954) 9,962; 22,834 including Boulder municipality, 3½ mi. from Kalgoorlie, and the Kalgoorlie Road board. Kalgoorlie is connected by the Trans-Australian railway with Fremantle and Port Augusta and is a junction for the lines to Esperance and Laverton. It also has an airport.

Kalgoorlie is at the centre of the rich East Coolgardie. Kalgoorlie and Boulder gold field. Gold was first discovered in the area in about 1888 and the town became the centre of the gold rush which began in 1893. Its population in 1900 was about 30,000. Water shortage proved a great difficulty (the climate is arid, with an average annual rainfall of about 9 in.) and led to the construction of the Goldfield Water Supply system, which began operation in 1903. By it water is piped from the Mundaring weir in the Darling ranges about 350 mi. to the west. The gold fields have had a meteoric existence, and output had greatly declined by the mid 1950s, when it was 31,000,000 fine oz., value: about £212,000,000. The main mines occur in quartz diabase, which has been chemically altered into a greenstone. The lodes occur as nearly vertical sheets.

KALI, "dark" or Kālī Mai, "dark mother," in the late Epic Hindu mythology a cult-title of Durga, wife of Siva. The origin of her worship is obscure and her attributes enigmatical. Usually regarded as a goddess of death and destruction, she is depicted as black, four-armed, with red palms and eyes, her tongue, face and breasts blood-stained, matted hair and fang-like teeth. She wears a necklace of skulls, corpses as earrings, and a girdle of snakes. She was also incarnate as Chamunda (Skt. Chhinnamastaka, "headless"), a type of those who lay down their life for a cause. One of her shrines was Kālīkshetra, near Kalighat (now Calcutta). There goats are slain as vicarious sacrifices to Kālī, at the Kālī-pūja, on the darkest night of November.

See Hastings' E.R.E. (Edinburgh, 1914, 7); *s.v.* Kalighat.

KĀLIDĀSA, the most illustrious name among the writers of the second epoch of Sanskrit literature, which, as contrasted with the age of the Vedic hymns, may be characterized as the period of artificial poetry. The extremely corrupt form of the Prākrit or popular dialects spoken by the women and the subordinate characters in his plays, as compared with the Prākrit in inscriptions of ascertained age, led Weber and Lassen to agree in fixing on the 3rd century A.D. as the approximate period of the writings of Kālidāsa.

He was one of the "nine gems" at the court of King Vikramaditya or Vikrama, at Ujjain, and the tendency is now to regard the latter as having flourished about A.D. 375; others, however, place him as late as the 6th century. Kālidāsa is in the first rank of Oriental poets. Kālidāsa's fame rests chiefly on his several dramas, but he is also distinguished as an epic as well as a lyric poet.

He wrote three plays, the most famous of which is *Sakuntalā*. There are two recensions of the text in India, the Bengali and the Devanāgarī, the latter being generally considered older and purer. *Sakuntalā* was first translated into English by Sir William Jones (Calcutta, 1789), who used the Bengali recension. It was soon after translated into German by G. Forster (1791; new ed. Leipzig, 1879). An edition of the Sanskrit original, with French translation, was published by A. L Chézy at Paris in 1830. This formed the basis of a translation by B. Hirzel (Zurich, 1830); later trans. by L. Fritze (Chemnitz, 1876). Other editions of the Bengali recension were published by Prema Chandra (Calcutta, 1860) for the use of European students and by R. Pischel (2nd ed , Kiel, 1886). The Devanāgarī recension was first edited by O. Bohtlingk (Bonn, 1842), with a German translation. On this were based the successive German translations of E. Meier (Tubingen, 1851) and E. Lobedanz (8th ed., Leipzig, 1892). The same recension has been edited by Dr. C. Burkhard with a Sanskrit-Latin vocabulary and short Prākrit grammar (Breslau, 1872) and by Professor Monier Williams (Oxford, 2nd ed. 1876), who translated the drama (jth ed., 188;). There is another translation by P. N. Patankar (Poona, 1888). There are also a South Indian and a Cashmir recension.

The *Vikramorvasī,* or *Urvasī won* by *Valour,* abounds with fine lyrical passages, and is of all Indian dramas second only to *Sakuntala* in poetic beauty. It was edited by R. Lenz (Berlin, 1833) and translated into German by C. G. A. Hofer (Berlin, 1837), by B. Hirzel (1838), by E. Lobedanz (Leipzig, 1861) and F. Bollensen (Petersburg, 1845). There is also an English edition by Monier Williams, a metrical and prose version by Professor H. H. Wilson, and a literal prose translation by Professor E. B. Cowell (1851). The latest editions are by S. P. Pandit (Bombay, 1879) and K. B. Paranjpe *(ibid.* 1898).

The third play, entitled *Mālavikāgnimitra,* has considerable poetical and dramatic merit, but is confessedly inferior to the other two. It possesses the advantage, however, that its hero Agnimitra and its heroine Mālavikā are more ordinary and human characters than those of the other plays. It is edited by O. F. Tullberg (Bonn, 1840), by Shankar P. Pandit, with English notes (1869), and S. S. Ayyar (Poona, 1896); translated into German by A. Weber (1856), and into English by C. H. Tawney (2nd ed., Calcutta, 1898).

Two epic poems are also attributed to Kālidāsa. The longer of these is entitled *Raghuvantsa,* the subject of which is the same as that of the *Rāmāyana,* viz., the history of Rāma, but beginning with a long account of his ancestors, the ancient rulers of Ayodhya (ed. by A. F. Stenzler, London, 1832; and with Eng. trans. and notes by Gopal Raghunath Xandargikar, Poona, 1897, verse trans. by P. de Lacy Johnstone, 1902). The other epic is the *Kumārasambhava,* the theme of which is the birth of Kumāra, otherwise called Kārttikeya or Skanda, god of war (ed. by Stenzler, London, 1838; K. M. Banerjea, 3rd ed. Calcutta, 1872; Parvanikara and Parab, Bombay, 1893; and M. R. Kale and S. R. Dharadhara, ibid. 1907; Eng. trans. by R. T. Griffith, 1879). Though containing many fine passages, it is tame as a whole.

His lyrical poems are the *Meghadūta* and the *Ritusamhāra.* The *Meghadūta,* or the Cloud-Messenger, describes the complaint of an exiled lover, and the message he sends to his wife by a cloud. It is full of deep feeling, and abounds with fine descriptions of the beauties of nature. It was edited with free English translation by H. H. Wilson (Calcutta, 1813), and by J. Gildemeister (Bonn, 1841); a German adaptation by M. Müller appeared at Königsberg (1847), and one by C. Schutz at Bielefeld (1859). It was edited by F. Johnson, with vocabulary and Wilson's metrical translation (London, 1867); later editions by K. P. Parab (Bombay, 1891) and K. B. Pathak (Poona, 1894). The *Ritusamhāra,* or Collection of the Seasons, is a short poem, of less importance. on the six seasons of the year. There is an edition by P. von Bohlen, with prose Latin and metrical German translation (Leipzig, 1840); Eng. trans. by C. S. Sitaram Ayyar (Bombay, 1897).

Another poem, entitled the *Nalodaya,* or Rise of 'Nala, edited by F. Benary (Berlin, 1830), W. Yates (Calcutta, 1844) and Vidyasagara (Calcutta, 1873), is a treatment of the story of Nala and Damayanti, but describes especially the restoration of Nala to prosperity and power. It has been ascribed to the celebrated Kālidāsa, but was probably written by another poet of the same name. It is full of most absurd verbal conceits and metrical extravagances. So many poems, partly of a very different stamp, are attributed to Kālidāsa that it is scarcely possible to avoid the necessity of assuming the existence of more authors than one of that name. It is by no means improbable that there were three poets thus named; indeed modern native astronomers are so convinced of the existence of a triad of authors of this name that they apply the term Kalidasa to designate the number three.

On Kālidāsa generally, *see* A. A. Macdonell's *History* of *Sanskrit Literature* (1900), and on his date, G. Huth, *Die Zeit des K.* (Berlin, 1890); M. B. Harris, *Ralidasa: Poet of Nature (1936).* (A. A. MA.)

KALIMPONG, a subdivisional town in Darjeeling district, West Bengal, India; 3,933 ft. above sea level and 8 mi. E.N.E. of Darjeeling. Pop. (1951) 16,677. It is a hill sanatorium and a frontier market to which wool and mules are brought from Tibet via Sikkim. An important agricultural fair is held in November. An intermediate college, developed out of the Scottish universities mission's educational work begun here in 1900, is now affiliated with Calcutta university.

KALININ, MIKHAIL IVANOVICH (1875–1946), Russian statesman, son of a peasant of Tver (Kalinin) province, was born in 1875. He went to a village school, and was apprenticed in a munition factory, afterward at the age of 16 going to St. Petersburg to work in the Putilovsk factory. In 1898 he joined the social-democratic party, was arrested 12 months later, and spent 10 months in prison. After being transferred from town to town, he was again arrested in 1903 and sent to Siberia in 1904. He returned in 1905, working in St. Petersburg and Moscow, and in 1908 was banished from St. Petersburg. Like many another peasant worker, during all these years he remained in touch with his home village, and kept his small holding in cultivation. In 1913 he was again arrested and sentenced to exile in eastern Siberia, but he escaped and remained illegally in St. Petersburg until the February Revolution of 1917. He took active part in the October Revolution; in 1919 he was elected a member of the central committee of the Russian Communist party, and in the same year became president of the central executive committee of the soviet government. A peasant himself, he was regarded as the peasants' representative in the soviet government. He was president of the supreme council of the U.S.S.R. from 1938 to 1946. He died on June 3, 1946.

KALINJAR, a town and hill fort in Banda district, Uttar Pradesh, India, 8j mi. W.S.W. of Allahabad. The fort stands on an isolated rock. the termination of the Vindhya range, at an elevation of 1,203 ft.. overlooking the plains of Bundelkhand. Kalinjar is the most characteristic specimen of the hill fortresses. originally hill shrines, of central India. Its antiquity is proved by its mention in the *Mahabharata.* It n-as besieged by Mahmud of Ghazni in 1023, and there the Afghan emperor Sher Shah met his death in 1545. Both the fort and the town at the foot of the hill are of interest to the antiquary because of their remains of temples, sculptures, inscriptions and caves.

KALIR (QAEIR), ELEAZER, Hebrew liturgical poet, whose hymns (*piyyutim*) are among the festival prayers of the German synagogal rite. He is said by some authorities to have lived in the 6th, by others in the 10th century.

Some beautiful renderings of Kalir's poems may be found in the volumes of Davis & Adler's edition of the German Festival Prayers entitled *Service of the Synagogue.*

KALISCH, ISIDOR (1816–1886), Jewish divine, was born at Krotoschin in Prussia on Nov. 15, 1816, and was educated at Berlin, Breslau and Prague. In 1848 he came to London, but passed on in 1849 to America, nhere he ministered as rabbi in various cities At Newark from 187j he gave himself entirely to literary work, and exercised a strong influence as leader of the radical and reforming Jenish party.

Among his works are *Wegweisen für rationelle Forschungen in den biblischen Schriften* (1853). *See* his *Studies in Ancient and Modern Judaism, ed.* with *Memoir by S.* Kalisch (1928).

KALISZ, a town of Poland in the province of Poznan, situated 147 mi. W.S.W. of Warsaw, on the Prosna river. The population in 1957 was 65,700. It is one of the oldest and finest cities of Poland, is the seat of a Roman Catholic bishop and possesses a castle and a large public park. The industrial establishments comprise a brewery, tanneries and factories for ribbons, cloth and sugar. It has been identified with the Galisia of Ptolemy, and its antiquity is indicated by the abundance of coins discovered on the site, as well as by the numerous burial mounds in the vicinity. It was the scene of a decisive Polish victory over the Swedes in 1706. Germany occupied it in World War II.

KALMAR, a seaport of Sweden on the Baltic coast, chief town of the district (lan) of Kalmar, 250 mi. S.S.W. of Stockholm by rail. Pop. (1950) 27,087. It lies opposite the island of Öland on two small islands and partly on the mainland. Most of the houses are of wood, but the principal buildings are of limestone from Oland, including the 17th-century cathedral. Kalmar, a town of great antiquity, was formerly strongly fortified. There remains the island-fortress of Kalmarnahus, dating from the 12th century, but principally from the 16th and 17th, and containing the beautiful chamber of King Eric XIV (d. 1577). The town gives name to the treaty (Kalmar union) by which Sweden, Norway and Denmark were united into one kingdom in 1397. Kalmar has an artificial harbour, with a depth from 15 to 22 ft. There are match factories, the produce of which, with timber and oils, is exported. Shipbuilding is carried on.

KALMUCK (KALMYK), a Mongolic people of the Soviet Union, residing chiefly in the Kalmyk Autonomous Soviet Socialist Republic (*q.v.*), who belong to the Oirat or western branch of the Mongolian language group. The Oirat dialects are also spoken in western Mongolia, Sinkiang and neighbouring provinces of China. The home of the Kalmucks lies west of the Volga river in its lower courses, in an arc along the northwestern shore of the Caspian sea. A small number of Kalmucks of the Buzama tribe live along the Don river. Another small group, called the Sart Kalmucks, live in the Kirgiz Soviet Socialist Republic (Kirgizia), near the Chinese border. A few emigrated after World War II to the United States, where they settled in New Jersey.

Their native habitat is a zone of dry steppe and steppe desert. Water is scarce; water courses are few, and many of the lakes are salt or brackish. The country is not suited for farming unless it is fertilized and irrigated; however, it is excellent for pastoralism and the Kalmucks are by long tradition nomadic pastoralists. They raise herds of horses and cattle, flocks of sheep and goats and a few camels. Their horses were marketed widely and as far west as Poland. Their nomadism is of a classical pattern: an annual round of movement from winter camp to spring, summer and fall pasture, and return.

The Kalmuck home is a yurt or tent of felt on a lattice frame. It is readily assembled and disassembled and packed on a wagon or camel's back for transport to the next encampment. During the latter part of the 19th century the Kalmucks undertook agriculture in conjunction with pastoralism. Where agriculture plays an important role, the Kalmucks have introduced fixed dwellings. Elsewhere they continue to live in tents and raise herds of livestock.

The western Mongols were enemies of the eastern Mongols of the Chingiside empire at the time of its apogee in the 13th century A.D. During the following centuries they maintained a separate existence under a confederation known as the dorben oirat ("four allies," from which the name Oirat is derived); at times they were allies, at times enemies of the eastern Mongols in the Chingiside line. Part of the western Mongols remained in their homeland, northern Sinkiang, or Dzungaria, and western Mongolia. Part of the Oirat confederation, including all or part of the Torgot, Khoshut, Dorbet and other groups moved across southern Siberia to the southern Urals at the beginning of the 17th century. From there they moved to the lower Volga, and for a century and a half, until 1771, they nomadized both to the east and west of this region. During the course of the 18th century, they were absorbed by the Russian empire which was then expanding to the south and east. In 1771, those on the left bank, to the east of the Volga, returned to China. The right-bank Kalmucks, comprising the contemporary Torgot, Dörbet and Buzawa, remained in Russia.

In their social organization the Kalmucks are strongly patrilineal. Family life, descent lines, marriage relations, inheritance of property, are all principally regulated by the lams of agnatic kinship. The family is traditionally an extended one composed of parents, married sons and their families and unmarried sons and daughters. Females marry away from their natal families. Several extended families are grouped into nomadic kin villages. The kin villages are grouped into lineages and clans, and these in turn were grouped in past centuries into clan confederation bearing the names indicated above: Torgot, etc. All these structures were interrelated by widening degrees of agnatic kinship. The wider kin structures, on the order of clan confederations, no longer exist. Current usage of such terms as Torgot and Dorbet refers to dialect groups and not to kin-political groupings.

Prior to the Russian Revolution, the Kalmucks were divided into a princely estate, which ruled the various confederations; a noble estate, which ruled the lower social hierarchies, clans and lineages; and a common estate. Aside from these estates there was a clerical order forming an estate of its own. All of these estates except the common have since disappeared.

The religion of the Kalmucks is that of the Mongols generally: Tibetan Buddhism (*q.v.*) or lamaism. This religion came from India to Tibet and from there passed to the Mongols in the 16th–17th centuries. The lamas are monastic clergy who take a vow of celibacy. They live apart from the communities of pastoralists and their monasteries contained at one time a large portion of the adult males of the people. This situation withdrew a large number of people from normal family life. However, lamaism has diminished to the point of virtual disappearance, both among the Kalmucks and in other parts of the Mongol world. Prior to their conversion to Buddhism, the Kalmucks were shamanists (see SHAMANISM). Their Buddhism has a strong admixture of shamanism. The Sart Kalmucks were converted to Islam.

Under the Soviet system they were organized into an autonomous region of the Russian Soviet Federated Socialist Republic. At the end of World War II they were accused of anti-Soviet activity as a whole, were moved from their home country and exiled to Soviet central Asia. In 1957 they were restored to their former territories and position in Soviet life. They numbered 134,000 in 1939. According to the Soviet census of Jan. 1959, they had decreased to 106,000 in 20 years. See also ASIA: Ethnology.

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KALMYK AUTONOMOUS SOVIET SOCIALIST REPUBLIC (KALMYKIA), constituted 1935, extending from the right bank of the Volga to the Manich depression on the southwest, and the Dagestan A.S.S.R. on the southeast, and from the Ergeni hills on the west to the Caspian sea on the east. Area 29,305 sq.mi. Pop. (1939) 183,000 (urban 38,000, rural 145,000). It was created in 1920 from the former Kalmuck (Kalmyk) reservation of the province of Astrakhan. A tongue of the area thrusts west from long. 43° 5' E. to about 41° 5' E., to include the Manich lakes and the settlement of Bashanta.

A tiny patch on the left bank of the Volga, in lat. 47° N. also belongs to the Kalmyk area. Much of the Kalmyk steppe was formerly part of the Aral-Caspian sea, and is a plain 30–40 ft. below sea level, sloping gently southeast. Large areas of moving sands exist near Enotayevsk, where high dunes or *barkhans* have been formed. A narrow tract of land along the coast of the Caspian, "the hillocks of Baer," is covered with hillocks elongated from west to east, perpendicularly to the coast line, the spaces between them being filled with water or overgrown with thickets of reeds, various willows, elms and almond trees. An archipelago of little islands is thus formed close to the shore by these mounds, which are backed on the north and northwest by strings of partly desiccated salt lakes. The escarpments of the Ergeni Hills represent the former shore line of the Caspian. The hills

are Tertiary, belonging to the Sarmatian division of the Miocene period and are covered with loess and black earth; the remainder of the region is salty, clayey or sandy soil, with islands of chestnut and light brown soils, favourable to agriculture if irrigated.

The water supply is poor. Streams from the eastern slopes of the Ergeni hills lose themselves in the sand, while those on the western slopes flow in spring only. Water on the steppe is obtainable from wells where sunk, but from no other source. About 50% of the steppe cannot be cultivated. Of the land available, 40% is pasture, 20% salt pasture. and ploughed land is less than 5%. This lies in the Ergeni region, where wheat, rye, barley, millet, oats, maize, sunflower seed, mustard and a few grapes are grown. Rainfall is 4–8 in. per annum; winter is severe, with average temperature much below freezing; summer temperatures average 85° F. Dust spouts and fierce winds are common, and the air is very dry and the sky cloudless. The chief occupation is nomad stock raising; sheep are the most numerous, draught cattle. goats, horses and camels are also bred, and there is some fishing. The administrative offices of Kalmykia are in the city of Elista. There are no large towns; agricultural villages exist in the west, but the Kalmuck people are mainly tent-dwelling nomads. The Kalmucks, however, are declining in number. Their region was an active centre during the civil war following the 1917 revolution, and their flocks and horses were requisitioned. Upon this followed the terrible Volga famine. when fugitives from other areas added to the starvation and distress consequent on the previous heavy depletion of their flocks. In 1909 only 3% of the nomads were without cattle; in 1924–25, 36% had none, while only 10% had the minimum number necessary for productive stock raising.

The Soviet government encourages their settlement. On the seacoast fishing is developing. Large fish canneries have been established on the Caspian coast.

The Kalmucks are a Mongol race, and are Buddhists. In the 16th century, under the name of *Oirat* (confederation), four tribes occupied a vast region in Central Asia, between the Altai and Tian-Shan. and the Desert of Gobi and Lake Balkhash. Internecine quarrels led to the migration of the western Kalmucks through the Kirghiz steppe into Russian territory. In 1636 they crossed the Emba river and settled in the Trans-Volga steppe. from which they raided the Russian colonies. By 1646. however, they had submitted to Russia, though retaining their own Khan and their own tribal methods of government. *See* also KALMUCK; MONGOLS.

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KALNOKY, GUSTAV SIEGMUND, COUNT (1832–1898), Austro-Hungarian statesman, was born at Lettowitz, Moravia, on Dec. 29, 1832, of an old Transylvanian family. After spending some years in a hussar regiment, in 1854 he entered the diplomatic service without giving up his connection with the army, in which he reached the rank of general in 1879. He was secretary of embassy at London (1860–70), served next in Rome and Copenhagen, became ambassador at St. Petersburg (Leningrad) 1880 and Austro-Hungarian minister of foreign affairs, 1881–95. Essentially a diplomatist, Kalnóky confined his activities almost wholly to foreign affairs. His advice was generally conservative and somewhat unimaginative, but not unsuccessful, especially in the Balkans. He confirmed and renewed Austria's alliance with Germany, co-operated with Bismarck to secure Italy's adherence, followed by that of Rumania's (1883) and the secret treaty with King Milan of Serbia, whom he saved from disaster after Serbia's defeat by Bulgaria at Slivnitza (1885). At the same time he prevented Bulgaria from falling wholly under the influence of Russia, with whom he tried to improve Austria's relations, notably at the meeting of the three emperors at Skiernevice (Sept. 1884). A convinced Catholic, Kalnóky once caused some friction with Italy by stating in a speech to the delegations (1891) that the question of the pope was still unsettled, and his resignation in 1895 was due to Hungarian suspicion of his ultra-montane tendencies. He died at Prödlitz, Moravia, soon after (Feb. 13, 1898).

KALOCSA, a Hungarian town on the left bank of the Danube in the county of Bács-Kiskun. Surrounded by marshy but fertile land, much of which is communal, its interests are mainly agricultural. Flax, hemp, cereals. fruit and vines are cultivated and supplemented by fishing and fowling. The town is one of the oldest in Hungary but suffered much from Turkish attacks in the 16th century and from fire in 1875. As the see of a Roman Catholic archbishop it still retains ecclesiastical importance and has in addition interesting educational institutions, *e.g.*, an observatory and training colleges for priests and teachers. The archbishopric, founded about 1135, is a development of a bishopric said to have been founded in the year 1000 by King Stephen the Saint.

It suffered much during the 16th century from hordes of Ottomans who ravaged the country. Pop. (1960) 13,663 (mun.).

KALONG, the name applied in the East Indies to fruit-eating bats of the genus *Pteropus*. *See* BAT; FLYING FOX.

KALPI, a town and tahsil (administrative subdivision), in Jalaun district, Uttar Pradesh, India. The town is on the right bank of the Jumna, 45 mi. S.W. of Kanpur. Pop. (1951). town 14.042; tahsil (480 sq.mi.) 119,202. Kalpi was founded. according to tradition, by Vasudeva, at the end of the 4th century A.D. In 1196 it fell to Kutb ud-Din Aibak, the viceroy of the Afghan conqueror Mohammed Ghori, and during the subsequent Mohammedan period it played a large part in the annals of this part of India. About the mid-18th century it passed to the Marathas. It was captured by the British in 1803, and was permanently occupied by them from 1806. In May 1858, during the Mutiny. Sir Hugh Rose (Lord Strathnairn) defeated there a force of about 10.000 rebels under the rani of Jhansi. There is a lofty modern tower ornamented with representations of the battles of the *Ramayana* epic.

The new town lies away from the river to the southeast. and is a centre of local trade, principally in grain, ghee (clarified butter) and cotton.

KALUGA, an *oblast* of the central European region in the Russian Soviet Federated Socialist Republic, U.S.S.R., with an area of 11.506 sq.mi.; pop. (1959) 935.852. Its surface is an undulating plain (800–900 ft.), deeply entrenched by rivers, the town of Kaluga lying at the junction of the valleys of the Ugra and the Oka. The *oblast* is mainly built up of Carboniferous deposits, with patches of soft Jurassic clays and limestones which formerly covered the whole region. Coal is mined along the railway running from Kaluga to the Oka River, but is smoky and not of very high calorific value; iron is mined in the southwest. Boulder clay covers the north, which is strewn with boulders brought from Finland and Olonets during the glacial period; in the centre are flint boulders, and to the south patches of loess. The soils are mainly of the grey forest type in the north, merging into black earth with a somewhat low humus content in the south. The climate is extreme, winter frost lasting for five months, and summer temperatures averaging 66° F.; the rainfall, about 20 in. per annum, is adequate in view of temperature conditions. These soil and climate conditions are not ideal for agriculture, but are more favourable than in some *oblasti* of central European C.S S.R., and plowed land here occupies about three times the area under meadow and grassland. Forest and shrub occupy 27 3% of the *oblast*, coniferous in the north and deciduous, with birch, ash and oak in the south.

The chief crops are rye (44.4%), oats (21.5%), and potatoes (8.2%). Grass, barley. buckwheat, flax and a little hemp are grown, and along the Oka river cucumbers, cabbages, onions and apples are cultivated. Flax, which demands much labour, is raised in greater quantity than in the Moscow *oblast*, where linen factories create a market for it, because there is more labour available, since there are fewer factories to draw off surplus hands. Stock raising includes sheep, working and milch cattle, horses and pigs; dairying is not much developed. In accordance with the better agricultural conditions of the loess area, peasant industries

are less important than in the *oblasti* of poorer agricultural opportumties, They include the making of wooden articles (69%), leather (20%), cement, and chemicals in the Medynsk district. Fireclay, china clay, chalk, grindstone, pure quartz sand, phosphorite and copper are extracted by peasant artels, and Medyn has a match factory. The province has a comparatively good railway net, and steam navigation is possible on 60% of its rivers.

Kaluga is the chief town of the oblast, situated on the left bank of the Oka, in 54° 35′ N., 36° 15′ E. Pop. (1956 est.) 122,000. Its industries include sawmilling, smelting, brewing, sausage manufacture, brickmaking and the making of leather goods. It is a good trading centre, on a navigable river, and has railways, roads and telegraph lines radiating from it. The first historical mention of Kaluga occurs in 1389; its incorporation with the principality of Moscow took place in 1518. In 1607 it was held by the second false Demetrius and vainly besieged for four months by the forces of Shuisky. In 1619 Kaluga fell into the hands of the hetman or chief of the Zaporozhian Cossacks. Later two-thirds of its inhabitants were carried off by a plague; and in 1622 the whole place was laid waste by a conflagration. It recovered, however, in spite of several other conflagrations (especially in 1742 and 1754). On several occasions Kaluga was the residence of political prisoners; among others Shamyl, the Lesghian chief, spent his exile there (1859–1870).

KALVOS, ANDREAS IOANNIDES (1792–1869), Greek poet, was the author of 20 patriotic odes published in two fascicules: The Lyre at Geneva in 1824 and Odes at Paris in 1826. Born in the Ionian island of Zante in 1792 he was brought up at Leghorn (1802–12) and later lived in Florence, Switzerland, England, France, and at Corfu (1827–52). Lastly he returned to England where he died at Louth in Lincolnshire in 1869.

The form of Kalvos' odes, though based on popular Greek rhythms, is individual, consisting of five-line stanzas, four lines of iambic and the fifth of dactylic structure. His poetic diction is his native "demotic" arbitrarily enriched by copious borrowing, both verbal and grammatical, from the Greek classics. His melancholy, romantic style owes much to the earlier English romantics (Edward Young, Thomas Gray, James Macpherson). In diction and subject he was influenced by his five-year contact (1812–17) with his fellow Zantiot Ugo Foscolo (*q.v.*). Though he had no followers in Greece, his concise, artificial, yet often moving verses delight the discerning critic.

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(R. J. H. J.)

KALYAN, a municipality and taluka (subdivision) in Thana district, Bombay state, India, situated where the two main lines of the Western railway diverge, 33 mi. N.E. of Bombay city. Pop. (1951). town 58,900; taluka (279 sq.mi.) 273,261. The population is increasing, owing to the proximity of Bombay. The chief industries are rice husking, brickmaking and tilemaking, and there are stone quarries nearby.

Kalyan was a royal capital and a centre of sea-borne commerce in the early centuries of the Christian era and a trade centre again in the 17th century.

KAMA or KAMADEVA, in the Vedic Hindu mythology, "desire," the first seed of the mind. From it emanate the gods in the Rig Veda. But in the Atharva Veda Kama is one of the titles of the Creator, who fulfils all desires. In post-Vedic writings he is the god of love.

See E. W. Hopkins, ***Epic Mythology*** (1915).

KAMAKURA, a coast village of Japan 12 mi. S. of Yokohama. Pop. (1955) 91,328. It was founded in the 7th century and was the established capital of the Minamoto shoguns. It is of great natural beauty and contains many important historical remains, including the famous Great Buddha or Daibutsu.

KAMCHATKA, an oblast (former province) of the Far Eastern region, Russian Soviet Federated Socialist Republic, including the peninsula of Kamchatka, and also that part of the mainland lying north of Cape Viligin (north of the town of Tumansk in 60° 40′ N., 156° 50′ E.), and east of a line going along the crest of the mountain range, and then across the ridge into the valley leading to Chaun Bay, west of the Pala river. The Arctic Ocean washes its northern shores from Chaun Bay eastwards, the Bering Strait, the Bering Sea and the Pacific Ocean its eastern shores, and the sea of Okhotsk its western shores.

Geography. — The peninsula of Kamchatka stretches south from the Koryak national *okrug* of the Anadir area for about 750 mi. to the long, low, undulating Cape Lopatka. It varies in width from 80 to 300 mi. (51° to 62° N. and 156° to 163° E.), and has an area of 188,687 sq.mi. Its southern point is 7 mi. from the northernmost point of the Kuril islands, belonging to Japan. The greater part of the peninsula is mountainous; the ranges have a general south-west and north-east trend. The tundra-covered plateau of Parapolski Dol separates them from the Stanovoi mountains, and they reappear to the north-east as the Polpol mountains of the Anadir region.

The two main fanges are the Central and the Eastern. The Central range (3,000 ft.), slopes sharply on the east to the upper Kamchatka river valley, but runs down to the sea on the west in long, low spurs. The Eastern or Miakovski range (4,000 to 4,800 ft.), a rugged mass containing many isolated volcanic peaks, is merged with the Central range around Lake Palanskoe north of the sources of the Tigil river in a confused mountain mass nearer to the west than the east coast, and from this point the Tigil Spur branches off from the Central range. North of the Lyesnaya river at the neck of the peninsula, the single range dies down, with the tundra covered plateau of the Parapolski to the north-west, and gentle slopes to the south-east. The Kamchatka river after flowing north for some distance between the Central and the Eastern chains turns eastward through a gap in the Eastern range. The Central and Eastern ranges towards the south approach one another, being separated by the Ganal tundra (1,200–1,300 ft.). South of this is a valley, with the Bistraya river flowing westward through it to join the Bolshaya river and south of this the peninsula is wild and rugged, with many volcanic peaks, and, as in the region farther north, a gentler slope westwards than eastwards.

The most striking feature of the peninsula is the series of volcanoes which stretches on the east from Cape Lopatka to the neighbourhood of Syedanka. Forty volcanoes, 14 active and 26 extinct, have been located in Kamchatka. Signs of former volcanic activity are known to exist elsewhere; *e.g.,* the Lyesnaya district. Klyuchevskaya (alt. 15,912 ft.) is the highest peak in Siberia and the highest active volcano in the old world. In the north the mountains consist chiefly of Tertiary sandstones and interbedded volcanic rocks, thick Tertiary deposits, probably Miocene, overlie the middle portions of the west coast.

The southern parts of the peninsula are mainly granites, syenites, crystalline slates and recent volcanic deposits. Extensive layers of melaphyre and andesite, with conglomerates and volcanic tuffs, cover the middle portions. In 1899 glaciers were discovered on the Byelaya and Utkinskaya mountains.

Hot springs are found all over the peninsula, and 8 mi. above the village of Paratunka, on the Paratunka river, is the confluence of a deep river, formed by hot springs, which is navigable for canoes for 2 mi. It rises among hot lakes, one of which is 200 yd. long and 14 yd. wide, and is much resorted to by the natives for its medicinal qualities.

The Komandorski islands, Bering and Myedni, form part of the province and are long and mountainous (2,600 ft.).

Their main industry in the past was the hunting of the fur seal (*Otaria* ursina); the male seals arrive at the end of May or in early June, and the females in mid-June for breeding. The pups are black at birth, but get a fresh coat of grey fur in August. The promiscuous killing of fur seals in calf in the open sea greatly diminished their numbers and led to protracted disputes. In 1890, 55,435 reached the market, but in 1911 only 200. Hunting these animals in the open sea was forbidden by the Washington International Commission for 15 years and 1912–17 was observed as a close season in the islands themselves; the industry is slowly recovering. There are also reindeer and arctic foxes.

The islands have been inhabited for about a century by Aleuts. The chief settlement is Nikolskoe, on Bering island, where a wire-

less station is projected, and which has a steamer link in summer with Petropavlovsk. Karaginski island, opposite the Karaga river, also belongs to the province, from which it is separated by a channel 30 to 50 m. in breadth. Its mountains (2,000 ft.) form precipices off the north coast.

The Kamchatka River.—The chief river of the peninsula is the Kamchatka about 350 m. long, and its longitudinal valley, before it pierces the volcanic chain, is the least unfavourable region for agriculture. Carrots, potatoes and cabbages do well in the small vegetable gardens, and clover and flax crops ripen. But rye, sown in May, frequently fails to mature by August, and the crop is rarely successful, so that the country depends on imported grain. Dairy cattle and horses could be bred, but, though a few are kept for local needs, attempts to introduce a dairy industry for export have failed up to the present. The Kamchatka river rises in two streams, one in the Ganal tundra, and the other in a lake in the Central range; it discharges into the Kamchatka gulf over a low tundra, after receiving the overflow of Nerpiche lake. Where the broad river meets the sea there is a maelstrom and motor boats visiting the river during the short summer season frequently capsize, so that to effect a landing is a precarious undertaking. The Russian village of Ust-Kamchatsk is situated to the south of the river, while in the north are the Russo-Japanese fish canneries of Ust-Kamchatsk, which afford employment to 2,000 Japanese in the summer. About 10 m. south of the river are the Japanese "Nichiro" canneries, also employing 2,000 summer hands. Both canneries are idle in winter. A powerful wireless station on the north bank of the river communicates with the wireless station at Petropavlovsk.

For 20 m. or more from the mouth of the river, extends a swampy tundra, intersected by the countless arms of the river, with stunted willows and osier beds in places. The mouth freezes over towards the end of November, and thaws between April and the end of June; the upper course thaws in March and floods result. Of the numerous short streams running east and west the more important are:—the Tigil, 250 m., but navigable only in the tidal area, the Bolshaya, both on the west, and the Avacha, the Goligino, famous for its pearls, and the Oblukovino, which has gold in its upper reaches, on the east.

Climate.—Though much of the peninsula is situated in the same latitude as the British Isles, its climate is extremely severe. The short June to August summer is cooler than on the mainland of Siberia, particularly on the east, where the effect of the open ocean is emphasised by a cold current. Monsoonal rain is heavy at this season, and Bergman noted heavy snowdrifts lying in the south of the peninsula in the second week in June, 1920. Winter snowstorms are frequent and of such violence that travel in them is impossible. Coastal fogs are prevalent in summer. Winter temperatures are not so low as on the mainland. At Petropavlovsk the average January temperature is 13·8° F, July 58·3° F, while in the upper Kamchatka valley they are January 16° F, July 58°–64° F. The average annual precipitation is 40 in. or more and is excessive in view of the lack of evaporation. The rivers are frozen for 6 months or more.

Fauna and Flora.—Much of Kamchatka is tundra-covered; mosquitoes are a terrible plague in summer. In other places is the dense Alschovnik (*Alnus maximowiczi*) jungle coming quite close to the settlements, and notably to Petropavlovsk, often 7 ft. high in summer and difficult to penetrate even with an axe. The Kamchatkan bear makes tracks of which the natives avail themselves through this dense undergrowth, especially along the course of the Upper Kamchatka river. The slopes of the mountains are well wooded with alder, willow, birch, larch, poplar, Siberian fir and "cedar" and a species of mountain-ash. Crake, whortle and other berries are plentiful. Hunting and trapping in winter and fishing in summer are the main occupations of the natives, who rely mainly on fish for their diet and that of their dogs.

The principal kinds of salmon that visit the rivers are:—*Chavucha* (S. orientalis), weighing about 15 to 20 lb. and supplying good caviare, *Goltsi* (S. collaris), a kind of sea trout, Keta (*Oncorhynchus* keta), or dog salmon, commonest of all except in South Kamchatka, where the chavucha prevails, *Gorbusha* (O. *proteus*), the humpbacked or Alaskan pink salmon, Krasnaya (O. lycoodon), a red salmon which salts well, and Kizhucha (O. sanguinolentus). The keta weighs about 9 lb., and its skin gives the natives food, sails, clothes and boots, while its pale pink caviare is now much in demand. Herring and cod are numerous, but are not used by the natives except in Gizhiga and Penzhina bays, when salmon are scarce. Other fish, not much used by the natives, are Mikisha (Salmo *purpurateus*), Korzhuka, a kind of smelt, and Uiki (*S.* socialis). Crabs and lobsters are also found.

The two main fishing seasons are spring and mid-June. There are about 148 fishing stations in West Kamchatka and 61 in East Kamchatka. Jukkola, or sun-dried salmon, is the main winter food of many natives, especially in western Kamchatka; in eastern Kamchatka diet is more varied. The sledge dogs are fed entirely on *jukkola* through the winter. Canning under Japanese direction, with up-to-date machinery, has been successfully started; salmon caviare is prepared and over 2,000 tons per annum exported. A fish preserve called balyk is exported to Vladivostok and San Francisco. The chief markets for Kamchatka fish products are China and Japan, though tinned salmon finds a wider market,

Of fur-bearing animals the sable (*Mustela* zibelliana) is the most important for the Kamchatkan hunter. Other animals hunted are the fox, especially by the Koryaks (the blue fox is only found on Komandorski islands), the brown or Kamchatkan bear (Ursus beringianus), otters, marmots, hares, wolves, wolverines, chamois, the mountain horned sheep (Ovis *nivicola*), and the wild reindeer. Great precautions against forest fires are taken all over the peninsula in view of the dependence of the people upon hunting products. The Kamchadals remove the lemming's winter store of grain and roots and replace it by caviare and fish remains.

Bird life is abundant and varied and includes ptarmigan, capercailzie, swans, ducks, mallards, red-breasted merganser, pine grosbeak, nuthatches, woodpeckers, waxwings, coal-tits in the spruce forests, eagles, ravens, hawks, hawk owl, sea gulls and northern divers. In the tundra the snowy owl and gerfalcon are numerous, and carrion crows and magpies frequent the villages in winter.

Reindeer are bred in the north and the Koryaks rely on their reindeer herds for food, clothing and transport. Their birch bark reindeer sledges are held together by strips of undressed reindeer skin. The Lamuts keep reindeer, but also rely on hunting, and some Lamuts keep dogs for sledge purposes. Neither tribe milks the reindeer. Both these tribes are nomadic, the mosquitoes making the tundra unbearable for the reindeer in summer, so that they migrate north, often leaving the women and children behind.

The Population in 1926 was reckoned to be about 20 to 30 thousand, but the difficulties of estimating numbers of a nomad population in the climatic conditions of the peninsula are great.

The Koryak tribe extends from the Stanovoi mountains to the sea; and on the west side of Kamchatka as far south as 55° N. The Koryaks are closely related by race and language to the Chukchi, and are divided into the Reindeer Koryaks of Gizhiga and Petropavlovsk districts, and the Maritime Koryaks of the west; the former intermarry with the Chukchi, the latter with the Kamchadals. Jochelson describes the Koryaks as below average height, but square and muscular, with black hair, narrow eyes, bronze skin, broad cheekbones and with little facial hair. Their wood, ivory, whalebone and horn carvings are artistic and they make decorated basketwork and reindeer skin rugs. The reindeer Koryaks camp in tents and have four main annual migrations: (1) in October they remain in the river valleys under the protection of high banks among poplar and aspen groves (2) at the end of March, before the fawning, they descend to the open tundra (3) in July they climb the mountains to the sources of the rivers (4) in autumn, at the time of the fawn festival, they return from the ridges to the tundras and river valleys.

The Maritime Koryaks have underground or semi-underground dwellings. They use kayaks (one man boats) and in Northern Kamchatka, dugouts. In the intervals between famines and epidemics of syphilis, arctic hysteria, smallpox and measles, the population increases. But the absence of medical help, the smug-

gling of spirits and the use of fly-agaric as an intoxicant and their low standard of sanitation are great drawbacks to them.

They are, however, more prosperous than the Lamuts, a branch of the Tungus, who depend on the Koryaks for a supply of reindeer meat in time of famine. They appear to be dying out more rapidly than the Koryaks. The Kamchadals (Itelmen; *Konchalo*) are mainly half breeds between aborigines of a Mongolian type and Siberian emigrants or escaped convicts; their language, except near Penzhina bay, has been replaced by Russian and their numbers have been much diminished by drink and syphilis.

Of incoming races, the Russians, descendants of the Cossacks settled there from the Lena, before the Amur region was conquered, some colonists settled in later times; groups of religious exiles and escaped convicts form the larger proportion. There are also numerous Chinese and Koreans. The Japanese summer population for the fish canning numbers 4,000 to 5,000. Petropavlovsk (*q.v.*) is the chief town.

The development of the fishing industry has increased coastal communications; the season for steamer connections opens earlier and there are several sailings direct to Petropavlovsk, and others to various east and west Kamchatkan centres. It has also helped to raise the standard of living, and the east coast inhabitants especially have a better and more varied diet, since there are more vessels to bring grain. There are no rail ays and no roads. Dog sledges are the chief means of transport, but the dogs are wild and ill trained and tracks are difficult to find in the heavy winter snows. The installation of wireless and telegraphic communications is already spreading news among the natives and lessening their isolation.

The North. — The remainder of the province is little explored, and much of it lies within the Arctic circle. The Chukchi peninsula lies north of the line that would connect Chaun bay on the Arctic ocean with Kresta (Holy Cross) bay on the Anadir gulf. It is apparently mountainous, sloping more gradually to the north than to the south, but no reliance should be placed on maps of the inland district, as it has not all been topographically surveyed. Vilkitski's exploring expedition in the steamship "Tobol" in 1913 opened up fresh ground. Seals, walrus, lemmings and foxes are found and fishing is good in the rivers and coast lagoons.

The population consists of Chukchi and Eskimos, the latter having crossed from Alaska, and settled along Bering strait. The Chukchi belong to the aboriginal Palaeo-Siberian group. The number of Chukchi in the Chukchi peninsula was estimated at 2,000, but the Chukchi have spread beyond Chaun bay and through the Anadir region to Kamchatka, and their total number is probably 10,000 to 12,000. Their name means rich in reindeer, and they are mainly nomad reindeer breeders; some hunt the wild reindeer, when the latter cross from the Polpol mountains over the Anadir river to the north in June and return south in July. Wolves, bears and foxes are also trapped. The maritime Chukchi are mainly seal hunters, but also catch walrus and whale. They use walrus skin boats and harpoons or guns. Reindeer breeding is more profitable than fishing and the evidence seems to point to the development of the reindeer Chukchi at a later date from the original maritime Chukchi. The maritime Chukchi are gradually transferring themselves to reindeer breeding. In view of the importance of the reindeer, a veterinary station was established in the Chukchi peninsula near Cape Dezhnev in 1927.

The trading centres of the Chukchi peninsula are mainly in Bering strait; whalebone, walrus tusks, skins and fur boots are the main exports. Coal, graphite and silver exist. but the remoteness of the district and the severity of the climate prevent their exploitation. There is a wireless station near Cape Dezhnev (East cape).

The Anadir river, south of the Arctic circle, has a drainage area of about 330,000 sq.mi. It is frozen from the middle'of October to June, and at Anadirsk (formerly Novo-Mariinsk) often to mid-July. It is navigable for 200 mi. up to Markovo during the summer and is rich in fish. The inhabitants of Markovo secure red salmon, in addition to whitefish, and stores of dried fish "onkolo" form their own and their dogs' winter food. In the Gulf of Anadir, pike, grayling, dorse and malma are fished and exported to Japan and Vladivostok, in addition to the supply for local needs. Gold mines were working at Bolshaya until 1907 and the gravels contained 240 grains of ore per ton, The region is rich in coniferous forests, and coal exists, but distance and climate prevent exploitation at present, though plans are being considered. There is no telegraph and only two steamers visit the Anadir per annum. There is a wireless station in 64° 34′ N. and 175° 35′ E.

The native tribes are Chukchi, Lamuts, Yukaghir and Chuvanzi. The Yukaghir and Chuvanzi are branches of a Palaeo-Siberian race, short, dark-haired, dark-eyed. yellow to brown in skin colour and have hairless faces; their eyes are not Mongolian in type. They are rapidly dying out, partly through drink and syphilis and partly through the limitation of their hunting of the wild reindeer by the increasing activities of the Chukchi. Markovo, at the centre of winter routes to Gizhiga, Kolima river, Chukchi peninsula and Anadirsk, is the chief settlement. There are a few horses, long-haired cows and pigs, but fishing is the chief occupation. There is a wireless station here, and at Anadirsk.

The country along the Pacific coast between the Polpol mountains and the Kerek villages to the south is altogether unknown and uninhabited. Dr. Bogoras crossed it in 1900. Mineral wealth reported from the Kamchatka province, in addition to that mentioned previously, includes lignite coal in Gizhiga and Penzhina bays and at Baron Korf gulf, wolfram near Klyuchevskaya, and iron, copper, iridium, palladium and osmium.

History. — In 1648 the Cossack Dezhnev, after whom East cape has been re-named Dezhnev, sailed round the Arctic coast and south to Anadir gulf, thus discovering Bering strait 80 years before Bering re-discovered it. Other Cossacks crossed from the Kolima river by land along the Anyui and over the watershed and joined him in the Anadir region. But quarrels ensued and Dezhnev remained a wanderer in the region until his disappearance about 1654.

In 1696 Vladimir Atlasov penetrated from the Anadir to Cape Lopatka, and established a fort at Verkhne-Kamchatka. His successors Kobelev and Zinovev further extended the Russian discoveries and a settlement was made at Nijne-Kamchatka. The natives burned the settlements and drove the Russians from the country in 1706, but Atlasov, who had been imprisoned, was released and returned to Kamchatka in 1707 and restored the Russian forts. The authorities at Yakutsk sent out expeditions in 1714 to find a shorter route to Kamchatka than that via Anadir and discovered the Aldan-Maya-Okhotsk route; this opened up quicker communication and ensured Russian rule in Kamchatka.

In 1720 a survey of the peninsula was undertaken; Bering's expedition visited it in 1725–30 and Krasheninnikov and Steller in 1733–45. From 1760 Kamchatka was governed by a naval officer from Okhotsk. In 1799 the Russian-American trading firm began to develop the district, and in 1803 it became a separate province.

Nijne-Kamchatka was the first administrative centre, Bolsheretsk succeeded it for a time, but in 1850 Petropavlovsk, with its fine harbour, became the centre of the Russian Pacific naval squadron.

In 1855 the French and English were defeated in an attack on the town, and in 1860 the squadron was transferred to Nikolaievsk and in 1872 to Vladivostok. Attempts at colonization, including the settlement of Cossacks from the Lena, were made during the period before the acquisition of the Amur region. They were not successful, and with the loss of the strategic importance of Kamchatka, the attempts were discontinued. Trading activities are reviving and the increased communications by sea will probably result in further development.

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KAME (a form of Scandinavian *comb,* hill), a more or less rounded hill or short ridge of sand and gravel which occurs associated with glacial deposits. Kames frequently occur in the outwash plain of a glacier and at the mouths of englacial streams and are formed by the deposition of the sediments carried by these streams. Kames are often situated directly behind a terminal moraine. They are common in Scottish glaciated valleys and morainic areas of north central United States. *See* GLACIER.

KAMENETS PODOLSKIY or PODOLIAN KAMENETS, a town in the Ukrainian S.S.R., in 48° 43' N.. 26" 35' E., on a high, rocky bluff of the Smotrich. a left-hand tributary of the Dniester. Pop. (1956 est.) 33,000. It is on the Bessarabian frontier, opposite to the castle of Khotin. The town (Polish *Kamieniec)* shares in the industrial development of the Ukraine and is the terminus of a branch railway from the north. It has smelting works, makhorka tobacco factories and a brewing industry; there is a municipal electric plant. A Workers' Scientific institute has been established. Its history and the present variety of racial types reflect its border position. The Roman Catholic cathedral of St. Peter and St. Paul, built in 1361, was used as a mosque by the Turks (1672–99). The Greek cathedral of John the Baptist dates from the 16th century, but up to 1798 belonged to the Basilian monastery. Other buildings are the Orthodox Greek monastery of the Trinity, and the Catholic Armenian church (founded 1398), possessing a 14th century missal and an image of the Virgin Mary that saw the Mongol invasion of 1239–42. Kamenets was laid waste by the Mongol leader Batu in 1240. In 1434 it was made the chief town of the province of Podolia. In the 15th and 16th centuries it suffered frequently from the invasions of Tatars. Moldavians and Turks; and in 1672 the hetman of the Cossacks, Doroshenko, assisted by Sultan Mohammed IV of Turkey, made himself master of the place. Restored to Poland by the peace of Karlowitz (1699), it passed with Podolia to Russia in 1795. There the Turks were defeated by the Poles in 1633, and there 20 years later peace was concluded between the same antagonists.

KAMENEV, LEO BORISOVICH (ROSENFELD), (1883–1936), Russian politician, born in 1883, son of an engineer, received a technical education, but in 1901 joined the Russian social-democratic party, and became a "professional revolutionary." While still a student in 1902 he was imprisoned for participation in a political demonstration. From 1903 he was a member of the Bolshevik section of the R.S.D.P., devoting himself to organizing, lecturing and writing on its behalf. In 1908 he was interdicted from living in St. Petersburg, and went to Paris. At the beginning of 1914 he was sent back to Russia by the Bolshevik party central committee, and as their representative in St. Petersburg directed all the party activities in Russia. He adhered to Lenin's revolutionary policy on the war question, and (1915) was arrested and sent to perpetual banishment in Siberia. He returned at the outbreak of the February 1917 revolution, and from March to October 1917 was a member of the praesidium of the Petrograd soviet. In October he, with Zinoviev and others, was in opposition to Lenin on the question of the Bolshevik revolution, and also in his advocacy of a coalition government formed from all the socialist parties, and temporarily resigned his membership of the Bolshevik central committee. From 1918 he was president of the Moscow soviet, and in 1922 was elected vice-chairman of the soviet of people's commissars. On the death of Lenin in 1924 he was elected chairman of the council of labour and defense. On the development of the Trotskyist opposition in 1923 Kamenev was at first violently anti-Trotsky, but in 1926 he with Zinoviev and others went over to the opposition platform, being expelled from the communist party and losing his official positions in December 1927, for anti-party activities. Readmitted in 1928, and expelled in 1932, he was executed for alleged conspiracy Aug. 25, 1936.

KAMERLINGH ONNES, HEIKE (1853–1926), Dutch physicist who was awarded the 1913 Nobel prize in physics for his work on low-temperature physics and his production of liquid helium, was born in Groningen on Sept. 21, 1853. After studying mathematics and physics in his native town, he went in 1871 to Heidelberg, where he studied under Robert Bunsen and G. R. Kirchhoff, later returning to Groningen, where in 1879 he took his doctor's degree. He was professor of experimental physics at Leyden, 1882–1923, where he founded (1894) and developed the famous Cryogenic laboratory. Stimulated by Johannes van der Waals, Kamerlingh Onnes became interested in the equations of state and the general thermodynamic properties of liquids and gases. *(See* THERMODYNAMICS.) Kamerlingh Onnes set himself the task of making measurements over a large range of pressures and temperatures, his name being associated particularly with the measurement and attainment of low temperatures; in this direction Kamerlingh Onnes showed himself a master of experimental physics. In 1908 he succeeded in liquefying helium, but was unable to solidify it; this was subsequently done by his successor Keesom. Kamerlingh Onnes obtained the isothermals for a number of gases and mixtures of gases at low temperatures; he also studied the optical, magnetic and magneto-optical properties of bodies. He carried out investigations on the influence of low temperatures on nickel and manganese iron alloys. He also demonstrated that the resistance of electric conductors disappeared suddenly at a temperature near absolute zero and termed this phenomenon "superconductivity."' His systematic researches on superconductivity (started in 1914) are of extreme importance because of their bearing on the theory of electrical conduction in solids *(see* ELECTRICITY, CONDUCTION OF: *Conduction in Solids).* In 1913 the Nobel prize for physics was conferred on him. His published work includes *Algemeine Theorie der Vloeistoffen* ("General Theory of the Fluids"; 1881). He died at Leyden on Feb. 21, 1926.

KAMES, HENRY HOME, LORD (1696–1782), Scottish lawyer, philosopher and agriculturist, whose *Elements of Criticism,* 2 vol. (1762), is remarkable in the history of aesthetics for its attempt to equate beauty with what is pleasant to the natural senses of sight and hearing. He was born at Kames. Berwickshire. Called to the bar in 1724, he was appointed a judge in the court of session in 1752, with the style of Lord Kames, and a lord of justiciary in 1763. He died on Dec. 27, 1782.

Other works include *Essays on the Principles of Morality and Natural Religion* (1751), which supported the doctrine of innate ideas and offended certain Presbyterian ministers by suggesting that God had implanted in the human mind a belief in free will, though without allowing actual freedom; *An Introduction to the Art of Thinking* (1761); *Sketches of the History of Man,* 2 vol. (1774); and *The Gentleman Farmer* (1776). His greatest practical achievement was the floating of a stratum of peat, covering 1,500 ac., piecemeal off his wife's estate at Blair Drummond, along channels of water raised artificially from the Teith river, into the Firth of Forth.

KAMPALA, the commercial capital and largest town of Uganda protectorate, East Africa, lies in Buganda province 21 mi. N.N.E. of Entebbe, on Lake Victoria, by road. Pop. (1959) 46,779 including 24,100 Africans, 19,268 Asians, 3,179 Europeans and 232 others. The town, built on a group of rounded hills, covers 8½ sq.mi. and contains separate residential, commercial and industrial areas. It is the residence of the kabaka of Uganda. The main street is more than five miles long and near the middle stands the town hall, the gift of an Indian merchant in 1950. Though Government house and some ministries remain at Entebbe, other government departments and offices are in Kampala where the legislative council meets and where the new parliamentary buildings are situated. The early style Indian shops, or *dukas,* have largely given way to modern store and office buildings such as Amber house (1950) which is the headquarters of the Uganda Electricity board, the Lint Marketing board and the Coffee Industry board. The high court is in old colonial style and the Uganda museum, with

its unique collection of musical instruments, was rebuilt in 1952.

There are mosques, Hindu temples and Christian churches in the town while on the hills around stand the white Kibuli mosque; the Rubaga Roman Catholic cathedral, headquarters of the White Fathers' mission; the Namirembe Anglican cathedral (to the west) with the headquarters of the Church Missionary society, its schools and teachers' training college for Africans and its hospital; and the Nsambya Roman Catholic cathedral (southeast), headquarters of the St. Joseph's mission (Mill Hill fathers) with hospitals, schools and a coffee plantation.

To the north is the large Mulago hospital; the broadcasting station is on Bugolobi hill. Kampala has 22 schools of all grades for all races, and on a wooded hill to the northwest are the expanding buildings of Makerere college, the University College of East Africa; its new library was opened in 1959 by Queen Elizabeth, the queen mother. Jubilee park, commemorating the jubilee of King George V, is on the slopes of Nakasero hill, and at Lugogo, on land reclaimed from swamps, there are a municipal sports ground and stadiums for multi-racial sports activities. Due south is Mengo where are the residences of the kabaka of Buganda and his ministers and the parliament house of his government.

From Kampala radiate Uganda's 11,000 mi. of roads and 1,400 mi. of naterways, including Lake Victoria. The railway runs eastward to the coast via Jinja and Nairobi, Kenya, and the extension westward runs 208 mi. to Kasese at the foot of the Ruwenzori (*q.v.*) range, where it also serves the Kilembe mines. Entebbe airport is on the main route to the United Kingdom, the Rhodesias and South Africa, and is also served by local airways.

The name Kampala ("place of the impala") is derived from the custom of the African rulers of the ancient kingdom of Buganda to graze their herds of tame impala on the hill now called Lugard's Fort in Old Kampala. It was here that Captain (later Lord) Lugard first flew the flag of the British East Africa company in 1890 (replaced by the union jack in 1893) and where the town subsequently grew. (WR. D. M.)

KAMPEN, a town in the province of Overijssel, Neth., lies on the river IJssel, 4 mi. above its mouth, 8 mi. N.W. of Zwolle. Pop. (1957 est.) 25,847 (mun.). It has railway communication with Zwolle and there are boats to Amsterdam. Kampen manufactures cigars and enamel goods and is a garrison town. Within its boundaries are farms reclaimed from the Zuider Zee.

The town was first mentioned in 1227. It was a Hanseatic town and, until it was supplanted by Amsterdam in the 16th century, was a leading commercial centre. Among notable buildings are the Old Town hall (Stadhuis), restored after the fire of 1543, with the *Schepenzaal* (court of sheriffs), and the church of St. Nicholas and the *Buitenkerk* or church of Onze Lieve Vrouwe, both enlarged in 1396. Three turreted gateways—one of which, the *Broederpoort,* is used as a to n museum—furnish excellent examples of 16th- and 17th-century architecture. (J. Do.)

KAMPHAENGBHET, a sparsely settled province in north central Thailand. Area, 3,457 sq.mi.; pop. (1956 est.) 127,454. Major products are rice, sugar cane and tobacco. Thailand'smajor north-south highway follows the west bank of the Ping river through the province, and Kamphaengphet town (pop. [1957 est.] 6,470) is the main commercial and transport centre on both the river and the road between Tak, 37 mi. to the northwest, and Paknampho (Nakhon Sawan), 71 mi. to the southeast. Kamphaengphet means "diamond walls," and the ruins of ramparts and ancient temples near the town attest its earlier importance as a fortified outpost. (*G.* W. SK.)

KAMRUP, a district of Assam, India. Area 3,837 sq.mi.; pop. (1951) 1,490,392. Near the Brahmaputra, which bisects the district, the land is liable to annual flooding, and only rice, the district's staple crop, is cultivated. The ground rises in undulating knolls northward toward the Bhutan mountains, southward toward the Khasi hills. The only considerable place is the headquarters town, Gauhati (43,615). There originated the important manifestation of Hinduism and Buddhism called Tantrism; and many pilgrims go to the nearby temple of Kamaksha-devi or Kamakhya. About A.D. 400, as Pragjyotishpur, Gauhati was the capital of Kamarupa, a kingdom stretching from Bhutan southward to the sea. Taken and retaken eight times in 50 years of the 17th century by Moslems and the Ahom dynasty (*q.v.*), it became in 1681 the seat of the latter's government of lower Assam and in 1786 the Ahom dynastic capital; from 1826 till 1874 it was the British capital of Assam. It is an important centre for Brahmaputra river trade and the seat of a university (1948) and three of its colleges.

KAMYSHIN, a town of the Stalingrad *oblast,* Russian Soviet Federated Socialist Republic, U.S.S.R., on the right bank of the Volga, at its junction with the Kamyshin river. Population (1959) 55,000. Being the terminus of the railway to Tambov, Moscow and the Baltic ports, it is a port for the export of cereals and salt from the Volga, and it imports timber and woodenwares. It has an electric plant, a grain elevator and a radio station, and also timber and flour mills. It is famous for its watermelons. It was at first a settlement on the left bank of the river, much exposed to raids from the steppe, but in 1668 the inhabitants moved to the right bank.

KANAGAWA, a Japanese prefecture (ken) south of Tokyo, with an area of 912 sq.mi. and a population (1955) of 2.919'497. Its capital city is Yokohama. The southern coastal zone has warm winters and is a noted resort. Agriculture supports 17% of the population, while manufacturing accounts for 25.2%. Kanagama depends upon imports for most of its rice, but horticulture and dairying are well developed. The port of Misaki is a base for bonito and tuna fishing and is one of the chief fishing centres of Japan. Many large factories are concentrated on the shore between the cities of Kawasaki and Yokohama. Kamakura and the Hakone area are popular tourist places. (R. B. H.)

KANAGAWA, TREATY OF, Japan's first treaty with a western nation. Entered into by representatives of the United States and Japan on March 31, 1854, at Kanagawa (now part of Yokohama). it marked the end of Japan's era of seclusion (1639–1854). Commodore Matthew C. Perry, commanding an American far east squadron of "black ships," sailed to Tokyo bay twice, in July 1853 and again in Feb. 1854, to induce the Japanese to open their doors to American ships and commerce. He was instructed to accomplish his mission by persuasion, if possible, or by show of force, if necessary. The Japanese, already aware that continued seclusion was dangerous, if not impossible, responded to Perry's threatening diplomacy by agreeing to admit American ships to the ports of Shimoda and Hakodate and to accept a U.S. consul at Shimoda. Townsend Harris, who went to take the latter post, exercised great skill and patience to turn the limited concession under the treaty into a full-scale commercial agreement. (F. H. Co.)

KANARA (formerly **NORTH KANARA**), a district in Mysore state, India, on the western coast. The administrative headquarters are at Karwar (pop., 1951, 19,764), 50 mi. S. of Pangim, Goa; Karwar is also the district's chief seaport. Area of district, 3,964 sq.mi.; pop. (1951) 517,780. Along the coast rice is the chiei crop and coconut palms are grown. In the upland there are valuable gardens of areca palms, cardamoms and pepper. Teak is the chief product, sandalwood carving, stone quarrying and salt manufacture are carried on, and manganese is worked. The range of the Western Ghats, running from north to south, divides the district into two parts, a lowland or coast strip (Payanghat), and an upland plateau (Balaghat). The coast line is broken only by the Karwar headland in the north and by the estuaries of four rivers and the mouths of many smaller streams, through which the salt water finds an entrance into numerous lagoons winding several miles inland. The breadth of the lowlands varies from 5 to 15 mi. From this narrow belt rise a few smooth, flat-topped hills; and at places it is crossed by lofty, rugged, densely wooded spurs, which, starting from the main range, maintain almost to the coast a height of not less than 1,000 ft. Among these hills lie well-tilled valleys of gardens and riceland. The plateau of the Balaghat is irregular, varying from 1,500 to 2,000 ft. in height. (*See* GHATS.) The four principal rivers of the district from north to south are the Kali, Gungawali, Tadri and Sharavati. The last of these forms the famous Gersoppa falls (*q.v.*). At Kumta (pop., 1951, 14,890), 30 mi. S.E. of Karwar, is Kanara college (1949), connected with Karnatak university, founded the same year.

KANARA, SOUTH, a district of Mysore state, India, on the west coast south of, and adjoining, the Mysore district of Kanara. Its headquarters are at Mangalore (pop., 1951, 117,083), 125 mi. W.N.W. of Mysore city and at the terminus of the west coast line of the Southern railway via Kozikhode (Calicut) and Mahé. Mangalore harbour is formed by the inlets of two small rivers; vessels of more than 200 tons lie offshore. The Portuguese had a factory there from 1596. Hyder Ali captured the town in 1763; the British took it in 1783, but capitulated to Tipu Sahib in 1784. It was restored to the British in 1799. It is the seat of a Roman Catholic bishop and of five colleges connected with Madras university. After the States Reorganization act of Nov. 1, 1956, the area of South Kanara was 3,250

sq.mi., and the adjusted 1951 population corresponding to the Nov. 1956 area was 1,330,917. The district's position between the Western Ghats and the sea makes its topography similar to that of the adjacent Kanara district, although the coastal lowland is wider (20–35 mi.) and the Ghats to the east higher (3,000–6,000 ft). Coffee is the chief export, followed by areca nuts. The staple crop is rice. There are tile factories, coffee works and saw and oil mills. Fishing and fish curing are carried on.

KANARESE (KANNADA), one of the Dravidian languages (*q.v.*), spoken chiefly in Mysore, Hyderabad and the adjoining districts of Madras and Bombay. It has an ancient literature, written in an alphabet closely resembling that employed for Telugu. The irregular forms in the alphabet are nearly the same as in Telugu, but it is closely related to Tamil. At mid-20th century there were about 15,000,000 speakers.

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KANARIS or CANARIS, **CONSTANTINE** (1790–1877), Greek patriot, born on the little island of Psara, northnest of Chios. He first became prominent as the leader of the signal vengeance taken by the Greeks for the massacre at Chios in April 1822 by the Turkish Capitan Pasha. The commander sent to assail the Turkish fleet was the navarch Miaoulis, but it was Kanaris who executed the attack with the fire ships on the flagship of the Capitan Pasha on June 18, 1822. Because of the celebration of a religious festival by the Turks, Kanaris, at the head of a volunteer party, succeeded in attaching his fire ships to the Turkish flagship, and escaping with his party. He repeated the feat at Tenedos in Nov. 1822, and his successful attacks at Samos and Mytilene in 1824 caused panic in the Turkish navy. His efforts to destroy the ships of Mohammed Ali at Alexandria in 1825 were defeated by contrary winds. When the Greeks tried to organize a regular navy he was appointed captain of the frigate "Hellas" (1826). In politics he was a follower of Capo d'Istria. He helped to upset the government of King Otho and to establish his successor, was prime minister in 1864–65, came back from retirement to preside over the ministry formed during the crisis of the Russo-Turkish War and died in office on Sept. 15, 1877.

KANAZAWA, a historic Japanese city, the capital of Ishikawa prefecture and an important industrial centre. Pop (1960) 298.972. In the 16th century Toyotomi Hideyoshi gave Kanazawa and the province of Kaga to the Maeda family, the wealthiest daimio family in Tokugawa times, and the city remained under their jurisdiction for about 300 years. The walls, gates and a few buildings of their castle remain. Kenrokuen, formerly the daimio garden, is considered one of the finest landscape gardens in Japan.

The industries of Kanazama grew from the luxury industries which flourished under the Maeda and include fine lacquer and the famous Kutani porcelain. The ancient silk industry has been expanded to include cotton, woolen, rayon and nylon textiles.

(C. A. MR.)

KANCHANABURI, a province in Thailand, situated northwest of Bangkok on the Burmese border. Area, 7,524 sq.mi.; pop (1960) 244,270. The province is drained by the Khwae Noi and Khwae Yai rivers, which join to become the Mae Klong near Kanchanaburi town (pop. [1957 est.] 11,958), the provincial capital. A wartime railroad, no longer maintained. was built in 1942–43 along the ancient trade route which ascends the Khwae Noi valley and passes through Three Pagodas pass to Rloulmein. Mineral products include tungsten, lead and zinc, while major crops are rice and tobacco. Extensive stands of bamboo supply pulp for the Kanchanaburi paper factory, Thailand's largest.

(G. W. SK.)

KANCHEEPURAM, formerly known as CONJEEVERAM (Sanskrit KANCHI [PURAM]; Tamil KACHCHI [PURAM]), one of the seven Hindu sacred cities, in Chingleput district, Madras, India, lies 43 mi. W.S.W. of Madras city. Pop. (1951) 84,810. Of its many temples the earliest surviving date from Pallava times (A D. 600–750). The architecturally important Kailasanatha (Rajasimhesvara), commemorating and imitating Mt. Kailasa, Siva's Himalayan fastness, was built about A.D. 670 by King Rajasimha. Its complex appearance comes from the repetition of *stupikas,* little domes, on the pyramidal tower of the main shrine, on the minor shrines and on the enclosure parapet (see also INDIAN ARCHITECTURE). The Kailasanatha, stemming eventually from Buddhist prototypes, foreshadows the Kailasa temple of Ellora (*q.v.*). Another important example of the Pallava style is the Vaikunthaperumal temple, built between 755 and 790 by Nandivarman Pallava Malla. Of the period of Chola rule there are several small but excellent examples. Of the Vijayanagar period there are notable remains: the great Ekambareshwara temple (parts of which go back to early Pallava times) was largely the work of Krishnadevaraya (1509–30). Its gopura (gateway) is 188 ft. high. Of the same period, but slightly earlier, is the second largest structure in the city, the Varadarajaswami Vaishnavite temple, 1,200 ft. long, 800 ft. wide, with a hall of 100 pillars, a rich treasury and many inscriptions. At Tirupparuttikunram, 2 mi. S. of the city, is the only Jain temple, built at the height of Chola power (late 10th to mid-11th centuries); its inscriptions record the dynasties that held the country.

Kanchi is first mentioned in Patanjali's Great Commentary of the 2nd century B C. The early rulers were Cholas (*q.v.*), later ousted by Pallavas. who made Kanchi their capital by the mid-4th century A.D. The Chinese traveler Hsuan Tsang described it about 640 as a Buddhist stronghold with considerable "Deva" (Hindu) and "heretic" (Jain) minorities. In the 9th century the Cholas' power was restored, and Kanchi was for a while their capital. Their successors, the Vijayanagar dynasty (1336–1565), enriched and enlarged the temples. In 1646 Kanchi fell to the Moslems and was successively part of the dominions of Golconda, Aurangzeb and the Carnatic. Captured by Robert Clive in 1752, it was ceded to the East India company in 1759. It was occupied and much damaged by Hyder Ali in 1768 and 1780. Kancheepuram is a centre for silk and cotton weaving. (F. R. A.)

KANDAHAR, the second city in Afghanistan, 370 mi. S.E. of Herat. Immediately round the city is a plain, highly cultivated and well populated to the south and west; but on the northwest barren, and bounded by a double line of hills, rising to about 1.000 ft. above its general level. To the northwest these hills form the watershed between the valleys of the Arghandab and the Tarnak, until they are lost in the mountain masses of the Hazarajat. On the southwest they lose themselves in the sandy desert of Registan. Pop. 60,000.

Kandahar is approximately square-built, with a wall from 25 to 30 ft. high, and 15 ft. broad. The tomb of Ahmad Shah is the only attempt at monumental architecture. This, with its rather handsome cupola, and the 12 minor tombs of Ahmad Shah's children grouped around, contains a few good specimens of fretwork and of inlaid inscriptions.

The walls are pierced by the four principal gates of "Kabul," "Shikarpur," "Herat" and the "Idgah," opposite the four main streets, with two minor gates, called the Top Khana and the Bardurani respectively, in the western half of the city. The Idgah gate passes through the citadel, a square-built enclosure with sides about 260 yd. long.

About 4 mi. W. of the present city are the ruins of the old city of Kandahar, sacked and plundered by Nadir Shah in 1738.

Kandahar is the most important trade centre in Afghanistan. No manufactures or industries are peculiar to Kandahar, but the long lines of bazaars display goods from England. Russia, Hindustan, Persia and Turkestan. The customs and town dues together amount to a sum equal to the land revenue of the Kandahar province, which is of considerable extent, stretching to Pul-i-Sangin, 10 mi. S. of Kalat-i-Ghilzai on the Kabul side, to the Helmund on the west, and to the Hazara country on the north. Although Farah has been governed from Kandahar since 1863, its revenues are not reckoned as a part of those of the province. The land revenue proper is assessed in grain, the salaries of government officials, pay of soldiers, etc., being disbursed by *barats* or orders for grain at rates fixed by government. The greater part of the English goods sold at Herat are imported by Karachi and Kandahar in view of the facility of the railway to Chaman, and a very large trade in fresh fruit now comes to India and is catered for by special refrigerator trains. The imports consist chiefly

of English goods, indigo, cloth, boots, leather, sugar, salt, iron and copper, from Hindustan, and of .shawls, carpets, *barak* (native woollen cloth), postins (coats made of skins), shoes, silks, opium and carpets from Meshed, Herat and Turkestan. The exports are wool, cotton, madder, cuminseed, asafoetida, fruit, silk and horses.

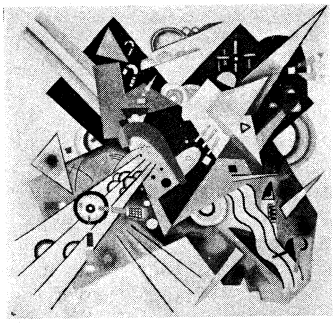
Immediately south and west of Kandahar is well-irrigated and highly cultivated country, but the valley of the Arghandab is the most fertile in the district, with luxuriant orchards and vineyards The pomegranates of Kandahar, with its *sirdar* melons and grapes, are famous. Vines are grown on artificial banks, probably for want of the necessary wood to trellis them—the grapes being largely exported in a semidried state. The art of irrigation is so well understood that the water supply is at times exhausted, no river water being allowed to run to waste. The plains about Kandahar are chiefly watered by canals drawn from the Arghandab near Baba-wali, and conducted through the same gap in the hills which admits the Herat road. The amount of irrigation and the number of water channels form a considerable impediment to the movements of troops. Irrigation by *karez* is also largely resorted to. The *karez* is a system of underground channelling which usually taps a subsurface water supply at the foot of the rugged and apparently waterless hills. The water is carried over long distances by an underground channel or drain, constructed by sinking shafts at intervals along the required course and connecting the shafts by tunnelling. The general agricultural products of the country are wheat, barley, pulse, fruit, madder, asafoetida, lucerne, clover and tobacco.

History.—Kandahar has a stormy history. Sultan Mahmud of Ghazni took it in the 11th century from the Afghans who then held it. In the beginning of the 13th century it was taken by Jenghiz Khan, and in the 14th by Timur. In 1507 it was captured by the emperor Baber, but shortly afterward it fell again into Afghan hands, to be retaken by Baber in 1521. Baber's son, Humayun, agreed to cede Kandahar to Persia, but failed to keep his word, and the Persians besieged the place unsuccessfully. Thus it remained in the possession of the Moguls till 1625, when it was taken by Shah Abbas. Aurangzeb tried to take it in 1649 with 5,000 men, but failed. Another attempt in 1652 was equally unsuccessful. It remained in Persian possession till 1708, when it was taken by the Afghans, but was besieged and retaken by Nadir Shah in 1737–38. Nadir Shah was assassinated in 1747, and immediately on hearing the news of his death Ahmad Shah (Abdali) seized Nadir Shah's treasure at Kandahar, and proclaimed himself king, with the consent, not only of the Afghans, but, strange to say, of the Hazaras and Baluchis as well. He at once changed the site of the city to its present position, and thus founded the Afghan kingdom, with modern Kandahar as its capital. Ahmad Shah died in 1773, and was succeeded by his son Timur, who died in 1793, and left the throne to his son Zaman Shah. This prince was deposed by his half-brother Mahmud, who was in his turn deposed by Shah Shuja, the full brother of Zaman Shah. After a short reign Shah Shuja was compelled to abdicate from his inability to repress the rising power of Fateh Khan, a Barakzai chief, and he took refuge first with Ranjit Singh, who then ruled the Punjab, and finally secured the protection of British power. Afghanistan was now practically dismembered. Mahmud was reinstated by Fateh Khan, whom he appointed his vizier, and whose nephews, Dost Mahommed Khan and Kohn dil Khan, he placed respectively in the governments of Kabul and Kandahar. Fateh Khan was barbarously murdered by Kamran (Mahmud's son) near Ghazni in 1818; and in retaliation Mahmud himself was driven from power, and the Barakzai clan secured the sovereignty of Afghanistan. While Dost Mahommed held Kabul, Kandahar became temporarily a sort of independent chiefship under two or three of his brothers. In 1839 the cause of Shah Shuja was actively supported by the British. Kandahar was occupied, and Shah Shuja reinstated on the throne of his ancestors. Dost Mahommed was defeated near Kabul, and after surrender to the British force, was deported into Hindustan. The British army of occupation in southern Afghanistan continued to occupy Kandahar from 1839 till the autumn of 1842, when Gen. William Nott marched on Kabul to meet Pollock's advance from Jalalabad. The cantonments near the city, built by Nott's division, were repaired and again occupied by the British army in 1879, when Shere Ali was driven from power by the invasion of Afghanistan; nor were they finally evacuated till the spring of 1881.

KANDERSTEG, a holiday resort in the Bernese Oberland, Switz., lies 3,937 ft. high and 44 km. (27 mi.) by road southwest of Interlaken. The population (1960, 933) is German-speaking and chiefly Protestant. Kandersteg is the highest station on the important Bern-Lötschberg-Simplon railway and has direct connections with Rome, Paris, Brussels and the English channel ports. It is a centre for winter sports and climbing—the Blümlisalp (12,-231 ft.), Balmhorn (12,178 ft.) and Doldenhorn (11,962 ft.) are all nearby. Mountain walks lead to the Oeschinensee, the Blausee and over the Gemmi pass between Bern and Valais cantons.

(O. E. ST.)

KANDINSKY (KANDINSKI), **WASSILY** (VASILI) (1866–1944), Russian painter, one of the originators of nonobjective painting, was born in Moscow on Dec. 4, 1866. While studying law and ethnology, he decided to become a painter and in 1896 went to Munich where he worked under Anton Azbe and Franz von Stuck and studied Impressionist colour and *art nouveau* form. From the very beginning his own work showed an interest in fantasy. During extended travels in the first decade of the 20th century he came in contact with Fauvism in Paris, and in 1909 he was instrumental in founding the New Artists' association in Munich, one of the springboards of the Expressionist movement. In 1910 he painted a water colour which is generally considered the first nonobjective painting and at this time formulated an aesthetic theory of abstract art in "Concerning the Spiritual in Art" (1912). Also in 1912 Kandinsky and Franz Marc edited the almanac *Der blaue Reiter* ("the Blue Rider"): in which they reproduced art from all ages that appealed to them by virtue of its unconventionality and spiritual authenticity. Kandinsky and Marc formed a rallying point for modern artists, and avant-garde, international exhibitions were held in Munich and traveled from there. With the outbreak of World War I Kandinsky left Germany and returned to Russia where he rose to an influential position after the Revolution of Nov. 1917. In 1921, however. he returned to Germany, and became professor at the Bauhaus school at Weimar, in 1922. Together with Paul Klee. Lyonel Feininger and Alexej von Jawlensky he formed the Blue Four. He continued what he called "concrete painting"; *i.e.*, a complete independence of colour and form from the world of nature. But a significant change took place in his work during the 1920s. In place of the dynamic, dramatic qualities of his earlier abstract expressionism, his painting crystallized into geometric forms: points, bundles of lines, circles and triangles.



COURTESY OF THE SOLOMON R. GUGGENHEIM MUSEUM, NEW YORK

"EMPHASIZED CORNERS" BY WASSILY KANDINSKY; IN THE SOLOMON R. GUGGENHEIM MUSEUM, NEW YORK CITY

Again he formulated this newly gained consciousness of formal relationships in an important essay, "Point and Line to Plane" (*Punkt und Linie zu Flache*, 1926). Kandinsky remained at the Bauhaus until it was closed by the Hitler regime in 1933. He then moved to Paris. He died on Dec. 15, 1944, at Neuilly-Sur-Seine. During the last decade of his life, he achieved a synthesis between the free, intuitive image of his earlier period and the more scientific ones of his Bauhaus period. He gave evidence that "art like nature creates form for its own ends in a world where everything is both tangible and intangible, physical fact and subjective symbol" (Selz). In both his painting and his art theory Kandinsky had profound impact on modern painting. *See* also PAINTING: *Expressionism.*

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Bill (ed.), *Kandinsky* (1955); Peter Selz, *German Expressionist Painting* (1957); W. Grohmann, *Wassily Kandinsky* (1958). (P. H. S.)

KANDLER, JOHANN JOACHIM (1706–1775), German sculptor and modeler of Meissen porcelain, was born in Fischbach, Saxony. In 1731 Kandler, a sculptor at the court of Augustus the Strong, elector of Saxony, was engaged to reorganize the modeling department of the porcelain factory at Meissen. He lent his great talents to the factory for a period of 44 years until his death in Meissen, May 18, 1775. His versatility and imaginative spirit were extraordinary and it was largely through his genius that the world fame of the Meissen factory was established. As a start he had to see to such details as the proper shaping of handles, spouts and other features. Through the years, however, he extended his work to modeling series of large and small animals, dinner sets consisting of hundreds of pieces, groups, genre figures, vases and whatever was ordered to decorate the palaces of the court of Saxony. Scarcely a palace in Europe did not contain Meissen porcelain of the Kandler period at some time.

See W. B. Honey, *Dresden China,* rev. ed. *(1946)*; G. W. Ware, *German and Austrian Porcelain* (1952). (Hs. H.)

KANDY, a town in the Central province of Ceylon, 75 mi. from Colombo by rail. formerly the capital of a kingdom of the same name, situated 1,602 ft. above sea level. Pop. (1953) 57,200 (mun.). It was occupied by the Portuguese in the 16th century and by the Dutch in 1763; but the native kings maintained their independence. In 1814–15 the British acquired control. It lies round the margin of an artificial lake constructed by the last king of Kandy in 1806.

There are Buddhist and Brahman temples in Kandy, that of Dalada Malagawa being best known. The Royal Botanic gardens are situated at Peradeniya, 3 mi. distant, and the district is renowned for its beauty. Kandy is an important centre of the tea plantation industry.

KANE, ELISHA KENT (1820–1857), U.S. scientist and arctic explorer who led an expedition to northwest Greenland, was born in Philadelphia, Pa., on Feb. 3, 1820. In 1842 he received the degree of M.D. from the University of Virginia and in 1843 entered the U.S. navy as surgeon. In 1850 Kane joined the first Grinnell expedition, under Lieut. Edwin de Haven, in search of Sir John Franklin. On his return he immediately made plans for an expedition of his own. Financed by Henry Grinnell he sailed in 1853 in the brig "Advance" to northwest Greenland and entered the sea which now bears the name of Kane basin. There the ship was beset in the ice, but much valuable geographical and scientific work was accomplished and the then highest northern latitude of 80° 35' N. was attained. After abandoning their ship, the expedition eventually reached Upernavik, and returned to New York in Oct. 1855. Kane died at Havana on Feb. 16,1857. (H. G. KG.)

KANESH: *see* KULTEPE.

KANGAROO, an Australian pouched mammal (marsupial) with the hind limbs enlarged for hopping and a long thick tail. The enlarged median lower incisors point forward and are used in snipping grass and other vegetation, which is cut up by the sharp cross-crests of the molar teeth. The kangaroo (a native Australian word) was described in 1773 by Capt. James Cook, who saw some in what is now north Queensland.

The kangaroos belong to the order Marsupialia, one of whose characteristics is the possession of a pouch in which the young remain for a considerable time after birth. They belong in the suborder Diprotodontia or that group of marsupials having the two median lower incisor teeth enlarged and inclined forward. The nearest living relatives of the kangaroos are the phalangers, which inhabit the same region. The kangaroos differ, however, from the phalangers, which are slow-moving, arboreal forms, in that they are adapted to rapid progression on the ground by hopping on the enlarged hind limbs.

The largest living kangaroos have a head the size of that of a sheep and stand about 8 ft. high. The largest extinct form had a head as large as that of a Shetland pony and stood 10 ft. or more. *Hypsiprynznodon,* the tiny musk kangaroo, has a head smaller than that of a rabbit. The foot is greatly elongated and very narrow. The first toe or hallux is wanting (except in *Hypsiprymnodon*); the second and third toes are exceedingly slender and joined throughout their length by skin. These syndactylous digits have no function in locomotion but are of use in scratching and cleaning the fur. The straight, long fourth digit forms the principal part of the foot and is provided with a heavy claw. The fifth digit also takes part in locomotion; its metatarsal is closely appressed to that of the fourth digit but the toe diverges.

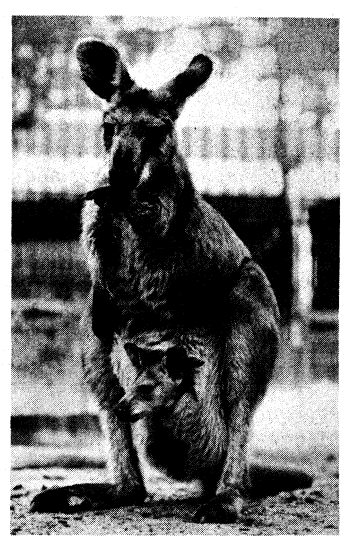
The tail is long, tapering and very heavy. It is used for balancing during rapid progression and when the animal moves slowly with its forefeet on the ground, the tail and forefoot together act as supports while the hind feet are moved forward. In standing and sitting with body erect and forefeet off the ground, the tail acts as a prop,

Except in *Hypsiprymnodon* the stomach is usually sacculated. The mouth opening is small and partly hidden by the lips. The dark brown eyes are of moderate size. The rounded ears are rather large and capable of being turned back and forth. The fur is soft and somewhat woolly in most large forms. In some rat kangaroos the pelage consists of still hairs and soft under fur.

In all kangaroos the pouch is well developed, opens forward and contains the four teats. As a rule there is but one young born at a time. In the colder parts of Australia the young are usually born at the beginning of the cold season. For an account of the birth of the young kangaroo, *see* MARSUPIALIA.

Among living mammals no other group affords a more striking example of the principle of adaptive radiation than do the *Macropodidae* or kangaroo family. The living kangaroos form an almost unbroken series illustrating the structural stages in the evolution of its members from the small forest-living type to the giant of the plains, to the harelike forms of thickets and the secondarily arboreal forms of the tropical forests.

On the damp floor of the tropical rain forest of north Queensland lives the musk kangaroo *(Hypsiprymnodon moschatus).* This form, the most primitive and generalized member of the *Macropodidae,* has a number of characteristics in common with the phalangers and stands near to the primitive diprotodonts from which both were derived. It also resembles the phalangers in its general arboreal heritage. From its peculiar characters *Hypsiprymnodon* is considered a distinct subfamily in which is included the somewhat larger Pleistocene *Propleopus.*



H. ARMSTRONG ROBERTS

SMALL WALLEROO KANGAROO (MACROPUS ROBUSTUS) CARRYING BABY IN POUCH

The bulky, heavy-jawed, short-headed and rather short-footed kangaroos of the Australian Pleistocene have been grouped together in the genus *Sthenurus.* All the short-footed kangaroos of the present time are forest-living animals; it is therefore assumed that the species of *Sthenurus* also lived largely in forests.

The New Guinean genus *Dorcopsis* is represented by many species, all living in tropical rain forest and none larger than a fox terrier. These are short-footed forms with rather short, partly naked tails, long heads and exceptionally long sectorial premolars. They are most closely allied to the tree-climbing kangaroos *(Dendrolagus)* of the rain forests of New Guinea and riortheastern Queensland. The tree kangaroos are about the same size as *Dorcopsis* but have shorter ears than any other kangaroos and longer, thinner tails and less disproportion between the fore and hind limbs, the toes of which are all provided with sharp, curved claws. The soles of the feet are broad and underlaid by a heavy pad of fat, modifications for climbing.

The pademelons *(Thylogale)* are stocky little animals resembling *Dorcopsis* except in their much shorter head. The sectorial teeth

are also much smaller than in *Dorcopsis* and *Dendrolagus* and the third upper incisor tooth is grooved at the posterior edge. They range from New Britain, New Ireland, New Guinea and the Aru Islands to eastern Australia, Tasmania and southwestern Australia in places where there is suitable forest.

The next group (*Protemnodon*), sometimes referred to as the large wallabies, contains numerous species, most of which are primarily grassland forms but others transitional in habitat, feeding at night in the open grasslands and resting during the day in dense scrubs. They resemble the true kangaroos in their proportions and many of the species are commonly called kangaroo rather than wallaby, the name by which most of the smaller forms are known. *Protemnodon* is characterized by a long, tapering tail, moderately long feet, large ears, cheek and hip stripes, palatal vacuities and a groove on the external face of the third upper incisor that divides the tooth into anterior and posterior halves. Some fossil species are larger than any living kangaroos.

The typical kangaroos of the genus *Macropus* are all large forms with long, narrow hind feet. The best known are the great gray kangaroo of the grassy plains of the open Eucalyptus forests, the wallaroo, whose build is more robust and who prefers grass-covered, stony ridges, while the red kangaroo inhabits the interior of the continent where most of the terrain is level and the vegetation sparse. The rock wallabies *(Petrogale* and *Peradorcas),* which are as specialized in foot structure as the large kangaroos, usually spend their days among the crevices of rocks on ridges and beside gullies, as a rule near watercourses. They feed on grass, much of which they obtain at night. The nail-tailed wallabies *(Onychogale)* are among the most beautiful of the kangaroos. These small, graceful creatures of the semiarid country are highly specialized in tooth and foot structure and have a peculiar, horny growth on the end of the tail resembling a nail. *Palorchestes,* the Pleistocene giant kangaroo, probably weighed as much as a small horse and to judge by its dentition also resembled a horse in feeding habits.

Branching off in another direction from a primitive type somewhat similar to *Hypsiprymnodon* there developed several genera of small size popularly known as rat kangaroos. The most primitive of these is the potoroo *(Potorous),* about the size of *Hypsiprymnodon.* It has, however, lost its great toe or hallux. Apart from *Hypsiprymnodon* it is the only member of the family with the primitive plantar pads. The three more specialized genera (*Caloprymnus, Bettongia* and *Aepyprymnus)* inhabit more open country but still may be called thicket-living. The banded wallaby *(Lagostrophus)* and the hare wallaby *(Lagorchestes)* avail themselves of much the same sort of habitat as do the kangaroos. They hop about on the open plains and take refuge among bushes.

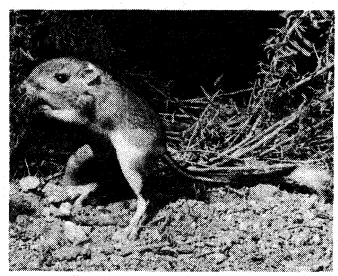
Thus the family Macropodidae may be divided into four subfamilies, the first and most generalized being the Hypsiprymnodontinae, including the genera *Hypsiprymnodon* and *Propleopus;* the second, the Potoroinae, including *Potorous, Bettongia, Caloprymnus* and *Aepyprymnus;* the third, by far the largest, the Macropodinae, including *Dorcopsis, Dendrolagus, Thylogale, Petrogale, Peradorcas, Protemnodon, Macropus* and *Onychogale;* the fourth, Sthenurinae, comprising *Sthenurus* and *Palorchestes.*

All the evidence indicates that the ancestors of the kangaroos were forest animals with an arboreal heritage. The members of the family now show various stages of specialization for terrestrial bipedal locomotion and for a vegetable diet. There is also a definite correlation between the foot and tooth structure of the animals and the type of habitat they occupy. The first two subfamilies feed principally on berries, roots and fallen fruits in the forest or thickets and all have low-cusped molar teeth. The members of the third subfamily either browse on leaves of vines and saplings in the forest, in which case they have crested, short-crowned molars, or graze in the open grasslands, in which case they have crested, long-crowned molar teeth; the crested molars being better adapted to grinding than the low-cusped types. The more specialized members of the Potorinae inhabit thickets in more open country and correlated with this is an elongation of the hind feet; thus these forms are exceedingly swift.

As recently revised the family of kangaroos comprises 21 genera, in which are included 158 species and subspecies; of these, 5 genera and 29 species are known only as Pleistocene fossils.

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KANGAROO RAT, any small North American jumping rodent of the genus *Dipodomys,* belonging to the family Heteromyidae. They resemble in appearance the gerbils and jerboas of the old world in having a large head, large eyes, tiny forelimbs and elongate hindlimbs and a tail somewhat longer than the body. They differ from these and other rodents, excepting the pocket gophers (Geomyidae) and the other heteromyids, in having fur-lined cheek pouches in which they carry a store of food. About 50 species and many subspecies are known, varying in length from 4 in. (tail 5¼ in.) to 6½ in. (tail 8½ in.) and in colour from rich brown to pale buff above; underparts, a hip stripe and the feet are white. The tail, which ends in a furry tuft, acts as a rudder when the animal is in one of its mid-air bounds; they are capable of jumping six to eight feet high.



WILLIS PETERSON

BANNER-TAILED KANGAROO RAT (DIPODOMYS SPECTABILIS)

Kangaroo rats are found on the great plains and southwestern deserts, where they forage by night for food consisting of seeds and retire to their burrows by day. The two to five young born in spring have a life span of about two years.

The name kangaroo rat is sometimes used to denote small kangaroos, better called rat kangaroos and known technically as the subfamily Potoroinae *(see* KANGAROO).

See also RODENT; POCKET MOUSE. (J. E. HL.; X.)

KANGCHENJUNGA (KANCHENJUNGA, KINCHINJUNGA, Nepali KUMBHKARAN LUNGUR), the world's third highest mountain, 28,168 ft. high, stands on the border between Nepal and Sikkim, south of the main axis of the Himalaya and 46 mi. N.W. of Darjeeling. from where it is conspicuous.

The Kangchenjunga massif is in the form of a gigantic cross, the arms of which lie north, south, east and west. There are four summits, of which the highest is at the centre of the cross and the second. Kangchenjunga II, 27.823 ft., is on the south ridge. A third summit is between Kangchenjunga I and Kangchenjunga II, and the fourth, Kangchenjunga West, is on the west ridge. The four main ridges join Kangchenjunga to neighbouring peaks: the south ridge to Talung peak, 23.080 ft., and Kabru. 24,002 ft.; the east ridge to Simvu, 22,360 ft., in Sikkim; the west ridge to Kambachen, 25,781 ft., and Jannu, 25.294 ft., in Nepal; and the north ridge to a range of high mountains on the watershed between Nepal and Sikkim, a range which includes The Twins, 24,117 ft., Nepal peak, 23,500 ft., and Langpo peak, 22.716 ft., near the Tibetan frontier. From the faces enclosed by these four ridges flow four main glaciers: the Zemu and Talung glaciers from the northeast and southeast faces, the Kangchenjunga glacier from the northwest face and the Yalung glacier. by way of which the first ascent was made in 1955, from the southwest face.

The name Kangchenjunga is derived from four words of Tibetan origin, usually rendered Kang-chen-dzo-nga or Yang-chhen-dzönga and interpreted in Sikkim as "The Five Treasuries of the Great Snow." The mountain has an important place in the mythology and religious ritual of the inhabitants of the country and its slopes were no doubt familiar to herdsmen and to traders for many centuries before a rough survey of it was made.

Exploration and Ascent.—The first map known of Kangchenjunga was made by Rinzin Namgyal, one of the Pundit explorers of the mid-18th century, who made a sketch of the circuit of the mountain. In 1848 and 1849 the first European, Sir Joseph Hooker, visited and described the region, and in 1899 the explorer-mountaineer Douglas Freshfield made a circuit of

the mountain and suggested that the summit might be reached from the Yalung valley. In 1905 this route was attempted by a mixed Anglo-Swiss party but the attempt ended when one of the Swiss and three porters lost their lives in an avalanche accident.

Twenty-five years later mountaineers began to explore other faces of the mountain, a Bavarian expedition led by Paul Bauer in 1929 and 1931 attempting it from the Zemu side and G. O. Dyhrenfurth in 1930 from the Kangchenjunga glacier. The greatest height reached during these explorations was 25,263 ft., the point on the northeast spur at which members of Bauer's party in 1931 were turned back by the dangerous state of the snow at the time. There were fatal accidents on two of these expeditions and the mountain acquired a reputation for unusual danger and difficulty. No more attempts were made to climb it until 1954 when. partly for the political reason that the Sikkimese objected to attempts on the mountain. attention was again turned to the Yalung face, which is in Nepal.

In 1951 and 1953 Gilmour Lewis had visited the Yalung and in 1954, with John Kempe, he took a party to examine the chance of an ascent from the upper Yalung. Their report was so favourable that in 1955 a British expedition under the auspices of the Royal Geographical society and the Alpine club and led by Charles Evans set out to make an attempt on the mountain from this side.

Two-thirds of the way up the Yalung face, at about 24,000 ft., there is a broad snowy shelf, easily seen even from Darjeeling. From a base camp at 18,000 ft. the party reached the shelf in three weeks; they pitched camp V at the upper end of it, at over 25,000 ft. Camp VI was put between the upper end of the shelf and the west ridge of the mountain, at nearly 27,000 ft., and from this camp it was found possible to reach the west ridge and to follow it to the summit. Oxygen was used on the upper slopes and at the high camps and the final ridge was climbed by two separate parties on successive days. Joe Brown and George Band on May 25, Norman Hardie and H. R. A. Streather on May 26. The actual summit was not climbed, for, in deference to the wishes of the Sikkimese, the two parties stopped when a few yards from the highest point.

See Charles Evans, *Kangchenjunga, the Untrodden Peak (1957)*
(R. C. Ev.)

KANGRA, a town. *tehsil* and district in Punjab, India. The town, sometimes called Nagarkot, is 2,409 ft. above the sea, with access by rail from Amritsar via Pathankot. Pop. (1951) 4,928; of *tehsil* (422 sq.mi.) 156,317. The Katoch rajas had a stronghold there. Mahmud of Ghazni took the fort in 1009 and from one of the temples carried off vast treasure. In 1360 Kangra was again plundered, by Feroz Shah. The temple of Devi, one of the oldest and aealthiest in northern India, was destroyed, together with the fort and the town, by an earthquake in 1905. In the 18th and 19th centuries Kangra was the centre of a notable school of Rajput miniature painting. In 1855 the district headquarters were removed to Dharamsala (pop. 9,933), 16 mi. N.E.; this is a health resort. Gurkha cantonment and seat of an undergraduate college of Panjab university.

KANGRA DISTRICT, besides some Rajput states annexed after the Sikh wars, includes Lahul. Spiti and Kulu, which are essentially Tibetan areas. Area 3.199 sqmi. Pop. (1961) 1,057,066. Tea cultivation was introduced into Kangra about 1850. Rice, tea, potatoes, spices, wool and honey are the chief products. Blanket- and shawl-making form the chief industry.

K'ANG YU-WEI (1858–1927), Chinese scholar noteworthy chiefly for his independent thought and leadership in the reform movement of 1898. Schooled in the prevailing Confucian tradition, he was stimulated into critical thinking by Buddhist texts and translations from western books. The troubled condition of the Chinese empire prompted him to advocate intellectual and institutional reforms. His intellectual reform began with an attack on Neo-Confucianism, hitherto honoured as the orthodox teaching. He blamed it for China's stagnation and denounced as forgeries the classics upon which it was based. He maintained that authentic Confucianism. essentially in accord with Buddhism and Christianity, pointed to progress, democracy and universal love. K'ang thought that it would make China a great nation and would lead mankind eventually to a world community of freedom, equality and happiness. His plans for institutional reform were aimed primarily at rendering the imperial administration more efficient and less autocratic. Many of his proposals were accepted by the emperor, Kuang Hsü, but foes of reform persuaded the empress dowager to proscribe him and to order his execution. He escaped and traveled in Japan, India, Europe and the United States for 15 years. He remained loyal to the cause of constitutional monarchism and antagonistic to the republic of 1911. He took an active part in the brief restoration of the emperor Hsiian-T'ung; he was rewarded with a high office but denied opportunity to shape the administration. After the overthrow of this regime, he sought refuge in the foreign legation quarter, but his fame as a scholar soon won him freedom and he continued to promote Confucianism as an antidote against "moral degeneration" and indiscriminate westernization. Intellectuals of the 1920s and 1930s tended to dismiss him simply as conservative or reactionary; but, in fact, in addition to making the last significant contribution to Confucianism, he prepared the ground for the reappraisal of traditional culture and anticipated some of the intellectual trends of republican China. (K. Hs.)

KANIAPISKAU, a river of Quebec, Can., rises in Lake Kaniapiskau among a maze of lakes in the east-central part of the province on the Hudson Bay-St. Lawrence watershed about 85 mi. S.S.W. of Schefferville. Below the upper gorge, which extends about 200 mi. northward from the lake and contains numerous cataracts, the Kaniapiskau continues north in a well-defined valley for about 250 mi. before joining the Larch river to form the Koksoak, which flows for about 90 mi. and discharges into Ungava bay at Fort Chimo, a post of the Hudson's Bay company. Albert P. Low, Canadian government geologist, explored the Kaniapiskau in 1893, giving it an Indian name meaning rocky point, after the iron-bearing rocks through which it flows. (J. D. I.)

KANISHKA, king of Kabul, Kashmir and northwestern India in the 2nd century A.D., was a prince of the Kushan tribe, one of the five into which the Yue-Chi (*q.v.*) were divided. His dominions probably extended as far down into India as Sarnath and as far to the northwest as Bukhara. Private inscriptions found in the Punjab and Sind, in the Yusufzai district and at Muttra and referred by European scholars to his reign are dated in the years 1 to 23 of an unknown era.

References by Chinese historians to the Yue-Chi tribes before their incursion into India, together with conclusions drawn from the history of art and literature in his reign, render the date given the most probable. Kanishka's predecessors on the throne were pagans; but shortly after his accession he professed himself a Buddhist. He spent vast sums in the construction of Buddhist monuments; and under his auspices the fourth Buddhist council, the council of Jalandhava (Jullunder) was convened under the presidency of Vasumitra.

At this council three treatises, commentaries on the Canon, one on each of the three baskets into which it is divided, were composed. King Kanishka had these treatises (when completed and revised by Aśvaghosha) written out on copper plates, which he enclosed in stone boxes and placed in a memorial mound. For some centuries afterward these works survived in India; but they exist now only in Chinese translations or adaptations. It is not known in what language they were written. It was probably Sanskrit, for it is known that Aśvaghosha, his court poet, wrote in chaste Sanskrit This change in the literary medium was partly the cause. partly the effect, of a complete revulsion in the intellectual life of India. The reign of Kanishka was the turning point in this change. It has been suggested that the extent of his domains facilitated the incursion into India of western modes of thought; and thus led first to the corruption and gradual decline of Buddhism and second to the gradual rise of Hinduism.

See also references under "Kanishka" in the Index volume.

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Buddhist *India,* chap. xvi (1903).

KANKAKEE, a city of Illinois, U.S., 55 mi. S. of Chicago on the Kankakee river; the seat of Kankakee county. The history of Kankakee really begins with the settlement of Bourbonnais, 3 mi. N., by French Canadians in the 1830s. Bourbonnais remained for 20 years the most important town in the region and became the parent of other French communities nearby, including Kankakee. The latter was largely the creation of the Illinois Central railroad, whose builders bypassed Bourbonnais in the 1850s and chose Kankakee as a station because it offered a better opportunity for townsite promotion. Kankakee quickly outstripped its older neighbour in population and became a thriving shipping centre for agricultural products. It is also important for its manufactures, which include home appliances, furniture and farm implements. The Kankakee State hospital for the mentally ill was established there in 1877. Central high school houses a large exhibition of George Gray Barnard's sculpture. Bourbonnais is the home of Olivet Nazarene college, a coeducational institution organized in 1907 and supervised by the Church of the Nazarene. The name Kankakee derives from the Indian name for the valley, meaning "beautiful land." For comparative population figures see table in ILLINOIS: Population. (D. E. F.)

KANNADA: see KANARESE.

KANNAPOLIS, an industrial city of Cabarrus county in the Piedmont region of North Carolina, U.S., 29 mi. N.E. of Charlotte. The town, built on land purchased by James William Cannon in 1906 for a textile village, is owned by Cannon Mills Inc. It is notable for its planned growth, its Williamsburg colonial architecture and its program of remodeling in progress since 1937. It is unincorporated. For comparative population figures see table in NORTH CAROLINA: Population. (B. P. R.)

KANNAUJ (ancient KANYAKUBJA), a town and tehsil in Farukhabad district, Uttar Pradesh, India, lies on the right bank of the Ganges, 52 mi. N.W. of Kanpur on the Grand trunk road to Delhi. Pop. (1951) 23,138. Area 1.3 sq.mi. Tehsil pop. (1951) 244,424. area 393 sq.mi. It is noted for the manufacture of fine perfumes and tobacco. Among its ancient monuments are the ruins of an old fort, the Jami Masjid and the shrine of Makhdum Jahania. Many mounds in and around the town are a rich source of ancient coins and occupy a semicircle 4 mi. in diameter but have been neither systematically excavated nor explored.

Although referred to in the epics and early Buddhist texts. the town came into prominence in the early 7th century when Harsha (*q.v.*) made it the capital of an empire extending throughout northern India. It continued to be a metropolitan city for several centuries and had unrivaled splendour, particularly under the Gurjara-Pratihara dynasty in the 9th and 10th centuries. During this period a large number of Hindu temples and Buddhist monasteries were established and the city became a great cultural centre. One of the highest divisions of the Brahman caste traces its origin to this city. In 1018 it was razed by Mahmud of Ghazni and passed to the Rathor dynasty, until Mohammed Ghori again plundered it in 1194. It was then almost totally destroyed and has since been of only minor importance. (B. SI.)

KANO, the principal city of the province of that name in the Northern Region of the federation of Nigeria, and one of the seven original Hausa states, lies about 550 mi. inland from the federal capital and port, Lagos. Pop. (1952) 93,016, Africans only; (1959 est.) 139.500. It has four distinct areas: the walled city, nearly 12 mi. in circumference, holding the Hausa population; the Sabon Gari (strangers' settlement) for non-Hausas; the commercial township; and the residential area for non-Africans. The architecture of the old city is unique but the buildings are of mud and of no great antiquity. Kano has a recorded history dating back to A.D 999 and a legendary one going several hundred years farther back, but the present city is probably no more than 200 or 300 years old. A carved wooden door in the emir's residence is reputed to be 500 years old. In the mid-20th century some impressive buildings were erected, outstanding ones being the mosque, council chamber and court (adjoining the emir's residence), the alkali's court and the native authority's administrative building.

In former times, travel to Kano involved a month-long hazardous journey; but Kano has again become the principal entrepôt for northwestern Nigeria and the African republics of former French West and Equatorial Africa. The railway connects it directly with Lagos and Port Harcourt on the coast, and with the east and west of the Northern Region. Trunk roads link it with most parts of the country and it has an important international airport (5 mi.).

"Kano," wrote Lord Lugard in 1900, "is said to be the greatest emporium in Africa." It was for centuries one of the chief markets of the region, known as Western Sudan, but, lying amid desert or near desert, it had little contact with the outside world until the arrival of British merchants in 1904. It was noted especially for its woven and embroidered cloth, tanned goatskins (which gave the world the famous "morocco" leather) and ornamental leatherwork. To these local crafts several industries were added: peanut milling and oil refining, meat canning, tanning of hides and skins, weaving of cotton drills and Bedford cords, and the making of concrete blocks, terrazzo tiles, soap, scent, carbon dioxide and Dry Ice, and steel furniture. Kano's principal wealth is derived from the export of peanuts, the annual production of which amounts to about £20,000,000 ($56,000,000). Hides and skins are also important exports. The names of the principal roads in the commercial area, Manchester, Liverpool and Hull. reflect the city's close commercial ties with the United Kingdom. In 1959 a "festival of Kano" was held to speed its growing importance, the first such event to be held in Northern Nigeria.

KANO province (area 16.630 sq.mi.) with a population (1952) of 3,397,695, contains more than one-fifth of the entire population of the Northern Region. It lies in the savanna country between the Sahara and the tropical forests, and drains northeastward into Lake Chad. In the south and west are scattered granite hills and in the north and east the deep sands of the Chad basin. The average annual rainfall is 30–35 in., falling between late May and October. March, April and early May are very dry and hot with shade temperatures up to 110° F.

The Hausa and Fulani (*qq.v.*) are the dominant tribes, the Hausa being more than twice as numerous. The Hausa language is understood everywhere and spoken by the majority as the mother tongue. English is a lingua franca for Nigerians from other regions. (F. O. B.-B.)

KANON (CANON) is one of the main forms of Byzantine liturgical chant. It consists of nine odes, based upon the nine biblical canticles of the Greek Church, which they replaced in the Morning Office after the Trullan council (691–692). The Kanon is melodically of great variety because each ode has its own melody which is established in the first strophe, called Hirmos. The melodies of the Hirmoi have come down in the Hirmologia, whose manuscripts date from the 9th to the 15th century.

All nine odes were sung on Sundays in Lent only; outside Lent the second ode (built on Deut. xxxii, 1–43) was soon omitted because of its mournful character. After the third and sixth odes monostrophic hymns were inserted. On weekdays during Lent three odes only were sung. The liturgical book containing the Lent Kanons was therefore called Triodion.

The Kanon originated in Jerusalem at the end of the 7th century. Andrew of Crete is the author of the "Great Kanon," unique for its length (250 stanzas). The greatest masters of the new genre are John of Damascus. the author of the famous Easter Kanon translated by J. M. Neale as "Tis the day of Resurrection," and John's foster brother Cosmas "the Melode," who wrote Kanons of great poetical beauty for the major feasts. The St. Saba monastery in Jerusalem where they both lived became the centre of hymnography at the beginning of the iconoclastic controversy, and hymnography flourished in Syria and Asia Minor. In 798 however the centre of hymn writing shifted to Constantinople. Theodore Studites (d 826), who inaugurated a liturgical revival, Theophanes Graptus (d. 845) and Joseph Studites (d. 886) were the principal hymnographers who enriched all the festivals with Kanons. When in the 11th century the church forbade the addition of new Kanons, the musicians (*maïstores*) began to embellish the existing melodies. Kanon writing, however, continued during the 12th century in the Greek monasteries in southern Italy. The melodies now used by the Greek church were mostly composed in the 17th and 18th cen-

turies; they are stylistically different from those which were sung in the heyday of Byzantine chant.

See the Kanons and their music published in C. Høeg (ed.), *Monumenta musicae Byzantinae. Transcripta,* vol. 3 (1950), vol. 4 (1952), vol. 5 (1949), vol. 6 (1952), vol. 8 (1956); *see* also *E.* Wellesz, *A History of Byzantine Music and Hymnography,* ch. 9 (1949).

(E J. Wz)

KANPUR (formerly CAWNPORE), a city, tehsil and district in the Xllahabad division of Uttar Pradesh. India, is situated on the south bank of the Ganges river 43 mi. S.W. of Lucknow, 115 mi. N.W. of Allahabad and 245 mi. S.E. of Delhi. Pop. (1961) 947,-793). The urban area includes the three railway colonies, the cantonment and the suburb of Armapur. The city's population has more than trebled since 1901 and the rate of growth remains high. Kanpur, a large rail and road junction, has long been an important military station which was further enhanced by the establishment of a military airfield at Chakeri. Developments in the mid-20th century enabled Kanpur to become the chief city in the state and one of the largest in India. After 1960 it was administered by a corporation.

As an educational centre, Kanpur contains several colleges affiliated to Agra university including the colleges of agriculture and textiles Its Indian Institute of Technology occupies a significant place among the higher technological institutions of India and its medical college was established as a constituent of Lucknow university. Places of interest include the agricultural college and experimental farm. Kamla Retreat (a picturesque resthouse on a small lake), the Memorial nell and a glass temple sacred to Hindus in the heart of the city.

Kanpur is on the Grand Trunk road from Delhi to Calcutta. As a main junction on the Northern, North-Eastern and Central railnays the tonn is connected to most parts of India.

The industrial development of Kanpur was unique in northern India The manufacture of leather goods, which started with a government harness factory. became a large-scale industry. Other industries include cotton spinning and weaving, cotton ginning and pressing, the manufacture of jute and woolen goods, vegetable oils and soap, plastics. biscuits (cookies) and chemicals, flour milling, rice husking, distilling and general engineering. The city is a commercial centre of wholesale trade in cotton piece goods, general merchandise, sugar. spices and grains.

As Cawnpore village, it formed from early times a frontier outpost of the people of Oudh and Bengal against their northern neighbours. In 1801, when the ceded provinces were acquired by the East India company, it became the chief British frontier statlon: but at the outbreak of the Indian mutiny (*q* v.; called by Indians the freedom struggle) in May 1857 the frontier had moved forward and Cannpore was denuded of troops. It was the scene in July 1857 of a siege by the Nana Sahib (*q.v.*). The British soldiers under Gen Sir Hugh Wheeler put up a heroic defense for 21 days but surrendered on the promise of safe conduct for the residents to Allahabad. Hundreds of Europeans were, however, attacked and slain by undisciplined forces at Sati Chaura Ghat (a sacred bathing place) while escaping by boats. Survivors were reported to have been thronn into a well, where a memorial was later raised and surrounded by gardens. The memorial, a Romanesque red brick building. is crowned by the figure of an angel in white marble and on the wall of the nell is a commemorative inscription.

KANPUR DISTRICT lies betneen the Ganges and the Jumna (Yamuna) rivers in the well-watered and fertile tract known as the doab Pop (1961) 2,362,439. Area 2.357 sq mi. Beside these tno rivers the main streams are the Arand (Rhind), the Kavnn or Sengar, the Isan and the Pandu. The climate is hot and dry in rummer and cold in winter nith an average annual rainfall of 33 in The district is also watered by the four branches of the Ganges canal and its principal crops are grain. nheat, jowar, barley. mustard, corn. sesame, rice, pearl millet. sugar cane and cotton. There are mango and mahua groves, and a part of the district is a dhak forest.

Bithur (*q* v) non in ruins, is a Hindu holy place and many small temples lie along the Arand, built betneen the 6th and 9th centuriei

See G Trevelyan, *Cawnpore* (1894); *D.* N Majumdar, *Social Contours of an Industrial City* (1960). (B. SI.)

KANSAS, popularly known as the "Sunflower state." is situated in the heart of the conterminous United States. Lying bet een approximately 37° and 40° N. and 94° 37' and 102" 03' W., it is not only the geographical centre of the country excluding Alaska but is also the site of the geodetic datum of North America from which all U.S., Canadian and Mexican mapping is made. The state is nearly rectangular in shape with a breadth of 207 mi. from north to south and a length of 403 mi. from east to west; the total area is 82.264 sq.mi., 216 sq mi. of which are water. The 14th state in size, it is bounded on the north by Nebraska, on the east by Missouri, on the south by Oklahoma and on the west by Colorado. Kansas was admitted to the union in 1861, the 34th state. The capital city is Topeka. The state flower is the native sunflower; the state tree, the cottonwood; the state bird, the western meadowlark; and the state animal, the American buffalo (bison). The state flag consists of a blue field bearing the state seal surmounted by a sunflower. The name is from the Kansa, or Kaw, Indians who inhabited the region.

PHYSICAL GEOGRAPHY

Physical Features.—Geologists claim that 50 seas flooded Kansas during the geological process through which the earth was formed This action left rich deposits of oil, gas, coal. lead, zinc and salt in the state. The surface structure of Kansas has often been thought of as a featureless flat plain, but this description is unfitting to a major portion of the state which offers a wide variety of landscapes. There are thousands of hills 100 to 400 ft in height and equally numerous valleys. The state lies in an area of transition from prairie lands to high plains. There are eight distinct surface areas in this transition. In the southeast corner lies the Cherokee plain. an extension of the Ozarks from Missouri that is rich in minerals. To the north are the Osage cuestas. distinguished by the presence of many east-facing rocky escarpments with fertile valleys. The northeastern section is the Glaciated region with many evidences of deposits from the early glaciers. West of the above three sections lie the Flint hills. This narrow band starts in Washington and Marshall counties on the northern border and extends southward across the state to Cowley and Chautauqua counties. The Flint hills are famous for bluestem pasture lands. They are rich in limestone deposits and are nearly mountainous in their appearance. West of the Flint hills, covering nearly one-third of the state, is a transition area to the High plains. The Smoky Hills upland in the north owes its origin to the exposure of moderately hard, thick, brown Dakota sandstone with numerous outcroppings. South of Smoky hills lies the Great Bend prairie, an area embraced by the great bend in the Arkansas river. The surface is quite flat, but is frequently interspersed with sand hills and dunes. To the south of the Great Bend prairie is a smaller area called the Red hills-Wellington area or Cimarron Breaks on which the higher country to the north and west is suddenly interrupted by a prominent escarpment carved by steep southnard flowing streams, most of them tributaries of the Cimarron and Medicine Lodge rivers. Much of the rock in this area is red shale or fine sandstone. and the rock exposures and the soils are coloured red. The western one-third of Kansas is in the High plains. There the land rises gradually toward the Rocky mountains in Colorado. The northern section of the High plains is carved by east and northeast flowing streams which form long and prominent uplands betneen the streams nith innumerable rounded hills. The central and southern portions of the High plains are unbroken and level. There are bluffs along the Arkansas river, and a belt of sand hills on the south side of the river. The land surfaces of Kansas slope eastward from a maximum elevation of 4 135 ft above sen level in Wallace county, adjoining the Colorado line on the west, to the lowest point, about 700 ft., where the Verdigris river crosses the Oklahoma boundary in Montgomery county on the south. The state has three main rivers or drainage systems. The Kansas (the Kaw) and its tributaries the Smoky Hill. the Blue and the Republican drain the northern half of the state. The southwestern part of the state is drained by the Arkansas river and its tribu-

taries. The southeastern section of the state has the Marais des Cygnes river system and the Neosho and Verdigris rivers which empty into the Arkansas in Oklahoma. Many of the rivers are subject to floods. A flood in eastern and southern Kansas in 1951 was one of the most damaging in the history of the state. The water area in the state is small. However, Kansas has more than 100 public and many private artificial lakes. Federal dam projects at Kanopolis, Fall River, Cedar Bluff, Webster, Kirwin and Tuttle Creek have greatly expanded the water area for irrigation. flood control and recreation. There are many springs which help to keep a constant flow in the rivers. Diamond springs was a historic spot on the Santa Fe trail. Rock springs, Big springs and Sand springs are scenic areas. The state has a huge underwater reserve which has been used extensively for pump-irrigation of farm crops.

Climate.— The climate of Kansas is subject to wide fluctuations typical of the central continental area. Extremes of heat and cold occur, but as a rule the winters are dry and fairly mild, while the summer heat is tempered by prairie breezes. The absolute temperature extremes range from 120° to −40° F. The sun shines eight out of ten days and beautiful sunsets are typical. The temperature across the state is more uniform than the precipitation which diminishes somewhat regularly westward. The average annual rainfall is about 27 in. In the eastern third of the state rainfall averages 35.27 in.; in the central area 26.45 in.; and in the western third 19.01 in. Low rainfall in the west has made necessary a revolution in farm crops and methods of farming, usually called dry farming (*q.v.*). Kansas is subject to floods and droughts. Damaging floods came in 1844, 1858, 1903, 1915 and 1951; years of severe drought were 1860, 1874, 1894, 1932–36 and 1952. Tornadoes are not infrequent.

Soils.—The soil of the upland prairies is generally a deep rich clay loam of a dark colour The bottom lands near the streams are a black, sandy loam; and the intermediate lands, or second bottoms are a rich deep and black loam containing little sand. These soils are easily cultivated and highly productive. Some soils in the uplands are composed of stiff clay and are more difficult to cultivate. There are frequent sandy areas in the state. Many of the soils derive from residual sandstone, shales, limestone and glacial accumulations.

Vegetation.— Kansas had three distinct areas of native vegetation. The eastern third of the state had a rich supply of the large bluestem grasses. Bluegrass flourishes in this section. On the high plains of the western section gramas and buffalo grass were predominant. The central part of the state had a mixture of the eastern and western grasses. The early pioneer in Kansas found an ample supply of oak, cottonwood, hickory and walnut trees in the wet bottom lands along the streams of the eastern half of the state. Man-made timber areas thrive in many parts of Kansas, offering much-needed shade and shelter.

Animal Life.—The pioneer found the animals and game birds common to the midwest in abundance in Kansas. Buffalo (bison), antelope, deer, elk and coyotes roamed the prairies and during the 1870s and 1880s buffalo hunting was a prominent sport. Turkeys, prairie chickens and quail furnished game and many family incomes were supplemented by trapping beaver and other small fur-bearing animals. The state has made a determined effort to restore many of the animals and game species. The buffalo sanctuary in Scott County State park, the animal and game refuge in Meade County State park and the Finney County State Game refuge located south of Garden City are examples of the wildlife preservation projects. More than 150 buffalo roam the Finney preserve. There are many similar preserves, such as the wildlife project in Linn county near La Cygne; Cheyenne bottoms in Barton county is a nationally known game refuge.

State Parks.—Kansas has no national parks or monuments. The state maintains about 40 state lakes and parks for fishing and other recreation. These are supervised jointly by a state forestry and game commission and a park commission. There are many historic sites and memorials. private parks and municipal parks. The Kansas State Historical society has under its supervision the first Territorial capitol on the Ft. Riley reservation, Funston Memorial State park near Iola, the old Indian mission at Council Grove and Shawnee mission in Kansas City. Among the private parks are the John Brown Memorial park at Osawatomie, the Bartlett arboretum in Belle Plaine, Pawnee Rock park and the Frontier Historical park in Hays.

Historic Sites.—Ft. Leavenworth, Ft. Riley and Point of Rocks in Morton county are federal property. Seventeen sites are owned by the state. The Kansas State Historical society has placed markers on nearly 50 sites and about 40 are marked by private organizations. Some of the well-known historical landmarks are: Ft. Larned, the Santa Fe trail remains near Dodge City, the Beecher Bible and Rifle church at Wabaunsee, the Pony express station near Hanover, Rock City near Minneapolis, the restored cow town in Wichita, the Boot Hill cemetery at Dodge City, the Kaw Methodist museum and the Post Office oak in Council Grove, the Ft. Harker Guardhouse at Kanopolis, the Eisenhower home and museum in Abilene, the Cathedral of the Plains at Victoria and the pueblo ruins of El Quartelejo in Scott county.

The state capitol (1866–1903) at Topeka, modeled after the national capitol, contains marble from many areas of the world, as well as mahogany and walnut. Murals by John Steuart Curry and David H. Overmeyer depict historical events in Kansas. A modern state office building was completed in 1957. The State Historical society's memorial building and museum is located east of the capitol building.

HISTORY

Early History.— Recorded history of the area now included in Kansas began when Francisco de Coronado led his company of Spaniards from Culiacán, Mex., across the plains in search of the wealth of the mythical kingdom of Quivira. Coronado's expedition reached the highlands of central Kansas, although the exact point reached is a matter of dispute. The sword of a member of the expedition, found in Kansas, is in the museum of the Kansas State Historical society in Topeka. Except for a brief French penetration, 1719–25, and a few minor explorations, the region was in possession of the Indians until 1803 when it passed to the U.S. (all except the part west of 100° and south of the Arkansas river) as part of the Louisiana Purchase (*q.v.*). From 1803 to 1820 the region was well explored. Lewis and Clark touched the northeast border on their way to the Pacific in 1803; Zebulon M. Pike traversed its breadth on his route to the southwest in 1806; and Maj. Stephen H. Long led a scientific expedition into the region in 1819 and reported it was a sandy wasteland. Kansas, however, was on the main overland routes to the west and by 1824 William Becknell had pioneered his lucrative commerce from Independence, Mo., across Kansas territory to Santa Fe, N.M., and opened the historic Santa Fe trail (*q.v.*). Part of the trail that the pioneers followed to Oregon and California also crossed Kansas. The Mormons and the gold seekers opened new western trails, and fur trading expeditions added to the new knowledge of the area. All these events helped to remove the myth of the "Great American desert" and stimulated the desire for permanent settlement of the territory.

The hunters, trappers, Mormons, miners and westward-bound homeseekers moved through Kansas hut did not settle there. Until official territorial status was secured in 1854 (see *The Free-State Struggle*, below), Kansas remained an Indian land. Archaeologists have uncovered many evidences of the early Indian cultures. The Upper Republican culture, 1200–1500, had an agricultural civilization along the Kepublican and Blue rivers. When the first whites reached the area the resident tribes were Kansa, Osage, Wichita, Pawnee and Pueblos. The hunter tribes of Kiowas. Comanches, Arapahoes, Cheyennes and Apaches roamed over western Kansas. Even before the Indian Removal act of 1830 several eastern tribes had been brought to the area. In 1850 the federal government sent approximately 19 tribes to Kansas. Nearly one-fourth the present state area was set aside as Indian lands. The Potawatomi reservation near Holton is the largest Indian reservation in the state. There are few Indians living in Kansas, but the state carries many place names from the Indian tribes and their languages. Some white settlers came with the

removal policy, mostly missionaries, agents, blacksmiths and farmers. Ft. Leavenworth was established in 1827; Ft. Scott in 1842; Ft. Riley in 1853; and three smaller forts—Mann, McKoy and Atkinson—between 1845 and 1854. Methodist (1830), Baptist, Quaker, Catholic and Presbyterian missions were active by 1837.

The Free-State Struggle.—By 1852 there was considerable political agitation for the creation of an organized territory. The Kansas-Nebraska bill, providing that the people of the territory should decide whether it should be free or slave, was introduced by Sen. Stephen A. Douglas of Illinois and became a law in 1854. *(See* UNITED STATES *[OF* AMERICA]: *History: Struggle for National Government, 1783–1865: Kansas-Nebraska Act.)* The news of the creation of the Kansas-Nebraska territory was a signal for southern proslavery forces to make a bold bid for the creation of a new slave state and opened a six-year era often referred to as "bleeding Kansas." Indian reserves vanished rapidly as new federal legislation and treaties opened the lands of eastern and southern Kansas to the white settlers. Soon there was intense activity in the northern states to create a free-soil state The first census, in Feb. 1855, listed 2,905 voters, but in the first election, a month later, 6,307 ballots were cast. Proslavery Missourians had crossed the border to vote. This single act kept the early government of Kansas territory in the hands of the proslavery forces for nearly four years. It gave the forces of slavery a touch of legality—a legality that was approved by the territorial court, supported by early governors and encouraged by presidents of the United States. The free-soilers maintained that this was a bogus legislature and Charles Robinson. agent for the New England Emigrant Aid society, led the citizens of Lawrence (*q.v.*) in the establishment of a free-soil government. James H. Lane raised a militia to defend the free-soil cause. Antislavery guerrilla bands known as Jayhaakers were organized. Meanwhile, Samuel J. Jones, a proslavery sheriff, took charge of the proslave militia. John Stringfellow organized the southern sympathizers of Leavenworth. A near reign of terror followed; each side sought to drive the other from the new territory. Emigrant companies were formed in both the north and the south. Rifles, ammunition and cannon were imported; cities were fortified, men were murdered, armed bands raided other armed bands, livestock was stolen. farm houses burned and the city of Lawrence was sacked. The nation witnessed these extremes, and leadership from Washington was ineffective as the slave controversy spread. The so-called Potawatomi massacre. led by abolitionist John Brown (*q.v.*), and Charles Hamelton's shooting of 11 free-state men in a ravine near the Marais des Cygnes river added to the uncertainty. Late in 1856. territorial Gov. John Geary, using federal troops, eased the tension and his successor Robert Walker, ended the southern control of the legislature. Proslavery forces by their excesses had defeated themselves. But the free-state legislature could not defeat the Lecompton constitution, framed by a convention of proslavery delegates meeting at Lecompton in 1857. which would have made Kansas a slave state. Congress delayed statehood by the English bill, introduced by William Hayden English, which conditioned the normal cession of land to a new state on acceptance of the Lecompton document, a proposition rejected by Kansas on Aug. 21, 1858, by a vote of 11,300 to 1,788. Gradually the leaders of the proslavery faction drifted away from Kansas territory and more moderate forces from Iowa, Pennsylvania. Ohio, Kentucky and Virginia took over. The slave question shifted to other areas in the Cnited States and became the leading political issue of the nation. Kansas, with the Wyandotte constitution, was granted statehood, as a free state, on Jan. 29, 1861.

The American Civil War.—In 1860, Kansans faced severe drought and famine and then. shortly after admission to statehood, in 1861, Kansans had to face the strain of the American Civil War; however, the state, with fewer than 30,000 men between the ages of 18 and 45, furnished over 20,000 men for the Union army, supplying 18 regiments and 3 batteries in addition to 2 Negro infantry regiments and a Negro battery. Some of the troops were used in defense against border raids by guerrilla, Indian and Confederate forces, but most of the regiments served outside the state; casualties reached 8,494. The most disastrous episode of the war in Kansas was William C. Quantrill's raid. After sacking several small towns along the Kansas border. on Aug. 21, 1863, Quantrill's forces invaded Lawrence. Approximately 200 buildings were burned and 150 citizens were killed. The largest military engagement on Kansas soil was the battle of Mine Creek in 1864 in ahich the Confederate Gen. Sterling Price was badly defeated—a defeat which ended the Confederate bid to control the west. Following the Civil War, although the Kansas tribes were rapidly moved to Indian territory after 1868, Indian raids harassed the state until the late 1870s.

The Coming of the Railroads.—At the close of the Civil War, the frontier civilization in Kansas developed rapidly. Two economic phases of this growth were found in the building of railroads and the development of the range-cattle industry. Even before the Civil War Kansans were chartering new railroad companies. In 1857, the Elwood-Marysville railroad was chartered as an extension of the Hannibal and St. Joseph line. Formal opening of this five-mile road between Elwood and Wathena, on which ran the first "iron horse" in Kansas, took place on July 19, 1860. While the war delayed further building, many surveys were made and the federal government made land grants possible in 1862. At the close of 1865. Kansas had only 71 mi. of railroad but, backed by federal, state and local aid, over 200 companies built railroads in the state during the next 30 years. By 1871 Kansas had about 1,200 mi. of track; by 1880, more than 3,000 mi. and by 1890 a total of more than 8,700. This last figure placed Kansas second in the union in railroad mileage. The railroads speeded settlement and made possible the shipment of the raw materials and farm products of the state to the markets of the world.

The Opening of the Range.—Before the Civil War it was commonly known that cattle would fatten during the summer months on the grasslands where the buffalo grazed; however, when several small herds of cattle were sent into the Flint hills during the winter months it was found they could live on the nutritious dried grasses. With the coming of the railroads this fact made possible the opening of millions of acres of range lands after 1866, and created one of the most profitable industries in Kansas. Thousands of tough Texas longhorns were driven to the railroads. A large number of these were shipped to market and to the corn-producing states of the east. But many of the herds that were a part of the "long drive" were left to winter on the plains. Cow towns sprang up at almost every western railway terminal and as the railroads moved westward, the cow towns followed. Baxter Springs and Chetopa were early cow towns. Some of the biggest drives came to meet the Kansas-Pacific at Abilene. Later Ellsworth, Wichita, Ellis, Newton, Dodge City and others became rival centres. Cattle trails, such as the Chisholm trail, became famous roadways to the new towns of uhich T. A. McNeal, a Kansan, said that "in a competitive examination for wickedness" they "would have given Hell a neck and neck race." During the same period many eastern cattle were brought into the state. Cattle raising brought considerable wealth and established one of the state's basic industries which often had a greater financial value than the wheat crop. Restorations of parts of the cow towns have been made in Dodge City, Wichita and Abilene.

Political History.—Politically, the history of Kansas has been basically Republican on both the state and national level. In the struggle for a free-soil state the majority of the voters joined the party of Abraham Lincoln. Following the Civil War a large number of Union veterans settled there. This gave the Republican party a firm control of political policy. However, this control frequently has been upset and from the 1870s reform elements were engaged in a succession of radical party protests. Leadership for the Grangers, the Farmer's alliance and the Populist party was often furnished by Kansans. The Populists controlled the state government in 1892–94 and 1896–98. In 1892–93, when the Populists elected the governor and senate, and the Republicans (as determined by the court) the house of representatives, political passion was so high as to threaten armed conflict in Topeka. Kansas, in its first 100 years as a state, had 35 governors, of whom 6 mere Democrats and 2 Populists; the remainder were Republi-

cans. George R. Docking (1957–60) was the only Democrat ever to be re-elected to the governorship. After World War II the Democrats made marked gains in state and national elections.

Kansas Populists helped to inject Jeffersonian liberalism into the progressivism of Theodore Roosevelt and Woodrow Wilson and the state has contributed much to progressive political issues. Under the first constitution women were given equal property rights with men. The first legislature gave women the right to vote in school elections; and in 1887 the right was extended to city and bond elections. Universal suffrage was granted in 1912 by constitutional amendment. From 1880 to 1948 Kansas had prohibition. The state pioneered in the direct primary, referendum and recall, the eight-hour day and blue-sky laws to protect purchasers of stocks and bonds from fraud. The Legislative council (little legislature) was a valuable experiment which developed an effective research division. The merit system for state employees was adopted in 1941. Kansas has no state bond debt, and is on a pay-as-you-go basis. The state has furnished a president (Dwight D. Eisenhower) and a vice-president (Charles Curtis) for the United States and native son Alfred M. Landon was the Republican nominee for the presidency in 1936.

GOVERNMENT

Kansans are governed by the original state constitution which came into effect on Jan. 29, 1861. An amendment to the constitution must have legislative origin. The amendments are numerous. Kansas has the usual type of state government with the governor and other state executive officers elected for a term of two years. Nearly 100 appointed boards and commissions assist the governor. There is a two-house legislature; the representatives are elected from 125 districts for a two-year term and the senators from 40 districts for a four-year term. The state is districted in a manner which gives rural areas advantages over urban areas in representation. The judicial system consists of a 7-member supreme court, 38 district courts with 51 judges and a probate court in each county of the state. All judges except the supreme court are elected. In 1958 an amendment to the constitution provided for the appointment of justices on the supreme court by the governor; the governor selects from a list submitted by a panel of laymen and lawyers. Kansas has 105 counties, 1,552 townships and 2,976 election precincts. The counties and townships are governed by elected officials. Kansas has 613 incorporated cities; 35 are governed by a city manager and 38 are operated under a commission form of government. A city must have 15,000 population to become a first-class city. Kansas derives revenue from a general property tax, an income tax, general sales tax and fees collected for special services. Other sources of revenue were vehicle licence fees and a gasoline tax. The total annual expenditures for all state functions in the second half of the 20th century were over $250,000,000. The total assessed value of all property in Kansas was more than $5,200,000,000; of this sum almost $900,000,000 was the assessed value of intangible property.

POPULATION

The population of Kansas in 1860, the year before it became a. state, was 107,206; in 1870 it was 364,399; in 1880 it was 996,096 and in 1890 it was 1,427,096. Few states had as rapid a growth in population as did Kansas from 1870 to 1890. In 1950 the population was 1,905,299 and in 1960 it was 2,178,611 by the federal census. In 1960 there was one city, Wichita, with over 250,000 people; two cities, Kansas City and Topeka, with over 100,000. In 1960 the Wichita standard metropolitan statistical area (Sedgwick county) had a population of 343,231 and the Topeka standard metropolitan statistical area (Shawnee county) had a population of 141,286. Kansas City, Kan., is included in the Kansas City, Mo., (*q.v.*) metropolitan area. Gradually the urban population is increasing over the rural: in 1960 the urban population accounted for 61.0% of the total, in 1950 it accounted for 47.4%.

While many of the early settlers came from eastern states, Kansas had many immigrants from Europe. Many of these nationalities settled in colonies within the state. Germans and Swedes predominated among the foreign groups; there were also settlements of Danes, Norwegians, English. Bohemians and French. These people made many contributions to the art, literature and music of the state. S. Birger Sandzén, born in Sweden. taught art

*Kansas: Places of 5,000 or more Population (1960 census)**

Place	Population				
	1960	1950	1940	1920	1900
Total state	2,178,611	1,905,299	1,801,028	1,769,257	1,470,495
Abilene	6,746	5,775	5,671	4,895	3,507
Arkansas City	14,262	12,903	12,752	11,253	6,140
Atchison	12,529	12,792	12,648	12,630	15,722
Augusta	6,434	4,483	3,821	4,219	1,197
Chanute	10,849	10,109	10,142	10,286	4,208
Coffeyville	17,382	17,113	17,355	13,452	4,953
Concordia	7,022	7,175	6,255	4,705	3,401
Derby†	6,458	432	256	—	—
Dodge City	13,520	11,262	8,487	5,061	1,942
El Dorado	12,523	11,037	10,045	10,995	3,466
Emporia	18,190	15,669	13,188	11,273	8,223
Fairway	5,398	1,816‡	—	—	—
Fort Scott	9,410	10,335	10,557	10,693	10,322
Garden City	11,811	10,905	6,285	3,848	1,590
Great Bend	16,670	12,665	9,044	4,460	2,470
Hays	11,947	8,625	6,385	3,165	1,136
Haysville	5,836§	—	—	—	—
Hutchinson	37,574	33,575	30,013	23,298	9,379
Independence	11,222	11,335	11,565	11,920	4,851
Iola	6,885	7,094	7,244	8,513	5,791
Junction City	18,700	13,462	8,507	7,533	4,695
Kansas City	121,901	129,553	121,458	101,177‖	51,418
Larned	5,001	4,447	3,533	3,130	1,583
Lawrence	32,858	23,351	14,390	12,456¶	10,862
Leavenworth	22,052	20,579	19,220	16,917	20,735
Leawood	7,466	1,167	—	—	—
Liberal	13,813	7,134	4,410	3,613	426
McPherson	9,996	8,689	7,194	4,595	2,996
Manhattan	22,993	19,056	11,659	7,989	3,138
Merriam	5,084§	—	—	—	—
	14,877				
	10,987	11,590	11,048	9,781	6,208
Ottawa	10,673	10,081	10,193	9,618	6,934
Overland Park	21,110	—	—	—	—
Parsons	13,929	14,750	14,294	16,028	7,682
Pittsburg	18,556§	19,341	17,571	18,052	10,112
Prairie Village	8,156	7,523	6,591	5,183	1,213
Platt	8,949§	—	—	—	—
Roeland Park	6,113	6,483	4,819	1,700	
Russell	43,202	26,176	21,073	15,085	
Salina	9,072	845‡	597	—	
Shawnee	119,484	78,791	67,833	50,022	33,608
Topeka	8,809	7,747	7,216	7,048	
Wellington	251,698	168,279	111,966	72,217	21,671
Wichita	11,117	10,264	9,506	7,933	4,442
Winfield					6,074

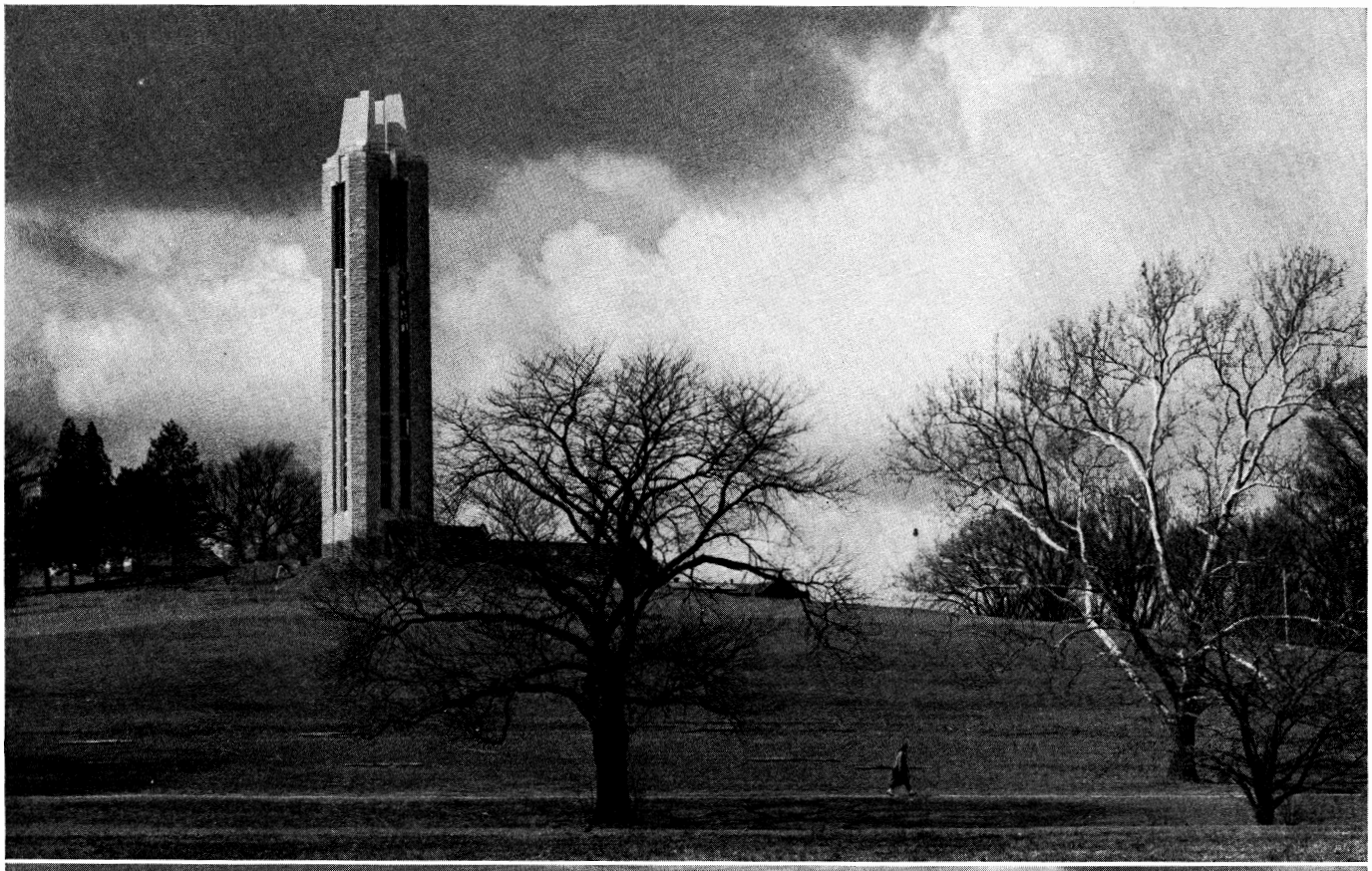
*Populations are reported as constituted at date of each census. †Name changed from El Paso since 1930. ‡Denotes an unincorporated place of under 2,500 in urbanized area. §Incorporated since 1950. ‖Total for 1900 includes population (5,878) of Argentine city, annexed to Kansas City between 1900 and 1910. Parts of Quindaro, Shawnee, and Wyandotte townships annexed to Kansas City since 1910. ¶Douglas. Part of Wakarusa township annexed to Laarence city since 1910. — indicates that place did not exist during the reported census, or data not available.

at Bethany college in Lindsborg. He became a leader in western art and his Kansas landscapes are to be found in the world's major art galleries. The state was also settled by religious sects, such as Quakers, Mormons and Mennonites. Kansas was one of the main recipients of the "Negro Exodus movement'! from the southern states after the Civil War. According to the 1960 census, 93.9% of the population in Kansas was native white, 1.5% foreign born and 4.6% nonwhite, practically all Negro.

EDUCATION

Kansas ranks high among the states in its small percentage of illiteracy. The state has a system of tax-supported free public schools. The state superintendent of public instruction is elected by popular vote and the state school board is appointed by the governor. Enabling legislation has permitted the reorganization of the small local school districts, each with a separate school board. into larger districts. Although consolidation proceeded slowly before World War II. considerable progress was made in this direction in the 1940s and 1950s: the more than 5.600 school districts in existence in 1038, for example, were consolidated into about 2.800 districts, a reduction of 50% by 1959. In addition to the public schools, there were about 250 private and parochial schools in the state.

Kansas has five state-supported institutions of higher learning. The University of Kansas (1865) at Lawrence has schools of engineering. law. pharmacy, liberal arts and sciences; fine arts! education, business and journalism and a graduate school. Kansas State university (1863) at Manhattan is the state land-grant col-





BY COURTESY OF (TOP) THE PHOTOGRAPHIC BUREAU, UNIVERSITY OF KANSAS; PHOTOGRAPH, (BOTTOM) H. ARMSTRONG ROBERTS

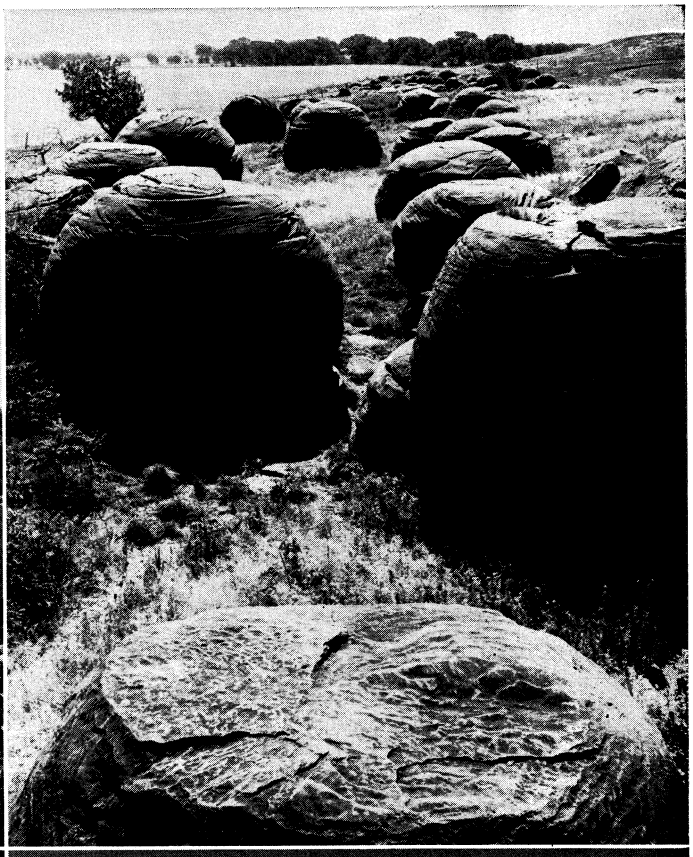
VIEWS OF KANSAS

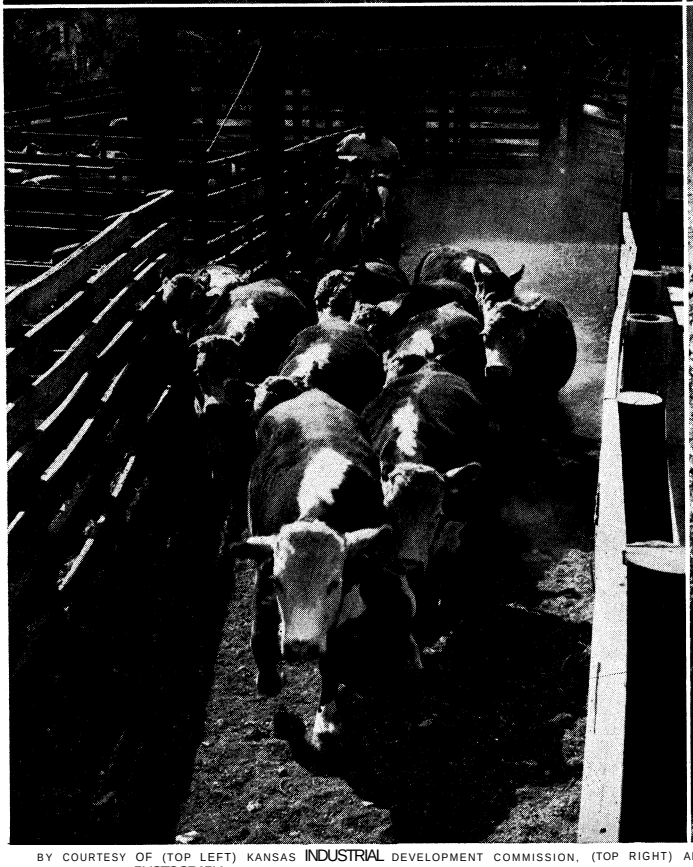
Top: The campanile at the University of Kansas, Lawrence, was erected in 1951 as a World War II memorial

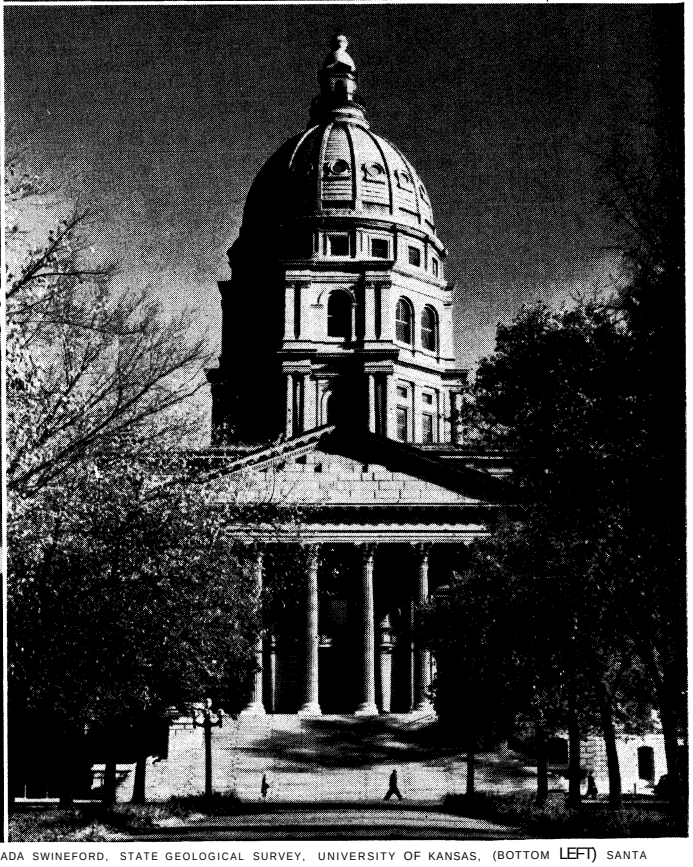
Bottom: Wheat harvesting. Kansas is the largest wheat producing state in the U.S.

KANSAS









BY COURTESY OF (TOP LEFT) KANSAS INDUSTRIAL DEVELOPMENT COMMISSION, (TOP RIGHT) ADA SWINEFORD, STATE GEOLOGICAL SURVEY, UNIVERSITY OF KANSAS, (BOTTOM LEFT) SANTA FE RAILWAY; PHOTOGRAPH, (BOTTOM RIGHT) H. ARMSTRONG ROBERTS

SCENES IN KANSAS

Top left: The Dwight D. Eisenhower museum at Abilene. The museum houses decorations, and trophies won and souvenirs collected by Eisenhower during his military career

Top right: "Rock City," Ottawa county, a group of about 200 sandstone concretions varying in diameter from 8 to 27 ft. The concretions were formed by water-borne calcium carbonate which was deposited between grains of sand thus cementing them. When the softer stone was eroded, the concretions remained

Bottom *left:* Cattle being driven toward railway cars at Eskridge. Kansas is one of the largest cattle-producing states in the **U.S.**

Bottom *right:* The state capitol at Topeka, built 1866–1903, stands in the centre of landscaped grounds covering four city blocks

lege and university. Kansas State Teachers College of Emporia (1863) at Emporia; Fort Hays Kansas State college (1902); at Hays and Kansas State College of Pittsburg (1903) at Pittsburg. The University of Kansas medical school (1899) is in Kansas City. There are agricultural experiment stations at Hays, Garden City. Colby and Tribune.

In addition to the state schools various accredited private and denominational colleges are maintained: Baker university (Baldwin. Methodist, 1858); Bethany college (Lindsborg, Augustana Lutheran, 1881); Bethel college (North Newton, Mennonite, 1887); College of Emporia (Emporia, related to Presbyterian Church, 1882); Friends university (Wichita, Society of Friends, 1898); Kansas Wesleyan university (Salina, related to Methodist Church. 1886); McPherson college (McPherson, Church of the Brethren, 1887); Marymount college (Salina, Roman Catholic, 1922); Mount St. Scholastica college (Atchison, Roman Catholic, 1863); Ottawa university (Ottawa, affiliate of American Baptist convention, 1865); St. Benedict's college (Atchison, Roman Catholic. 1859); St. Mary college (Xavier, Roman Catholic, 1923); Southwestern college (Winfield, affiliate of Methodist Church. 1885); Sterling college (Sterling, related to United Presbyterian Church, U.S.A., 1887); University of Wichita (Wichita, municipal control, 1895); and Washburn university (Topeka. municipal, 1865). There are also a number of junior colleges and several small business and professional schools. Haskell institute (1884) at Lawrence is a U.S. government school for Indians.

HEALTH AND WELFARE

State charitable institutions are supervised by a state board of social uelfare Hospitals for the mentally ill are maintained at Topeka. Larned and Osawatomie and a hospital for epileptics at Parsons. Kansas has an advanced program for the care of mental illness Other charitable institutions are a school for feebleminded youths at Winfield; a tubercular sanatorium at Norton; an orphans' home at Atchison; a soldiers' home at Ft. Dodge; Mother Bickerdyke home, founded after the Civil War for armed services nurses and mothers. nidons and daughters of veterans, at Ellsworth; a school for the blind at Kansas City; and a school for the deaf at Olathe. The industrial school for girls is at Beloit and a similar school for boys at Topeka. The state maintains a penitentiary at Lansing and a reformatory at Hutchinson. Kansas cooperates with the programs of aid to the aged, the blind and the disabled and to dependent children which are supported by the federal government.

THE ECONOMY

Agriculture. — Nearly one-third of the state's population lives on about 120.000 farms and ranches. Kansas has approximately 50,000,000 ac. in farm land and pasture. The total value, of farm production in an average year will range from $1,500,000,000 to $2~000,000~000Often called the breadbasket of the world. Kansas is by far the nation's leading wheat state! producing one-fifth of the nation's crop, nearly all of it hard winter wheat. In addition to wheat the state's leading crops include sorghums, corn, oats, barley, alfalfa, hay, flax, soybeans, potatoes, sugar beets, apples and other fruits. The total annual value of farm crops in the second half of the 20th century exceeded $500,000,000. Livestock, dairy products and poultry had an additional value of about $1,000,000,000. There are excellent herds of purebred cattle. Agriculture is varied and highly diversified in the eastern half of the state.

Industry. — Since 1940, the state has industrialized at a rapid rate and industrial paychecks have been the largest single source of income. The state's 3,250 plants turn out thousands of products from glass fibres to aircraft; these plants employ nearly 130,000 persons. At the top of the list of payrolls is transportation equipment, followed by meat products, machinery, printing and publishing, chemicals, petroleum and coal products, fabricated metals, stone, clay and glass, dairy products and grain milling. Two of the newer industries are cellophane and chemical fertilizers.

Minerals. — Mineral production in Kansas is increasing, with the state eighth in the nation at mid-20th century. There are about 20 basic minerals in production. Petroleum is the state's greatest mineral asset; annual production in the second half of the 20th century was approximately 124,000,000 barrels. Kansas has a number of large oil refineries. Gas production exceeds 550,-000,000,000 cu.ft. annually; the largest production is in the Hugoton field. The state has 14,765 mi. of pipelines to carry oil and gas. Other valuable mineral products include salt, cement, stone, sand, gravel and clay products.

Transportation and Communications. — Sixteen .companies operate 8,700 mi. of rail service. Four cities (Hutchinson, Kansas City, Topeka and Wichita) have Civil Aeronautics administration (CAA)-operated airport traffic control systems. Major commercial airlines serve the state which ranks high in private ownership of airplanes. Kansas City, Leavenworth and Atchison are served by barge lines in the Missouri river. Kansas is well supplied with the means of communication; about 300 weekly and 50 daily newspapers are published. These are supplemented by about 50 radio stations and a dozen television stations.

Trade and Finance. — Retail, wholesale and service industries employ about 200,000 persons per year. There are more than 25,000 retail and 4,200 wholesale establishments. In addition to the many national and state banks and several trust companies, Kansas also has numerous building and loan associations and home-o ned insurance companies.

See also Index references under "Kansas" in the Index volume.

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See *Kansas Historical Quarterly, Kansas Magazine* and "Directory of Interesting Facts" prepared by the secretary of state in 1958. Current statistics on production, employment, industry, etc., may be obtained from the pertinent state departments; the principal figures, together with the current history, are summarized annually in the *Britannica Book of the Year,* American edition. (A. B. SR.)

KANSAS CITY, a city of eastern Kansas, U.S., and the seat of Wyandotte county, is located on the eastern boundary of the state at the confluence of the Kansas (Kaw) and Missouri rivers. Only the state line separates the city from Kansas City, Mo., and there is no apparent division between the two areas. Much of the city is built on hills and bluffs overlooking the Kansas river, which in its flow from the southwest approximately bisects the urban area. It is the eastern terminus of the Kansas turnpike, a state toll road.

The city is the site of a large proportion of the heavy industry of the Kansas City metropolitan area and is a leading meat-packing centre. Important manufactures include chemicals, paper goods, automobiles, railroad cars, petroleum products, casting and foundry materials and dairy and agricultural commodities. Pop. (1960) 121,901; for comparative figures *see* table in KANSAS: *Population.* (For metropolitan area *see* KANSAS CITY, MO.)

History. — Kansas City has not grown in a regular pattern. The city is a consolidation of small towns, many of which sprang up as the result of the rapid development of the area as a livestock and meat-packing centre after the American Civil War. In 1843 an educated tribe of Wyandot Indians, who had come to the region from Sandusky, O., founded the original settlement within the city's boundaries on land purchased from the Delaware Indians. With the opening of large-scale white settlement in the territory after the passage of the Kansas-Nebraska act (1854). the Wyandots sold the site to a town company, which laid out Wyandotte (initially called Wyandott) in 1857. By the mid-1850s, the transfer points for overland trade to the west had

moved up the Missouri river to the Missouri-Kansas border and the quiet Indian village was quickly changed into a thriving river town. A short distance north, a group of free-state leaders in 1856 founded the town of Quindaro on the east bank of the Missouri river. The town was intended to serve as a free-state port to compete with proslavery river towns. For two years, the widely advertised town grew rapidly and constituted a rival to Wyandotte. But Quindaro's prosperity declined during the Civil War; the town's business houses were abandoned and the community was eventually absorbed through natural growth of Kansas City.

Wyandotte, officially incorporated as a city on Jan. 29, 1859, was the site during July of that year of the writing of the Kansas constitution under which the territory entered the Union early in. 1861 (see KANSAS: History). In 1863 the town was selected as the eastern terminus of the Cnion Pacific, Eastern division (later the Kansas Pacific), the first transcontinental railroad. After this decision, the town temporarily boomed. Community leaders predicted that Wyandotte would eclipse its larger rivals, Leavenworth, Kan., and Kansas City, Mo., and would eventually become the metropolis of the lower Missouri river valley.

This hope proved illusory. In order to make connection with projected lines into central and southern Kansas, the Hannibal and St. Joseph railroad, the 'first line to reach the western border of Missouri, decided in 1866 to support the building of a branch from Cameron, Mo.. to Kansas City, Mo., and to bridge the Missouri river at the latter point. This decision assured that the Missouri town would become the area's railroad centre and the dominant regional city: at the end of the Civil War, vast numbers of Texas cattle were driven northward to railheads on the Kansas Pacific for shipment eastward and it quickly became a major marketing and reshipment point. During the late 1860s and early 1870s. stockyards and meat-packing plants were built on the bottom lands between Wyandotte and Kansas City. Mo. Although the business operations accompanying this trade were concentrated in Missouri, much of the physical development occurred on the Kansas side of the line. Over 62% of the land on which the stockyards are built, for example, lies within the boundaries of Kansas City, Kan.

As population poured into the area, efforts were made to develop systematically the land lying near railroads. In 1869. the year the Hannibal and St. Joseph bridge across the Missouri was opened to traffic, a section of land between the Kansas river and the Missouri state line was platted as Kansas City, Kan. The town was incorporated three years later. A settlement called Armstrong developed on a hill south of Wyandotte. An industrial district, Armourdale, named after the meat-packing firm, was laid out north of the Kansas river in 1880 by a group of Boston investors important in the Hannibal and St. Joseph railroad and in the organization of the stockyards. South of the river. Argentine grew up around the Santa Fe railway shops and yards and became the site of a smelting plant. After several years of agitation, Wyandotte, the largest of the communities, Armourdale, Kansas City and Armstrong combined as a first-class city on March 6, 1886, and took the name Kansas City. At the time of incorporation, the city had a population of 21,299. By 1910, with the annexation of Argentine, the population had grown to 82,331. Rosedale, a second town south of the river, was annexed in 1922. Because much of this urban development occurred in low land along the Kansas river: Kansas City has been subject to serious floods. Particularly destructive were those of 1903 and 1951.

Population Characteristics. — During the latter part of the 19th century, European immigrants were attracted to the city by the prospect of employment in packing plants and other manufacturing establishments. Accordingly, the city has a greater proportion of foreign-born and first-generation Americans than does the metropolitan area. Partly because of the effect of the "great exodus" into Kansas from the south during the late 1870s, Negroes constitute about 20% of the population of the city. Yearly per capita income and the median value of individual homes is significantly lower in the city than in the urban area as a whole. It has been argued that the Missouri city leaders have deliberately followed the policy of trying to confine heavy industry across the state line as a means of insuring that Kansas City, Mo., will retain the desirable features of a primarily mercantile community.

Administration. — With few architecturally significant buildings and with much of its central business district located along a wide main street (Minnesota avenue), Kansas City in appearance is little like its more cosmopolitan Missouri neighbour. Still, Kansas City leaders have had little success in their struggle to emphasize the separate identity of their city in the metropolitan area. It is frequently confused with the Missouri city.

Recreational and Educational Facilities. — Kansas City has a number of parks and several auditoriums, including that of the municipal memorial building, which seats 4,000. There are two junior colleges, Donnelly, a Roman Catholic coeducational college founded in 1949, and the Kansas City, Kansas Junior College, a municipal institution opened in 1923. The University of Kansas medical school is located there. (C. N. GL.)

KANSAS CITY, a city of western Missouri, U.S., on the Missouri river, at the mouth of the Kansas (locally, the Kaw), is the heart of a metropolitan area composed of Jackson and Clay counties in Missouri and Johnson and Wyandotte counties in Kansas, as defined by the census bureau. Other cities in the metropolitan area are Kansas City, Kan., (*q.v.*), separated from the Missouri city only by the state line; Independence, Mo., (*q.v.*) and North Kansas City, Mo. The population of the standard metropolitan statistical area in 1960 was 1,039,493 and of the city 475,539. (For comparative population figures see table in MISSOURI: Population.)

In the city. diversified terrain has made possible an extensive park system and drives of unusual beauty, notably Cliff drive. 3.5 mi. long. The downtown section was occupied originally by high bluffs and deep ravines, which were graded and filled. West of this high land, along the Kansas river, is a low, level tract, occupied chiefly by railway yards, stockyards, wholesale houses and manufacturing establishments. North and east are Missouri river valley lands, which have grain elevators as well as yards and factories. Northeast of the business section, in the bend of the Missouri opposite the mouth of the Kansas, lies the municipal airport.

History. — The first pioneer settlement within the present city limits was established in 1821. A second settlement was made in 1831. This became the town of Westport in 1834 and for a time seemed destined to become the dominant city of the locality. It was a rival of Independence in the Santa Fe trade and succeeded to most of it after the floods of 1844 destroyed the Independence landing. Westport, incorporated in 1857, continued as a corporate entity until near the turn of the century when it was merged with Kansas City. Lots were surveyed in 1838 for the town of Westport Landing, which eventually grew into Kansas City. The town of Kansas was incorporated in 1850. Chartered as the city of Kansas in 1853, rechartered in 1875, it adopted new charters in 1889, 1908 and 1925. Kansas City assumed its present name with the 1889 charter.

Before 1850, what is now Kansas City was practically the exclusive eastern terminus for western and Santa Fe trade. Whiskey, groceries, prints and notions were sent to Santa Fe; wool, buffalo robes, dried buffalo meat, Mexican silver coin. gold and silver dust and ore came in return. During the American Civil War Independence and Westport were scenes of battles. There was no fighting in Kansas City but its trade went to Leavenworth, protected by a Federal army post and a quiet frontier. After the war, Kansas City declined as a trading centre until the coming of railroads assured its resurgence On Sept. 25. 1865. the first railroad reached Kansas City from St. Louis. Finally, in 1869, a railroad bridge across the Missouri assured predominance over Leavenworth and St. Joseph.

The population of Kansas City grew from 4,418 in 1860 to 55,-785 in 1880. By 1900 it increased almost threefold and between 1900 and 1920 almost doubled Between 1930 and 1940 it decreased slightly but after 1940 continued to increase.

Government. — Under the fifth charter, adopted Feb. 24, 1925. and subsequent amendments. the city is under a council-manager form of government. The city council has nine members, elected for four years. including the mayor as president. The council ap-

points the city manager, clerk, auditor and street railway commissioner. The mayor appoints the board of park commissioners and other citizen boards and commissions. The city manager is the chief administrative officer. The police department is under the direction of a board appointed by the governor of Missouri with the mayor as chairman ex officio. The municipal court forms the judicial branch of the government.

The water plant, completed in 1928, is owned by the city. All other public utilities are under private ownership. The municipal auditorium, completed in 1936, seats a total of 24,000 persons in 32 separate units. The skyscraper city hall was dedicated in 1937. Quality Hill project, started in 1950, was the first urban redevelopment project in the state.

Commerce, Industry and Transportation. — Kansas City is the seat of the Federal Reserve bank of the tenth district. In the 20th century it has become an increasingly important manufacturing city. Its economic life is closely linked with that of its neighbouring cities, especially Kansas City, Kan. (*q.v.*). Greater Kansas City ranks among the first in the nation in hard wheat, stocker and feeder, cash wheat and primary wheat markets; in vending machine production and farm equipment distribution; as a sorghum grains market and futures wheat market; in total flour production, grain elevator capacity, automobile assembly, wheat flour production; and as a railroad centre. The city is also important as a cattle market; as a correspondent banking centre; in the apparel industry (women's wear); and in the printing trade.

Union (passenger) station, built in 1915 at a cost of over $6,000,000, is one of the largest in the country; it is operated by the Kansas City Terminal Railway company, which also operates freight terminals. The Kansas City Connecting railroad transfers livestock between all roads and the stockyards. The 4,590 ac. Mid-Continent International airport, one of the largest municipal airports in the nation and designed primarily for jet aircraft began operation in 1955. In 1952 the Southwest Trafficway was completed, the first link in a $150,000,000 expressway plan; the second link, Sixth Street Freeway, was completed in 1958. Three railroad and six highway bridges span the Missouri; across the Kaw valley extends a great interstate viaduct.

Because of its central position Kansas City is an advantageous meeting place for national conferences. The American Royal Livestock show, held each October, is one of the largest horse and livestock exhibitions in the nation. The Kansas City Livestock exchange is the largest livestock exchange building in the nation.

Education and Cultural Activities. — The Kansas City public school system includes a junior college, opened in 1915, and there is a large parochial (Roman Catholic) school system. The University of Kansas City, a private institution founded in 1933, is in the centre of a south-side area which includes Rockhurst, a Roman Catholic college for men, founded 1910; the College of St. Teresa, a Roman Catholic college for women, founded in 1916; the Conservatory of Music, founded in 1907 and joined with the University of Kansas City in 1959; the Kansas City Art Institute and School of Design (private, 1884); the Nelson-Atkins Art galleries, the Midwest Research institute and Linda Hall library, a privately endowed library of science and technology. Also in the city are National college (Methodist, 1899); the Police academy, serving the greater Kansas City area; three Protestant theological seminaries, Nazarene (1945), Midwestern Baptist (Southern Baptist convention, 1959) and National Methodist (1958); and other institutions for professional and technical training. Kansas City museum is in the north part of the city. The public library maintains several branches. A downtown library and board of education building was completed in 1960. Citizen support maintains the Philharmonic orchestra, established in 1933, and the Lyric theatre, established in 1958. The leading newspaper is the *Kansas City Star*, established in 1880 and employee-owned.

Parks and Recreation. — Of more than 50 parks comprising over 3,000 ac., the most notable is 1,300-ac. Swope park, which contains a zoo and an outdoor theatre. In Oct. 1958, the Volker Memorial fountain, the work of Carl Milles, was unveiled at the south end of a vista looking north to the Nelson galleries. Noteworthy also is the Liberty memorial, facing Union station across a plaza to the south. It was completed in 1525 at a cost of $2,500,000, raised in one week by popular subscription. The city supervises 50 playgrounds and operates several full-time community centres. (C. ST.)

KANSK, a town in Krasnoyarsk *krai* of the Russian Soviet Federated Socialist Republic. U.S.S.R., stands on the left bank of the Kan river, a tributary (not navigable) of the Yenisei, where it is crossed by the Trans-Siberian railway 135 mi. E. of Krasnoyarsk city. Pop. (1959) 74,000. Founded in 1640 as a Russian fort. it is now the centre of a developing coal field and has cotton, timber and food industries. (R. A. F.)

KANSU (KAN-SU SHENG), a province of northwest China. Area 137,104 sq.mi.; pop. (1953) 12,928,102, (1957 est.) 12,800,000. The west section of the Great Wall divides southeastern Kansu from former Ningsia, which after incorporation extended the boundary of Kansu as far as Outer Mongolia. In 1958 Ningsia was separated from Kansu province and became autonomous.

Physical Characteristics. — The province lies in the most active earthquake zone of China. Kansu may be divided into three major divisions: (1) the desert area about 300 mi. wide by 600 mi long reaching from the west arm of the Yellow river loop to Sinkiang Uigur Autonomous Region; (2) southeast Kansu east of this arm of the river; and (3) the Ho-hsi or Kansu corridor in which the line of oases at the base of the northern Tibetan mountain front provides the historic and productive route of communication betneen eastern China and central Asia. The first major division forms parts of the Mongolian plateau and runs without a break into the Gobi desert. Into its western half flows two rivers that irrigate extensive oases, the Etsin Gol and the Su-lo Ho or Shuleh river. Most of the plateau here lies between 3,000–5,000 ft. above sea level. Separating the Mongolian plateau division from the Ho-hsi corridor are the Ho-li, Lung-shou and Ma-tsung mountains rising up to almost 10,000 ft. in the Ho-li range. These and the Ch'i-lien (Nan Shan) to their south which rises to over 13,000 ft. run more or less parallel, and sandwich between them the corridor of 10–40 mi. width that for a distance of over 600 mi. runs at elevations around 4,000–5,000 ft. The corridor begins west of the Wu-hsiao mountains which divide it from east Kansu with its chief city and provincial capital of Lan-chou (Lanchow; *q* v.). The Wu-hsiao and the Ho-lan Shan (sometimes erroneously, Alashan mountains) along the west bank of the Yellow river farther north form the divide between internal and external drainages. East Kansu may be divided into five subregions, including the Tsinling Shan (*q.v.*) adjoining the Szechwan border. the southwest grasslands of the Hsia Ho, the rolling loess hills of the Wei Ho (river) drainage facing Shensi province, and the Yellow river oases running in a line northward and known as the Ningsia plain.

Climatically, there is a gradual change from a monsoon regime in east Kansu to the continental desert regime in the northwest. In parts of east Kansu rainfall may reach 20–25 in. but west of the Ho-lan Shan and Wu-hsiao Shan in most areas it is under 4 in. Sandstorms during the winter sometimes last two to three days. Streams are few in the northwest and disappear into the desert or end in salt lakes after irrigating oases lands. Even in east Kansu stream beds are often dry during the winter half of the year. Winters are bitterly cold.

Production. — Kansu's agriculture is mainly extensive, with spring wheat and millet predominating. Tobacco and cotton are cash crops. In the 19th century frequent uprisings by the Moslem section of the population caused much land abandonment. The Chinese Communist regime made great efforts to restore production on arable land, with emphasis on irrigation, especially in the Ho-hsi corridor. The largest of the many irrigation projects in the 1960s were those involving the damming of the Yellow River. at the Liu-chia (Liukia) gorge and at Tsingtung (Ching-tung) south of Wu-chung. Livestock raising is carried on in the more arid areas and is significant in the former Ningsia province.

Kansu is rich in minerals. Coal is found south of Lan-chou and at Shih-tsui-tzu on the east slope of the Ho-lan Shan; salt and soda in the Ningsia desert lakes. In the late 1950s a major iron ore find on the flanks of the Ch'i-lien Shan provided the basis for

important iron and steel developments at Lan-chou.

One of the most significant minerals, however, is oil, developed first in the Yü-men district in the 1930s on a modest scale, and expanded greatly in the 1950s by the Communist regime. Oil is brought by railroad from Yii-men and Chiu-ch'iian to Lan-chou for refining.

The Yellow river still continues to provide primitive transport by oxskin and sheepskin rafts and shallow-bottomed junks but the important means of transportation are the highways that enter the province from the Wei river valley and along the Yellow river to funnel into the great Northwest highway at Lan-chou, and the railroad paralleling this highway running northwestward from the Lung-hai railroad at T'ien-shui to eastern Turkestan. Petroleum and mineral exploitation and the railroad have brought industrial progress to Kansu, centred especially at Lan-chou. Many industrial projects were in operation in the province in the 1960s, including textile mills, power stations, printing presses, marble quarries; also food processing, fertilizer, cement, steel and paper plants.

History.——From the earliest times the Chinese have had contact with central Asia and the west via the Ho-hsi corridor which was the route of the "Silk Road." From the 3rd century B.C. when China organized a defensive scheme against the steppe nomads and connected the various sections of the Great Wall to its terminus at the Jade Gate (Yii-men), the function of the Ho-hsi corridor as the key to the defense of the western borderland became increasingly conspicuous. Under strong dynasties, notably those of the Han and T'ang, the corridor was kept open and military colonies were placed at strategic oases. At such times, too, new influences such as Buddhism and Nestorian Christianity reached China via this route, while overland trade reached even Rome. Tun-huang is the site of famous caves preserving ancient paintings and sculptures. *(See* CHINESE PAINTING.) During times of disintegration and weakness in China, however, numerous Tatar invasions penetrated along the route, and Lan-chou became a base for conquering China.

Chinese now constitute nearly 90% of the population. The remainder comprises mixed ethnic groups resulting from the movements of peoples. These include Mongols in the northwestern desert steppes, Tibetans in the southwestern uplands and Moslems in the corridor and east Kansu. The latter are largely T'ung-kan (Dungan) of Chinese origin, and have often risen in rebellion and devastated China's northwest. The Communist regime has organized the various ethnic groups into so-called autonomous areas (*chou* and *hsien).* (H. J. Ws.)

KANT, IMMANUEL (1724–1804), German philosopher, one of the most important thinkers of modern times, the exponent of "critical," "transcendental" or "formal" idealism, was born at Konigsberg in East Prussia on April 22, 1724. According to his own account his grandfather was an emigrant from Scotland. His father was a master saddler of very small means, his mother an uneducated woman remarkable both for her character and for her natural intelligence. Kant went to school at the Collegium Fridericianum in Konigsberg, founded at the end of the 17th century to bring up children on the basis of Pietism; and the influence of the Pietists was very strong in his early years. He proceeded to the University of Konigsberg in 1740.

Little reliable information is available about the content of the education that he received either at school or at the university, but he probably owed his wide knowledge of Latin literature to the former, and he was certainly introduced at the latter both to the fashionable philosophy of Leibniz and of Christian Wolff and to the ideas of Sir Isaac Newton. His earliest work, *Thoughts on the True Estimation of Living Forces,* written in 1746, was concerned with a point in Leibniz' physical theory. After leaving the university Kant earned his living for several years as a private tutor before returning to Konigsberg as a *Privatdozent* (official but unsalaried lecturer) in 1755. He taught in this capacity for the next 15 years, lecturing on a wide range of subjects, scientific and mathematical as well as philosophical, and managing in this way to gain an income which was at best extremely modest. In 1770 he was elected professor of logic and metaphysics in Königsberg, a post in which he was active until a few years before his death.

Kant's literary activity in the '60s *(see* below) brought him into contact with most of the best-known thinkers in Germany, including Moses Mendelssohn and J. H. Lambert; and he also made the acquaintance of J. G. Hamann and J. G. Herder during these years.

The publication of the *Critique of Pure Reason* in 1781, an event long awaited in learned circles, produced mixed results. Many were enthusiastic for the new doctrines and flocked to Konigsberg to hear their author; teachers of philosophy in universities all over Germany began to call themselves Kantians. But there were others who said, to Kant's great chagrin, that there was nothing in the *Critique* which could not be found in Leibniz, and yet others who, under the influence of the growing romantic movement, argued that Kant had failed to understand himself and had not pushed his arguments to their logical conclusion. For about 15 years after 1781 Kant was vigorously engaged, both publicly and privately, in explaining exactly what he meant and in defending himself against misunderstanding: we owe the *Prolegomena* of 1783, the attack on J. A. Eberhard in 1790 and the abortive essay on the "progress of metaphysics in Germany" (1793), among other productions, to this activity.

In the '70s and '80s Kant had been on excellent terms with the Prussian authorities (the first *Critique* was dedicated to Baron von Zedlitz, minister in charge of education, who in 1778 had offered him a professorship at Halle), but in his declining years he fell foul of them. This was because of his writings on religion, which were altogether too rationalistic for orthodox taste. The publication of *Religion Within the Bounds of Mere Reason* in 1793 was followed next year by a *démarche* from the authorities in which Kant was informed that the king, Frederick William II, had long observed with displeasure how he was "misusing" his philosophy to the "distortion and depreciation of many leading and fundamental doctrines of holy writ and Christianity" and was required to give an undertaking not to lecture or write further on religious subjects. Kant duly gave the undertaking, but privately interpreted it as being a personal promise to the king, from which he felt himself to be released on the latter's death in 1797. At all events he returned to the forbidden subject in his last major essay, *The Conflict of the Faculties (Der Streit der Fakultaten),* in the following year.

Kant's physical and intellectual powers declined rapidly toward the end of his life. Physically he had always been feeble (he was only just over five feet in height and hollow chested), but by dint of imposing a stern regimen on himself he avoided major illnesses and did not need regular medical attention until within a year or two of his death. Nor did his weakness interfere with his social life: until late in life he had a circle of friends with whom he dined regularly and conversed, so it is said, according to rule. He died on Feb. 12, 1804, about two months before his 80th birthday.

Kant's general intellectual and cultural interests were lively and wide ranging, if not entirely catholic in scope. He admired English literature of the Augustan period as well as Voltaire and Rousseau and his own German contemporaries, though his taste was for prose and satire rather than for imaginative writing (he once refused a professorship of poetry). Although he never journeyed far from Konigsberg, never even visiting other parts of Prussia, he was a great reader of books of travel. He took little interest in the fine arts, but followed political developments with close attention, greeting the French Revolution with enthusiasm. He had a relatively low opinion of women and did not marry.

KANTIAN PHILOSOPHY

Kant's philosophical career may be divided into three main periods. The first, commonly called his "precritical" period, ran from 1747, the year in which he published his *Thoughts on the True Estimation of Living Forces (Gedanken von der wahren Schätzung der lebendigen Krafte),* to 1770, when he became professor in Konigsberg. During these years Kant produced a num-

ber of studies which won him attention among philosophers in his own country, but remained unknown outside it. Looking back on these studies now, we can see many of his later ideas in the making, but there is little trace of the constructive genius which shaped his final system.

In the 20 years from 1770 to 1790, which form the second period in his career, Kant mas occupied with the elaboration and exposition of his mature philosophy. He published virtually nothing between 1770 and 1781, but from 1781 onward he poured out an astonishing series of original works on a wide variety of philosophical topics, including the *Critique of Pure Reason (Kritik der reinen Vernunft,* 1781; 2nd rev. ed., 1787), *Prolegomena to Every Future Metaphysics (Prolegomena zu einer jeden künftigen Metaphysik,* 1783), *Growzdwork of the Metaphysic of Morals (Grundlegung zur Metaphysik der Sitten,* 1785), *Metaphysical Foundations of Natural Science (Metaphysische Anfangsgründe der Naturwissenschaft,* 1786), *Critique of Practical Reason (Kritik der praktischen Vernunft,* 1788) and *Critique of Judgment (Kritik der Urtheilskraft,* 1790). These works brought him immediate fame in Germany and presently stirred interest in France and England, though it was long before their meaning was properly appreciated there (the first English translation of the *Critique of Pure Reason* dates from 1838).

With the publication of the third *Critique* Kant's main philosophical work was done; his third period, from 1790 to his death, was devoted partly to the elaboration of subjects not previously treated in detail, partly to replies to criticisms and to the exposure of misunderstandings. In his last years he was engaged on a work which might have amounted to a major restatement of his philosophical views, but which he did not live to complete. The chief published writings of this period are *Religion Within the Bounds of Mere Reason (Die Religion innerhalb der Grenzen der blossen Vernunft,* 1793), the essay on *Perpetual Peace (Zum ewigen Frieden,* 1795) and *Metaphysic of Morals (Die Metaphysik der Sitten,* 1797).

Kant's mature philosophy is often known as the critical philosophy. He himself contrasted "criticism" with the "dogmatism" that he imputed to previous philosophers; "dogmatism" being understood here as the presumption that the human intellect can arrive at important truths by pure thinking, without first undertaking a critical survey of its own resources and powers. Kant also described his position as one of transcendental, critical or formal idealism; his use of the first of these terms, with his statement that the *Critique of Pure Reason* laid the foundation for a complete "transcendental philosophy," explain why he was sometimes referred to by later writers as a "transcendentalist" *(see* TRANSCENDENTALISM).

Precritical Writings.—A modern commentator has described Kant's procedure as "taking the form of a continuous discussion with Leibniz." Whether or not this description is appropriate to the works of his maturity, it certainly fits his precritical writings. The prevailing philosophy in the German universities in the half century or so after Kant's birth was the philosophy of Leibniz as systematized and popularized by Christian Wolff (1679–1754) and by Alexander Gottlieb Baumgarten (1714–62). Leibniz' works as we have them now were not fully available to these writers (even the *Nouveaux essais sur l'entendement humain,* his commentary on Locke, did not appear until 1765), and the Leibniz they presented was extravagantly rationalistic, abstract and cut and dried. Yet he remained, even in this distorted version, a powerful figure, and the main efforts of independent thinkers in Germany at the time were devoted to examining his ideas. This applies to C. A. Crusius and to J. H. Lambert, the most gifted of Kant's philosophical contemporaries. as much as to Kant himself.

Kant's philosophical position in his early years is best characterized as that of a critical follower of Leibniz (in the general sense of the word critical). Accepting the main outlines of Leibniz' system, he nevertheless had many doubts about its details. His doubts, moreover, sprang largely from his admiration for Newton, to whose writings he is said to have been introduced by his Konigsberg teacher Martin Knutzen. Newton was important for Kant at this period as much for the philosophical implications of his ideas as for their scientific content; for Kant as for Voltaire he represented English empiricism as against continental rationalism. But it would be quite wrong to think of Kant as taking only an amateur interest in scientific developments. The truth is, of course, that the dividing line between philosophy and physics or "natural philosophy" was by no means sharply defined at the time and was often crossed and recrossed by the same people. Many of Kant's first essays would be classified as scientific by modern standards, but he never kept his philosophy and his science in watertight compartments. The same, for that matter, had been true of Leibniz himself.

Something must here be said about the main philosophical problems with which Kant was concerned in his precritical writings. First, there was the problem of philosophical method. The Leibnizians held that philosophy should model itself on mathematics; ideally, it would consist of a chain of demonstrated truths whose first premisses were self-evident. In his *Inquiry Into the Distinctness of the Principles of Natural Theology and Morals (Untersuchung über die Deutlichkeit der Grundsatze der natürlichen Theologie und der Moral,* 1764) Kant trenchantly exposed the deficiencies of this view. Mathematics proceeds from definitions which are arbitrary and by operations which are clearly and sharply defined; it has, moreover, the advantage of being able to exhibit its concepts in concrete form. In contrast with this, philosophy deals with concepts which are already given. "though confusedly or insufficiently determined." Philosophers cannot begin with definitions, or they will remain shut up in the circle of words; at best they can arrive at them as an end product. Philosophy has to analyze and clarify where mathematics can proceed synthetically.

Secondly, there was the problem of causality, which arose for Kant in the first place as a problem about the status of Leibniz' "principle of sufficient reason." Wolff had attempted to deduce this principle from the logical principle of contradiction, thus carrying rationalism to extreme lengths. Kant, under the influence of Crusius, was already expressing doubts about this move in 1755; in a later essay, published in 1763, he pointed out clearly the differences between opposition as treated in logic and opposition as encountered in things. The relation of causality could not be reduced to the logical relation of ground and consequent. Closely connected with this second problem was a third, which concerned the question of existence. The ontological argument *(see* THEISM), which sought to prove God's existence by pure logic, was the exact counterpart of Wolff's identification of real with logical relations and had of course been accepted by Leibniz. In *The Only Possible Ground of Proof for a Demonstration of God's Existence (Der einzig mogliche Beweisgrund zu einer Demonstration des Daseins Gottes,* 1763) Kant exposed the fallacy of this argument by pointing out the difference between existential and attributive statements.

Finally, we may mention the problem of the nature of space, over which there had been a direct clash between Leibniz and Newton. Kant discussed this repeatedly in his precritical writings, deciding eventually that Leibniz' view that space is "an order of co-existences," and that spatial differences are hence capable of statement in conceptual terms, is untenable.

Some indication of a possible alternative of Kant's own to the Leibnizian standpoint can be gathered from two works written at the end of the period—the curious *Dreams of a Spirit-Seer (Traume eines Geistersehers,* 1766) and the inaugural *Dissertation (De mundi sensibilis atque intelligibilis forma et principiis,* 1770). The former is an examination, in the context of an inquiry into the spiritualist claims of Emanuel Swedenborg, of the whole notion of a world of spirits. Kant's general attitude to this notion seems at first to be entirely skeptical (the influence of Hume is more apparent here than in any previous work of his), but closer reading suggests that this impression is misleading. Kant is not so much arguing that the notion of a world of spirits is illusory as insisting that we have no insight into the nature of such a world—a conclusion which has devastating implications for metaphysics as Leibniz conceived it. Metaphysicians dream just as spiritualists dream, but that is not to say that their dreams are necessarily

empty: there are already hints that moral experience can give content to the idea of a *mundus intelligibilis* (intelligible world), Rousseau (whom Kant is known to have greatly admired) acting here as a counterinfluence to Hume.

The implicit dualism of the Dreams is made explicit in a bold, not to say incautious. manner in the Dissertation of 1770, the argument of which rests on a wholly un-Leibnizian interpretation of the distinction between sense and understanding. Sense is not, as Leibniz had supposed. a confused form of thinking but a source of knowledge in its own right, though the objects known through the senses are still described in Leibniz' term as "appearances." They are appearances because all our sensing is conditioned by the presence in our sensibilities of the forms of time and space, which are not objective characteristics or frameworks of things but "pure intuitions." But though all knowledge of things sensible is thus of phenomena, it does not follow that we know nothing of things as they are in themselves. Certainly we have no intuition of (direct insight into) an intelligible world, but the presence in us of certain "pure intellectual concepts" ("possibility, existence, necessity, substance, cause" are given as examples) enables us to attain some descriptive knowledge of it. By means of these concepts we can arrive at an "exemplar" which is "the common measure of all other things as far as real. This exemplar—*Perfectio Noumenon*—is perfection either in a theoretical or in a practical sense. In the former, it is the supreme being, God; in the latter, moral perfection" (Dissertation, sec. 9).

The pure intellectual concepts here mentioned, to which there was no counterpart in the Dreams, are of course the ancestors of the later categories. But to see the very different role which Kant was to assign them in his mature thinking we must turn to consider the *Critique* of *Pure Reason*.

The Critique **of** Pure Reason.—The simplest way of characterizing the contents of the Critique of Pure Reason is to say that it is a treatise about metaphysics; it seeks to show the impossibility of one sort of metaphysics and to lay firm foundations for another. The metaphysics which Kant criticized is that practised by Leibniz and Wolff, the complaint against whom is, briefly, that they assume that the human intelligence has powers which a careful examination shows to be nonexistent; they believe that it is possible for men to arrive by pure thought at truths about en-, tities which in their nature can never be objects of experience, and for this belief there are no proper grounds. It is true that explanations can be offered to show why metaphysics as thus understood is what Kant calls "a natural disposition of human reason": for example, by pointing to the special interest which we all, as moral agents, have in establishing that the world of the scientist is not the only world, and by mentioning the encouragement that metaphysicians have derived from the success of mathematicians in using purely rational procedures. But to explain here is not to justify. Metaphysics regarded as the speculative study of things suprasensible, or as demonstrated doctrine about God, human freedom and immortality, is a sham; and its place must be taken by something more modest, though nonetheless important: an inventory of those rational principles which men necessarily employ within experience rather than outside it.

This question of metaphysics seems, on the face of it, highly academic, but Kant himself did not see it in that light. He thought it important to get rid of the metaphysics of his predecessors not merely because it involved wasted intellectual effort, but for more serious reasons. Metaphysical arguments might have little popular effect, but the endless disputes between metaphysicians on such subjects as the existence of God and the immortality of the soul were, even so, more than unedifying. They served indirectly to undermine the beliefs of the common man and so to encourage "materialism, fatalism, atheism, free-thinking, fanaticism and superstition."

Only a thorough investigation of the powers of reason, such as he proposed to undertake, could show the emptiness of these disputes and at the same time reveal the true basis on which popular belief rested. It is important in this connection to emphasize that, far from wanting to undermine belief in God or in the spiritual nature of man, Kant was anxious to strengthen it. But he thought the way to do so was not to offer one more set of supposed speculative proofs; it was to show the impossibility of any speculative proof or disproof in these fields.

Because of his insistence on the need for an empirical component in knowledge and his antipathy to speculative metaphysics, Kant has sometimes been presented as a positivist before his time. It was on these lines, for example, that the German neo-Kantians tended to interpret him. But it is not difficult to show that the interpretation is mistaken. Not only did Kant propose to put metaphysics "on the sure path of science," rather than to destroy it; he was prepared also to say (Critique of Pure *Reason*, and ed., p. 856) that he "inevitably" believed in the existence of God and in a future life and was certain that nothing could shake those beliefs. But he added that this was not logical but moral certainty and rested on the "subjective" ground of moral sentiment. A man should say not "It is morally certain that there is a God," but only "**I** *am* morally certain . . ."; for except to a person who felt the force of moral scruples the statement could have no real significance.

Synthetic A *Priori* Truths.—In order to bring the problem of metaphysics more sharply into focus, Kant introduced the now celebrated distinction between synthetic and analytic judgments. An analytic judgment he defined as a statement whose predicate-concept was "contained in" its subject-concept, or again as a statement whose truth was guaranteed by the principle of contradiction. Analytic truths were in this way one and all necessary or a priori Synthetic judgments, by contrast, were such that their truth or falsity could not be determined by purely logical considerations; reference to something further was needed to decide whether or not they were valid. In most cases this something further was simply fact, but in the case of a small but all-important group it was not. For there were certain judgments which were at once synthetic and a priori; it was into this class, indeed, that metaphysical judgments must be supposed to fall. Hence the importance of asking the question "How (*i.e.*, under what conditions) are synthetic a priori judgments possible?" Only by answering this could we hope to decide "what and how much understanding and reason can know apart from all experience."

The problem of synthetic a priori judgments arises, according to Kant, in three fields, namely mathematics, physics or science of nature, and metaphysics; and the three main divisions of the *Critique,* "Transcendental Aesthetic," "Transcendental Analytic" and "Transcendental Dialectic" (the latter two being grouped together under the heading "Transcendental Logic"), deal respectively with these. In each case Kant explains what he takes to be the facts by linking them up with necessary features of the human cognitive apparatus. He accounts for the synthetic a priori judgments of mathematics by arguing that mathematics has a necessary connection with space and time, which are a priori forms of human sensibility; for those of "pure physics" (as he calls it) by tracing them to our possession of categories or pure concepts of the understanding; and for those of metaphysics by connecting them with a further group of a priori concepts which he calls ideas of reason.

But the three cases are not precisely parallel, for while Kant is in no doubt that we have synthetic a priori knowledge in mathematics and physics, he holds that the reverse is true of metaphysics as hitherto conceived. His procedure in the "Dialectic" is accordingly to argue that ideas of reason are misused by metaphysicians and to show in detail how this misuse leads to error. He does, however, indicate at the end of this section a way in which even these concepts can be given a positive use, though it turns out to be very different from that to which previous philosophers had put them.

The "*Transcendental* Analytic."—It will not be possible in this short survey to consider the grounds on which Kant maintains that space and time are a priori intuitions conditioning whatever is apprehended through the senses rather than concepts arrived at by reflection on experience, or to discuss the philosophy of mathematics which he believes to be bound up with this view. Of the first we need remark only that it leads, in the Critique as in the Dissertation, directly to the conclusion that all the

objects of sense experience are "appearances" as opposed to things in themselves; of the second, that, whatever its initial attraction, it is presented altogether too impressionistically to satisfy a modern student of the subject. But the argument of the "Transcendental Analytic" cannot be dealt with in this summary fashion. This is, by universal agreement, the most crucial as well as the most difficult part of the Critique; in it Kant both deploys his main case against traditional metaphysics and expounds the alternative which he proposes to put in its place.

The central concept of this section is the concept of a category (a term which Kant took over from Aristotle), and its main argument can be stated in the following terms. To account for what knowledge we have and, in particular. to account for our scientific knowledge, we need to recognize the existence and operation of concepts of a special sort.

These concepts are not so much read out of experience as read into it and, for that reason, are described as pure or a priori as opposed to empirical. But they differ from empirical concepts in something more than their origin. Their whole role in knowledge is different, for whereas empirical concepts serve to correlate particular experiences and so to bring out in a detailed way how experience is ordered, categories have the function of prescribing the general form which this detailed order may be expected to take. As "concepts of an object in general," to use Kant's own description of them, they are of a different logical type from concepts of particular kinds or characteristics of objects. They belong, as it were, to the framework of empirical knowledge rather than to its substance, and without them the whole building would, in Kant's view, collapse.

It may help in this connection to notice that, while the Kantian categories are rather obviously descendants of the innate ideas of Descartes and Leibniz, the account that Kant gives of them is altogether more subtle than that put forward by any innate-idea theorist. The Cartesian innate ideas were nonempirical in a singularly crude way: they were supposed to be literally present in the mind at birth and to be a source of knowledge of material truths which would otherwise not be available to us. Kant himself in the Dissertation, while denying that his pure intellectual concepts were literally innate, had nevertheless assigned them a sornewhat similar role: by means of them we were to attain some sort of knowledge of a nonsensible world. But, as his correspondence during the 1770s makes clear, he had soon asked himself how he could guarantee that such concepts have any objective reference and had concluded that the question could be answered satisfactorily only if they could be shown to play a part in empirical knowledge. The part that he found for them was that of supplying the framework of ultimate presuppositions inside which empirical questions were posed or, in his own terminology, of conferring "objectivity" on the data of the senses.

There is another respect in which Kant disagreed with his predecessors over this matter. Previous rationalists had been all too apt to assume that the mind has a power of intellectual intuition; *i.e.,* that it is a source of knowledge on its own account. But Kant was convinced that the human intellect is a discursive instrument, which can come into operation only when it is supplied with material on which to work. The functions of the intellect were, in his view, essentially formal; its prime business was to conceptualize the data of the senses. The subject of knowing itself—the "unity of apperception" which preceded experience as its necessary condition—had no content of its own. But this innovation set Kant a special problem about the categories, a problem which must be taken into account if we are to understand what would otherwise be a singularly obscure part of his work. Since there is no such thing as intellectual intuition for human beings, the core of the categories can be nothing but pure logic; the fundamental ideas which they represent cannot be other than purely logical ideas. But if this is so, me are left asking how they can be used to say anything specific—in Kant's own language, how they can be shown to have any real "sense and significance."

Kant sought to solve this problem by his doctrine of schematism. He argued that the categories are not empty because in the case of each one of them we can point to a "pure schema," a "transcendental time-determination" (to use his own mystifying phrase), which helps us to apply it. Thus to the pure category of ground and consequent there corresponds the schema succession of events in time according to a necessary rule, and the latter is, Kant believes, a sort of phenomenal counterpart of the former, which enables us to bring it down to earth and to make a concrete use of it. Except in conjunction with schemata, categories are abstract and indeterminate—a point which was not appreciated hy writers like Leibniz when they tried to use them to determine the characteristics of "things in general."

Categories are indispensable for objective knowledge, but the sole knowledge that they can give is of objects of possible experience. The whole argument of the "Analytic," negative and positive, comes out in this statement. Negatively, the restriction of categories to experience involves the condemnation of many famous metaphysical arguments such as the argument to God's existence as a first cause; positively, the need for a priori concepts to underly the presuppositions of experience means that the place of the old transcendent metaphysics can be taken by a new metaphysics of experience. Whether metaphysicians can find much consolation in this substitute is another matter. but at any rate it is the sole substitute (apart from "pure practical belief") to which in Kant's view they are entitled.

Kant is not content to work out the argument here summarized in general terms. Professing to have not merely a list of categories but a complete list. he proceeds to offer proofs of the principles to which they severally give rise. The argument starts in each case from some feature of experience and attempts to discover its necessary condition. "The possibility of experience" is the "third thing" which, in the case of this group of synthetic a priori judgments, "mediates" subject and predicate and so can be appealed to to decide their validity.

Kant himself seems to have thought that such a "transcendental" argument, from a fact to its necessary condition. was an important discovery of his own; he distinguished it both from the "dogmatic" proofs of his predecessors (who in his view had argued "from concepts"; *i.e.,* by arbitrarily adopting certain notions and working out their implications) and from inductive arguments. Unlike the latter, transcendental arguments were alleged to lead to conclusions which were certain and incorrigible. Unfortunately Rant did not explain how they could achieve such a result; he did not make clear how we could know what was *the* necessary condition (or set of necessary conditions) of a fact. His failure to deal with this question is part of a wider failure to discuss the nature and conditions of philosophical assertions—a problem which clearly arises in his work but to which he nowhere gave sufficient attention.

Despite this general defect, there is much that still deserves careful study in Kant's treatment of his individual principles. For instance, the subsection entitled "Anticipations of Sense-Perception" (in ch. 2 of book ii) raises interestingly the question why we suppose that every quality must be present in a determinate and measurable degree. The "First Analogy," in the following subsection "Analogies of Experience," attempts to find an empirical use for the old metaphysical concept of substance, interpreted here as the permanent which must be thought of as underlying change. The "Second Analogy." which is often said to contain Kant's "answer" to Hume. offers a parallel treatment of the concept of cause in which the emphasis on the notions of precedence and succession in time is very much in Hume's spirit even if some other aspects of the argument are not.

In a provocative discussion of real possibility (in the subsection "Postulates of Empirical Thought") Kant tells us that concepts like precognition and telepathy, although they involve no formal contradiction, "cannot be based on experience and its known laws" and "without such confirmation are arbitrary combinations of thoughts which can make no claim to objective reality" (op. *cit.,* p. 270). It would be interesting to know why he felt so sure about this. The significant point is, however, not where Kant drew the line between what is and what is 'not really possible, but the fact that he had no doubts that such a line could be drawn. The bold and clear-cut—or, as critics would have it. extravagant and schematic—character of his philosophical thinking is nowhere

more evidently displayed.

Some later writers have argued that, in drawing up his detailed list of categories and principles. Kant was unduly dependent on Newton; it is a common complaint that he set out to find the presuppositions of experience and found only the presuppositions of Newtonian physics. The passage just mentioned might be cited in support of this view. The charge is certainly not without foundation, but it can all the same be pressed too far.

Kant was at least encouraged in his belief that certain principles were synthetic a priori by finding counterparts to them in the Newtonian scheme; but despite his description of the principles of the understanding as belonging to pure physics he clearly thought of them as something wider. The very fact that, after completing the *Critique of Pure Reason,* he went on to write a further work, *Metaphysical Foundations of Natural Science,* in which he tried to apply the results of the *Critique* to the sphere of physics proper, shows as much. What he attempted in the *Critique* was to find out what was involved in any objective knowledge of things in space and time. But the distinction between everyday and scientific knowledge of the world mas perhaps not so clear to him as it should have been.

Theoretical and Practical Reason: the "Dialectic" and Ethics. — The "Transcendental Dialectic," which follows the "Analytic" in the *Critique of Pure Reason,* introduces a fresh type of a priori concept, that of an idea of reason, and the reader might expect to find in it an independent discussion of the problem of metaphysics. In fact, however, virtually all the main conclusions of this part of Kant's work could be anticipated, given the argument of the "Analytic." The "Dialectic" consists, in effect) of criticism of a number of detailed metaphysical positions in the light of Kant's discussion of the nature and significance of the categories. The only concept brought into play which was not present in the "Analytic" is the concept of the unconditioned, and this is, in truth, the one and only idea of theoretical reason in the technical sense of that term.

Reason, according to Kant, seeks for the unconditioned or absolute in three distinct spheres. First, in the sphere of psychology, it seeks for an absolute subject of knowledge. Second, in the sphere of cosmology, it seeks for an absolute beginning of things in time, for an absolute limit to them in space and for an absolute limit to their divisibility; it further seeks for an absolute beginning to the causal series. Finally, in the sphere of theology, it seeks for an absolute condition for all things. Relying mainly on the results of the "Analytic," but introducing a series of independent arguments in the chapter called "The Antinomy of I'ure Reason," Kant has no difficulty in showing that the effort is in every case doomed to failure. The metaphysical "sciences" of rational psychology, rational cosmology and natural theology, familiar to Kant from the text of Baumgarten on which he had to comment in his lectures, thus turn out to be without foundation.

This, however, is not the end of the matter. Although it is impossible to make a constitutive use of ideas of reason, they can, Kant thinks, be employed regulatively to guide the operations of the understanding. The absolute regarded as a suprasensible object may be unattainable, but even on the theoretical plane the urge to reach it can be converted into something healthy, namely an impulse to push empirical inquiries to the greatest possible extent and to introduce the maximum amount of system into our knowledge. Further, the failure of reason to make good its claims in its theoretical capacity does not entail that those claims be entirely abandoned. Practical (moral) reason can take over where theoreticai reason fails. This does not mean: as Kant carefully explains in the *Critique of Practical Reason (see* book ii of that work), that morality gives us insight into the suprasensible. From the cognitive point of view the ideas remain as empty as before; it is only in moral contexts (because we see that they are bound up with the fulfillment of certain injunctions which are morally incumbent on us) that they can be said to have significance, and even here it cannot be said that the ideas are made comprehensible in any very palpable sense. To bring them home to ourselves we have to interpret them in familiar terms, a process which involves the use of symbols and analogies; thus we can make sense of the idea of God by thinking of God's relation to the world on the analogy of a father's relation to his children. But it is idle to suppose that by this means we extend our knowledge in the strict sense. As Kant says in the *Prolegomena,* sec. 58, "by means of this analogy we are left with a concept of the highest being adequately determined *for us,* although we have left out everything that could determine it absolutely and *in itself."* Fortunately, however, this is not only all that we can attain, but also all that we need. Insight into the true nature of things might well have destroyed the essential value of moral actions, for if we had it "God and eternity in their awful majesty would stand unceasingly before our eyes" and "most actions conforming to the (moral) law would be done from fear, few would be done from hope, none from duty" *(Critique of Practical Reason,* in the *Werke,* Berlin ed., vol. v, p. 148).

The *Critique of Practical Reason* is the standard source book to be consulted not merely for Kant's views on the subject just discussed but also for his ethical doctrines. The earlier *Groundwork of the Metaphysic of Morals* is a shorter and, despite its title, more readily comprehensible treatment of the same general topic; there are no differences of importance in the views expressed in the two works. Both differ from the *Metaphysic of Morals* in that they deal with "pure" ethics and try to elucidate basic principles, whereas the later work is concerned with applying what they establish in the concrete, a process which involves the consideration of particular virtues and vices and the foundations of law and politics.

There are many points of similarity between Kant's ethics and his theory of knowledge. Just as the distinction between sense and intelligence is fundamental for the argument of the *Critique of Pure Reason,* so is that between the inclinations and moral reason for his ethical writings. And just as the nature of the human cognitive situation is elucidated in the first *Critique* by reference to the hypothetical notion of an intuitive understanding, so is that of the human moral situation made clear in Kant's ethics by reference to the notion of a "holy will." For a will of this kind there mould be no distinction between reason and inclination; a being possessed of a holy will would always act as it ought. It would not, however, have the concepts of duty and moral obligation, which are in point only where reason and desire find themselves opposed. In the case of human beings the opposition is continuous, for man is at once flesh and spirit; the influence of Kant's religious background is here at its clearest. Hence the moral life is a continuing struggle in which morality appears to the potential delinquent in the form of a law which demands to be obeyed for its own sake, a law, however, whose commands are not issued by some alien authority, but represent the voice of reason which the moral subject can recognize as his own.

The notions of duty, the moral law, the categorical imperative and the autonomy of the will are thus all bound up together and constitute the distinctive concepts of Kantian ethics. It is perhaps worth emphasizing that there are many systems of ethics in which these concepts have no such importance, or indeed are altogether absent. In the system of Aristotle, for example, the moral problem is conceived as one of training the inclinations, which are looked on as natural to human beings, in such a way that in the end the person concerned will engage by second nature in those activities which lead to true happiness. Both the optimism and what may be called the humanism of this view are quite foreign to Kant. Doing what we ought and pursuing happiness are for him two entirely different things, even though it is true that all men seek their own happiness. There is a world of difference between the commands or laws of morality, which demand to be obeyed for their own sake, and counsels of prudence, which, like rules of skill! are only '!hypothetical imperatives" or in other words have authority only because they lead to a certain end and for persons who seek that end.

Kant is often described as an ethical rationalist, and the description is clearly not wholly inappropriate. Nevertheless it should be recognized that his rationalism here, as in theory of knowledge, is rationalism with a difference. He never espoused the full-

blooded rationalism favoured by some of his contemporaries as well as by some more recent philosophers, the sort of view which claims that reason has insight into a world of values or can intuit the rightness of this or that moral principle. Practical, like theoretical, reason was for him essentially formal rather than material. This is why Kant put such stress on his first formulation of the categorical imperative, "Act only on that maxim through which you can at the same time will that it should become a universal law." Lacking any insight into the moral realm, men can only ask themselves whether what they are proposing to do has the formal character of law: the character, namely, of being the same for all persons similarly circumstanced.

It is true that Kant proceeds in the *Groundwork* from this formulation to others which are on the face of things less formal; he introduces the notions of man as an end in himself and of a kingdom of ends in which the moral agent is at once subject and lawgiver to give body to his moral thinking. But, rightly or wrongly, he believed that these notions could be derived from that of the moral law and its formal characteristic, impartiality. He certainly never suggested that they were attained through rational intuition.

In his applied ethics Kant has been criticized as unduly rigorous; his views on capital punishment, in particular, are often cited as those of a reactionary. It is true that he was a stern moralist, keenly aware himself of the call of duty and never tired of reminding others of their moral responsibilities. But that he was such should be ascribed neither to moral priggery nor to inhumanitv: it was rather that he saw an essential connection between moral freedom and human dignity and constantly wished to bring the connection home. As some of his occasional writings show, he was certainly not insensitive to the extent to which external factors beyond their control shape men's actions and inhibit their moral effort. But he thought all the same that, normally at any rate, men have the power to lift themselves out of their natural environment and adopt the moral point of view; and he believed that they were most truly themselves when they did so. This belief is the key both to his moral philosophy and to his general philosophical outlook.

The Critique of Judgment. — The *Critique of Judgment* is perhaps best regarded as a series of appendices to the other two *Critiques* and, especially, to the *Critique of Pure Reason.* It treats in detail a number of topics on which Kant had touched in passing in his earlier works and takes up others which naturally connect with what is there discussed. This description must not, however, be taken as indicating that the third *Critique* is of minor importance, for despite its scholastic exterior it is among the most original and instructive of all Kant's writings.

The work falls into two main parts, called respectively "Critique of Aesthetic Judgment" and "Critique of Teleological Judgment," and these are preceded by a long introduction. The first part discusses the concepts of the beautiful and of the sublime and the logical status to be assigned to judgments which employ these predicates. The second part treats of the concept of teleology as applied to objects in nature; it contains a careful analysis of the notion of a "purpose of nature" or organism and a discussion of the status of the teleological principle and its place in natural science and theology. The introduction not only attempts to relate these apparently unconnected topics by arguing that the concept of purposiveness is involved in each case, but also finds a further use for that concept in yet another field, that of the everyday search for scientific laws.

The purposiveness considered in the introduction is "logical purposiveness," by which is meant the characteristic that nature has which makes it such that we can have scientific knowledge of it. Kant professed to have proved in the first *Critique* that whatever falls within experience will stand under the categories. But the order imposed by use of the categories is entirely general; if scientific knowledge is to be possible we need something more specific. We need for science not merely concepts but an interconnected system of concepts, and it is not obvious that nature will accommodate us by providing material which can be fitted into such a system.

In the first *Critique,* as we saw, Kant connected the demand for system with the faculty of reason and carefully underlined that the "maxims" to which this faculty gives rise do not have the constitutive status of principles of the understanding. In the *Critique of Judgment* he develops what is essentially the same view, but now speaks of "reflective judgment" where he had previously spoken of reason. Reflective judgment, he says, proceeds in its search for particular laws on a principle which it cannot strictly prove, but which is all the same indispensable to it: the principle that it will be able to make sense of its experience in detail. The bearing of this doctrine on what later philosophers have called the problem of induction should be obvious.

In the "Critique of Aesthetic Judgment" Kant moves on to consider "aesthetic purposiveness." He begins from the paradox that judgments which ascribe beauty at once, unlike mere judgments of taste, lay claim to general validity and yet cannot be said to be cognitive. When we say that something is beautiful we are not predicating an objective characteristic of it (as is shown by the fact that we regard it as a question of feeling rather than of argument), and yet we expect other people to agree with our judgment. The explanation of the paradox, according to Kant, is as follows. When we contemplate an object and find it beautiful there is a certain harmony between our imagination and our understanding, and of this we are aware in the form of the immediate delight that we take in the object. Imagination grasps the object and finds it orderly and yet is not restricted to any definite concept; in such a case it is as if we were always on the point of expressing the order in conceptual terms and never have to do so. We impute the delight that we feel to others because it springs from the free play of our cognitive faculties, which may be supposed to be the same in all men.

Kant's remarks on the sublime are of more specialized interest, and we may pass on at once to the last main topic of the *Critique,* the concept of teleology in nature. Kant's powers of subtle and incisive analysis are perhaps nowhere seen to better advantage than in his treatment of this concept. He explains at the outset how the problem is set, not by the fact that some things serve the purposes of others, but by the existence of things whose parts are reciprocally means and ends to each other, namely organic bodies. In dealing with these bodies we cannot be content with merely mechanical principles, for it is too much of a coincidence to suppose that they might have been produced by the ordinary play of mechanical forces. Yet if we abandon mechanism and take the term *Naturzweck* (purpose or end of nature) literally, we seem to be implying that the things to which it applies must be the work of some supernatural designer and so to be passing from the sensible to the suprasensible in a way which was expressly forbidden in the *Critique of Pure Reason.*

Kant's solution of the difficulty is again to have recourse to reflective judgment. We cannot avoid using teleological language if we are to take proper account of natural phenomena, but we must not press it. Organisms must be thought of as *if* they were the product of design, but that is by no means the same as saying that they *are* deliberately produced. For that matter, even the more moderate way of speaking is not entirely satisfactory, for, after all, living things are only something like products of art; they do not literally answer that description. Kant even suggests, in a passage of remarkable insight, that mechanism and teleology stand in this respect on the same footing: both belong to reflective judgment and have regulative rather than constitutive force. But elsewhere he makes his preference for the mechanical model clear enough. We feel satisfied with the thought of nature as a machine, because we know what machines are, have insight into their workings and can produce them ourselves. To produce living things in the same sort of way (*i.e.,* artificially) is, by contrast, "infinitely" beyond our powers. Hence teleology forms no "proper part of theoretical natural science," but "is relegated to theology by way of a propaedeutic or transition" *(Critique of Judgment,* sec. *68).*

Other Philosophical Writings. — Kant's philosophical output from 1781 onward was not only enormous in bulk, but also extraordinary in its range, and the above account is necessarily confined only to his best-known works. To fill it out adequately we should

need to go into his detailed contributions to philosophy of science (in the *Metaphysical Foundations* of 1786), to philosophy of history (especially in his essay *Idea for a Universal History,* that is, *Idee zu einer allgemeinen Geschichte in weltbürgerlicher Absicht,* written in 1784), to philosophy of religion (in *Religion Within the Bounds of Mere Reason)* and to the philosophies of law and politics in the late *Metaphysic of Morals.* In all these fields Kant's views had decisive importance for later developments of the subject. Indeed. the very names "philosophy of science." "philosophy of religion." etc., derive from his critical approach.

Neither these works nor the contents of Rant's lectures, published toward the end of his life, on anthropology (philosophical psychology), logic, physical geography and pedagogics can be treated here, but a word must be said of the *Opus Postumum,* the treatise whose preparation occupied Kant's last years and the fragments of which fill the two final volumes of the great Berlin edition.

It should be said at once that this is not so much an unfinished work as a series of notes for a work which was never written, the interpretation of uhich is naturally somewhat conjectural. Kant seems to have begun by asking himself whether the argument of the *Metaphysical Foundations,* in which, starting from the categories and a single empirical concept, he had claimed to deduce the basic lans of physical science. could not be taken a stage further. He now thought it possible to construct a priori not merely the general outline of a science of nature, but a good many of its details as well; and, making extensive use of the concept of the ether, he tried to elaborate the construction in detail Constructivism of this sort was, as the early works of Fichte and Schelling nitness, very much in the air at the time; and in carrying out this "transition" from "metaphysics" to physics Kant may only have been wanting to show that there was nothing in the new fashion nhich was not already implicit in his own uork But there is some evidence that he was attempting something more ambitious, namely a reconstruction of his whole theory of knowledge on lines which would make the "transition" plausible. H. J. de Vleeschauwer has gone so far as to say that the *Opus Postumum,* if completed, would have amounted to a third edition of the *Critique of Pure Reason,* an edition in which the cautious empiricism of the original statement of Kant's viens would have been modified on the lines of, though somewhat differently from. those folloned by Schelling in his *System of Transcendental Idealism* (1800). Whatever the truth on this point. however, Kant never got as far as writing out his ideas in continuous form, and we must judge him not by these fragments but by the magnificent series of uorks that he put out when his powers were at their height.

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KANYA KUMARI, a district in the extreme south of Madras. India. Pop. (1961) 996.852: area 643 sq.mi. It comprises the predominantly Tamil-speaking areas formerly in Kerala, which were transferred to Madras in 1956 and reconstituted as the Kanya Kumari district with its headquarters at Nagercoil. It is an important Christian centre, closely linked with British missionary effort, and contains the Scott Christian college and the Salvation Army hospital. The temple of Kanya Kumari lies on the Cape Comorin headland *(see* COMORIN. CAPE), and the beach sands there contain rich deposits of ilmenite and monazite. (G. KN.)

KAO-HSIUNG (Japanese TAKAO), the second largest city and leading port (pop. 1956; 365,159) and one of two heavy industrial centres of Formosa, is on the southwest coast of the island in an area of relatively low precipitation and irrigated agriculture.

Settled originally by Chinese from Kwangtung and Fukien, Kaohsiung was developed by the Japanese (1895–1945) as a manufacturing centre and port. Its development was accelerated by Japan's expansion toward southeast Asia and its position as chief outlet for Formosa's exports. After World War II Kao-hsiung came to handle over half of the island's imports and nearly three-fourths of its exports, chiefly salt, sugar. cement, and canned pineapple.

Kao-hsiung's industries are concentrated in two areas, one near the port, the second in the northern periphery. They produce textiles, aluminum, machine tools, ceramics, chemicals, lumber, printed matter, cement, petroleum products, fertilizers and foodstuffs. Kao-hsiung also is a fishing centre, handling about 10% of

the Formosa marine production. (N. S. G)

KAOLACK, a town in the Republic of Sénégal, west Africa. the headquarters of a *cercle* (district), lies on the right bank of the Saloum river, 95 mi. E.S E. of Dakar. Pop. (1958) about 45,222 (commune). Kaolack is a river port nith an important export trade in peanuts and is linked by rail with Guinguinéo (13 mi. N E.) on the metre-gauge Dakar-Niger railway. The administrative quarter lies between the station and the river, with an African market place and European trading stations. The African houses, mostly low and square and built of banco (clay) or wood with thatched roofs, extend along the river bank. The town has no industries but salt pans nearby yield 20.000–30,000 tons annually. Kaolack is the centre of the important Tijania Muslim brotherhood, whose great mosque of Al Hadj Ibrahima Niasse is just outside the town. (J. D.)

KAOLIANG: ***see*** SORGHUM.

KAOLIN (CHINA CLAY) is an essential ingredient in the manufacture of whiteware (china) and porcelain and is widely used in the making of paper, rubber, paint and many other products. The word kaolin is derived from the Chinese Kau-ling ("high ridge"), a hill east of Fou-liang (Kingtechen), where the earliest samples of clay sent to Europe were obtained by a French Jesuit missionary, François Xavier Dentrecolles (1662–1$41). The samples represented materials used by the Chinese in the manufacture of porcelain. Some of the earliest discoveries of china clay or kaolin in Europe were at Aue. near Schneeberg in Saxony, and at St. Yrieix, near Limoges in France. In England it was discovered in Cornwall about 1750 by William Cookworthy of Plymouth, and the area near St. Austell has continued to supply much of the world's kaolin. Since then in Europe important deposits of kaolin have been developed in Bohemia, in the Zettlitz area, and in Brittany in France. In the United States many states contain kaolin, but the best-known deposits are in the Carolinas. Georgia. Florida, Tennessee and Kentucky. Good-quality kaolin has also been found in many other parts of the world; *e.g.,* Brazil, Italy, Australia and South Africa.

Physically kaolin is a white. soft powder consisting of crystals and groups of crystals nhich range in diameter from about 0.2 to 50 μ (one micron = one-thousandth of a millimetre). These crystals are mostly small particles of the mineral kaolinite (*q.v.*) which may be observed in the electron microscope as masses resembling small books, hexagonal in shape. Each leaf of every book is composed of a succession of parallel layers of oxygens, silicons, oxygens and hydroxyls, aluminums and hydroxyls arranged in a definite structural pattern. The chemical formula of kaolinite is $Al_2O_3.2SiO_2.2H_2O$. It has a theoretical composition of 46.3% silica; 39.8% alumina; 13.9% nater. Some few kaolins also contain particles of the mineral halloysite ***(see*** CLAY AND CLAY MINERALS), which has the same proportions of aluminum and silicon as kaolinite. but frequently somewhat more water. Also halloysite has a slightly different atomic structure which causes the mineral to occur in tubular particles.

Kaolin as found naturally usually contains varying amounts of small particles of other minerals such as muscovite. quartz, feldspar and anatase (TiO_2). In addition the crude kaolin is frequently stained yellowish by iron hydroxide pigments. Often it is necessary to bleach the clay chemically to remove the iron pigment and to wash it with water to remove the quartz. mica. feldspar and anatase in order to prepare the kaolin for satisfactory commercial use.

When kaolin is mixed with water in the range of 20% to 35% it becomes plastic, *i.e.,* it can be molded under pressure. and the shape is retained after the pressure is removed. With larger percentages of water, the kaolin forms a slurry or watery suspension. The amount of water required for plasticity varies with the size of the kaolinite particles and also nith certain chemicals which may be present in the kaolin or added to control plasticity. The viscosity and other properties of kaolin suspensions also vary with the size of the kaolinite particles and with the presence of certain chemicals. With some sodium polyphosphate dispersing agents, fluid slurries containing at least 70% kaolin can be prepared.

Uses.—Approximately one-half of the kaolin produced in the world is used in the filling and coating of paper, In filling, the kaolin is mixed with the cellulose fibre and forms an integral part of the paper sheet to give it body, colour, opacity and printability. In coating, the kaolin with an adhesive (starch, casein, rubber) is plated on the surface from a slurry to give gloss, colour, high opacity and greater printability. Kaolins for paper must be grit free and yield the above properties. By wet classification, some kaolins for coating are prepared so that most of the kaolinite particles are less than two microns in diameter.

Kaolins are used extensively in the ceramic industry where their high fusion temperature and white burning characteristics make them particularly suitable for the manufacture of whiteware (china), porcelain and refractories. The absence of any iron, alkalies or alkaline earths in the structure of kaolinite confers upon it these desirable ceramic properties.

In the manufacture of whiteware the china clay or kaolin is usually mixed with approximately equal amounts of fine quartz (silica) and feldspar, and a somewhat smaller amount of a plastic light burning clay known as ball clay. These other components are necessary to get proper properties of plasticity, shrinkage, vitrification, etc., for forming and firing the ware. Sometimes other constituents may be added, for example, small amounts of phosphates in bone china to attain high translucency in the fired product. Kaolin is generally used alone in the manufacture of refractories.

Substantial tonnages of kaolin are used for filling rubber to improve its mechanical strength and resistance to abrasion. For this purpose, it must be extremely pure kaolinite and exceedingly fine grained (mostly particles of less than one micron). Kaolin is also used as an extender and flattening agent in paints. It is frequently used in adhesives for paper to control the penetration into the paper. Kaolin is an important ingredient in ink, organic plastics, some cosmetics and many other products where its very fine particle size, whiteness, chemical inertness and absorption properties give it particular value.

It has been shown that the surface of the kaolinite particles may be reacted with various organic compounds. This property makes kaolin particularly valuable as filler in many organic compounds, and further permits kaolinite particles to be coated mith various organic molecules so that the particles become an integral part of the organic material.

Also, cracking catalysts which have outstanding heat stability have been made from kaolin for the production of gasoline.

Modes of Occurrence.— There are two modes of occurrence of kaolin. The so-called primary type of which the Cornwall, Eng., deposit is an example is formed in place by the alteration, primarily of the feldspar minerals, of a granitic igneous rock. The alteration may be due to the action of water from the surface seeping downward through the granite. or more often by the action of hot water rising from great depths in the earth's crust and penetrating the granite. The reaction is essentially that the potassium, sodium and/or calcium are leached from the feldspars, and the mass is hydrated and recrystallized into the sheet structure of kaolinite or the tubular structure of halloysite, depending on the composition of the granite and the conditions of alteration. Kaolins in France, Germany, North Carolina and elsewhere have had this mode of origin.

The parent granite for primary kaolins must not contain appreciable amounts of minerals containing iron and magnesium as their alteration will produce detrimental compounds. The altered igneous rock may contain quartz and unaltered feldspar along with the kaolinite in proportions suitable for whiteware manufacture. This is called china stone. Usually the kaolinite is separated from the other components by allowing the nonkaolinite minerals to settle out of an aqueous suspension. The kaolin is collected from the suspension by filtration or by spray drying.

The second mode of occurrence of kaolin is in sedimentary beds which may be 20 ft. or more in thickness and have areal dimensions of many thousands of square yards. In such deposits, kaolinite from a primary source has been transported by streams and then deposited in lakes or lagoons. Sedimentary kaolins often contain particles of quartz and mica, pigmentary iron hydroxyls

and organic material mixed with the kaolinite. In some deposits the amount of nonkaolinite is so small that it is difficult to postulate the sedimentary conditions which could have permitted the formation of such high-purity kaolinite. For many ceramic uses, no purification of sedimentary kaolins is required, but for use in paper and other purposes, the clay must be washed and bleached chemically to purify it.

The kaolin deposits in Georgia, South Carolina and Florida are examples of sedimentary kaolins. Other examples are to be found in France, South Africa and elsewhere.

Ball clays are sedimentary kaolins with unusually high plastic and colloidal properties. These properties are imparted to the clay because the kaolinite particles are relatively poorly crystalline and because of the presence of considerable organic material and/or small amounts of other clay minerals such as illite and montmorillonite. Ball clays are extensively produced in England, Germany and in the United States in Kentucky, Tennessee and Mississippi. *See* CHINAWARE; POTTERY AND PORCELAIN.

See also references under "Kaolin" in the Index volume.

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(R. E. GM.)

KAOLINITE, a hydrated aluminum silicate having the formula $(OH)_8Al_4Si_4O_{10}$. This mineral was so named by S. W. Johnson and T. M. Blake in 1867 from kaolin, or china clay, of which it is the principal ingredient. It occurs in scales which are crystalline but too minute for identification under the microscope. The silvery-white powder. found at Almwich in Anglesea, is described by A. Dick as consisting of minute hexagonal plates, with perfect basal cleavage, which belong to the monoclinic system.

Kaolinite is a decomposition product of many aluminum silicates (*e.g.,* albite, orthoclase, leucite, scapolite, beryl and topaz); but all large deposits of china clay are due to the decomposition of orthoclase feldspar in granite. Ball clay or potters' clay and common clay are also mixtures of kaolinite, or lithomarge and halloysite, which are compact or colloidal varieties of the same mineral, with other decomposition products and minerals which resist weathering such as quartz, muscovite and other silicates. *See* CLAY AND CLAY MINERALS; KAOLIN. (F. H. HA.)

KAPITZA, PETER LEONIDOVICH (1894–), Russian physicist, noted for his research in magnetism and low-temperature physics, was born in Kronstadt, Russia, on June 26, 1894. His father and grandfather were tsarist generals. He attended Petrograd Polytechnical institute. where he remained as a lecturer until he went to England in 1921 to study at Cambridge. He worked there with Sir Ernest Rutherford and became assistant director of magnetic research at Cavendish laboratory in 1924. In the following year he was made a fellow of Trinity college; in 1929 he was elected to the Royal society, the first foreigner in 200 years to become a member; and in 1930 he was named Messel research professor by that society, which had the Mond laboratory built especially for him in 1933.

In 1934 Kapitza went to the U.S.S.R. for a professional meeting. as he had done before, but did not return. In 1935 the Mond laboratory was sold to the Russian government at cost and transported to the Institute for Physical Problems of the Academy of Sciences in Moscow, of which Kapitza became director.

At Cambridge Kapitza's contributions included the development of means of producing extreme magnetic fields and of a technique for liquefying helium by adiabatic expansion which eliminated the presence of liquid hydrogen characteristic of previous methods. Later he invented a turbine for producing large quantities of liquid air cheaply, and his work in the production of liquid oxygen and its application to industry was of great importance, particularly to Soviet steel production. Universities on four continents awarded him honorary degrees, and he received various prizes from the Soviet government, awards from western professional societies and a host of other honours.

Kapitza's research in atomic structure caused much speculation among western scientists on his contribution to the Soviet atomic and hydrogen bombs, but reliable information was not available. In 1955 it was announced that he was engaged in the earth satellite program.

KAPLAN, MORDECAI MENAHEM (1881–), U.S. religious leader. founder of the Reconstructionist movement in Judaism, was born in Swenziany, Lithuania, on June 11, 1881, the son of a rabbi. He went to the U.S. at the age of 8, was graduated from the City College of New York in 1900, from Columbia graduate school in 1902 and mas ordained the same year at the Jewish Theological Seminary of America. In 1909 he became principal of the teachers institute there, a position he held until he was made dean in 1931. He also taught homiletics and philosophy.

In 1916 he organized the Jewish centre in New York, the first synagogue centre in the U.S. In 1922 he organized the Society for the Advancement of Judaism. The Reconstructionist movement dates from the publication of Kaplan's book *Judaism* as *a Civilization* (1934). The next year *The Reconstructionist,* a biweekly periodical under Kaplan's editorship, appeared. Reconstructionism is a school of thought which interprets Judaism as a civilization with the Jewish religion as its core. It emphasizes the necessity of a Jewish community, organized across lines of difference, which will encourage participation in Jewish life.

Kaplan also wrote *Future of the American Jew* (1948) and *Judaism in Transition* (1936) and was co-editor of *The New Haggadah for the Pesah Seder* (1941) and *Sabbath Prayer Book* (1945). The latter, in which Kaplan denied that the Jews are a chosen people and that the Torah is divinely inspired, caused a controversy in which the Union of Orthodox Rabbis issued a proclamation of excommunication, their first, against him. In 1957 he was honoured on his 75th birthday by a banquet which over a thousand Jewish leaders attended, and was presented with $250,000 for the endowment of Jewish Reconstructionist foundation.

KAPODISTRIAS, IOANNIS ANTONIOS, COUNT (GIOVANNI ANTONIO CAPO D'ISTRIA) (1776–1831), Corfiote statesman, prominent first in the Russian service and later in Greece during the war of independence, son of Count Antonio Capo d'Istria, was born in Corfu (then still under Venetian rule) on Feb. 11, 1776, and studied at Padua. In 1803 he became secretary of state in the "septinsular republic" of the Ionian Islands, then in effect under Russian protection after a short-lived French occupation (1797–99); in 1807, while organizing their defense against Ali Pasha, he met Theodoros Kolokotronis and other future chieftains of the war of independence. On the return of the French to the islands after the peace of Tilsit, he saw in Russia the best hope for the Orthodox Christian subjects of Turkey and, in 1809, accepted a career in the Russian foreign service. After three years his grasp of Balkan affairs earned him a post with the Russian commander on the lower Danube; but that army soon had to march north to meet Napoleon's invasion of Russia. Attached diplomatically to the army staff during the campaign of 1813, he was chosen personally by the tsar Alexander I for a difficult mission in Switzerland, where he was praised for his conciliatory and successful mediation (1814). He did not oppose the treaty placing the Ionian Islands under the sole protection of Great Britain (which had already seized them from the French), but he later much resented the British high commissioner's treatment of the islands virtually as a colony. His antipathy was sharpened during a visit to Corfu and by a cool reception of his pleas to the cabinet during a visit to London (1819).

Between 1815 and 1821 his influence with the tsar was great, and from Jan. 1816 he was second secretary of state, sharing the conduct of foreign affairs with K. R. Nesselrode. He opposed any undue humiliation of France and expressed doubts about the tsar's Holy alliance and about Austrian policy in Italy; he was less sympathetic toward Germany, but he drafted the tsar's protest against the Carlsbad decrees. From about this time, the tsar's confidence in him was gradually undermined by Metternich, notably during the congress of Laibach when the Greek revolt (March 1821; *see* GREEK INDEPENDENCE, WAR OF) created an intolerable dilemma for a man of Greek sentiments in Russian service. Find-

ing the tsar unwilling fully to exploit a revolutionary situation which he and his minister had not planned but had partly foreseen and could not try to extinguish, Capo d'Istria withdrew in 1822 and for five years devoted himself, from his retreat at Geneva, to the material and moral relief of the Greeks. who began to see in him a potential leader. When the British statesman George Canning tried to restrain the new tsar, Nicholas I, by means of an alliance (1826–27), Kapodistrias (as he was now called) saw his opportunity and, in April 1827, was elected governor of Greece for seven years. with unwonted concord and with the support of the leading British philhellenes. Sir Richard Church and Thomas Cochrane. who were to command the Greek forces by land and sea. He was alloned to resign from the Russian service, toured Europe in search of financial and diplomatic support and landed at Nauplia in Jan. 1828.

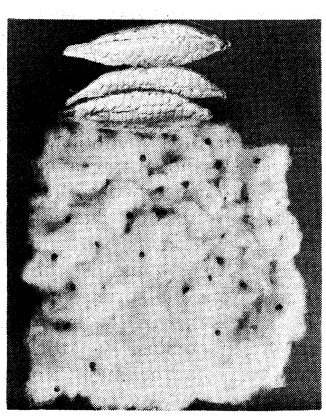
He foresaw the difficulties—a penniless government, a land still not rid of an Egyptian army and a people divided between a peasantry attached to the church and to different fighting chieftains and a limited class of more articulate men, some of whom were touched by western political ideas. Nor was it easy to satisfy the three protecting powers. Russia, France and Great Britain, each jealous of the others. His austere devotion to duty and his tenacity in making head against financial and diplomatic obstacles, won him widespread support; but his unconcealed distrust of personal and sectional rivalries among the leaders, and his promotion of Phanariote and Corfiote newcomers (including his own brothers) produced an active opposition centring in the islands and fostered by the British and French residents, who represented him as the tool of a despotic tsar. Finally, two members of the powerful Mainote clan of Mavromikhalis, resenting his treatment of the family, assassinated him on Oct. 9, 1831, as he was entering the church at Nauplia.

Kapodistrias' death was no victory for liberty; contemporary critics dwelt on his real and supposed defects but later historians stressed rather his devoted practical services to Greece in face of appalling handicaps

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(C. W. CR)

KAPOK is the name for the moisture-resistant fibres derived from the seeds of the silk-cotton or kapok tree (*Ceiba pentandra*), or the tree itself. Actually many species of the family (Bombacaceae) yield good seed fibres. some of which doubtless enter commerce as kapok. The tree is wild in the tropical American forests; it has also been widelv introduced throughout the world, and many strains or varieties selected. Kapok is reported especially abundant in second-growth African forest. and is much planted in the far eastern tropics. Normally about 90% of commercial production, several thousand tons annually, comes from the orient, especially Indonesia. about 3.000 tons of which is consumed in the United States.



BY COURTESY OF REPUBLIC OF INDONESIA INFORMATION OFFICE

FIBROUS FLOSS AND SEED CAPSULES OF THE KAPOK TREE (CEIBA PENTANDRA)

The kapok tree is large. with spreading crown, elephantine trunk and broad palm-shaped leaves. Mature trees bear hundreds of football-shaped pods filled with fibrous seeds. Fallen fruits are gathered, or they are cut donn with knives affixed to long poles. The fruits are dried, then the cottony fibre extracted by hand.

The hollow fibres are similar to such seed fibres as cotton and milkweed. They are outstanding for resiliency and buoyancy. Very impervious to water, they achieved most renown as life-preserver filling, remaining afloat for hours without appreciable absorption of water. Other uses are for insulation. especially in the less expensive sleeping bags. and as a stuffing material. The seed, after fibre divestment, can provide an oil similar to cottonseed oil. edible or used to make soap.

With development of foam rubber, plastics and synthetic fibres, kapok became less important but still continued to fill specialty uses. (R W. SY.)



EDGAR AUBERT DE LA RUE

KAPOK TREE OF MARQUESAS ISLAND

KAPP, GISBERT (1852–1922), electrical engineer, was born at Mauer, near Vienna, in 1852. His father was German and his mother Scottish. Kapp studied at Zurich, and after traveling in Europe and north Africa he took a post in 1875 with Messrs. Crompton and Company, at Chelmsford. In conjunction with Crompton, Kapp invented a system of compound winding for direct current dynamos. From 1894 to 1904 he lived in Berlin, when he was secretary of the German association of electrical engineers, lecturer at the Technische Hochschule, Charlottenburg, and editor of the *Electrotechnische Zeitschrift.*

Kapp was appointed professor of electrical engineering at Birmingham university in 1904 and retired in 1918; he died on Aug. 10, 1922. Kapp developed a dynamo which has been used to a great extent but has now been superseded by a more modern type of machine. He designed power stations and transformers and invented many laboratory methods of electrical testing.

Kapp was awarded a number of honorary degrees and other honours, including the Telford medal. He was the author of *Principles of Electric Engineering, Vector Analysis of Alternating Currents, Dynamos, Alternators and Transformers* and *Electric Transmission of Energy.*

KAPP, WOLFGANG (1868–1922), German politician, was born in New York on July 24, 1868. He pas the son of Friedrich Kapp. a national liberal member of the *Reichstag* in Bismarck's time, and grew up under the Bismarckian influences. Having held various minor official posts, he founded the agricultural credit institute in East Prussia, which achieved great success in promoting the prosperity of landowners and farmers. He was consequently in close touch with the Junkers of East Prussia and during World War I made himself their mouthpiece in an attack on Bethmann Hollweg (*Die Nationalen Kreise und der Reichskanzler* [1916]). He was also one of the founders of the "Vaterlandspartei." For a brief period in 1918 he was a conservative member of the *Reichstag.*

Kapp remained in the background until March 12, 1920, when the republican government suddenly issued an order for his arrest, which was not, however, executed. It became known that he had organized, with General von Lüttwitz and other officers and civilians. a conspiracy to occupy the government offices, and assume power in Berlin. This he actually succeeded in doing on the morning of March 13. The ministers withdrew to Dresden, and then to Stuttgart, and Captain Ehrhardt marched in from Doberitz, and occupied the government buildings. Kapp styled himself "chancellor of the *Reich,*" and appointed Luttwitz minister of war. But he had no real plans. The working classes of Berlin rendered the continuance of the Kapp regime impossible by declaring a universal strike. and on the evening of March 17 Kapp and Luttwitz fled from Berlin. Warrants were issued for their arrest. but Liittwitz disappeared completely, and Kapp eventually escaped by airplane to Sweden. In April 1922 Kapp re-

turned to Germany and was immediately arrested for high treason. but he died on June 12 before the case was heard.

KAPTEYN, JACOBUS CORNELIUS (1851–1922), Dutch astronomer, who was noted for his application of photography in astronomy, was born at Barneveld, Neth., on Jan. 19, 1851. He attended the University of Utrecht and in 1875 became a member of the observing staff of the Leiden observatory. In 1878 he was elected to the chair of astronomy and theoretical mechanics at Groningen.

Kapteyn was not the first to utilize the photographic method in astronomy, but his breadth of scientific vision and capacity for carrying through large programs gives him a classical position in the field of photographic astrometry. In conjunction with Sir David Gill, he determined the positions of more than 400,000 stars of the southern hemisphere. In a series of publications from the Groningen laboratory, Kapteyn investigated the motions and distribution in space of the stars; in the course of that work he discovered the phenomenon known as star streaming; *i.e.*, that the peculiar motions of the stars are not at random, but prefer two opposite directions in space.

Kapteyn's influence on the astronomical research of the first quarter of the 20th century was profound, and even as late as mid-century many of the investigations in the realm of the distances and arrangement in space of the stars stemmed from his work. He died at Amsterdam on June 18, 1922. (W. W. M.)

KAPURTHALA, a municipal town, district and tehsil in the Jullundur division of Punjab, India. The town (pop. [1961] 29,-288) lies 11 mi. W. of Jullundur city. It has a beautiful palace, a garden, a college affiliated to Panjab university and a hospital. The town was founded in the 11th century. In 1780 Sardar Jassa Singh conquered it and from then until 1948 it remained the capital of the princely state of Kapurthala. It is connected by rail and road with Jullundur city.

KAPURTHALA DISTRICT, with an area of 630 sq.mi. and a population (1961) of 343,775, corresponds with the former princely state. It lies to the northwest of Jullundur district mainly along the Beas river, and is predominantly agricultural. Wheat, gram, cotton and sugar cane are the major crops. Sultanpur (pop. [1961] 7.661) and Phagwara (37.943) are the other main towns in the district. Phagwara has a cotton and a sugar mill and is also a centre of trade. (O. P. B.)

KARA-BOGAZ-GOL, a gulf (*zaliv*) in the eastern littoral of the Caspian sea, is situated in the Turkmen Soviet Socialist Republic of the U.S.S.R. It is practically landlocked by sandbanks in the west, the only entry being by a narrow sound of the same name. The total area is 5,019 sq.mi. The length from north to south is 160 km (99 mi.) and the breadth from east to west 150 km. (93 mi.). The gulf is a few metres deep and the water temperature varies from 95° F. to below freezing point. The high rate of evaporation results in a constant drain from the Caspian which has a distilling effect on the latter's waters and increases the concentration of mineral salts in the gulf. These have considerable economic value, particularly sodium sulfate and Glauber's salt (mirabilite). Kara-Bogaz-Gol town, Chagali, Poselok Severnykh Promyslov Ozera Nomera Shestogo and Kizylkup are the chief extraction centres. (G. E. WR.)

KARACHAI-CHERKESS AUTONOMOUS OBLAST (KARACHAYEVO-CHERKESSKAYA AVTONOMNAYA OBLAST) forms part of Stavropol *krai* in the Russian Soviet Federated Socialist Republic. U.S.S.R. The oblast lies on the northern flank of the Greater Caucasus range. Its area (5,444 sq.mi.) extends from the broad plains and gently rolling foreland hills of the Stavropol uplands, across the Chernyye, Skalisty and Bokovoi ranges, to the main crest line. Just over the boundary at the southeast of the oblast is Mt. Elbruz, 18,481 ft. On the boundary crest itself are Mts. Dombai-Ulgen, 13,254 ft., and Gvandra, 13,068 ft., and a number of other high peaks, many of which have large glaciers. The oblast is drained by the Kuban, which rises in the Elbruz ice field, and by its tributaries, the Teberda, Aksaut, Marukha, Bolshoi Zelenchuk. Kyafar and Laba, which flqw north in deep, more or less parallel valleys and gorges. In the northeast of the *oblast* are the headwaters of the Kuma, flowing to the Caspian. The vegetation ranges in vertical zones, from feather grass steppe on the northern uplands. through deciduous and coniferous forest and alpine meadow, up to the bare rock, snow and ice of the great peaks. Soils display a similar vertical zoning. The black earths of the steppe are particularly rich in humus. The deciduous forest zone. dominated by oak, beech and hornbeam and with brown earth soils. lies between 2,300–2.600 ft. and 4,900–5,250 ft. The coniferous forest, chiefly of fir and spruce, reaches up to 6.500–7,900 ft. Climate varies greatly with relief. the mountains having long, severe winters and brief, cool summers, while the steppe areas have very hot summers, with maximum temperatures reaching 100° F. and more. Rainfall is low in the north, 20–24 in. a year, but rising to 40 in. in the mountains.

The population at the 1959 census was 277,959, concentrated mostly on the northern plains and in the valleys. About 23.6%, 65,520, were urban, living in the two towns of Cherkessk (41,000), the administrative centre (formerly known as Batalpashinsk) and Karachayevsk, together with five urban districts ("settlements of town type"). The Cherkess or Circassian peoples are Caucasian. closely related ethnically and linguistically to the neighbouring Kabardinians and to the Adygei (see CIRCASSIAN). They speak a Japhetic language, which only after the Revolution received a written form. The 1959 census recorded 30,000 Cherkess living in the whole U.S.S.R. The Karachai are a Turkic group. During World War II they were deported to the eastern regions of the U.S.S.R., together with the related Balkar. In the U.S.S.R. as a whole, at the 1959 census, they numbered 81,000. Both groups are mainly Sunni Muslims and both, like other Caucasian peoples, put up a long and fierce resistance to Russian conquest in the 19th century. They participated in the great revolt of Shamil, after which many migrated to Turkey. A considerable proportion of the present population is made up of Russian and Ukrainian settlers. There are also some Nogai Tatars and Abaza.

The Karachai-Cherkess oblast was originally formed in 1922. It was divided into the Cherkess national okrug and the Karachai autonomous oblast in 1926, the former being constituted as an autonomous oblast in 1928. In 1936 the Karachai and Cherkess oblasts were reunited as a single autonomous region. In 1944, because of alleged collaboration of its population with the Germans, the Karachai areas were partitioned and merged into the reconstituted Cherkess autonomous oblast and the Georgian Soviet Socialist Republic. The dispersed Karachai minorities were rehabilitated and resettled after 1957, when the Karachai-Cherkess autonomous oblast was again restored.

Agriculture is the most important sector of the economy and is concentrated in the north. There wheat, maize (corn), millet, barley, sunflowers and hemp are grown, together with many fruits and vegetables, especially melons. The mountain areas have abundant pastures and large numbers of sheep and cattle are kept. There is considerable transhumance between the high pastures in summer and the steppe of Stavropol krai in winter. Poultry and beekeeping are widespread, and Kabardinian horses are bred. The presence of coal has been known since the 1840s, but only since the Revolution has it been exploited. By the early 1960s, 15 pits were operating near Ordzhonikidzevski. Zinc, lead and barites are mined at Magaro. Marble quarried near Karachayevsk was used in the Moscow underground railway. There is much timber cutting in the mountains, supplying the furniture industries of Cherkessk and Karachayevsk. Many of the industries of the oblast are concerned with processing agricultural products: meat packing, butter and cheese making, milling, jam making and fruit drying. Cherkessk has light engineering and makes clothing and shoes. The mountains, the attractive scenery and the presence of many mineral springs have made the area popular with tourists. Teberda is one of the main resorts, with nearby springs. There are six tuberculosis sanatoria. The oblast is served by a branch railway from the main Rostov-Baku line at Nevinnomyssk to Cherkessk and on to Ust-Dzhegutinskaya. From the railhead the Sukhumi military highway follows the Kuban and Teberda valleys and crosses the Greater Caucasus range by the Klukhorski pass to Sukhumi. (R. A. F.)

KARACHI, former capital of Pakistan and principal seaport

of West Pakistan, lies immediately to the northwest of the Indus delta. Formerly, Karachi was the capital of the province of Sind and the headquarters of the district of the same name. On July 23, 1948, the area of the capital of the federation was demarcated from the province of Sind and formed into a centrally administered unit called Federal Capital Area Karachi comprising the city and cantonments, the islands in Karachi harbour and 54 of the dehs (villages) which had previously formed part of the Karachi district. Population at the 1961 census was 1,912,598. In Oct 1959 the seat of government was moved to Rawalpindi, which was officially proclaimed the national capital on Aug. 2. 1960.

Karachi has grown to its present position within a comparatively short time. When the British under Sir Charles Napier annexed Sind in 1843, there was only a fishing village with a small fort and a ditch called Kalachi-jo-Kun with two gates, one called the



BERN KEATING FROM BLACK STAR

VIEW OF THE VEGETABLE AND FRUIT SECTION OF THE LEA MARKET IN THE OLD PART OF KARACHI, PAKISTAN

Kharadar (the salt water gate) facing the sea and the other called Mithadar (the sweet water gate) facing the Lyari river. Neither the actual site nor the immediate surroundings suggest conditions favourable to the emergence of a city of such importance.

It stands on a backwater opening south on the east-west stretch of coast, which marks a sharp change in direction of the shore line, between Cape Monze and the Indus delta. Westward this backwater is screened from the sea by the rocky point of Manora, joined to the mainland by a sandspit. Manora head is the extremity of a 10-mi. reef, and the natural harbour this provides is mainly responsible for the growth of Karachi as a seaport. On its eastern side the city is bounded by what was once the island of Kiamari but which, as a result of the construction of the Napier mole (1850) and subsequent reclamation undertakings, is no longer an island. The western approach, passing under Manora point, has always been the principal one, and today it is the only one. the eastern approach having been closed when Chinna creek was finally blocked in 1873. Prior to improvements following upon British occupation, the backwater filled and emptied with every tide, and presented at low water a stretch of mud flats and mangrove swamps. The deepwater anchorage lay off Kiamari and there ships had to unload into small boats which proceeded with the tide up to Karachi.

The hinterland in the north is practically a desert. In the prevailingly hilly landscape (Kohistan), the limestone spurs of the Kirthar range break down southward into sandy wastes. The Indus delta shows in the southeast a monotonous expanse of alluvium riddled by creeks and passing seaward into mangrove swamp. Physically divergent, the two areas are alike in that they afford little support to human life.

The natural scour of the backwater under the action of currents on either side of Kiamari was a real asset along a coast prone to severe silting, and it is to this that the port owes its foundation and early development by Hindu merchants at the beginning of the 18th century. About that time the port serving Baluchistan, at the outfall of the Hab river in the neighbourhood of Cape Monze, became choked, while a similar fate was always overtaking ports at the mercy of the shifting Indus. Besides the natural protection against monsoon storms. Manora head furnished an excellent site for the defense of the harbour, and the Mirs, who gained Karachi from the khan of Kalat in 1795, erected a permanent fort on it. This was eventually demolished by British guns in 1839, and a modern fortification, naval and other establishments, and a lighthouse (148 ft. above sea level) now stands there. In 1909 the lighthouse was fitted with a flashing light in place of the old fixed light. The trading genius and rare diplomacy of its founders exploited the site when they built the port of Karachi in the immediate proximity of the Indus delta and the ports then in use at its head. The tidal creeks of the great river were avoided by the early establishment of direct connections eastward by road and water, and by centres upstream.

Yet it remains true that the rise of Karachi in its earlier years has been to a great extent due to its key situation in the strategic and economic scheme of empire space relationships. Its strategic value in relation to the North-West frontier and to the route via Suez is obvious. Karachi is the nearest port to Europe (being 6.077 mi. from London, via Suez) not only for West Pakistan but also for Afghanistan and adjacent parts of central Asia, Persia and the western part of India.

The development of international air transport has considerably increased Karachi's importance. It has both a P.A.F. cantonment and a large. modern airport covering more than 600 ac. It forms an essential link in air communications between all parts of Europe and India, Malaya, the far east and Australia. Meteorological observations are carried out over a wide area. Proximity to oil fuel, abundant space at sea level, immunity from floods and heavy rains, and minimum frequency of low cloud all favour Karachi as an airport, and it is largely for climatic reasons that it has been preferred as a main base to Bombay or Calcutta. During World War II Karachi's air facilities were greatly extended because its geographical position between India, as a great supply base, and the near eastern theatres of war made it a vital air base. It is linked by the North-Western railway with the interior of West Pakistan.

The greatest single stimulus to the growth of modern Karachi was the expansion of irrigation in Punjab and Sind which gave it a great export trade, mainly in wheat and cotton. The establishment of independent Pakistan in 1947 further increased its importance, though the port was already developed, having 21 deep-sea berths. one bulk-oil pier and 18 moorings with a capacity to handle about 4,300,000 tons of cargo a year. Under the west wharfage scheme the ship channel had been widened from 600 ft. to 1,200 ft. and deepened to take vessels drawing 32 ft. at any state of tide. The Karachi Port trust had, by 1956, begun the reconstruction and modernization of the east wharf (built between 1886 and 1909) which would increase the capacity of the port by 30%. The depth of water along the berths would also be increased from 27 ft. to 34 ft. below datum. In a new shipyard ships of 5,000–7,000 tons dead weight can be built. A dry dock, 600 ft. × 90 ft., is deep enough for ships about 16 ft. at low tide. (K .S.AD.)

KARADŽIĆ, VUK STEFANOVIĆ (1787–1864), the father of modern Serbian literature, was born on Nov. 6, 1787, in the Serbian village of Trshich, on the Bosnian border. He learned to read and write in the old monastery Tronosha (near his native village), and mas engaged as uriter and reader of letters to the commander of the insurgents of his district at the beginning of the

first Serbian rising against the Turks in 1804. Mostly in the position of a scribe to different voivodes (military leaders), sometimes as schoolteacher, he served his country during the first revolution (1804–13). At the collapse of the revolution he left Serbia, but instead of following Karageorge and other leaders to Russia he went to Vienna. There he was introduced to the great Slavonic scholar Yerney Kopitar, who encouraged him to collect the poems and popular songs, write a grammar of the Serbian language and, if possible. a dictionary.

His first book, *Mala Prostonarodna Slaveno-Serbska Pyesmaritsa* (Vienna, 1814), contains 100 lyric songs, sung by the peasant women of Serbia, and six poems about heroes or as the Serbs call them *Yunachke pesme*, which are generally recited by the blind bards or by peasants. From that time Karadžić's literary activity moved on two parallel lines: (1) to give scientific justification and foundation to the adoption of the vernacular Serbian as the literary language; and (2) by collecting and publishing national songs, folk lore, proverbs, etc.. to show the richness of the Serbian people's poetical and intellectual gifts and the wealth and beauty of the Serbian language. By his reform of the Serbian alphabet and orthography, his Serbian grammar and his Serbian dictionary, he established the fact that the Serbian language contains 30 distinct sounds. for 6 of which the Old Slavonic alphabet had no special letters. He introduced new letters for those special sounds, at the same time throwing out of the Old Slavonic alphabet 18 letters for which the Serbian language had no use. This reform was strenuously opposed by the church and many conservative authors, who went so far as to induce the Serbian government to prohibit the printing of books in new letters, a prohibition removed in 1859. Karadžić's alphabet facilitated his reform of orthography; his principle was "write as you speak, and read as it is written!" Hardly any other language in the civilized world has such a simple, logical. scientific spelling system and orthography as the Serbian has in Karadžić's system. His first grammatical essay was published in Vienna in 1814, *Pismenitsa Serbskoga yezika po govoru prostoga naroda* ("The grammar of the Serbian language as spoken by the common people"). An improved edition appeared in Vienna in 1818, together with his great work *Srpski Ryechnik* (Lexicon *Serbico-Germanico-Latinum).* This dictionary — containing 26,270 words—was full of important contributions to folk lore, as Karadžić never missed an opportunity to add to the meaning of the word the description of the national customs or popular beliefs connected with it. A new edition of his dictionary containing 46,270 words, was published at Vienna in 1852.

Meanwhile he gave himself earnestly to the work of collecting the "creations of the mind of the Serbian common people." He traveled through Serbia, Bosnia, Herzegovina, Montenegro, Dalmatia, Syrmia and Croatia, and the result was shown in a largely augmented edition of his *Srpske Narodne Pyesme* (Leipzig, 3 vol., 1823; vol. iv, Vienna, 1833). *Popular Stories and Enigmas* was published in 1821, and *Serbian National Proverbs* in 1836. From 1826 to 1834 he was the editor of an annual, called *Danitsa* (The Morning Star), which he filled with important contributions concerning the ethnography and modern history of the Serbian people. In 1828 he published a historical monograph, *Milosh Obrenovich, Prince of Serbia;* in 1837, in German, *Montenegro and Montenegrins;* in 1867, *The Serbian Governing Council of State.* He supplied Leopold Ranke with the materials for his *History of the Serbian Revolution.* He also translated the New Testament into Serbian, for the British and Foreign Bible society (Vienna, 1847). Karadžić died in Vienna on Feb. 6, 1864; the government in 1897 transferred his remains to Belgrade. (C. MIJ.; X.)

KARAGEORGE (*c.* 1766–1817), Serbian revolutionary leader and founder of the Serb dynasty of Karageorgević, was born in 1766 or 1788, the son of a peasant of the name of Petrini. His own name, "Black George," was derived from his swarthy complexion and morose disposition: he signed himself indifferently in the Turkish or Serb versions as Kara George Petrovic or Georg Petrović Cerai. After an apprenticeship with a Turkish brigand named Fazli-Bey, he settled down on a farm. But having killed a Turk, he fled to the Austrian military frontier, where he served two years as forest guard to a monastery before enlisting in a frontier regiment. He served as sergeant in the Austrian war against Turkey (1788–91), then deserted and returned to Serbia, settling in Topola as a dealer in cattle and swine. At the same time he took part in irregular "haiduk" warfare against the Turks, so distinguishing himself that when the Serbs rayah rose against the janissaries in 1804, a meeting of insurgent leaders at Orašac in Feb.–March 1804 elected Karageorge supreme leader.

For the story of the subsequent wars *see* SERBIA: *History.* Karageorge's chief part was that of military leader; he displayed real practical and strategical genius combined with dauntless personal courage, so that his mere appearance was said to suffice to turn defeat into victory for the Serbs. The diplomatic negotiations were largely conducted by others; but it is remarkable with what tenacity Karageorge, perhaps influenced by his past experience, begged Austria to proclaim a protectorate over Serbia. At first, too, he maintained his loyalty to the sultan against the latter's rebellious janissaries; only later, relying on Russian promises, did he aim at complete independence for Serbia. His troops had repeatedly defeated the Turks, and cleared Serbia of them; and in 1808, when the Serb leaders suspected that Russia was attempting to gain an excessive influence in Serbia, they determined "to honour Karageorge so that the Russians too should respect him," and on Dec. 26, 1808 the national council (Soviet) swore "to recognize Karageorge Petrović and his lawful descendants as rulers," while he swore to care for the people as a father, and to issue his commands through and in agreement with the Soviet.

In the following years Karageorge maintained his reputation as a soldier; but his position and autocratic methods aroused the jealousy of the rival voivodes, which was fostered by the Russian agent Rodofinikin. When the treaty of Bucharest (1812) freed Turkey's hands, and it advanced in 1813 against the Serbs, Karageorge was sick of typhus. The unsupported Serb forces were defeated and Karageorge took refuge in Hungary (Sept. 20, 1813). He was interned in Graz and later settled in Hotin (Bessarabia) on a pension provided by the tsar. In the summer of 1817, he reappeared suddenly and alone, near Surederevo, apparently with the object of organizing a general Balkan rising in conjunction with the Greek Hetairia. The new Serbian leader, Miloš Obrenović I (*q.v.*) reported his presence to the pasha of Belgrade, who demanded Karageorge's surrender, alive or dead. Karageorge was murdered in his sleep, and his head sent to Constantinople. From this act (the responsibility for which has not, however, been absolutely brought home to Obrenović) sprang the feud between the rival dynasties, which distracted Serbia for a century.

Karageorge was feared rather than loved. His temper was morose and choleric, and he punished the slightest transgression by death. He is believed to have killed his own father in a fit of anger when the old man refused to follow him in his flight to Hungary at the beginning of his career. He hanged his brother for rape, and forbade his mother to go into mourning for him. Even by his admirers he is admitted to have killed by his own hand no fewer than 125 men who provoked his anger. Yet he was a military genius of the highest order, a man of unsurpassed energy and valour. and the true founder of Serbian independence; and even in civilian matters, if his hand was heavy, he was just and even magnanimous.

See SERBIA; also Ranke, *Die serbisrhe Revolution; M. G.* Militye-vich, *Karadyordye* (1904); *S.* Novakovic, *Vaskzhs srpske drzhave* (1904); *Die Wiedergeburt des Serbischen Staates* (1912).

KARAISKAKIS, GEORGES (1782–1827), leader in the War of Greek Independence, was born at Agrapha in 1782. During the earlier stages of the war he served in the Morea, where he shared in the intrigues which divided the Greek leaders. But he saw the necessity of providing the country with a government, was a steady supporter of Capo d'Istria, and gave honourable service in the middle and later stages of the war. He helped to raise the first siege of Missolonghi in 1823, and did his best to save the town in the second siege in 1826. In that year he commanded the patriot forces in Rumelia. and though he failed to co-operate effectually with other chiefs, or with the foreign sympathizers fighting for the Greeks, he gained some successes against the

Turks. He took a share in the unsuccessful attempts to raise the siege of Athens in 1827, and made an effort to prevent the disastrous massacre of the Turkish garrison of fort S. Spiridion. He was shot in action on May 4, 1827.

See G. Finlay, *History of the Greek Revolution* (1861).

KARAISM (QARAISM), from Hebrew Qara, to read or study the Scriptures, a Jewish movement originating in Persia in the 8th century, rejecting the oral tradition and challenging the authority of the rabbinites, the teachers of the Talmud. Factors in the development of the movement were the messianic hopes aroused by local conditions as a result of the Moslem conquest of Persia (640) and the fall of the Umayyad dynasty (750). Karaism is characterized by a prophetic passion for individual righteousness and social justice, puritanical zeal and asceticism, yearnings for national redemption and uncompromising monotheism.

The Karaites claimed that the Bible is a self-explanatory book, requiring no completion by the Oral Law, and accused the talmudists of misinterpreting the Biblical law and of substituting a man-made talmudic lam for a God-given Torah. The chief points of difference with the rabbinites were the calendar, Sabbath and marriage laws.

The Karaites were also influenced by the school of Mu'tazilites (see ISLAM), which, emerging in the and century of the Hegira, brought about a schism in the Moslem theological schools of Basra. In order to avoid the stigma of heresy, the Mu'tazilites sought the support of philosophy. They thus founded a rational theology designated the *Ilm-al-Kalam* (Science of the Word), and those who professed it were known as Mutakallimun. They accused their opponents of destroying monotheism. The Karaites derived many of their reformatory notions from this Moslem movement. Both Karaites and Mu'tazilites believed in the confluence of revelation. reason and conscience.

Anan ben David, elder son of the exilarch, emerged as legislator of the sect and its first literary figure. In his *Sepher ha-Mizvot,* written in 760, he delineated a code of life that excluded the Talmud. A small number, calling themselves Ananites, accepted his authority. Other groups sprang up two centuries later, vehemently rejecting the Oral Lam. The outstanding leader mas Benjamin ben Moses al-Nahawandi of Persia, who called the sect Karaites and wrote their first systematic book of observances and regulations. Adherents traveled extensively to make converts among the rabbinites; but they were handicapped greatly by schisms within the movement. which resulted from their insistence on the freedom of each individual to interpret the Torah in the light of his own understanding and judgment. They were also affected by the dearth of scholars backing their views and, since the lives of the Jemish masses were already full of privation and self-denial, by the austerity of their asceticism, Karaism burdened life even more than did rabbinism. the adherents could have no fire on Sabbath; prohibited degrees of consanguinity were expanded; dietary laws and laws of ritual cleanliness, clothing and fasts became harsher; the celebration of Hanukkah and the use of *tephilin* (phylacteries) and *mezuzoth* (door post amulets) were eliminated. Despite their controversies, the Karaites under the influence of the rabbinites borrowed much from the Talmud and developed a similar Oral Law of their own. The stress was laid on practical observances rather than on ethics and metaphysics.

Their first antagonist was Saadia ben Joseph (*q.v.*), who in his philosophical and exegetical nritings bitterly attacked the Karaites and tried to exclude them from the Jewish community. The onslaught by Saadia and others united the factions and brought about the Golden Age of Karaitic literature in Hebrew and Arabic, producing noted works in Hebrew lexicography. Biblical exegeses, polemics and codes. It also played an important part in the formation of medieval Jenish philosophy and exerted some influence on the development of a Jewish prayer book. The movement flourished from the 9th to the 12th centuries, spreading from Babylonia to Palestine (where the Karaites established themselves as "Mourners of Zion"), thence to Egypt, Syria and into Europe by way of Spain and Byzantium.

In Spain. Abraham ibn David (1110–1180) refuted their claims in his Sefer ha-Qabalah (Book of Tradition); in Egypt they were favoured by the Moslem authorities, but the influence of Maimonides (*q.v.*) and his descendants caused their numbers to shrink after the 12th century. They have never been numerous. Toward the end of the 17th century, Protestant theologians in Sweden became interested in Karaism, and wrote studies on the sect. After the establishment of the state of Israel, several thousand Karaites settled there.

The liturgy of the Karaites is jejune, being composed almost entirely of scriptural excerpts and possessing practically no hymns. Nevertheless this constitutes no general reflection on Karaite intellectualism. No movement can be considered barren from the literary standpoint that has produced scholars such as the theologian Abu Yusuf Ya'qub al-Qirqisani (10th century) and his contemporary exegetes and theologians Yefet ben 'Ali, Sulayman ibn Ruhaym, Daniel al-Qumisi, Sahl ben Masliah, Mishawayh al-'Ukbari, Malik ar-Ramli, Abu 'Imran at-Tiflisi and Jeshuah ben Judah (11th century); the poet Moses Dar'i (12th century); the philosopher Aaron ben Elijah (14th century); the codifiers Samuel ben Moses al-Magribi and Elijah ben Moses Basyatchi (15th century); the chronicler David ben Se'adel ibn al-Hiti (15th century); the author of the best-known anti-Christian polemical work, *Hizzuq 'emunah,* Isaac ben Abraham Troki (1533–94); and, latterly, Abraham Firkovich (1785–1874). Firkovich came from the Crimean peninsula and, in his zeal to prove that the Karaites mere descendants of the ten lost tribes of Israel and had settled in the Crimea in the 6th century B C., traveled to Cairo, Palestine and Constantinople and succeeded in bringing together the largest collection of Hebrew, Samaritan and early Karaitic manuscripts in the uorld, later acquire? by the St. Petersburg (now Leningrad) Public library. Firkovich's efforts contributed greatly to the exemption of the Karaites from the religious persecution that the Russian Jews suffered. A notable controversy arose in consequence of his discoveries, but modern Masoretic studies by Paul Kahle and others incline to support them, with reservations.

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(4.1 K)

KARA-KALPAK, Autonomous Soviet Socialist Republic, a part of the Uzbek Soviet Socialist Republic, U.S.S.R., north of the Khiva oasis and stretching southeast from the shores of the Aral sea along the right bank of the Amu-Darya. Its area is 60,154 sq.mi. and for the most part it consists of the Kyzyl-kum (*q.v.*) (red sand) desert, vast plains having an elevation of about 160 ft. near the Aral sea and rising gradually toward the southeast.

Near the Aral sea, the Kyzyl-kum is covered with sand dunes from 30 to 60 ft. high, mostly arranged in parallel lines. In the intervening spaces are clay-covered belts. During the short spring, there is rich pasture available for the nomad Kirghiz flocks. But in summer the great heat and the lack of water, combined with strong winds raising hot sandstorms, make it almost impassable; a sudden heavy rainstorm is even more disastrous in the clay area, reducing it to a trackless sea of mud. The average annual rainfall is 4 in. Farther east are dunes covered with a species of sedge forming food for sheep. and saksaul trees, used as fuel and from which charcoal is made and sent to Bokhara. The climate is continental in type and very dry. At Turt-Kul the average January temperature is 5.0° C., average July 29 0° C.. though temperatures as high as 43.4° C. and as low as 28.4" C. have in the past been recorded.

The region of the right bank of the Amu-Darya (Oxus) and the right portion of its delta have much fertile alluvial soil. and irrigation is successfully practised there from Turt-Kul to the sea: Figs. melons, pomegranates. grapes and other fruits and vegetables grow luxuriously. Wheat forms 33.5% of the harvest, maize 16.5% lucerne 12 6%, cotton 11 5% and millet 8%. Transport across the river to Khiva is by flat-bottomed boats towed through the channels between the numerous islands; at some places swamps

make landing difficult. Steam navigation on the Amu-Darya is just possible for military purposes from Charjui onward. A fleet of steel-built steamers carrying 200 tons of cargo and uith a draft of 2 ft. was inaugurated in 1887, but for purposes of commerce it is impracticable, since the channel is constantly shifting and sandbanks may appear and disappear in a couple of hours. The Amu-Darya once bifurcated at Kohna Urgani, 70 mi. S. of the river, and a branch flowed southwestward to the Caspian. entering Balkhan bay. At some period in the 15th or 16th centuries, either because of an artificial dam raised by the Khivans, or through some natural obstruction, this branch was diverted and entered the Aral sea. Projects for re-opening the exit to the Caspian have at various times been discussed, but have never materialized.

The region came under Russian rule in 1867, forming part of the Turkistan province created after the successful campaigns of General Kaufmann, when Tashkent and Kokhand were captured In 1873 Khiva was subdued and made a protected native state of Russia, losing the irrigated right bank areas of the Amu-Darya. The river saings perpetually to the right, and thus favours the Kara-Kalpak irrigation systems at the expense of the left bank Khivan district. The population in 1959 was 510,000, and consisted of an urban population of 138,000 and a rural population of 372 000

The Kara-Kalpaks or Black Bonnets, so called from their sheepskin hats, are a tribe allied to the Kirghiz-Kazaks. They followed Xttila in his raiding expeditions in the jth century and probably settled on the east of the Aral sea after their migration from the Volga region. Little, however is known of this period of their history. There is a definite record that they were settled and practising cultivation and sheep raising on the eastern side of the Aral sea in the early 18th century, and were divided into an Upper and a Lower Horde.

A khan of the Kara-Kalpaks made friendly overtures to the Russians in 1722. They are taller and larger eyed than the Kazaks, and prefer a settled agricultural life. They were much persecuted by their nomad neighbours, so that some returned to the Volga and settled in the Astrakhan district, while others crossed the Dzungharian gate into Mongolia

The Kara-Kalpak area was entirely dependent on caravan routes for communication with the eutside world until 1950 when a railroad connecting Kungrad (near the Aral sea) and Kagan was constructed.

Nukus (1959 pop. 39,000) is the administrative centre, producing cotton textiles, shoes, clothing and leather. Chimbay, Khodzheyli and Turtkul are other major towns of the republic and are dependent on cotton and its by-products.

KARAKORUM, a great mountain region between the western Himalaya on the south and the western branch of the Kuenlun on the north. It includes (1) the Northern Foreland, including the region of the Karakorum pass; (2) the main chain of high summits north of the great glaciers. extending westward to the south Hindu Kush and eastward into the Tibetan highland; (3) the Southern Karakorum; (4) the Cadok chain. The south part is mainly granite and syenite and reaches down to the Indus valley, metamorphic rocks of uncertain age and supposedly Triassic limestones are included.

In the region of the high peaks, eruptive, metamorphic and sedimentary rocks are mingled; the last are specially important. On the Karakorum pass Liassic and Cretaceous rocks have been identified. In the east the Jurassic strata are of continental formation, and so is the Tertiary, but there is evidence of a Cretaceous maritime transgression

Many peaks are extraordinarily steep, and 60 summits rise about 22 000 ft., K-2 (28.250 ft.) being the highest. The glaciers reach loner in the west (10,500 ft.) than in the east (12,000–16,000 feet).

KARAKORUM (Mongolian KHARA-KHORIN), famous ancient capital of the Mongol empire whose ruins lie on the upper Orkhon river in the Arakhangai *aimak* (province) of the Mongolian People's Republic. It was founded in 1220 by Jenghiz Khan (*q* v j, a Mongol chief. who gradually acquired dominion not only over all the Mongols but also over other more or less related peoples of the whole steppe from the Altai mountains to the middle Amur river. In 123j Ogdai (Ugedei) Khan surrounded Karakorum with walls and built a rectangular palace, 230 by 150 ft., supported by 64 wooden columns standing on granite stones. Karakorum had many brick houses along its streets, 12 Shamanist shrines, 2 mosques and, according to William of Rubruquis, a Christian church. In 1260 Kublai, the great khan, moved his capital to Khanbaliq (Cambaluc, modern Peking). When his younger brother Arig Buga rose against him, making Karakorum his headquarters, Kublai's forces took the city and destroyed it in 1261.

In 1368. Bilikt Khan. the son of Togon Timur, the last emperor of the Mongol (or Yuan) dynasty of China, who had been banished from Peking, returned to Karakorum which was partly rebuilt. It was then known as Erdeni-Dzuu (Mongol name for Buddha). because during the 13th century Lamaistic Buddhism (see TIBETAN BUDDHISM) had made progress under Kublai Khan. Erdeni-Dzuu served as the capital of Togon Timur's descendants, who were described by the Chinese as *liao* van-tse (small or negligible khans). By the 16th century Erdeni-Dzuu had fallen completely into decay, but the three temples of Buddha remained. Surrounded by a wall, they are now a museum.

In 1246 and 1254, respectively, Karakorum was visited by the Franciscan monks, Joannes de Plano Carpini and William of Rubruquis (*qq.v.*). The precise location of Karakorum was established at the end of the 19th century by two Russian orientalists, N. M. Yadrintsev and A. M. Pozdneev.

During 1948–49 the ruins were explored by U.S.S.R. and Mongol archaeologists under the leadership of S. V. Kiselev of the Academy of Sciences of the U.S.S.R.

See Bibliography to the article MONGOLIA. (K. SM.)

KARA-KUL, the name of two lakes ("Great" and "Little") of Asia. situated on the Pamir plateau. The larger, Great Kara-kul, is located in the Gorno-Badakhshan autonomous oblast, Tadzkik Soviet Socialist Republic, of the Soviet Union. Great Kara-kul, 18 mi. long and 14 mi. wide is under 39° N. to the south of the Trans-Alai range, and lies at an altitude of 12,841 ft.; it is surrounded by high mountains and is reached from the north over the Kyzyl-art pass (14,042 ft.). A peninsula projecting from the south shore and an island off the north shore divide it into two basins, a smaller eastern one which is shallow and a larger one, which has a maximum depth of 780 ft. It has no drainage outlet.

Little Kara-kul, located in Sinkiang. China. lies in the northeast Pamir (or Sarikol) northwest of the Muztagh-ata peak (24,462 ft.), at an altitude of 12,700 ft. It varies in depth from 79 ft. in the south to 50 to 70 ft. in the middle, and 1.000 ft. or more in the north.

KARA-KUM ("Black Sands"), a flat desert of the Soviet Union, occupying most of the Turkmen Soviet Socialist Republic and extending on the northwest into the Kazakh Soviet Socialist Republic. Its area is nearly 110,000 sq.mi., it is bounded on the northwest by the Ust-urt plateau, between the Aral and the Caspian seas, on the northeast by the Amu-darya, on the south by the Turkmen oases, and on the west it nearly reaches the Caspian sea. Only part of this surface is covered with sand. There are broad expanses (takyrs) of clay soil upon which water accumulates in the spring; in the summer these are muddy, but later quite dry, and merely a few Solanaceae and bushes grow on them. There are also *shors,* similar to the above but encrusted nith salt and gypsum, and relieved only by Solanaceae along their borders.

The remainder is occupied with sand, which, according to V. Mainov, assumes five different forms: (1) Barkhans, chiefly in the east, which are mounds of loose sand. 1j to 35 ft. high, hoof-shaped, having their gently sloping convex sides turned toward the prevailing winds, and a concave side, 30° to 40° steep, on the opposite slope. They are disposed in groups or chains, and the winds drive them at an average rate of 20 ft. annually toward the south and southeast. Some grass (Stipa *pennata*) and bushes of *saksaul* (*Haloxylon ammodendron*) and other steppe bushes (e.g., *Calligonium, Halimodendron* and *Atraphaxis*) grow on them. (2) Mounds of sand, of about the same size, but irregular in

shape and of a slightly firmer consistency, mostly bearing the same bushes, and also *Artemisia* and *Tamarix;* they are chiefly met with in the east and south. (3) A sandy desert, slightly undulating. and covered in spring with grass and flowers (*e.g.,* tulips. *Rheum,* various Umbelliferae), which are soon burned by the sun—these cover very large spaces in the southeast. (4) Sands disposed in naves from 50 to 70 ft., and occasionally up to 100 ft. high, at a distance of from 200 to 400 ft from each other; they cover the central portion. and their vegetation is practically the same as that of the preceding division. (5) Dunes on the shores of the Caspian, composed of moving sands, 35 to 80 ft. high and devoid of vegetation.

A typical feature of the Kara-kum is the number of old river beds, which may have been either channels of tributaries of the Amu and other rivers. or depressions which contained elongated salt lakes.

Water is found only in wells. 10 to 20 mi apart—sometimes as much as 100 mi—nhich are dug in the *takyrs* and give saline water, occasionally unfit to drink. and in pools of rain water retained in the lower parts of the *takyrs.* The population of the Kara-kum, consisting of nomad Kirghiz and Turkmen, is very small.

The region between the Aral sea and Lake Chelkar-Tengis is also called Kara-Kume.

KARAMANIA, formerly an independent inland province in the south of Asia Minor. named after Karaman, the son of an Armenian convert to Islam, who married a daughter of Ala ed-Din Kaikobad, the Seljuk sultan of Rum. and was granted Laranda in fief, and made governor of Selefke 1223–45. The name Karaman is. however, Turkoman and that of a powerful tribe, settled apparently near Laranda. The Armenian convert must have been adopted into this

On the collapse of the Seljuk empire. Karaman's grandson, Mahmud (1279–1319) founded a state. which included Pamphylia. Lycaonia and large parts of Cilicia, Cappadocia and Phrygia. Its capital. Laranda. superseded Konia. This state was frequently at war with the kings of Lesser Armenia. the Lusignan princes of Cyprus and the knights of Rhodes. It was also engaged in a long struggle for supremacy with the Osmanli Turks, which only ended in 1472, when it was definitely annexed by Mohammed II. The Osmanlis divided Karamania into Kharij north. and Ichili south, of the Taurus. and restored Konia to its metropolitan position. The name Karamania is now often given to Ichili only; but so far as it has had any exact significance in modern times, it has stood for the whole province of Konia. Before 1864 Karamania was the vilayet of which Konia was the capital, and it did not extend to the sea, the whole littoral from Adalia eastward being under the pasha of Adana. Nevertheless, in Levantine popular usage, "Karamania" signifies the coast from Adalia to Messina.

KARA MUSTAFA (d. 1683). Turkish vizier, surnamed "Merzifunli," was a son of Uruj Bey. a notable Sipahi of Merzifun (Marsovan), and brother-in-law to Ahmed Kuprili, whom he succeeded as grand vizier in 1676. After conducting an unsuccessful campaign in Poland, he responded to the appeal for aid made by the Hungarians under Imre Thokoly (q v.) when they rose against Austria, his hope being to form out of the Habsburg dominions a Mohammedan empire of the West. of which he should be the sultan. The plan nas foiled by the heroic resistance of Vienna and its timely relief by John Sobieski, king of Poland. Kara Mustafa nas beheaded at Belgrade in 1683 and his head nas brought to the sultan on a silver dish.

KARAMZIN, NIKOLAI MIKHAILQVICH (1766–1826). Russian historian, critic. novelist and poet. was born at the village of Mikhailovka. in the government of Orenburg, and not at Simbirsk as many of his English and German biographers incorrectly state. on Dec. 1 (old style), 1766. His father, of Tatar extraction. nas an officer in the Russian army. He was sent to Moscon to study under Schaden, whence he afternard moved to St. Petersburg (Leningrad). After residing there some time, he went to Simbirsk. where he lived in retirement until induced to revisit Moscow. In 1789 he resolved to travel, and visited Germany. France. Switzerland and England. On his return he published in the *Moscow Journal* (which he edited), his *Letters of a Russian Traveller,* afterward collected in six volumes (1797–1801). In this magazine appeared some of his prose tales, one of which. "Poor Liza ·· is famous in the history of Russian literature as the first example of "sensibility" in Russia, the first fruits of the teaching of Rousseau. In 1794–95 Karamzin abandoned his literary journal, and published a miscellany in two volumes, entitled *Aglaia,* in which appeared, among other things, "The Island of Bornholm" and "Ilia Murometz," a story based upon the adventures of the hero of many Russian legends. In 1797–99 he issued another miscellany or poetical almanac. *The Aonides,* in conjunction with Derzhavin and Dmitriev. In 1798 he compiled *The Pantheon,* a collection of pieces from the works of the most celebrated authors ancient and modern, translated into Russian. Many of his lighter productions were subsequently printed by him as *My Trifles.* In 1802–03 Karamzin started the monthly *European Messenger,* which he abandoned in 1804 to make the necessary research for his *History of the Russian State* (1819–26). In 1816 he moved to St. Petersburg. where he spent the happiest days of his life, enjoying the favour of Alexander, and submitting to him the sheets of his great work which the emperor read with him in the gardens of the palace of Tsarkoe Selo. He only reached the 11th volume. carrying his work as far as the accession of Michael Romanov in 1613. He died on May 22 (old style) 1826, in the Taurida palace. A monument was erected to his memory at Simbirsk in 1845

The style of his history is elegant and flowing, modeled rather upon the easy sentences of the French prose writers than the long periodical paragraphs of the old Slavonic school. Karamzin left his mark on the vocabulary and the syntax of the Russian language, and introduced many Gallicisms. Perhaps he may justly be censured for the romantic colouring given to the early Russian annals. concealing the coarseness and cruelty of the native manners; in this respect he recalls Sir Walter Scott, whose writings probably had their influence upon him Karamzin appears openly as the panegyrist of the autocracy; indeed, his work has been styled the "Epic of Despotism" He does not hesitdte to avow his admiration of Ivan the Terrible and considers him and his grandfather Ivan III as the builders of Russian greatness. a glory nhich in his earlier aritings, perhaps at that time more under the influence of western ideas he had assigned to Peter the Great. The characters of many of the chief personages in the Russian annals are drawn in firm and bold lines.

As a historian, Karamzin has deservedly a high reputation. Until the appearance of his work little had been done in this direction in Russia. The preceding attempt of 'Iatistchev was merely a rough sketch, inelegant in style, and without the true spirit of criticism. Karamzin was most industrious in collecting materials and the notes to his volumes are mines of curious information.

In the battle pieces (*e.g.,* description of the field of Koulikovo, taking of Kazan etc.) are found considerable powers of description, As a critic. he was undoubtedly of great service to his country and may be regarded as the founder of the review and essay (in western style) in Russia.

KARANGA, a collective name applied to many of the indigenous Bantu-speaking tribes of southern Rhodesia. They all keep cattle and goats, and raise crops of millet and maize. Each tribe occupies its onn territory under its own chief who is assisted in his government by a council of influential heads of households. Within the tribe the people are organized into exogamous patrilineal clans which are totemic. Marriage is polygamous, and involves the payment of a bride price. Cross-cousin marriage is practised. Ancestor worship is the main form of religious cult, but there is also a belief in a supreme being knonn as *Mwari,* nho is associated nith the phenomena of weather. *See* AFRICA: *Anthropology and Ethnology: South Africa*

See F. W Posselt, *A Survey of the Native Tribes of Southern Rhodesia* (1927); C. Bullock, *Mashona Laws and Customs* (1913) and *The Mashona* (1928).

KARA SEA (KARSKOYE MORE), demarcated by Novaya Zemlya. Vaygach Island and the Siberian coast. It is approached from the west by three straits—Matochkin, between the tno islands

of Novaya Zemlya, and Kara and Yugor to the north and south of Vaygach Island, respectively. On the southeast Kara bay penetrates deeply into the mainland, to the west of this the short Kara river enters the sea. The sea has an area of 328,185 sq.mi.

The sea is shallow (average depth 650 ft.), the deepest parts (1,772 ft.) lying off Vaygach Island and the north part of Novaya Zemlya. After E. H. Johannesen had demonstrated its accessibility in 1869, and A. E. Nordenskiöld had crossed it in 1875, it was considered a possible route between European Russia and the north of Siberia. But the open season is very short, and the western straits are sometimes icebound during the entire year.

KARBALA, a town in Iraq situated in 32° 40' N., 44° E. 60 mi. S.S.W. of Baghdad on the Husainya canal, 20 mi. W. of the Hindiya branch of the Euphrates, on the edge of the Syrian desert. The population amounted at the census of 1957 to 60,804, practically all Shiah Moslems, Persians and Arabs. A branch line joins the Baghdad-Basra railway north of Hilla. The town is the capital of the province of Karbala (area, 2,355 sq.mi.), with a population of 217,015 in 1957. The town is a centre of pilgrimage of all Shiah hfoslems. It is second only in holiness to Mecca and Najaf and is visited by the old and infirm and by pious pilgrims bearing their dead, for burial in these holy places is a certain way to paradise. Being both a pilgrim centre and a "desert port" considerable trade is done, the exports consisting principally of dates, hides, wool and pious objects. In return Karbala buys Manchester goods, carpets, candles, spices, coffee and tea

The country round the town is fertile and well irrigated and there are considerable groves of date palms. The outer town has broad streets, but the inner town (within the walls almost destroyed by the Turks in 1843) is of the usual narrow streeted and crooked lane type of all old oriental cities. It was there that Husain, the Moslem martyr and son of Ali, was murdered by the soldiers of Yasid in A.D. 680. Like Najaf the ecclesiastical revenues of the town are great, but Karbala, because of its position on the edge of the alluvial plain, is able not only to act as an entrepôt for desert goods, but also to raise agricultural products. In addition to being itself a holy place. it acts as a stopping place on the way for pilgrims both to Najaf and to Mecca.

KARELIA (Finnish KARJALA), an autonomous republic of the Soviet Union. bounded west by Finland, north by the Murmansk oblast, east by the White sea and the Archangel oblast and south by the Vologda and Leningrad *oblasts* of the Russian Soviet Federated Socialist Republic. On March 31, 1940, Karelia became known as the Karelo-Finnish Soviet Socialist Republic. According to a law passed July 16, 1956, the Karelo-Finnish Soviet Socialist Republic became the Karelian Autonomous Soviet Socialist Republic incorporated in the Russian Soviet Federated Socialist Republic.

Physical Geography.—Geologically and orographically Karelia is closely linked with Finland. Its western hills rise to about 1,000 ft., the highest point being 1,354 ft. The remainder of the country is either coniferous forest or marshland, dotted with about 2,500 lakes of which Lake Onega is the largest (3.819 sq.mi.). Among the many rivers the most important are the Kem and the Vyg emptying into the White sea and the Suna which empties into Lake Onega. Lakes and rivers are frozen for 180 to 200 days. The soil and climate are unfavourable for agriculture. Average January temperatures are from −4° to 14° F. and average July temperatures from 50° to 59° F. in the north and from 59° to 68° F. in the south. The average annual rainfall is about 15 in.

History.—The Karelians are of the same race and speech as the Finns. It was among them that the great Finnish epic Kalevala (*q.v.*), was collected. With the Swedish expansion into Finland during the 12th century. Karelia became a disputed area between Sweden and the Russian republic of Novgorod. In 1323, by the treaty of Nöteborg (Schlüsselburg), Karelia was split: its western region. with Viborg (Viipuri) and Sortavala, went to Sweden and the eastern part with the White sea coast to Novgorod. In 1617 the treaty of Stolbovo with Muscovy confirmed this division. In 1721, Peter the Great. by the treaty of Npstad (Uusikaupunki), added to Russia western Karelia. In 1809, by the treaty of Fredrikshamn. Finland was ceded to Russia by Sweden, but retained its autonomy. In 1811 Alexander I reunited western Karelia with Finland. On Dec. 6, 1917, Finland proclaimed its independence.

Although the Soviet government recognized this (Jan. 4, 1918) it helped to organize a Finnish Red army. A Finnish national army was hastily recruited and, with the help of German forces, won the Finnish War of Independence (see FINLAND). A British expeditionary force, under Maj. Gen. Sir Charles Maynard, was sent to protect north Russian ports against seizure by the Germans, and was joined by a regiment of 4,000 Karelians who fought against the Red army in the cause of Karelo-Finnish union. On May 21, 1919, the Allies took Medvezhyegorsk, at the northern end of Lake Onega. The Finnish national army moved into southern Karelia, took Olonets (Aunus) on April 23. and by the end of May stood before Petrozavodsk. As the Allies did not want to interfere in the Russo-Finnish territorial dispute, the Karelian regiment was disbanded because the men were deserting to the Finnish army.

A Karelian national assembly convened at Chta on March 17. 1918, and voted for reunion with Finland. When Finnish-Soviet peace negotiations started at Tartu, Estonia. the Finns insisted that the Soviet Union should grant political autonomy to Karelia. The peace treaty, restoring the "historic border." was signed on Oct. 14. 1920 As nothing was done by the Soviet government to ensure Karelian autonomy, rebellion broke out in Oct. 1921, while the Finnish government appealed in vain to the League of Nations. The rising was crushed after a few months. However, on July 23, 1923, the Soviet government created a Karelo-Finnish A.S S.R. under the control of Russian and Finnish Communists When the U.S.S.R. attacked Finland on Nov. 30, 1939, it signed an alliance nith a "Finnish" puppet government headed by Otto Willie Kuusinen. The planned conquest of Finland did not materialize, but by the Moscow peace treaty (March 12, 1940), uestern Karelia with Viborg was annexed to the U.S.S R. and on March 31 included in a Karelo-Finnish S.S R. When (June 22. 1941), the Germans invaded the U.S S.R.. the Finns decided to recover the lost province. They reconquered the whole of western Karelia, and also the southern part of eastern Karelia with Petrozavodsk, which they held until June 29. 1944. But a Soviet-Finnish armistice of Sept. 19, 1944, re-established the 1940 frontier. This was confirmed by the Finnish peace treaty signed on Feb. 10, 1947.

Area and Population.—The Karelo-Finnish A S S R. had an area of 56,718 sq.mi. This area had, in 1920. an estimated population of 129,000, including 114,000 Finns (88%). By 1926 the population had increased to 269,734, but the number of Finnish Karelians fell to 99,790 (37%). By May 1938 the industrial district and town of Kandalaksha (Kannanlahti) had been incorporated into the Murmansk oblast of the R S.F S.R. The 1939 census revealed a total population of 469,145. Finnish Karelians in the R.S.F.S.R. in 1926 and 1939 were respectively 248,120 and 252,559, two-thirds of them in the Kalinin oblast. When western Karelia was ceded to the U.S.S.R. in 1940, 425,301 Finns were resettled in Finland. New Russian colonists had to be brought to a Karelia which now had an area of 68,918 sq.mi. and was one of the 16 Soviet republics. By June 1, 1941, the population was estimated at 606,333. According to the 1959 census the population of the Karelo-Finnish S.S.R. (which on July 16, 1956. became the Karelian A.S.S.R.) was 651.346 with an area of 66.564 sq.mi. Petrozavodsk. the capital, had 26.344 inhabitants in 1926, 69.728 in 1939 and 135,000 in 1959. During World War II about 60% of the city was destroyed; it mas rebuilt by 1954. The population of other towns was in 1941 as follows: Kem 16,700; Kondopoga 14,000; Belomorsk 13,500; Medvezhyegorsk 13,400; Sortavala 13,000. While the Finns were converted by the Swedes to Catholicism in the 12th century and later became Lutheran. the Finnish Karelians accepted from the Russians the Orthodox form of Christianity.

Economy.—Timber and fishing, the most important industries before World War I. were developed by the building in 1916 of a one-track railway line linking Leningrad with Murmansk. Between World Wars I and II this line was linked with the Archangel-Moscow line. Another strategically important communication line is a canal built by slave labour in 1931-33 to connect the Baltic with the White sea: its total length is 141 mi., it has 19 locks

and is big enough to allow the passage of heavy cruisers. The building of a hydroelectric power station at Kondopoga (capacity 5.000 kw.) and of a thermoelectric plant at Solomennoye (capacity 6.000 kw.) favoured the development of local metallurgical, paper and cellulose industries. Karelia is rich in iron ores.

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KAREN, a term applied to a group of tribes in south Burma, of which the most important are the Sgaw and Pwo (each numbering about 500,000), the Taungthu, Bre and Padaung. Each of these tribes (and some of their subsections) possesses its own language, religion and laws, but no scientific research has been done among them and much of the evidence concerning them is confusing. Classified variously as of Tai-Chinese and pre-Chinese stock, their own tradition claims that they occupied lower Burma until driven into the mountains by the Mon and later the Burmese. The Karen are dispersed over a wide area, a factor which led to the failure to agree with the Burmese in 1947 over the boundaries of a proposed Karen state, and to the disastrous Karen rebellion. They occupy hill areas in the south of the Shan state, the Kayah (Karenni) and Karen states and contiguous parts of Thailand, and in the Pegu Yoma range in lower Burma, and also an important "island" of Irrawaddy delta land in the civil districts of Bassein, Myaungmya and Henzada. Varying forms of animism are still the dominant religion among the Karen. though there are many Buddhists among those settled in plains districts and some 250,000 (predominantly Sgaw) are Christians. The success of the early Christian missions is attributed to an ancient Karen prophecy which foretold that the Golden Book of their god Y'wa would be returned to them by a white man. Karens show a tendency toward religious syncretism, as exemplified in the cults of Hpo Pai San (1866) and Thompson Durmay (1933). Deep suspicion of the Burmese. coupled with a fairly strictly observed endogamy, has resulted in preservation of the ethnic identity of the Karens to a remarkable degree.

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KAREN LANGUAGES. Considerable interest attaches to these pre-Chinese languages which are spoken in Lower Burma and on the borders of Thailand. **A** number of forms exists. such as Karenni or Reo Karen in the north, Pwo and Sgaw of the south, and Taungthu. The relationship of these languages has not been satisfactorily determined, and their detailed examination by the Linguistic Survey of Burma should yield relevant material.

See *Linguistic Survey of India,* vol. i (1927); *Gazetteer of Upper Burma,* vol. i, part 1; *Census of Burma* (1921).

KARENNI (KAYAH), a state of the Union of Burma situated approximately between 18° 50′ and 19° 55′ N. and between 97° 10′ and 97° 50′ E.; it is bounded on the north by the Shan state. on the east by Thailand, on the south by the Salween district and on the west by the Toungoo district. Pop. (1956 est.) 82.244.

The country consists of a series of chains of hills, intersected by deep valleys, through which run the two main rivers. the Salween and the Pawn, and their feeder streams. It is crossed by several tracks, passable for pack animals. The principal peak east of the Salween is on the Loi Lan ridge (7,097 ft.). The Pawn is unnavigable because of its rocky bed, but the Salween is navigated by large native craft.

The chief tribes are the so-called Red Karens, Bres and Padaungs. Little of their history is known. but probably Bawlake was originally the chief state of the whole country. Kantarawadi under Papawgyi early became the most powerful. The latter's ruler, Sawlapaw, having defied the British government. was deposed by Brig. Gen. H. Collett in 1889. Sawlawi was then appointed *myoza,* and received a sanad, or patent of appointment, on the same terms as the chiefs of the Shan states (see SHAN STATE). The independence of the western Karenni states, Kyebogyi and Bawlake, had been guaranteed by the British government in a treaty with King Mindon in 1875. They were, however, formally recognized as feudatqries in 1892 and were presented with *sanads* on Jan. 23 of that year.

The Mawchi mine in Bawlake was an important source of tungsten and the 1939 production amounted to 3,954 tons of tungsten concentrates (WO_3); *i.e.,* 16% of the world's output. However, production during the late 1950s was negligible because of labour problems and to insurgent-created transportation difficulties. Mawchi is connected by a road with Toungoo.

From Oct. 1, 1922, the three Karenni states (Kantarawadi, Kyebogyi and Bawlake) were administered by the commissioner of the federated Shan states. The constitution of the Union of Burma of Sept. 24, 1947, proclaimed that the three states should form a constituent unit of the union and be known as Karenni state. It was constituted on Jan. 14, 1952, and its name changed to Kayah state. (J. CE; X.)

KAREN STATE. According to the constitution adopted on Sept. 24, 1947, the Salween district and certain undefined adjacent areas were to form a constituent part of the Union of Burma to be known as Karen state. The Karens, however, considered inadequate both the degree of autonomy accorded to them and the territory of the proposed state. Being excellent soldiers, the Karens were preferred before Burmese for military service under British rule and they formed half the effectives of the Burma rifles. During World War II, a Karen anti-Japanese resistance movement was active. while the Japanese-controlled Burmese Independence army was fighting the Karens. The independence of Burma meant for the Karens only the change of suzerainty and a change for the worse for they were despised by the Burmese (Karen in Burmese means "wild man"). Moreover, as the central government in 1948 began calling in their arms to equip its own supporters, the Karens' National Defense organization (K.N.D.O.) rallied and occupied all the allegedly Karen territory east of the Sittang river besides many localities in the Irrawaddy delta.

A long rebellion began during which the government forces regained some of the territory occupied by the K.N D.O. On Aug. 12, 1950, Saw Ba U Gyi, the Karen leader, was killed in an encounter with the Burmese army, but the Karens seemed determined to continue their resistance until their demand for an autonomous Karen state was conceded. An effort to conciliate them was made by the passage of Act XIV of 1952 establishing the Karen state comprising, in addition to the Salween district, the adjoining townships of Kya-in, Kawkareik, Hlaingbwe. Pa-an and Thandaung. The Karen state government was formed, with headquarters at Rangoon; their power of administration over the area forming Karen state was to begin when law and order were declared restored in the whole Karen state by the president of the Union of Burma. Karen state was formally inaugurated on June 1, 1954, with Pa-an as its capital

KARIKAL, one of the isolated parts of the state of Pondicherry (*q.v.*), India. on the southeast coast, geographically within Tanjore district, Madras: area 52 sq.mi.; pop. (1955 est.) 75,680. The site was promised to the French by the Tanjore rajah in 1738, in return for services rendered, but was only obtained from him by force in 1739. It was captured by the British in 1760, restored in 1763. again taken in 1768. and finally restored in 1817. The French transferred it to India on Nov. 1, 1954. The town is neatly built on one of the mouths of the Cauvery, and carries on a brisk trade with Ceylon and Malaya, though the port is only an open roadstead. It is served by a short branch of the Southern railway starting at Peralam, and is thus connected with Madras and the north via Mayavaram; and with Tanjore, Trichinopoly, Madura and the south via Tiruvarur.

KARLFELDT, ERIK AXEL (1864–1931), Swedish lyrical poet who received the Nobel prize for literature posthumously in 1931 after refusing it in 1918. He was born at Folkarna, in the province of Dalarna. July 20, 1864, of peasant stock, and his work showed the influence of his rural homeland and upbringing. He studied at Uppsala. but his father's loss of fortune and early death forced him to spend several years as a schoolmaster before taking his degree in philosophy in 1898. He was an assistant at the royal library in Stockholm (1900–03) and librarian of the

academy of agriculture (1903–12). He mas elected to the Swedish academy in 1904, and became its permanent secretary in 1912. He died in Stockholm on April 8, 1931.

Karlfeldt's poetry is remarkable for its transmission of sensual impressions rather than for intellectual content. His rich poetic orchestration depends on an acute sensitivity to physical sensation —colour, sound, scent and touch. In *Fridolins visor* (1898) and *Fridolins lustgård och Dalmålningar på rim* (1901) he depicts the scenery and people of his native province and with warmth, humour and nostalgic sadness recalls the traditional folk culture. then threatened by the modern age. Fridolin, a dashing independent yeoman farmer, who has had a scholarly education, and is also a poet and dreamer, has much in common with Karlfeldt himself. *Flora och Pomona* (1906) shows wilder and more primitive elements: especially in the famous cycle about witches. *Flora och Bellona* (1918) contains some poems which treat contemporary society and wartime conditions with nithering scorn. His last collection, *Hösthorn* (1927), is marked by a more religious, contemplative and personal note, but retains Karlfeldt's highly individual style: a baroque mixture of archaic vocabulary. artistic playfulness and strength drawn from rural themes and symbols.

Selected poems were translated by C. W. Stork as *Arcadia Borealis* (1938). (L. G. G. T.)

KARLI, a village in Poona district, Bombay state. India. famous for its rock-cut chaitva or Buddhist sanctuarv. This is of the normal basilican plan, 124 ft. long. 46 ft. 6 in. wide and about 45 ft. to the crown of its teak-ribbed vault. Dedicated in 80 B.C., it is the largest and most elaborate of the cave temples of Hinayana (early. doctrine-emphasizing) Buddhism.

Karli differs from earlier chaityas in that its entrance screen—other than the teakwood lotus window—is of stone; and the nave columns are elaborated with lota (water-jar-shaped) bases and lotiform capitals crowned with groups of figures riding elephants. Unadorned octagonal shafts are used only in the ambulatory enclosing the usual rock-cut stupa or relic dome. The entrance-screen reliefs date from the sanctuary's conversion for Mahayana (later. Buddha-worshiping) ritual, probably in the 6th century A.D.

KARL-MARX-STADT (until 1953 CHEMNITZ), the capital of the Karl-Marx-Stadt district. Germany, in the former *Land* of. Saxony. It stands on the Chemnitz river at the foot of the Erz mountains, about 1,000 ft. above sea level. and to the northeast of the Erz coal field. Pop. (1959 est.) 286.226. The tonn nas severely damaged in World War II. The Street of the Nations leads from the main station to the market place, in which are the medieval and modern town halls. It passes through Schiller square, where stands a memorial to Marx and Engels, and where is also the academy of machine construction (founded as an industrial school in 1836), and also through the Theatre square, which contains a big hotel, the opera house, a museum and the Red tower, one of the oldest buildings in Karl-Marx-Stadt, originally built as a courthouse.

The Schlossbergmuseum, to the northwest, was formerly a Benedictine monastery founded in 1136; it was fortified as a castle in 1546 and now contains objects of local historical interest. In the Gothic church of the castle and the "Stiftskirche" of Ebersdorf are many valuable sculptures. The cultural centre for the miners of the district is in the suburb of Siegmar, and there are the institute of education and various technical colleges. There are a number of municipal parks.

Chemnitz was founded in 1150 as a trading-place on a salt-route to Prague, and as a result of the grant in 1357 of a monopoly in bleaching it became a centre for the textile industry. In the 17th century hosiery manufacture was added to linen and cotton weaving, and in the 19th century the machine construction industry began. The first German machine tools and the first German locomotive were made in Chemnitz.

Its chief products include stockings, gloves, underwear, textiles, heavy and light machinery and chemicals.

KARLOVAC (German. KARLSTADT), a town of Croatia, Yugos.. occupied by Italy in 1941. Pop. (1961) 39,803. The town, built in 1579, retains portions of its old fortress and walls, beneath which the skulls of 900 Turks are said to be interred, their attacks having been successfully repulsed. There are Orthodox and Roman Catholic cathedrals, a Franciscan monastery law courts. a university and several large schools, including one for military cadets. Karlovac has a considerable transit trade in timber, grain. mine, spirits and honey, and there are in the town woolen mills, leather tanneries, boot factories, a chemical factory and distilleries for the manufacture of a liqueur called rosoglio.

KARLOVY VARY (CARLSBAD; Ger KARLSBAD), a celebrated spa in West Bohemia region. Czech. lies at the junction of the Tepla and Ohre rivers 70 mi W of Prague. Pop. (1957 est.) 42.660; in 1936 the great majority of inhabitants were German speaking. The Tepla valley near the confluence is deeply entrenched in the northern part of the Tepla plateau. and the ancient granitic rocks which form this highland area were subject to the volcanic eruptions and intrusions of Tertiary times. This volcanic activity accounts for the number and character of the thermal springs. The word *tepla* means "warm," and the word *var* itself means "boiling." Vridlo is the Czech name for the great Sprudel. the geyser which forms the main supply of the spa; the total number of springs is 19, 17 of hot water and 2 of cold.

The emperor Charles IV is often cited as the discoverer of the springs. but they were certainly knoan long before his time (1316–78). The town grew steadily in the 18th and 19th centuries because af the valued medicinal properties of the spring water (mainly sulfate and bicarbonate of soda, sodium chloride, potassium sulfate and bicarbonates of magnesium and lithium) Before World War I it was a gathering place of the wealthy invalids of Europe. and the town, spreading up the steep, aooded slopes, retains the framework of its fashionable past. The Carlsbad decrees (*q.v.*) of 1819. devised to discipline liberalist university education in German hands. were framed there There are glass and porcelain industries, both of long tradition. (H G S.)

KARLOWITZ (Yugoslav, SREMSKI KARLOVCI), a city of Serbia, Yugos., occupied by Italy in 1941, during World War II. Population (1961) 6,383. Karlowitz is the seat of an Orthodox metropolitan. The fruit farms and vineyards of the Fruska Gora, a range of hills to the south, yield excellent plum brandy and red nine. An obelisk at Slankamen, 13 mi. S.E., commemorates the defeat of the Turks by Louis of Baden in 1691. The treaty of Karlowitz betaeen Austria Turkey. Poland and Venice nas concluded in 1699. In 1848–49 the city was the headquarters of the Serbian opposition to Hungary.

KARLSEFNI, THORFINN: *see* THORFINN KARLSEFNI.

KARLSKRONA or CARLSCRONA, a seaport of Sneden. on the Baltic coast, chief tonn of the district (*län*) of Blekinge, and headquarters of the Swedish navy. Population (1960) 33.010. It is 290 mi. S.S.W. of Stockholm by rail. The harbour is capacious and secure, and deep enough for the largest vessels. The principal entrance, and the only one practicable for large vessels. is to the south of the tonn, and is defended by forts at Drottningskar on the island of Aspo and on the islet of Kungsholm. The large dry docks are cut out of the solid granite. There is slip accommodation for large vessels. Karlskrona has a navy arsenal and hospital. The toun became the naval headquarters in 1680. There are factories for naval equipments, galvanized metal goods, felt hats, canvas, leather and rice. and breweries and granite quarries. Exports are granite, dairy produce and timber, imports, coal. flour, provisions, hides and machinery.

KARLSRUHE (CARLSRUHE), a city of the Land of Baden-Wurttemberg, Ger., 33 mi. S.W. of Heidelberg. on the railway Frankfurt on Main-Basel, and 30 mi. W.N.W. of Stuttgart. Pop. (1959 est.) 234,759. It is on an elevated plain, 5 mi. E. of the Rhine and on the fringe of the Hardtwald. It takes its name from Karl Wilhelm. margrave of Baden, who, owing to disputes with the citizens of Durlach, erected there in 1715 a hunting seat, around which the town has been built. The Schloss, built in 1751–76 on the site of the previous erection, was a plain building in the old French style. In front were government offices. The older city has a fan-like plan. Other notable buildings are the town hall; the hall of representatives; the mint; the law courts; and the hall of fine arts. The Evangelical town church was the burial-place of the margraves of Baden. During World War II,

Karlsruhe was bombed by the Royal Air Force. On Sept. 3, 1942, third anniversary of Britain's entry into war, a particularly severe air raid, carried out by hundreds of bombers, set fire to the Schloss and left much of the city a smoking shambles.

Since 1870 the industry of the city has grown rapidly, as well as the city itself. There are large railway workshops; and the principal branches of industry are the making of locomotives, carriages, tools and machinery, watches, surgical instruments, furniture, gloves, cement, carpets, perfumery, tobacco and beer. Maxau, on the Rhine, serves as the river port of Karlsruhe and is connected with it by a canal finished in 1901.

KARLSTAD, a town of Sweden, capital of the district *(lan)* of Varmland, on the island of Tingvalla near the estuary of the Klar, 205 mi. W. of Stockholm by Oslo rail. Pop. (1960) 42,924. Karlstad was founded in 1584, and is the seat of a bishop and has a cathedral. Turbines and papermaking machinery are manufactured; and there are numerous iron works. Trade is carried on by way of Lake Väner and the Gota canal. There are match and stockinet factories, and a mineral spring rich in iron. Under the constitution of united Sweden and Norway, in the event of the necessity of electing a regent and the disagreement of the parliaments of the two countries, Karlstad was indicated as the meeting place of a delegation for the purpose. Here, in Aug. 1905, the conference met to decide upon the severance of the union between Sweden and Norway.

KARLSTADT (CARLSTADT), **ANDREAS RUDOLF BODENSTEIN VON** (?1477–1541), German Reformer and pioneer of radical Puritanism in the 16th century, was born in the Franconian village of Karlstadt. He attended the Universities of Erfurt and Cologne, and was trained as a Thomist. In 1505 he was appointed to the new University of Wittenberg, where he combined teaching duties with his religious offices in the *Schlosskirche,* first as canon: then as archdeacon. In 1517 he began to lecture on Augustine's *De spiritu et litera.* He assisted his younger colleague, Martin Luther, in replanning theological studies round Augustine and "the old Fathers." With the opening of the Indulgence controversy, Karlstadt defended Luther and became the protagonist against Johann Eck in the Leipzig disputation of July 1519, in which Luther also took part. His name was added to the papal bull against Luther in 1520. In 1521 he went to Denmark at the request of King Christian II, but the reformation was abortive and he returned in June 1521 when Luther's enforced sojourn in the Wartburg had left his friends to deal with numerous practical problems. Karlstadt published many theses and tracts dealing with clerical celibacy, private Masses and communion in both kinds. Until mid-October it seems that the initiative lay with the Augustinians led by Gabriel Zwilling and on Oct. 19 Karlstadt urged caution against Melanchthon. By the end of the year he had come to the fore as a radical reformer, announcing his bethrothal to a girl of 16, Anna von Mochau, and administering Holy Communion to the laity in both kinds on Christmas day, without vestments and with an abridged service.

The magistrates of Wittenberg carried through practical reform in Jan. 1522 which owed something to Luther's ideas and to Karlstadt's initiative, and Karlstadt's iconoclastic tract *Von abtuhung der Bilder* (1522) revealed a radical, legalistic attitude to the Old Testament. It is not clear how much he nas influenced by the Zwickau prophets who had come to the city the previous December, or by their ally, Thomas Müntzer, who became his friend, but his own religion had earlier shown mystic traits.

At the beginning of February, Zwilling and Karlstadt were named as authors of the serious revolutionary ferment which eventually forced Luther to leave his hiding place and redress the situation in a series of masterly sermons stressing the need of care for the weaker brethren, against Karlstadt's vehement program of reform without tarrying for any. Karlstadt now dressed as a peasant, calling himself "Brother Andreas," and denounced all academic degrees and distinctions. In 1523 he retired to Orlamiinde on the Saale where he displaced his own vicar. Konrad Glitzsch. and introduced his own pattern of reformation. From Jena he published a stream of pamphlets full of mystical jargon and much influenced by J. Tauler and the *Theologia Germanica,* notably *Von dem Sabbat, Was das wort Gelassenheit bedeutet* and *Von mannigfaltigkeit des eynfeltigen willen Gottes.*

Aug. 1524 was a dangerous time in Thuringia, and Luther undertook a preaching tour of the Saale area at the request of his prince. He and Karlstadt met dramatically at Jena when Luther tossed a golden guilder at him in token of open feud. As Luther left Orlamiinde Karlstadt preached against him, amid pealing bells. But he had overreached himself and exile followed. He now wrote a series of bitter tracts which did immense harm to Luther's cause by championing a symbolic presence in the Eucharist. Luther had dealt firmly with Karlstadt's legalism in "Of the Heavenly Prophets" *(Wider die himmlischen Propheten).* but the division in the matter of the Eucharist remained an open wound in the Reformation movement. Karlstadt's tract "Shall We Go Slowly?" *(Ob man gemach faren soll)* was read with delight by the radicals from whom the Anabaptists later arose.

During the peasant war, Karlstadt was at Rothenburg ob der Tauber, and though he was no social revolutionary only obtained pardon through the intercession of Luther and by recantation. But he could not remain silent and left Saxony for East Frisia where he joined the equally explosive Melchior Hoffmann. In 1530 he went to Basel and Ziirich, where the Reformers were kind to him. In 1534 he became professor of Old Testament theology in Basel. There he became involved in a great controversy, setting the university against the pastors led by Oswald Myconius and Simon Grynaeus, and demanding that they be submitted to university discipline and take their doctorates. Thus he who in 1523 attacked a learned ministry now elevated it above the Word and sacraments. At the end of 1541 plague raged in the city. Karlstadt was infected early in December and died on Dec. 24.

Despite his eccentricities an amazing amount of later Puritanism is to be found in the turgid style of his writings. German Protestantism suffered from a lack of such a mystic lay Puritan element as Karlstadt could have supplied had not the personal element bedeviled the situation. He was a persistent troublemaker to the end, frustrating his own many gifts.

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KARMA (sometimes written KARMAN), a Sanskrit noun (from the root *kri,* "to do"), meaning deed or action. As applied to the action of a conscious being. it is the doctrine that every deed, good or bad, receives due retribution. In Hindu thought it has been combined with the doctrine of transmigration, making it possible to explain any apparently undeserved pleasure or pain as a result of deeds done in a previous existence. The doctrine is not found in the earliest Vedic thought, but appears in the Brahmanas. and is fully developed in the earliest Upanishads. It has remained an essential part of the Indian religions that accept the doctrine of transmigration. Both the Jains and the Buddhists took it for granted. The Jains worked it out most consistently by making the extinction of karma essential to the attainment of salvation. The Buddhists interpreted karma strictly in terms of ethical cause and effect. In all sects the doctrine remains a powerful ethical argument, used especially in tales (Xvadana. Jataka) invented to illustrate its effects. (CE. H. H.)

KARMATIANS, one of the names applied to the Muslim Shi'ite sect of the Isma'ilis, derived from the name of Hamdan Karmat, the leader of the movement in southern Iraq in the second half of the 9th century, and mainly used for the members of the movement in Iraq, Yemen and more especially Bahrain, during the 9th–11th centuries. The name of the Karmatians became notorious owing to their insurrection in Syria and Iraq in the years 903–906. and to the exploits of the Bahrain leader Xbu Sa'id al-Jannabi. who several times invaded Iraq and in 930 sacked Mecca.

See S. M. Stern, "Isma'ilis and Qarmatians," *L'Élaboration d'Islam* (1961). (S. M. SN.)

KARNAK (AL KARNAK), a village in Qena province, Upper Egypt, which has given its name to the northern half of the ruins of Thebes on the east bank of the Nile, the southern being knoan as Luxor (*q.v.*). The Karnak ruins comprise three great enclosures built of crude brick. The northernmost and smallest of these contained a temple of the god Mentu. built by Amenhotep III and restored by Rameses II and the Ptolemies. Except a well-preserved gateway dating from the reign of Ptolemy Euergetes I, little more than the plan of the foundations is traceable. Its axis, the line of which is continued beyond the enclosure wall by an avenue of sphinxes, pointed downstream (northeast) The southern enclosure contained a temple of the goddess Mūt, also built or continued by Amenhotep III, and almost as ruinous as the last, but on a much larger scale. At the back is the sacred lake in the shape of a horseshoe The third and greatest enclosure is of vast dimensions, forming approximately a square of 1,500 ft. and it contains the greatest of all known temples, the Karnak temple of Amen.

Inside and outside each of these enclosures there were a number of subsidiary temples and shrines, mostly erected by individual kings to special deities. The triad of Thebes was formed by Amen, his wife Mūt and their son Khansu. The large temple of Khansu is in the enclosure of the Amen temple, and the temple of Mūt is connected uith the latter by an avenue of rams. The Mentu temple, on the other hand, is isolated from the others and turned away from them.

It is probable that a temple of Amen existed at Karnak under the Old Kingdom. if not in the prehistoric age. Slight remains of a considerable temple of the Middle Kingdom survive behind the shrine of the great temple, and numbers of fine statues of the 12th and later dynasties have been found buried in a great pit. which has yielded an enormous number of valuable and interesting monuments reaching to the age of the Ptolemies. The axis of the early temple lay from east to west, and was followed by the main line of the later growth; but at the beginning of the 18th dynasty, Amenhotep I built a temple south of the west front of the old one, and at right angles to it. Thothmes I built a court around the temple of the Middle Kingdom, entered through a pylon (no. v), and later added the pylon no. iv with obelisks in front of it. Queen Hatshepsu placed a splendid obelisk (the largest in Egypt) between the pylons iv and v, and built a shrine in the court of Thothmes I, in front of the old temple. Thothmes III, greatest of the Pharaohs, remodeled the buildings about the obelisks of his co-regent Hatshepsu with the deliberate intention of hiding them from view, and largely reconstructed the surroundings of the court. At a later date, after his wars were over, he altered Hatshepsu's sanctuary, engraving on the walls about it a record of his campaigns. The small innermost pylon (no. vi) is likenise the work of Thothmes III. Amenhotep III, though so great a builder at Thebes, seems to have contented himself with erecting a great pylon (no. iii) at the west end. The closely crowded succession of broad pylons there is explained by a trace of a quay found by Legrain in 1905 near the southern line of pylons, indicating how close was the channel of the Nile, which may have limited their growth. Thothmes III continued on the southern axis and erected a large: pylon (no. vii) to the north of Hatshepsu's sanctuary, to which Haremheb added two great pylons and the long avenue of ram figures, changing the axis slightly so as to lead direct to the temple of Mūt built by Amenhotep III. All of these southern pylons are well spaced. In the angle between these pylons and the main temple was the great rectangular sacred lake. By this time the temple of Karnak had attained to little more than half of its ultimate length from east to west.

With the 19th dynasty there is a notable change. No more was added on the southern line of building, but westward Rameses I erected pylon no. ii at an ample distance from that of Amenhotep III; Seti I and Rameses II utilized the space between for their immense Hall of Columns, one of the wonders of the world. Ramesei III built a fine temple, still well preserved, to Amen at right angles to the axis westward of pylon no. ii; Shishak I (22nd dynasty) commenced a great colonnaded court in front of the pylon, enclosing part of this temple and a smaller triple shrine built by Seti II. In the centre of the court Tirhaka (Tirhaka. 25th dynasty) set up huge columns 64 ft. high, rivaling those of the central aisle in the Hall of Columns, for some building now destroyed. A vast unfinished pylon at the west end (no. i), 370 ft. wide and 142½ ft. high, is of later date than the court. and is usually attributed to the Ptolemaic age. It will be observed that the successive pylons diminish in size from the outside inward.

Besides the kings named above. numbers of others contributed in greater or less measure to the building or decoration of the colossal temple. Alexander the Great restored a chamber in the festival hall of Thothmes III, and Ptolemy Soter built the central shrine of granite in the name of Philip Arrhidaeus. The walls throughout, as usually in Egyptian temples, are covered with scenes and inscriptions. Many of these. such as those which record the annals of Thothmes III, the campaign of Seti I in Syria, the exploit of Rameses II at the battle of Kadesh and his treaty with the Hittites, and the dedication of Shishak's victories to Amen, are of great historical importance. Several large stelae with interesting inscriptions have been found in the ruins. and statues of many ages of workmanship. In Dec. 1903 M. Legrain, who had been engaged for several years in clearing the temple area systematically, first tapped an immense deposit of colossal statues. stelae and other votive objects large and small in the space betneen pylon no. vii and the great hypostyle hall. They were found lying in the utmost confusion; in date they range from the 12th dynasty to the Ptolemaic period.

The inundation annually reaches the floor of the temple, and the saltpetre produced from the organic matter about the ruins, annually melting and crystallizing, has disintegrated the soft sandstone in the lower courses of the walls and the lower drums and bases of the columns. There is moreover no solid foundation in any part of the temple. Slight falls of masonry have taken place from time to time, and the accumulation of rubbish was the only thing that prevented a great disaster. Repairs have gone on side by side with the clearance, especially since the fall of many columns in the great hall in 1899. All the columns which fell in that year were re-erected by 1908 and systematic restoration, both of the hypostyle hall and generally, has been continuously carried on. The whole temple area is now enclosed by a restoration of the old walls of the temenos.

The temple of Khansu, in the southwest corner of the great enclosure, is approached by an avenue of rams, and entered through a fine pylon erected by Euergetes II. It was built by Rameses III and his successors of the 20th dynasty. Excavations in the opposite southeast corner have revealed flint weapons and other sepulchral remains of the earliest periods, proving that the history of Thebes goes back to a remote antiquity.

KARNAL, a town. *tehsil* (subdivision) and district in the Ambala division of Punjab, India. The town is 7 mi. from the right bank of the Jumna and 76 mi. N. of Delhi. Pop. (1951) 57,906; of the *tehsil* (861 sq.mi.) 325,91j. There are manufactures of cotton cloth and boots, besides considerable local trade and an annual horse fair.

KARNAL DISTRICT stretches along the right bank of the Jumna, north of Delhi. It is entirely an alluvial plain, but is crossed by the low uplift of the watershed between the Indian ocean and the Bay of Bengal. Area, 3,073 sq mi.; pop. (1951) 1,079,379. The principal crops are millet, wheat, pulses, rice, cotton and sugar cane. There are several factories for ginning and pressing cotton. The district is traversed by the Delhi-Ambala-Kalka line of the Northern railway, and also by the Western Jumna canal.

No district of India can boast of a more ancient history than Karnal, as almost every town and stream is connected with the legends of the *Mahabharata*. The town of Karnal itself is said to owe its foundation to Rajah Karna, the mythical champion of the Kauravas in the great war which forms the theme of the national epic Panipat, in the south of the district, is said to have been one of the pledges demanded from Duryodhana by the mythical hero Yudisthira as the price of peace in that famous conflict. In historical times the plains of Panipat (*q.v.*) have three times proved the theatre of battles nhich decided the fate of upper India. During the turbulent period which then ensued the Sikhs managed

to introduce themselves, and in 1767 one of their chieftains, Bhai Desu Singh, appropriated the fort of Kaithal, *14* mi. north of Karnal.

The town of Kaithal (pop. 25,732) was traditionally founded by Yudisthira and is associated with Hanuman, the monkey-god. The bhais or rulers of Kaithal mere the most powerful of the Cis-Sutlej chiefs until their territory lapsed to the British in *1843.*

Under British control, Karnal was for a time an important cantonment but was abandoned as unhealthful.

There are colleges of Panjab university at Kaithal, Karnal and Panipat.

KÁROLYI, MIHÁLY, COUNT (*1875–1955*), Hungarian politician, born on March *4. 1875,* belonged to an ancient family which gave many distinguished men to Hungary. He received a cosmopolitan education not without the aristocratic tendency to independence. He was a member of the short-lived parliament of 1905–06 Re-elected to parliament in 1910 he first belonged to the moderate wing of the Independence party, which raised him to leadership in *1912.* Over the Defense bill and the suffrage reform he adopted, however. a sharper opposition against Count István Tisza (1861–1918), the premier.

On Socialist platforms he advocated the introduction of universal suffrage and, unlike the moderate opposition. he was hostile to the German alliance and favourable to a federal reorganization of Austria-Hungary.

In May 1914 Károlyi went to Paris to promote understanding with France and its allies and he visited the Hungarian communities in the U.S. to collect opposition funds for the forthcoming election.

In July 1916 the Independence party was split over foreign policy. the moderate majority follo ing Count Albert Apponyi (1846–1933) and the minority Károlyi. In June 1917, after Tisza's fall, the Károlyi group entered the government coalition, but its leader took no office in order to keep a free hand concerning the German alliance. In Oct. *1918* the creation of national councils in the imperial provinces made the organic law of *1867* obsolete.

'The full independence of Hungary, under a personal union. was considered to be the coming constitution by parties formerly opposed to Károlyi whom they invited into a new coalition. He made the immediate withdrawal of all pro-Germans a condition of his acceptance. Elements oi the dissolving armies took his side in this crisis and, on Oct. *30,* proceeded to violent action. King Charles IV appointed him premier to prevent further disorder, but dispensed him from the usual oath, as constitutional changes made Hungary's whole status uncertain.

A national council, mainly Socialist, took the place of the dissolved parliament.

In December the moderate ministers resigned; the council, on Jan. *9. 1919,* nominated Kirolyi as president of the state until a constituent assembly, planned for April, should meet. Károlyi was unable to stem the growing anarchy, and hopes that his pro-Allied reputation would make the new states more amenable toward Hungary were disappointed. On March 21, in the expectation of Soviet support against the invading Rumanians. he called in a purely Socialist government but his ministers made an agreement with the Communist leader Béla Kun (*q.v.*), who discarded the democratic form of Károlyi's presidency. A manifesto, never actually signed by him, announced Károlyi's resignation. He left soon afterward for exile.

The counterrevolution introduced proceedings against him which resulted in a sequestration order concerning his estates. This measure provoked strong criticism in parliament. Abroad Károlyi became more extreme in his views. He visited the Soviet Union in 1931 and gave a favourable account of his experiences to the French press.

During World War II he supported the Allied cause and was chairman of a Hungarian council in London, grouping Socialist and pro-Communist elements. He returned to Hungary in *1946,* was appointed minister plenipotentiary to Paris. but resigned this post in 1949, disapproving the trial of László Rajk and his associates.

Károlyi died on March 20, 19jj, at Vence, France.

See Count Mihály Károlyi, *Fighting the World: The Struggle jor Peace* (1925) and *Memoirs: Faith Without Illusion* (1956). *(B. MR.)*

KAROSS, a cloak made of sheepskin, or the hide of other animals, with the hair left on. It is properly confined to the coat of skin without sleeves worn by the Hottentots and Bushmen of South Africa. These karosses are now often replaced by a blanket. The chiefs wore karosses of the skin of the wild cat, leopard or caracal.

The word is also loosely applied to the cloaks of leopard skin worn by the chiefs and principal men of the Kafir tribes. Kaross is probably either a genuine Hottentot word or else an adaptation of the Dutch *kuras,* a cuirass.

KARPATHOS (Ital. *Scarpanto*), an island of the Aegean Islands. belonging to Greece, about *30* mi. S.W. of Rhodes in that part of the Mediterranean which was called, after it, the Carpathian sea (*Carpathium Mare*). It was both in ancient and medieval times closely connected with Rhodes; it was held by noble families under Venetian suzerainty, notably the Cornari from *1306* to 1540, when it mas acquired by the Turks. In 1912 it passed into Italian occupation and remained so until after World War II. From its remote position Karpathos has preserved many peculiarities of dress, customs and dialect, the last resembling those of Rhodes and Cyprus. Area, *112* sq.mi.; pop. (1951) 7,053.

KARRER, PAUL *(1889–*), Swiss chemist, shared with W. N. Haworth of Birmingham, Eng., the 1937 Nobel prize for chemistry for his researches into the constitution of carotinoids, flavins and vitamins A and B_2. He was born in Moscow on April *21, 1889,* of Swiss parents and was educated in Switzerland, receiving his doctor's degree at Ziirich in *1911.* After a year in the Chemical institute at Ziirich he joined Paul Ehrlich at the Georg Speyer Haus in Frankfurt am Main where he remained for six years.

In *1918* Karrer returned to Ziirich as professor of chemistry and in 1919 also became director of the Chemical institute. His best-known researches were on the plant pigments, particularly the yellow ones (carotinoids) which are related to the pigment in carrots. He not only elucidated the chemical structure of the carotinoids, but also showed that some of these substances are transformed into vitamin A in the animal body.

In 1930 he established the correct constitutional formula for P-carotine—the chief precursor of vitamin A—and this was the first time that the chemical structure of a vitamin or provitamin had been established. Shortly afterward he was able to clear up the constitution of vitamin A itself, and he also confirmed the constitution ascribed to ascorbic acid (vitamin C) by A. von Szent-Gyorgyi von Nagyrapolt.

Later Karrer turned his attention to vitamin B_2 and vitamin E, and made important contributions to the chemistry of flavins, one of which, lactoflavin, is part of the complex originally described as vitamin B_2.

His *Lehrbuch der organischen Chemie* (1930) passed through many editions in several languages. (W. J. BP.)

KARROO, two extensive plateaus in the Cape province, Union of South Africa, known respectively as the Great and Little Karroo. Karroo is a corruption of *Karusa,* a Hottentot word meaning dry, barren, and its use as a place name indicates the character of the plateaus so designated.

The Little (also called Southern) Karroo is bounded north by the Zwarteberg, which separates it from the Great Karroo. From west to east the Little Karroo has a length of about *zoo* mi., while its average width is *30* mi. West of the Zwarteberg the Little Karroo merges into the Great Karroo. Eastward it is limited by the hills which almost reach the sea in the direction of St. Francis and Algoa bays.

The Great Karroo is of considerably larger extent. Bounded south by the Zwarteberg, farther east by the Zuurberg (of the coast chain), its northern limit is the mountain range which, under various names, such as Nieuwveld and Sneeuw Bergen, forms the wall of the inner plateau. To the southwest and west the Great Karroo is bounded by the Hex river mountains and the Cold Bokkeveld. eastward by the Great Fish river West to east it extends fully *350* mi. in a straight line, varying in breadth from more than *80* to less than *40* mi. While the Little Karroo is divided by a chain of hills which run across it from east to west, and

varies in altitude from 1,000 to 2,000 ft., the Great Karroo has more the aspect of a vast plain and has a level of from 2,000 to 3,000 ft.

The total area of the Karroo plateau is stated to be 100,000 sq.mi. The plains are dotted with low ranges of *kopjes*. The chief characteristics of the Karroo are the absence of running water during a great part of the year and the consequent parched aspect of the country. The vegetation consists mainly of stunted shrubs and shrublets known as karroo bush, while some remarkable succulents occur on the rock outcrops. The river banks are frequently lined with acacia bush and tree. Such parts of the Karroo as are under perennial irrigation are among the most productive lands in South Africa. The Karroo is admirably adapted to sufferers from pulmonary complaints. In a looser sense the term Karroo is also used of the Cape's northern plains which are a part of the inner tableland of the African continent and which give it a distinctive physical character.

See CAPE OF GOOD HOPE.

KARS, an *il* of Turkey. It is a mountainous (or rather a highland) country, being in reality a plateau, with ranges of mountains running across it. The northern border is formed by the Karcal mountains, which attain an altitude of 9,842 ft. In the south the Kara-dagh reach 10,282 ft. in Mt. Ala, and the Agry-dagh 10.728 ft. in Mt. Asagi; and in the middle Allahuekber rises to 10,246 ft. The passes which connect valley with valley often lie at considerable altitudes, the average of those in the southeast being 9.000 ft. Chaldir-gol (6.427 ft.) and one or two other smaller lakes lie toward the northeast; the Chaldir-gol is overhung on the southwest by the Kisirindagi (10.335 ft.). The east side of the province is throughout demarcated by the Arpa-chai, which receives from the right the Kars river, and as it leaves the province at its southeast corner joins the Aras. The Kura rises within the province not far from the Kysyr-dagh and flows across it westward, then eastward and northeastward, quitting it in the northeast. The winters are very severe. The towns of Kaghyshman (4.620 ft.) and Sarykamish (7,800 ft.) have a winter temperature like that of Finland, and at the latter place, with an annual mean (35°) equal to that of Hammerfest in the extreme north of Norway, the thermometer goes down in winter to —40° and rises in summer to 99°. The annual mean temperature at Kars is 40.5° and at Ardahan, farther north, 37°. The Alpine meadows (*yailas*) reach up to 1,000 ft. and afford excellent pasturage in spring and summer. The province is almost everywhere heavily forested. Firs and birches flourish as high as 7,000 ft., and the vine up to above 3.000 ft. Cereals ripen well, and barley and maize grow up to considerable altitudes. Large numbers of cattle and sheep are bred. Extensive deposits of salt occur at Kaghyshman and Oltu. The area is 7.175 sq.mi. and population in 1960 was 544,713. In remote antiquity the province was inhabited by Armenians, the ruins of whose capital. Ani, attest the ancient prosperity of the country. The Turks followed the Armenians, while Kurds invaded the Alpine pasturages above the valley of the Aras; and after them Kabardians, Circassians. Ossetes and Karapapaks successively found a refuge in this highland region. After the Russo-Turkish War of 1877–78, this region was transferred to Russia by the treaty of Berlin; it was returned to Turkey by treaty with the Union of Soviet Socialist Republics in 1921.

KARS, the capital of a Turkish *il* on the border of U.S.S.R. It is situated in 40° 37' N. and 43° 6' E., 185 mi. by rail S.W. of Tiflis, on a dark basalt spur of the Soghanlidagh, above the deep ravine of the Kars-chai, a sub-tributary of the Aras. Pop. (1960) 32,046.

During the 9th and 10th centuries the seat of an independent Armenian principality, Kars was captured and destroyed by the Seljuk Turks in the 11th century, by the Mongols in the 13th, and by Timur (Tamerlane) in 1387. The citadel, it would appear, was built by Sultan Murad III during the war with Persia. at the close of the 16th century. It was strong enough to withstand a siege by Nadir Shah of Persia, in 1731, and in 1807 it successfully resisted the Russians. surrendering to them, however, in 1828 and again in 1855. The fortress was stormed by the Russians in the war of 1877–78, and on its conclusion was transferred to Russia. It was returned to Turkey by the Union of Soviet Socialist Republics in 1921. The town has three considerable suburbs — Orta-Kapi to the south, Bairam Pasha to the east, and Timur Pasha on the western side of the river.

At the northwest corner of the town, overhanging the river, is the ancient citadel, in earlier times a strong military post, but completely commanded by the high ground around. Coarse woolens, carpets and felt are manufactured.

KARSAVINA, TAMARA (1885–), Russian-born ballet dancer, whose partnership with Waslaw Nijinsky helped to revive the interest in ballet in western Europe, was born at St. Petersburg (Leningrad) on March 10, 1885. The daughter of a famous dancer, Platon Karsavin, she was educated at the Imperial Theatre school, St. Petersburg. As prima ballerina at the Maryinsky theatre she danced in such roles as *Giselle* and Odette-Odile in *Swan Lake*, and was with Sergei Diaghilev's Ballet Russe from its beginning in 1909 until 1922. Between 1909 and 1914 she created the majority of famous roles in the neoromantic repertoire of Michel Fokine, including the waltz in *Les Sylphides*, the young girl in *Le Spectre de la Rose*, Columbine in *Carnival*, the *Firebird*, the dancer in *Petrouchka*, *Thamar*, and in the later Massine repertoire the miller's wife in *The Three-Cornered Hat* and Pimpinella in *Pulcinella*

After her retirement Karsavina taught in London for a time, and occupied herself with writing and various dance-educational activities. As a ballerina she combined to an exceptional degree the ability to interpret roles from the classicism of *Swan Lake* to the drama of *Scheherazade*.

Karsavina's autobiography, *Theatre Street*, was published in 1929 (A. L. HL.)

KARST, a type of terrain usually characterized by barren, rocky ground caves, sinkholes. potholes, underground rivers and the absence of surface streams and lakes. Karst results from the work of underground water on massive soluble limestones. The term was originally applied to the Carso, a limestone area along the Dalmatian coast of Yugoslavia, but, by extension, is now applied to all areas exhibiting similar features Karst topography is found in widely scattered sections of the world. In Europe it occurs in the Dinaric alps. the Causses of France and the Pennine range in England In the United States it occurs in the middle nest, in southnestern Illinois. southern Indiana, the Mammoth cave area of Kentucky and north central Florida. Karst areas are found in Cuba, the Yucatán peninsula of Mexico, the Philippines, parts of Indonesia and at various other places in the tropics.

Limestone (calcium carbonate) dissolves relatively easily in slightly acidic water, which occurs widely in nature. Thick layers of limestone have both horizontal and vertical cracks; rain water percolates along these cracks dissolving the limestone and carrying it away in solution. This gradually enlarges the cracks and in places carves them into intricately grooved and jagged terrain called *lapies*. Flowing along cracks underground, the water will continue to niden and deepen the cracks until they become underground caverns or caves or underground stream channels

Most but not all of the principal cave areas of the world are areas of karst topography If the cave becomes large enough and the top extends close enough to the surface the top collapses This produces depressions called dolines or sinkholes into which surface water may flow to disappear underground Sinkholes are among the most characteristic features of karst Sinkholes commonly coalesce into much larger depressions called *poljen*, oftentimes flat-floored and sometimes carrying a surface stream The bottoms of sinkholes and *poljen* usually have a covering of soil which is derived from the insoluble residues of the limestone Consequently since soil and water are available at the bottom of a *polje*, it may be the only part of a karst region where cultivation can be carried on

However, limestones vary notably in their solubility and in the proportion of their insoluble components hence the general surface of some karst areas as in southern Indiana, can be farmed

Over broad areas surface streams may be totally absent In fact, in some karst areas with heavy rainfall all precipitation may

disappear underground so completely that water even for domestic purposes may be difficult to find; the only source for miles may be a small pool at the bottom of a sinkhole.

In other places water may appear at the surface as large springs, flow as a stream across the surface and then disappear again underground.

For discussion of the processes involved in the formation of karst topography *see* CAVE; LIMESTONE. *See* also BALKAN PENINSULA: *Geography.* (W. C. C.)

KARTEL: *see* CARTEL.

KARTIKEYA, in epic Hindu mythology Skanda, god of war. He has been regarded as a deification of Alexander, but this is quite uncertain, and he is unimportant in the early epics. Siva, it would seem, needing a new battle leader chose Kumara (Skanda), son of Agni, for that post, making him his own son. One of the many myths about his birth says that Siva was his sole parent, and that he was mothered by the Krittikas, the Pleiades, the asterism of battle, whence he was called Kartikeya. In order that he might be suckled by these six nymphs he was endowed with as many faces; but another tale is that he was miraculously born as the six sons of as many spinsters (*krittika* possibly meaning "web" or "sword" maidens) and that Parvati, Siva's wife, hugged him in her arms so that he became one, with 6 faces, 12 arms, etc. His vehicle is the peacock. His title in South India, Subramanya, is postepic.

KARUN, an important river of Iran. The river has a basin area of 22,069 sq.mi. and a length of 528 mi. Its headwaters are in the mountain cluster known since at least the 14th century as Zardeh Kuh (14,920 ft.), and situated in the Bakhtiari country about 100 mi. W. of Isfahan. In its upper course, until it emerges from the hills above Shushter it is called Ab-i-Kurang.

From the junction of the two principal sources in the Zardeh Kuh at an altitude of about 8,000 ft., the Ab-i-Kurang is a powerful stream, full, deep and flowing with great velocity for most of its upper course between precipices varying in height from 1,000 to 3,000 ft. The steepness and height of its banks there make it useless for local irrigation purposes. From its principal sources to Shushter the distance as the crow flies is only about 75 mi., but the course of the river is so tortuous that it travels 250 mi. before it reaches that town.

Besides being fed on its journey through the Bakhtiyal country by many mountain streams, it receives several tributaries, the most important being the Ab-i-Bazuft from the right and the Ab-i-Bar from the left. At Shushter it divides into two streams, one the Ab-i-Gargar, a channel, in part artificial, cut in ancient times and flowing east of the town; the other, and main stream, the Ab-i-Shatait, flowing west. The two streams unite, after a run of about 50 mi. at Band-i-Qir, 24 mi. S. of Shushter, where the Ab-i-Diz (river of Dizful) also comes in, on the right bank.

From Band-i-Kir to a point 2 mi. above Mohammerah the river is called Karun and is navigable from thence to its mouth except for a distance of about 2 mi. just below Ahwaz, where a series of cliffs and rocky shelves cross the river and cause rapids. Between Ahwaz and Band-i-Qir (46 mi. by river, 24 mi. by road) the river has an average depth of about 20 ft., but below Ahwaz down to a point a few miles above Mohammerah it is in places very shallow and in the summer vessels with a draft exceeding 3 ft. are liable to ground. About 12 mi. above Mohammerah and branching off to the left, is a choked-up river bed called the "Blind Karun," by which the Karun found its way past Qubban to the sea, until about 1766. Ten miles lower down a channel called the Bahmishir takes off from the left bank and flows southward. It is navigable to the sea for small craft. The main river, there about a quarter of a mile broad and 20 to 30 ft. deep, now flows west and after passing Mohammerah enters the Shatt-al-Arab about 20 mi. below Basra.

This part of the river, from the Bahmishir to the Shatt, is a little over 3 mi. in length, and as its name Hafar (dug) implies, is an artificial channel. The Arab geographer Muqaddasi (A.D. 986) states that it was dug about A.D. 980 to facilitate water communication between Ahwaz and Basra. The total length of the Karun is about 528 mi. while the distance from its sources to its junction with the Shatt is only 160 mi. as the crow flies. The Karun up to Ahwaz was opened to international navigation on Oct. 30, 1888, and Messrs. Lynch of London established a fortnightly steamer service on it immediately afterward. River steamers ply between Mohammerah and Nasiri and there is a daily service of motor bellums to Ahwaz. A boat of the Mesopotamia Persia corporation runs four times a month from Ahwaz to Shalili and back, and one of the Nasiri company three times. The shipping on the lower Karun has in the last few years become increasingly important, on account of the activities of the Anglo-Persian Oil Co.'s oil fields in southwest Iran.

To increase the water supply of Isfahan, Shah Tahmasp I (1524–1576) and Shah Abbas I (1587–1629), undertook some works for diverting the Kurang into a valley which drains into the river of Isfahan, by tunneling through a narrow rocky ridge separating the two river systems. The result of many years work, a cleft 300 yd. long, 15 broad and 18 deep, can be seen at the junction of the two principal sources of the Kurang.

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KARYOKINESIS ("nucleus-movement") is defined as indirect nuclear division, involving the formation and longitudinal splitting of spireme threads and chromosomes, and of an achromatic spindle. Karyokinesis is also often applied to the indirect division of the cell as a whole.

In its more restricted sense, karyokinesis is practically equivalent to mitosis, which is fully described and illustrated in detail in the article CYTOLOGY.

KASAI (CASSAI), a river of Africa, the chief southern affluent of the Congo. It enters the main stream in 3° 10′ S., 16° 16′ E., after a course of 1,338 mi. The Kasai river system as a whole consists of innumerable consequent streams which have remarkably parallel courses and flow north rising in the highlands which stretch from Angola along the southern boundary of the Republic of The Congo and which form the watershed between the Zambesi and the Congo. The chief rivers of the Kasai system which flow in that direction are the Sankuru, Lulua, Kasai, Luembe, Chiumbe, Longachimo, Chikapa, Lovua, Loange, Kwilu, Kwengo, Inzia, Wamba and the largest, the Kwango. In their upper courses, as they flow over the Archaean massif, these streams occasionally assume a subsequent direction, but it is not until they reach the northern plain that this direction becomes dominant. The Sankura, whose waters are a bright yellow colour, is the first to flow westward near Bena Dibele and this stream, which at Basongo is joined by the Kasai and by which name it is henceforward known, intercepts the others or those of them which have been formed by the confluence of several.

Numerous falls and rapids occur in the upper reaches of all the streams, thus preventing navigation upon most of the tributaries. The Kasai river system is navigable for 2,896 mi. Navigation is possible on the Sankuru to above the town of Lusambe; on the Kasai it is stopped by the Wissmann falls a few miles below its confluence with the Lovua. The other tributaries are navigable for only short distances while even on the Kwango navigation does not proceed very far. Apart from those already mentioned, the only important right-bank tributary is the Mfini, known above Lake Leopold II, into which it flows, as the Lukenie, which, rising in the eastern Republic of The Congo, flows westward and joins the Kasai 450 mi. from its mouth. The Kasai, in its lower course a broad stream strewn with islands, is narrowed to about half a mile on passing through a gap in the inner line of the West African highlands, by the cutting of which the old lake of the

Kasai basin must have been drained. The Kasai enters the Congo with a minimum depth of 25 ft. and a breadth of 700 yd.. at a height of 942 ft. above the sea. The confluence is knonn as the Kwa mouth, Kwa being an alternative name for the lower Kasai

The Kwango affluent of the Kasai was the first of the large affluents of the Congo known to Europeans, being reached by the Portuguese in the 16th century, but of its lower course they mere ignorant. The first accurate knowledge of the river basin was obtained by David Livingstone, who reached the upper Kasai from the east and explored in part the upper Kwango (1854–55). V. L. Cameron and Paul Pogge crossed the upper Kasai in the early 1870s. The Kwa mouth was seen in 1877 by H. M. Stanley, who in 1882, ascended the river to the Kwango-Kasai confluence and then proceeded up the Mfini and discovered Lake Leopold II. In 1884 George Grenfell journeyed up the river beyond the Kwango confluence. The systematic exploration of the main stream and its chief tributaries was, however, mainly the work of Hermann von Wissmann, Ludwig Wolf, Pogge. Major Von Mechou, Grenfell and Holman Bentley, Capt. C. Lemaire and E. Torday. See CONGO RIVER.

KASBEK: see KAZBEK.

KASHAN, a former province and town of Iran, the province being situated to the north of Isfahan province, on the Iranian plateau. The administrative centre was Kashan, 150 mi. from Tehran at an elevation of 3,190 ft. Pop. (1956) 45,998. The town lies on a caravan route slightly eastward of the Isfahan-Qum-Tehran road. passihle by motor car.

The summer heat is excessive—a mean maximum in July of 100° was recorded for the period 1881–84. Water, which is scarce. is brought by aqueduct from a spring at the garden of Fin, 4 mi. W. of the town. one of the most beautiful in the country.

The melons and figs of Kashan are greatly esteemed. Manufactures are copper utensils, embroidered silks. plain stuffs and a kind of velours. The trade in velvets and brocades, at the end of the 19th century. had been almost killed by the competition of European machine-made stuffs. hut the textile skill of the natives was largely concentrated on woolen and silk carpets. These are some of the finest Iran can produce. Prosperity revived hut again declined. partly because of the relocation of the main north-south road which by-passes Kashan.

Kashan was the most important centre of the ceramic art in Persia, producing the finest decorated pottery as well as glazed tiles that were exported throughout the near east. Its lustrewares were especially famous. Kashan also exports rose water made in the villages around; cobalt is obtained from the mine at Kamsar, 19 mi. south.

KASHER: *see* KOSHER.

KASHGAR (SHU-FU, SU-FU, K'O-SHIH), a city of Sinkiang Uigur Autonomous Region (pop. [1953 est.] 91,000) and an oasis of the same name, situated at an altitude of more than 4,000 ft. at the extreme west end of the Tarim basin where the mighty Tien Shan and the Muz Tagh Ata range of the Pamirs meet. Between these ranges of over 22,000 ft. altitude, runs the 12,400-ft. high Terek pass (Turug Art Dawan or Pereval Turugartj linking Kashgar with the Soviet Union's Ferghana valley railhead at Xndizhan. The entire caravan route requires about eight days. In the south. past the Khotan oasis, runs the trade route over the Karakorum pass (18,290 ft.) to Kashmir. Two low passes (under 3.000 ft.) provide access through the Tien Shan to Lrumchi and the Dzungarian basin in northern Sinkiang Uigur Autonomous Region.

The fertility of Kashgar oasis lies in its loess soil, which depends upon river and well water for irrigation. The northern edge is about 5 mi. from the city, beyond which in sharp contrast stretches a great sweep of gravelly desert fanning out from the deeply eroded foothills of the Tien Shan. The average January temperature at Kashgar is 42° F. while the July average is 99°. The lowest readings in January are around zero and the highest shade temperature in August is about 105°. The scanty, irregular annual rainfall averages a little more than 3 in. Between the middle of November and the end of February. irrigation is not undertaken because ice obstructs the channels. Strong winds are rare in winter, although the dust from the Takla Makan desert in the east fills the atmosphere and only occasionally in early summer and late autumn is there clear visibility. Cholera, typhus and plague are reported to be unknown, although typhoid fever and smallpox and a mild form of malaria are epidemic. Mosquitoes and sand flies are persistent pests.

Kashgar is the centre for cotton growing in Sinkiang. Its staple food crops are first wheat and maize, followed by barley. rice, millet and legumes. Abundant fruits include peaches, apricots, cherries, mulberries and grapes as well as sweet melons. Silk also is produced. There is some fishing in the Tumen and Kizil Darya rivers flowing through the oasis.

In the 1940s some rich copper ores were mined in a small way in the mountains to the north and northwest of the city. Most of the industry is of the handicraft type, such as the making of homespun cloth. wool rugs. felt, furs, leather goods and pottery. The city's external trade is oriented toward the Soviet Union. Exports include wool, raw silk, hides, sheep intestines. dried fruits, rugs. camel's hair and horsehair. Imports include cotton and wool textiles. granulated sugar. pig iron. petroleum products, matches, tobacco products, leather, paper, liquors and silkworm eggs.

History.—Kashgar actually comprises two cities: the Chinese city called Lai-ning (Shu-lo or Su-lo). and the much larger Uihur city to the west—Kashgar proper (Shu-fu or Su-fu). The name Kashgar comes from *kash* (varicoloured) and *gar* (brick houses). During the Han and T'ang periods it was known as the Shu-lo kingdom. In the 3rd century B.C. a branch of the Indo-Scythians called the Yue-chi (*q.v.*) were forced westward from the Kansu region, drove out the Sska (*q.v.*) from the Kashgar oasis and occupied it.

The Chinese conquered Chinese Turkistan and Kashgar during the 1st century B.C. and the famous Chinese general Pan Chao is said to be buried at Kashgar. Later the Yue-chi reconquered Kashgar. They are credited with introducing Buddhism from India into China.

Turkish and Mongol hordes repeatedly swept through the region in the centuries that followed. Though the Chinese had a garrison in Kashgar in the 8th century, it finally succumbed to the western Turks. In the 10th and 11th centuries Kashgar formed part of the Turkish Ligur kingdom, which was overthrown by the Kara-Kitais, another westward-moving Turkish tribe, in the early 12th century. In 1219 Jenghiz Khan added the district to his empire and during Kublai Khan's reign Marco Polo visited Kashgar about 1275.

In the 13th century Kashgar was ravaged by the troops of Timur (Tamerlane), and in succeeding centuries it suffered many attacks, once being completely destroyed. The Chinese recaptured it in 1755 and it remained in their hands until the Tung-kan (Dungan) rebellion in 1862.

Following a local insurrection and a Russian intervention at Kashgar. a Muslim general. Yakub Beg. usurped the throne of the king of Kashgar and made himself the ruler. Chinese Gen. Tso Tsung-t'ang then led an army into Sinkiang and subdued Yakub Beg. The province, including Kashgar, remained thereafter in Chinese hands through the period of the republican revolution. After the death of Gov. Yang Tseng-hsin in 1928, the Muslim Gen. Ma Chung-ying headed a rebellion in the Tarim that was not finally suppressed until 1937 by Gov. Sheng Shih-ts'ai with Soviet help. This instituted a period of a strong Soviet hand in the economic and political affairs of the province until Jan. 1943 when full Chinese control was restored.

In the winter of 1949 Chinese Communist troops, reportedly under Soviet 4th army supervision, took over control in Sinkiang, suppressing Muslim resistance. The political and economic system was radically altered. In 1955 Sinkiang was organized as the Sinkiang Uigur Autonomous Region.

See SINKIANG. (H. J. Ws.)

KASHI or KASI, formerly the Persian word for all glazed and enameled pottery irrespectively: now the accepted term for certain kinds of enameled tilework, including brickwork and tile mosaic work, manufactured in Persia and parts of Mohammedan India, chiefly during the 16th and 17th centuries.

Undoubtedly originating in the Semitic word for glass, kas, it is quite possible that the name kaslzi is immediately derived from Kashan, a town in Persia noted for its *faïence.* This ancient pottery site, in turn. probably receives its name from the old-time industry; as a "city of the plain" it would obviously have no claim to the farther-eastern suffix *shan,* meaning a mountain.

Kashi work consisted of two kinds: (a) Enamel-faced tiles and bricks of strongly fired red earthenware, or terra-cotta; (b) enamel-faced tiles and tesserae of lightly fired "lime-mortar," or sandstone. Tile-mosaic work is described by some authorities as the true kashi. From examination of figured tile-mosaic patterns, it would appear that, in some instances, the shaped tesserae had been cut out of enamelled slabs or tiles after firing; in other examples to have been cut into shape before receiving their facing of coloured enamel. Conventional representations of foliage, flowers, fruit, intricate geometrical figures, interlacing arabesques and decorative calligraphy — inscriptions in Arabic and Persian — constitute the ordinary kashi designs. The colours chiefly used were cobalt blue, copper blue (turquoise colour), lead-antimoniate yellow (mustard colour), manganese purple, iron brown and tin white. A colour-scheme, popular with Mogul and contemporary Persian kashigars, was the design, in cobalt blue and copper blue, reserved on a ground of deep mustard yellow.

In India the finest examples of kashi work are in the Punjab and Sind provinces. At Lahore, amongst many beautiful structures, the most notable are the mosque of Wazir Khan (A.D. 1634) and the gateways of three famous pleasure gardens, the Shalamar Bagh (AD. 1637), the Gulabi Bagh (A.D. 1640), and the Charburji (c. A.D. 1665). At Tatta the Jami Masjid, built by Shah Jahan (C. A.D. 1645), is a splendid illustration; whilst in that "vast cemetery of six square miles" on the adjacent Malki plateau are numerous Mohammedan tombs (A.D. 1570–1640) with extraordinary kashi ornamentation. Delhi, Multan, Jullundur, Shahdara, Lahore cantonment, Agra and Hyderabad (Sind), all possess excellent monuments of the best period, viz., those erected during the reigns of Akbar and Jahangir (A.D. 1556–1628).

In Persia at Isfahan. Kashan, Meshed and Kerman are a few buildings and ruins showing the old kaslzi work; the palace of Chehel Situn in Isfahan, built during the reign of Shah Abbas I (*c.* A.D. 1600), is a magnificent specimen of this art.

Occasional revivals of the manufacture have taken place both in India and Persia. Mohammed Sharif, a potter of Jullundur in the Punjab, reproduced the Mogul enamelled tile-work in 1885, and there is a manuscript record of a certain Ustad Ali Mahommed, of Isfahan, who revived the Persian processes in 1887.

KASHMIR, a state in the Indian subcontinent including much Himalayan country of the Punjab; it is bounded northwest by Afghanistan, northeast by Sinkiang province of China and east by Tibet. Famed for its beauty, it was formerly the chief health resort for Europeans in India. Politically it became important as guarding one of the approaches to India on the northwest and as a source of friction between India and Pakistan. The official name of the state is Jammu and Kashmir. Area 92,780 sq.mi.; pop. (1941) 4,021,616; (1951 est.) 4,410,000. It includes the provinces of Jammu (including the *jagir* of Punch). Kashmir, Ladakh, Baltistan and Gilgit; the Shin states of Yaghistan, of which the most important are Chilas, Darel and Tangir, are nominally subordinate to it. and the two former pay a tribute.

Physical Conformation, Geology and Climate. — The country, mountainous save for the continuation of the plains of the Punjab in the southwest, is divisible into (1) the outer hills and the central mountains of Jammu district, (2) the valley of Kashmir and (3) the far side of the great central range, including Ladakh, Baltistan and Gilgit.

The hills forming the northern half-circuit of the Kashmir valley, and running beyond, include many high mountain masses and peaks, the most conspicuous of which is Nanga Parbat, 26,660 ft. above the sea, with a large glacier on its east face. The great ridge thrown off by Nanga Parbat rises, at a distance of 12 mi., to another summit of 20,740 ft. in height, from which run southwest and southeast the ridges nhich are the north water-shed boundary of Kashmir. The former range, after running 70 mi. southwest between the valleys of the Kishenganga and the Kunhar or Nainsukh, turns south, closely pressing the Jhelum river, after it has received the Kishenganga, with a break a few miles farther south which admits the Kunhar. The highest summits are 16.487 and 15,544 ft. above sea level. The range which runs southeast from the junction peak mentioned above divides the valley of the Kishenganga from that of the Astor and other tributaries of the Indus. The highest point on this range, where it skirts Kashmir, is 17,202 ft. above sea level. For more than 50 mi. from Nanga Parbat there are no glaciers on this range; thence eastward they increase; one, near the Zoji-la pass, is only 10,850 ft. above sea level. The mountains at the east end of the valley, running nearly north and south, drain inward to the Jhelum, and on the other side to the Wardwan, a tributary of the Chenab. The highest part of this eastern boundary is 14,700 ft. There are no glaciers. The highest point on the Panjal range, which forms the south and southwest boundary. is 15,523 ft. above sea level.

The Jhelum river (*q.v.*) or Behat (Sanskrit *Vitasta*)—the Hydaspes of Greek historians and geographers — flows northwest through the middle of the valley. After a slow and winding course it expands about 25 mi. below Srinagar over a slight depression in the plain, and forms the Wular lake and marsh, about 12½ mi by 5 mi. in extent, surrounded by the lofty mountains which tower over the north and northeast of the valley. Leaving the lake on the southwest side, near Sopur, the river flows slowly southwest about 18 mi. to the gorge at Baramula. From this point the stream is more rapid through the narrow valley which conducts it west 75 mi. to Muzaffarabad, where it turns sharply south, joined by the Kishenganga. At Islamabad, about 40 mi. above Srinagar, the river is 5,400 ft. above sea level, and at Srinagar 5,235 ft. It thus has a fall of about 4 ft. per mile in this part of its course. For the next 24 mi. to the Wular lake, and thence to Baramula, its fall is only about 2¼ ft. to the mile. On the 80 mi. of the river in the flat valley between Islamabad and Baramula, there is much boat traffic; but none below Baramula till the river comes out into the plains.

On the northeast side of this low narrow plain of the Jhelum is a broad hilly tract, and between it and the higher boundary range runs the Kishenganga river. Near the east end of this interior hilly tract, and connected with the higher range, is one summit of 17.839 ft. possessing many small glaciers. These heights look down on one side into the beautiful valley of the Sind river, and on another into the valley of the Lidar, which joins the Jhelum. Among the hills north of Srinagar rises one conspicuous mountain mass, 16,903 ft. in height, from which on its north side descend tributaries of the Kishenganga, and on the south the Wangat river, which flows into the Sind.

Geology. — The general strike of the beds, and of the folds which have affected them, is from northwest to southeast, parallel to the mountain ranges. Along the southwest border lies the zone of Tertiary beds which forms the Sub-Himalayas. Next to this is a great belt of Palaeozoic rocks, through which rise the granite, gneiss and schist of the Zanskar and Dhauladhar ranges and of the Pir Panjal. In the midst of the Palaeozoic area lie the alluvium and Pleistocene deposits of the Srinagar valley and the Mesozoic and Carboniferous basin of the upper part of the Sind valley. Beyond the great Palaeozoic belt is a zone of Mesozoic and Tertiary beds which commences at Kargil and extends southeast past the Kashmir bcundary to Spiti and beyond. Finally, in Baltistan and the Ladakh range there is a broad zone composed chiefly of old gneiss and schist.

Climate. — The valley of Kashmir, sheltered from the southwest monsoon by the Panjal range, has not the periodical rains of India. Its rainfall is irregular, being greatest in the spring months. Occasionally storms in the monsoon pass over the crests of the Panjal and give heavy rain on the elevated plateaus on the Kashmir side. And again clouds pass over the valley and are arrested by the higher northeast hills. Snow falls on the surrounding hills at intervals from October to March. As a health resort Kashmir, excluding Srinagar, has no rival anywhere in the neighbourhood of India. In consequence of the varied range of temperature and the facility of moving about, the visitor is enabled with ease to select places at elevations most congenial to him. The railway to

Rawalpindi and a driving road thence to Srinagar make the valley easy of access. When the temperature in Srinagar rises at the beginning of June! visitors normally go to Gulmarg, a fashionable hill-station. The great influx of visitors resulted in a corresponding diminution of game. Special game preservation rules have been introduced and *nullahs* are let out for stated periods with a restriction on the number of head to be shot. The wild animals of the country include ibex, markhor, oorial, the Kashmir stag, and black and brown bears.

History. — The history is enshrined in four Sanskrit books. The *Rajatarangini*, commencing with traditional history of very early times, comes down to the reign of Sangrama Deva, 1006; the second work, by Jonaraja, takes up the history in continuation and, entering the Mohammedan period, gives an account of the reigns down to that of Zain-ul-ab-ad-din, 1420. P. Srivara carried on the record to the accession of Fath Shah, 1489. The fourth work, called *Rajavalipataka*, by Prajnia Bhatta, completes the history to the time of the incorporation of Kashmir in the dominions of the Mogul emperor Akbar, 1586.

In the *Rajatarangini* it is stated that the valley of Kashmir was formerly a lake and that it was drained by the great *rishi* or sage, Kasyapa, son of Marichi, son of Brahma, by cutting the gap in the hills at Baramula (Varaha-mula). When Kashmir had been drained, he brought in the Brahmans to occupy it. In the 7th century Kashmir is said by the Chinese traveller Hsuan Tsang to have included Kabul and the Punjab and the hill region of Gandhara, the country of the Gandarae of classical geography.

At an early date the Sanskrit name of the country became *Kásmir*. The earliest inhabitants, according to the *Rajatarangini*, were the people called Naga, a word which signifies "snake." The other races mentioned as inhabiting this country and the neighbouring hills were Gandhari. Khasa and Daradae. The Khasa people were supposed to have given the name Kasmir. In the *Mahabharatn* the Kasmira and Daradae were named together among the Kshattriya races of northern India.

In the time of Asoka one of the Indian Buddhist missions was sent to Kashmir and Gandhara. After his death Brahmanism revived. While Kashmir was under Kushan rule: Buddhism was to a great extent restored, though for several centuries the two religions existed together in Kashmir, Hinduism predominating. In this Hindu-Buddhist period, and chiefly between the jth and 10th centuries of the Christian era, the Hindu temples in Kashmir were erected. In the 6th and 7th centuries Kashmir was visited by some of the Chinese Buddhist pilgrims to India. The country is called Shie-mi in the narrative of To Yeng and Sung Yun (578). One of the Chinese travellers of the next century was for a time an elephant-tamer to the king of Kashmir. Hsuan Tsang spent two years (631–633) in Kashmir *(Kin-chi-mi-lo)*. He entered by Baramula and left by the Pir Panjal pass. In the following century the kings of Kashmir appear to have paid homage and tribute to China, though this is not alluded to in the Kashmir chronicle. Hindu kings continued to reign till about 1346, when Udiana Deva was put to death by his Mohammedan vizier, Amir Shah, who ascended the throne under the name of Shams-ud-din.

Of the Mohammedan rulers mentioned in the Sanskrit chronicles, one, who reigned about the close of the 14th century. made his name prominent by his active opposition to the Hindu religion and his destruction of temples. This was Sikandar, known as *Butshikan*, or the "idol-breaker." It was in his time that India was invaded by Timur, to whom Sikandar made submission and paid tribute. The country fell into the hands of the Moguls in 1586. In the time of Alamgir it passed to Ahmad Shah Durrani, and from that time it remained in the hands of Afghans till it was wrested from them by Ranjit Singh,' the Sikh monarch of the Punjab, in 1819. Eight Hindu and Sikh governors under Ranjit Singh and his successors were followed by two blohammedans similarly appointed, the second of whom, Shekh Imam-ud-din, was in charge when the battles of the first Sikh war (1846) brought about new relations between the British government and the Sikhs.

Gulab Singh, a Dogra Rajput, had been raised from a humble position to high office by Ranjit Singh. who conferred on him the small principality of Jammu. On the final defeat of the Sikhs at Sobraon (Feb. 1846), Gulab Singh was called to take a leading part in arranging conditions of peace. The treaty of Lahore (March 9, 1846) set forth that, the British government having demanded, in addition to a certain assignment of territory, a payment of a crore and a half of rupees (1,500,000 sterling), and the Sikh government being unable to pay the whole, the maharajah (Dhulip Singh) cedes, as equivalent for one crore, the hill country belonging to the Punjab between the Beas and the Indus, including Kashmir and Hazara. The governor-general. Sir Henry Hardinge, considered it expedient to make over Kashmir to the Jammu chief, securing his friendship while the British government was administering the Punjab on behalf of the young maharajah. Gulab Singh was well prepared to make up the payment in default of which Kashmir was ceded to the British; and so, in consideration of his services in restoring peace, his independent sovereignty of the country made over to him was recognized, and he was admitted to a separate treaty. Gulab Singh had already, after several extensions of territory east and west of Jammu, conquered Ladakh (a Buddhist country, and till then subject to Lhasa), and had then annexed Skardo, which was under independent Mohammedan rulers. He had thus by degrees half encircled Kashmir, and by this last addition his possessions attained nearly their present form and extent. Gulab Singh died in 1857 and was succeeded by his son; Ranbir Singh, who died in 1885. The next ruler, Maharajah Partab Singh (1850–1925), on his accession inaugurated the settlement reforms already described. His rule was remarkable for the reassertion of the Kashmir sovereignty over Gilgit (*q.v.*). In 1925 Maharajah Sir Hari Singh (1895–1961) succeeded to the title of maharajah of Jammu and Kashmir. He went into exile in 1949 and his son: Tuvaraj Karan Singh, became regent. In 1952 the hereditary monarchy was abolished and the regent was elected head of state.

After the partition of the Indian subcontinent in Aug. 1947, Kashmir became a bone of contention between India and Pakistan. On Oct. 20, 1947, tribesmen from the northwest frontier of Pakistan invaded Kashmir and threatened its capital Srinagar, which was saved by the intervention of Indian air-borne troops. In the same month the ruler of Kashmir executed an instrument of accession to the Indian union. In this action he was supported by the influential Sheikh Mohammed Abdullah, head of the Jammu and Kashmir National conference and subsequently de *facto* prime minister of the state. On Jan. 6, 1948, India brought the case before the United Nations Security council on the grounds that Pakistan was assisting the invaders. Although a "cease-fire" was in force from Jan. 1949. all efforts of the Security council and its representatives in Kashmir failed to bring about a solution.

People and Industries. — The great majority of the inhabitants of Kashmir are professedly Mohammedans, but they are still strongly influenced by their ancient superstitions. At the census of 1941, out of a total population of 4,021,616 for the state, there were 807.549 Hindus, 3,073,540 Moslems, 3,079 Indian Christians, 29.374 tribes and 108,074 others.

Up to recent times flood. fire and epidemics were very serious troubles; the cultivator lived under a system of *begar*, which entitled an official to take either labour or commodities free of payment. But the land settlement of 1889 swept many abuses away. Restrictive monopolies, under which certain manufactures were closed to private enterprise, were abolished. In consequence of this improvement in their conditions of life and of the influx of wealth into the country brought by visitors. the Kashmiri grew every year in material prosperity and independence of character.

The language spoken in Kashmir is akin to that of the Punjab, though marked by many peculiarities. It possesses an ancient literature, which is written in a special character (see KASHMIRI LANGUAGE). The University of Jammu and Kashmir, an affiliating body with headquarters at Srinagar, was founded in Nov. 1948.

Crops. — The staple crop of the valley is rice, which forms the chief food of the people. Indian corn comes next; wheat, barley and oats are also grown. Vegetables which thrive well include asparagus. artichoke, sea kale, broad beans, scarlet-runners, beetroot, cauliflower and cabbage. Fruit trees grow all over the valley, wild but bearing fruit, and the cultivated orchards yield pears,

apples. peaches. cherries, etc., equal to the best European produce. The chief trees are deodar, firs and pines. *chenar* or plane. maple, birch and walnut. A complete list of the flora and fauna of the valley will be found in Sir Walter Laurence's book on Kashmir.

Industries —The chief industry of Srinagar nas formerly the weaving of the celebrated Kashmir shawl. which dates back to the days of the emperor Baber. These shanls first became fashionable in Europe in the reign of Napoleon III when they fetched from £10 to £100; but the industry received a blow at the time of the Franco-German War, and the famine of 1877 scattered the weavers. The place of the Kashmir shawl was to some extent taken by the Kashmir carpet, but silk-weaving became the most thriving industry. Srinagar is also celebrated for its silverwork, papier mâché and wood-carving.

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KASHMIRI LANGUAGE (properly *Kāśmīrī*), the name of the vernacular spoken (by nearly 1,500,000 people according to a 1931 census) in the valley of Kashmir (properly *Kaśmīr*) and in the hills adjoining. By origin it is the most southern member of the Dard group of the so-called Dardic languages (*q.v.*).

The language has lost most of its original Dardic character, and is now a mixed form of speech. Sanskrit has been actively studied in Kashmir for many centuries. and the Kashmiri vocabulary, and even its grammar. are now largely Indian.

Kashmiri has few dialects. The only important varieties are Kishtwārī. spoken in the hills southwest of Kashmir, and Poguḷ and Rāmbanī of the hills south of the Banihāl pass.

The two principal features are the numerous epenthetic changes of vowels and consonants, and the employment of pronominal suffixes. In both cases the phenomena are perfectly plain, cause and effect being presented in the complicated systems of declension and conjugation. The Indo-Aryan languages (*q.v.*) proper long ago passed through this stage, and a study of Kashmiri explains a number of difficulties found by the student of Indo-Aryan vernaculars.

In the following account the contractions employed are: D = Dardic; Ksh. = Kashmiri; Skr. = Sanskrit; Sh. = Shinā.

Vocabulary. — The vocabulary of Kashmiri is mixed. At its basis it has a large number of words which are also found in the neighbouring Shins, such as connote the most familiar ideas and are in most frequent use. There is also a large Indian element, consisting partly of words derived from Sanskrit vocables introduced in ancient times, and partly of words borrowed in later days from the vernaculars of the Punjab. Finally. there is a considerable Persian (including Arabic) element owing to the long Moslem domination of the area. Many of these elements have been considerably altered in accordance with Kashmiri phonetic rules. The difference of religion is reflected in the vocabulary. The Moslems employ Persian and Arabic words with great freedom, while the Hindus. use almost entirely words derived from Sanskrit. The literary class being mostly Hindu, Kashmiri literature, taken as a whole, hardly represents the language spoken by the mass of the people.

Alphabet. — The Persian character is quite unsuited for representing the very complex Kashmiri vowel system. Hindus employ the Śāradā alphabet, of Indian origin and akin to the well known Nāgarī. Kashmiri vowel sounds can be recorded very successfully in this character. but there is, unfortunately, no fixed system of spelling. The Nāgarī alphabet has also been used in printed books, no Śāradā types being yet in existence.

Phonology. — There is, as compared with Sanskrit, a considerable extension of the vowel system. Ksh. possesses the vowels a, *ā, i, i, u, ū, r, ē*, ai, *ō, au*, and the nasal symbol', a flat *ă* (like the *a* in "hat"). a flat *ĕ* (like the *e* in "met"), a short *ŏ* (like the o in "hot"), and a broad *å* (like the *a* in "all"); also a series of what natives call "*mātrā* vowels." which. though slightly heard, yet exercise a great influence on the sound of the preceding syllable. The back action of these *mātrā* vowels is technically known as *umlaut* or epenthesis, and is the most striking feature of the Kashmiri language.

With one important exception. common to all Dardic languages, Kashmiri employs every phoneme found in the Sanskrit alphabet. The exception is the series of aspirated phonemes. *gh, jh, ḍh, dh* and *bh,* which are wanting in Ksh., the corresponding unaspirated phonemes being substituted for them. There is a tendency to use dental phonemes where Hindi employs cerebrals. Cerebral phonemes are. however, owing to Sanskrit influence, on the whole better preserved in Ksh. than in the other Dardic languages. From the palatals *c, ch, j,* a new series of phonemes has been formed. viz., *ts, tsh* (aspirate of *ts,* that is. *ts* + *h,* not *t* + *sh),* and *z* (as in English. not *dz*).

The palatal sounds i, *e*, *ū-mātrā* and *y* often change a preceding consonant. Cerebral phonemes (*t, ṭh, d*), change only before i, *ĕ* or *y*, and not before *ū-mātrā*. The others change before *ĕ, y* or *ū-mātrā*.

No word can end in an unaspirated surd consonant. If such a consonant falls at the end of a word it is aspirated.

Declension. — If the phonetic rules are borne in mind, declension in Kashmiri is a fairly simple process. Nouns substantive and adjective have two genders, a masculine and a feminine. Words referring to males are masculine. and to females feminine. Inanimate things are sometimes masculine and sometimes feminine. Pronouns have three genders. arranged on a different principle. One gender refers to male living beings, another to female living beings, and a third (or neuterj to all inanimate things whether they are grammatically masculine or feminine. Nouns ending in ü are masculine, and most, but not all, of those ending in ⁱ, ᵘ, *ĕ* or *ñ* are feminine. No rule for nouns ending in consonants can be formulated except that all abstract nouns ending in *ar* (a very numerous class) are masculine. There are four declensions: masculine nouns ending in a consonant, in a, *ĕ* or ü (very few of these last two); masculine nouns in ᵘ; feminine nouns in ⁱ, ü or *ñ* (being the feminines corresponding to the masculine nouns of the second declension); and feminine nouns ending in *ā, ĕ* or a consonant.

The noun possesses two numbers, a singular and a plural, and in each number there are, beside the nominative, three organic cases. the accusative, the case of the agent, and the ablative. The accusative. when not definite, may also be the same in form as the nominative.

Other case relationships are indicated by postpositions, some of which are added to the accusative, while others are added to the ablative case. The "genitive" postpositions, and also the "dative" postposition *kyutᵘ*, are adjectives: and agree with the governing noun in gender, number and case and are declined regularly as substantives. the masculine ones belonging to the second declension and the feminine ones to the third.

Adjectives ending in ᵘ (second declension) form the feminine in ᵘ, with the usual changes of the preceding consonant. Other adjectives do not change for gender. All adjectives agree with the qualified noun in gender, number and case.

Kashmiri makes very free use of pronominal suffixes, which are added to verbs to supply the place of personal terminations.

Before these the verbal terminations are often slightly changed for the sake of euphony, and, when necessary for the pronunciation, the vowel a is inserted as a junction vowel.

Another set of suffixes is commonly added to verbs, with an adverbial force. Of these *na* negatives the verb, a asks a question, *ti* adds emphasis, and *tyā* asks a question with emphasis. Two or three suffixes may be employed together.

Conjugation. — The conjugation of the verb is mainly participial. Three only of the old tenses, the present, the future and the imperative have survived, the first functioning as a future: and the second a past conditional. These three may be called radical tenses. The rest, viz., the Kashmiri present. imperfect, past, aorist! perfect and other past tenses are all participial.

The verb substantive, which is also used as an auxiliary verb. has two tenses, a present and a past. The former is made by adding the pronominal suffixes of the nominative to a base *chu*

(h), and the latter by adding the same to a base $\bar{a}s^{u}$.

As for the finite verb. the modern future (old present), and the past conditional (old future) do not change for gender, and do not employ suffixes. but retain relics of the old personal terminations of the tenses from which they are derived.

For the imperative there are second person singular, *kar,* plur. *kariv;* third person singular and plural *karin.*

The present participle is formed by adding *in* to the root. It does not change for gender. From this a present and an imperfect is formed by adding respectively the present and past tenses of the auxiliary verb. There are several past participles. all of which are liable to change for gender, and are utilized in conjugation. In the strong past participle and the pluperfect participle, the final *v* and y are only added for the sake of euphony. There are three conjugations. The first includes all transitive verbs. These have both the weak and the strong past participles. The second conjugation consists of *66* common intransitive verbs, which also have both of these participles. The third conjugation consists of the remaining intransitive verbs. These have only the strong past participle. The weak past participle in the first two conjugations refers to something which has lately happened. and is used to form an immediate past tense. The strong past participle is more indefinite: and is employed to form a tense corresponding to the Greek aorist. The pluperfect participle refers to something which happened a long time ago, and is used to form the past tense of narration. As the third conjugation has no weak past participle, the strong past participle is employed to make the immediate past, and the pluperfect participle is employed to make the aorist past, while the new pluperfect participle is formed to make the tense of narration.

The corresponding tenses are formed by adding pronominal suffixes to the weak, the strong or the pluperfect participle. In the last two the final *v* and *y,* being no longer required by euphony, are dropped. In the case of transitive verbs the participles are passive by derivation and in signification, and hence the suffix indicating the English subject must be in the agent case. If the thing made is feminine the participle must be feminine, and similarly if it is plural it must be plural. The past participles of intransitive verbs are not passive, and hence the suffix indicating the English subject must be in the nominative form. These suffixes may be piled one on another.

Tenses corresponding to the English perfect and pluperfect are formed by conjugating the auxiliary verb, adding the appropriate suffixes. with the compound past participle.

The infinitive is formed by adding *-un* to the root. It is declined like a somewhat irregular noun of the first declension. There are three forms of the noun of agency.

The passive is formed by conjugating the verb *yi,* come! with the ablative of the infinitive.

Indeclinables.—Indeclinables (adverbs, postpositions. conjunctions and interjections) must be learned from the dictionary. The number of interjections is very large, and they are distinguished by minute rules depending on the gender of the person addressed and the exact amount of respect due to him.

Literature. — Kashmiri possesses a small literature, which has been very little studied. The very popular *Lallā-vākyāni,* a collection of verses on Saiva philosophy by a woman named *Lallādēvī,* is said to be the oldest work in the language which has survived. Another esteemed work is the *Siva Pariṇaya* of Krishna Rājānaka, a living author.

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Under the title of "The Word of Lalla the Prophetess" (1924) R. C. Temple has provided a metrical translation into English of the Lallā Vākyāni, with notes and an elaborate historical introduction.

See also *Linguistic Survey of India,* vol. i (1927); Sir George A. Grierson, *A Dictionary of the Kashmiri Language,* Asiatic Society of Bengal (1915–32); T. Grahame Bailey, *The Pronunciation of Kashmiri* (1937). (ET. B.)

KASHUBES, a Slavonic people living in the northwest part of Poland inland from the Baltic sea and the Hel peninsula, niainly in the vicinity of Danzig and Wejherowo. They are mainly peasants and fishermen. Their language in some points is quite independent of Polish, in some it offers a resemblance to the language of the Polabs (*q.v.*).

In Kashube, as against Polish, all the vowels can be nasal instead of *a* and *e* only, it has preserved quantity and a free accent, has developed several special vowels, *e.g., ö, oe, ü,* and has preserved the original order, *e.g., gard* as against *grod.* The consonants are very like Polish. (*See* also SLAVS.)

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KASSALA, a province headquarter town of Sudan, is a military station lying on the Gash in 15° 28′ N., 36° 24′ E., *260* mi. E.S.E. of Khartoum. Population *(1956)* 35,612. It is built on a plain 1,735 ft. above sea level. at the foot of the Abyssinian highlands 15 mi. west of the frontier of Eritrea. Mokram (1,949 ft.) and the dome shaped Kassala (4,415 ft.) rise abruptly from the plain some *3* mi. to the east and southeast; under the latter lies Khatmia the local centre of the Mirghania family which, being reputedly of descent from the prophet Mohammed's family, exercises considerable religious influence in the eastern Sudan. Kassala was founded by the Egyptians in 1840 to control newly conquered territory near the Abyssinian frontier. In 1885 it fell to the dervishes but was recovered by the Italian Gen. Oreste Baratieri on July *17. 1894,* and handed over to Egypt on Dec. 2, *1897.* On July *4.* 1940, Italian forces from Eritrea overran the town only to be ejected by British forces Jan. *19.* 1941 as a preliminary to the successful campaign. which broke fascism in East Africa. The Kassala town council received a warrant from the governor general in 1944.

Kassala province (pop. [1956] 941,039) stretching from Gallabat to Egypt includes the Old Red sea province and the modern Port Sudan and is inhabited mainly by the Hadendoa. Bisharin. Shukria and Beni Xmer camel-owning tribes. Area *131,527* sq.mi. Rains are light. but excellent cotton and grain are grown on land flooded by the Gash and by the Baraka at Tokar; Gedaref produces rich crops of grain and sesame. (A. C. BN.)

KASSEL (CASSEL), a city of Germany. which after partition of the nation following World War II was included in the *Land* (state) of Hesse in the Federal Republic of Germany. It lies at the western side of the Kassel basin on both banks of the Fulda. a navigable tributary of the Weser. *90* mi. N.N.E. of Frankfurt am Main. The city is the administrative centre of a district. Population *(1959* est.) was *202,493.* Its business life centres in the Königstrasse, Wilhelmstrasse and Friedrich-Ebert-Strasse. The Friedrichsplatz has buildings on three sides, the fourth affording a view of the countryside; it contains the monument of the landgrave Frederick II (1760–85), the Museum Fridericianum and the new state theatre; nearby is the site of the Ottoneum *(1603–05)* claimed as the oldest theatre building in Europe, largely rebuilt in *1697* and now a museum of natural history. There are academies of applied arts and music and schools of building and mechanical engineering. The Hessian *Land* museum has prehistoric art collections, and the picture gallery is especially rich in Flemish and Dutch paintings. The Habichtswald park contains the Wilhelmshöhe castle *(1798–1803)* and the celebrated cascades.

Kassel is a railway centre and the meeting place of lines from Hanover, Berlin, Leipzig and Frankfurt and of many main roads; the Hanover-Munich motorway touches Kassel. The city has long been an industrial centre and its manufactures include locomotives; freight cars, optical and precision instruments and heavy fabrics.

The name of the town (Chassala, Chassela) was first mentioned in A.D. *913* and in the middle ages was usually spelled Casle. As its name was derived from the Latin-Franconian *castella,* it was probably a stronghold of the Franconian kings. It received town rights before 1189 and became the residence of the landgraves of Hesse about 1277. An extension (Neustadt) was added on the

right bank of the Fulda, and a further extension in the 14th century, of which the Gothic St. Martin's church (destroyed in World War II) became the centre. Large fortifications were built by the landgrave Philip the Magnanimous (1518–67). In the 17th century the landgrave Karl built for the many Huguenot refugees the Oberneustadt (upper new town) outside the walls. The fortifications were removed from 1767 after they had proved useless in the Seven Years' War, and the old and new towns were connected. Kassel was the capital of Westphalia (1807–13) and, after the fall of the Hessian state (1866), of the Prussian province of Hesse-Nassau. The city, heavily damaged during World War II, has been rebuilt. (Ro. Fr.)

KASSENA (more properly Kasena), a tribe inhabiting the area north and south of the northern frontier of Ghana (Navoro district) with the French Sudan, to the east and southeast of Leo. Their language and culture belong to the Gurunsi (Grunshi) group, being closely related to those of the Awuna, Nuruma and Nankanse. Marriage customs include an institutionalized *ménage à trois*. Ancestor shrines are maintained outside the compounds, and a form of clan totemism exists.

See L. Tauxier, *Le Noir du Soudan* (1912); R. S. Rattray, *Tribes of the Ashanti Hinterland,* 2 vol. (1932). (W. B. Fg.)

KASSITES, written *Kashshū* by the Babylonians, *Kassī* by the Assyrians and *Kossaioi* by classical writers, inhabited that part of the central range of the Zagros mountains now known as Luristan. First mentioned in late 3rd millennium B.C. Elamite texts, they penetrated into Babylonia in the 2nd millennium B.C., were repulsed by Hammurabi's son, but secured holdings within the Tigris-Euphrates valley on the northern frontiers of Babylonia, and later established the 2nd Babylonian dynasty. No record exists of the decisive invasion or of the first occupation of Babylon. Chronicles and king lists are imprecise and conflicting. The tradition that Kassite kings ruled over Babylonia for 576 years is generally accepted, and it is certain that the first Kassite kings reigned in Babylonia simultaneously with the last kings of the 1st Babylonian dynasty. A plausible solution of the complex historical problem thus arising is that Gandash, the first Kassite king, began his reign about the middle of the 18th century B.C., but not at Babylon.

The Kassite kings were of Indo-European stock, unlike their subject Kassites who were Asianic. They appear to have been members of a small military aristocracy. Their long and secure hold over the Babylonians suggests that they were efficient rulers and not unpopular. Their capital city is unknown, and little is known of their language. Babylonian and Assyrian lexicons supply Semitic equivalents of some Kassite proper names and words. It is not certain that the words are Indo-European, though the names of some Kassite deities recall Indo-European gods; *e.g.,* Buriash, the Greek Boreas, and Shuriyash, the Indian Shuriyah (Surya). Another god was Kashshu after whom, probably, the Kassites are named. The horse, which first came into use in Babylonia under Kassite rule, was perhaps a divine symbol. The evidence of published contemporary documents shows that the traditional language and religion were preserved and promoted by Kassite rulers who made gifts and offerings to Babylonian deities and temples, and recorded their piety in the Babylonian language. One king, Agum II, recovered and restored to Babylon the statues of the Babylonian god Marduk and his consort, Sarpanit, which the Hittites had removed to Hana when they ravaged Babylon about 1926 B.C.

Contemporary Kassite records are few in comparison with the quantities and variety of documents from the previous dynasty. They throw little light on contemporary affairs in Elam, Babylonia and the outer Semitic world. Most records belong to the archive of the *guenna* (provincial governor) of the city of Nippur. Of these, the letters from the kings and high officials to the *guenna,* and from superior to inferior functionaries, reveal a feudal system during the 14th and 13th centuries B.C. in Babylonia. The *guenna* is the chief landlord, apparently in perpetuity, and the feoffees pay taxes and do corvée. Rations are supplied from the government depot, as are loans of grain with or without tax. The many records of taxes and rents received from holdings in and around Nippur fill in the picture of the system at work. Taxes include all kinds of field produce, wool, hides and fats, from individuals and towns. A feature of Kassite records is that the date is given according to the number of the year of the reigning king, and not, as hitherto, according to some important event occurring about that time. Another innovation under the Kassites was the boundary stone (*kudurru*) of which a few examples have been recovered. This is a block of stone which served as a charter of gift of land by the king to favoured persons. On the stone are engraved the clauses of the contract, the astronomical and other symbols of the gods under whose protection the gift was placed and the curse on those who violate the rights conferred. The interest of the boundary stones is not only economic and religious but also artistic, even if not on a high level.

Other examples of contemporary art are the cylinder seals with inscriptions rather longer than those on seals of earlier times, and with symbols such as the sphinx, suggesting relations with Egypt, and the Greek cross, the winged disk, and various bird and animal forms which reflect foreign influences. But the temples which the Kassite kings built or rebuilt at Ur, Warka (Erech) and Aqarquf (Dur Kurigalzu) are mainly in the Babylonian tradition, with occasional details which derive from northern Mesopotamia or, perhaps, from the land of the Kassites. One innovation, noticed in a Kassite temple at Warka, is the use of moulded bricks to form figures in relief on the temple façade.

At Aqarquf terra-cotta figures have been found, including a well-modelled true-to-life head of a lioness and a man's head with painted moustache and a full beard. But on the whole, Kassite relics so far discovered in literature, sculpture and architecture compare unfavourably with what had gone before. A revived Elam struck the final blow at Kassite power in Babylonia, already weakened by local insurrection. In the 1st millennium B.C., the Kassites, back in their homeland, opposed the eastward expansion of Assyrian power, paid tribute to Persia. They were conquered by Alexander, but later regained their independence. (*See* also Babylonia and Assyria.)

See *Cambridge Ancient History,* vol. i, chap. xv (Cambridge, 1924). (T. Fh.)

KASTAMUNI (Kastomonu). (1) A province of Turkey, rich in mineral wealth, with many mineral springs and extensive forests, the timber being used for charcoal and building and the bark for tanning. The products are chiefly cereals, fruits, opium, cotton, tobacco, wool, ordinary goat hair and mohair, in which there is a large trade. Pop. (1960) 435,304. Area 5,067 sq.mi. (2) The capital of the province, the ancient *Castamon,* altitude 2,500 ft., situated in the narrow valley of the Geuk Irmak (*Amnias*) and connected by a carriage road, 54 mi., with its port Ineboli on the Black sea. The town is noted for its copper utensils, but the famous copper mines about 36 mi. north, worked from ancient times to the 19th century, are now abandoned. The climate is continental, with extremes of heat and cold; in winter the roads are often closed by snow. Pop. (1960) 19,450. Castamon became an important city in later Byzantine times. It lay on the northern trunk road to the Euphrates and was built around a strong fortress whose ruins crown the rocky hill west of the town. It was taken by the Danishmand Amirs of Sivas early in the 12th century and passed to the Turks in 1393.

KÄSTNER, ERICH (1899–), German novelist and poet, was born in Dresden on Feb. 23, 1899. Since his family wanted him to be a teacher, he went to a grammar school, but left school to become a bank clerk, and left that to study at the universities of Berlin, Leipzig and Rostock. He received his Ph.D. degree in 1925. He started his writing career as a journalist, contributing to the Frankfurt *Zeitung,* the Berlin *Tageblatt,* and the *Vossische Zeitung.* His early books of verse, such as *Herz auf Taille* (1928) and *Lärm im Spiegel* (1929), reflected a bitter post-World War I mood, and his novel *Fabian* (1930; Eng. trans. by C. H. Brooks, 1932) is satirical; but his first great popular success came from *Emil und die Detektive* (1929; Eng. trans. by M. Massee, 1930) and *Drei Männer im Schnee* (1934; Eng. trans. by C. H. Brooks, *Three Men in the Snow,* 1935), both of which were made into highly successful motion pictures in the 1930s, as was *Georg und die Zwischenfälle* (1938) in 1938 and 1949.

Kastner acquired a European reputation for the social consciousness underlying his serious and satirical verse and prose. and an international reputation for his lighthearted works, including such children's books as *Pünktchen und Anton* (1930); *Annaluise und Anton* (1932; Eng. trans. by E. Sutton, 1932); *Das fliegende Klassenzimmer* (1932; Eng. trans. by C. H. Brooks, *The Flying Classroom,* 1934): and *Das doppelte Lottchen* (1950; Eng. trans. by C. H. Brooks, *Lisa and Lottie,* 1951), which was also made into a motion picture in 1951.

KASTORIA, a city of Greek Macedonia, in the department of Florina, 45 mi. S. by W. of Monastir. Pop. (1951) 9,468. In 1941, after the axis conquest of Greece, the town was occupied by Italians and after 1943 by the Germans, who withdrew in 1944.

Kastoria occupies part of a peninsula on the western shore of Lake Kastoria, which there receives from the north its affluent the Zhelova. The lake is formed in a deep hollow surrounded by limestone mountains and is drained on the south by the Vistritza. The lake has an area of 20 sq.mi., and is 2,850 ft. above sea level. Kastoria is the seat of an Orthodox archbishop. It is identified with the ancient *Celetrum,* captured by the Romans under Sulpicius, during the first Macedonian campaign, 200 B C., and known for the defense maintained by Bryennius against Alexis I in 1084. A Byzantine wall with round towers runs across the peninsula.

KASUR, a municipality in the Lahore district and division of West Pakistan. The town is 34 mi. S.E. of Lahore, on the road and railway to Ferozepore in India. Pop. (1951) 63,086. Occupying the site of an ancient Rajput city Kasur late in the Moslem period was settled by a Pathan colony from east of the Indus.

Kasur is the centre of local trade, with cotton ginning and pressing mills. It is noted for harness and other leather goods.

KATANGA, the southern province of the former Belgian Congo, composed of four districts: Haut-Katanga, Lualaba, Tanganyika and Hait-Lomami. Its total area is 191,878 sq.mi. and its population in 1958 was estimated at 301 Asians, 1.654.176 Africans and 33,507 Europeans, three-fourths of whom were Belgians. The Katanga plateau is hilly and diversified in character. In it rise the main headstreams of the Congo. At Bukama, the Lualaba or Upper Congo becomes navigable. The climate resembles that of south Africa. The province is suitable for cattle breeding and agriculture.

An expedition of 1891–92, led by Capt. W. G. Stairs, secured Katanga for the Congo free state, thereby forestalling the plans of Cecil Rhodes to add the area to British possessions in central Africa. Elisabethville, founded in 1910, is the capital. It lies on a railway line linking it with Port Francqui on the Kasai river, a navigable left-bank tributary of the Congo; with the Portuguese port of Lobito, Angola; and, across Northern Rhodesia. with the Portuguese port of Beira in Mozambique.

Katanga is best known for its mineral wealth. Its immense copper deposits, estimated at about 115,000,000 tons, lie in the hills separating it from Northern Rhodesia. Between 1938 and 1954 copper production rose from 123,943 to 223,791 metric tons. Three-quarters of the noncommunist world's cobalt came from Katanga and its production rose between 1938 and 1954 from 1,166 to 8,603 tons. Katanga is also the largest world producer of uranium. No data of its production are published, but it is known that by mid-20th century the province supplied the United States with more than half the uranium produced in the noncommunist world. Katanga's production of zinc rose between 1938 and 1954 from 5.869 to 84,301 tons and its extraction of coal from 41,699 to 378,940 tons. Production of other metals was as follows (1954, in tons): manganese 192,468; tin 2,498; lead 167; silver 141; cadmium 63. Production of cement amounted in 1954 to 201,176 tons. Generation of electricity rose between 1938 and 1953 from 361,450,642 kw.hr. to 873,663,407 kw.hr. The mineral and metal production was controlled by the Union Minière du Haut-Katanga, whose profits in 1953 amounted to more than 3,000,000,000 fr., two-thirds of which were paid to the Belgian government and one-third to private investors. The provincial government's announcement of its intention to secede from the central government after the Republic of The Congo was proclaimed June 30, 1960, led to crises and outbreaks of violence.

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KATAYEV, VALENTIN PETROVICH (1897–), Russian novelist and dramatist, was born at Odessa, the son of a schoolmaster and the grandson of a general and a priest. In 1915 during World War I he enlisted in the artillery and was wounded and gassed. In the civil war that followed he was badly treated by both the White and the Red Russians, being imprisoned for eight months by the Cheka. He fought for the Reds in the Ukraine after the revolution.

In 1922 he moved to Moscow. married in the next year, and began his career writing verse, motion picture scenarios, comic opera librettos and two adventure novels while working on his first serious novel. *Rastrachiki* (1927; Eng. trans. by L. Zarine, *The Embezzlers,* 1929). Later novels covered the revolutionary movement and Communist regime from the abortive revolution in 1905–06. *Beleyet parus odinokiy* (1936; Eng. trans. by C. Malamuth, *Lonely White Sail,* U.S. title, *Peace Is Where the Tempests Blow,* 1937); the peasants' resistance in the Ukraine in 1918, *Ya, syn trudovogo naroda* (1937); the peoples' difficulty during the five-year plan. *Vremya vpered!* (1932; Eng. trans. by C. Malamuth, *Forward, Oh Time,* 1934; U.S. title, *Time, Forward!* 1933); the story of a woman worker submerging her personal problems in working harder, *Zhena* (1944; Eng. trans.. *The Wife,* 1946); and the Odessa partisans in World War II. *Za vlast' Sovietov* (1949).

Of his plays, the comedy, *Kvadratura kruga* (first produced by the Moscow Art theatre in 1928, and in an English translation, *Squaring the Circle,* by N. Goold-Verschoyle, at the Mercury theatre, London. in 1933), won him international fame. It portrays the troubles of two couples forced by the housing shortage to share one-room living quarters.

Ratayev was notable for his humorous treatment of Soviet difficulties and problems. which provoked criticism of his World War II comedy as being too lighthearted; and of his World War II novel, as not giving sufficient credit to the Communist party.

Evgheny Petrovich Katayev (1903–1942), his brother, was a well-known humourist who died while serving as a war correspondent in the defense of Sevastopol.

KATHA, a district in the Sagaing division of Burma. with an area of 7,593 sq.mi., more than 3,000 of which consists of the former separate state of Wuntho. Katha now includes the former separate district of the Ruby mines. The district stretches from the main divide between the Irrawaddy and Chindwin valleys on the west to the border of the Shan states on the east. Three ranges of hills run through the district, known as the Minwun, Gangaw and Mangin ranges. They separate the three main rivers—the Irrawaddy, the Mèza and the Mu. The Minwun range runs from north to south, and forms for a considerable part of its length the dividing line between the Katha district proper and what formerly was the Wuntho state. Its average altitude is between 1.500 and 2.000 ft. The Gangaw range runs from the north of the district for a considerable portion of its length close to and down the right bank of the Irrawaddy as far as Tigyaing, where the Myatheindan pagoda gives its name to the last point. Its highest point is 4,400 ft., but the average is between 1,500 and 2.000 ft. The Katha branch of the railway crosses it at Petsut, a village 12 mi. W. of Katha town. The Mangin range runs through Wuntho (highest peak, Maingthon, 5.355 ft.).

Gold, copper, iron and lead occur in the district but are not now worked. Jade and soapstone also exist, and salt is produced from brine wells. There are important forest reserves in Katha.

Population (1941) 290,990. Burmese comprise nearly half the population and Shans (mostly in Wuntho and the hills east of the Irrawaddy) about a third; nearly all the Sak (Lui) of Burma are in this district. Rice is the chief crop in the plains, tea, cotton, sesamum and hill rice in the hills. The district was first occupied by British troops in 1886, but it was not finally quieted till 1890, when the Wuntho Sawbwa (chief) was deposed and his state incorporated in Katha district. Wuntho and other parts of the district have evil reputations for fever.

The portion of Katha lying east of the Irrawaddy forms geographically a portion of the Shan plateau. There, in the centre of a valley, 4,000 ft. above sea level and 61 mi. by motor road from the river port of Thabeitkyin, lies Mogok, the centre of the famous ruby mines. Synthetic rubies ruined the market for real stones. and after many vicissitudes the Burma Ruby Mines company finally ceased operations in 1927. The system adopted was to excavate large open pits, from ahich the ruby-bearing earth was removed and washed by machinery. The rubies occur *in situ* near the junction of gneissose and calcareous rocks, and some attempt was made at mining the solid rock, but the stones proved inferior to those naturally weathered out. The industry is still carried on by native uorkers. and in addition to rubies, sapphires, spinels and other coloured stones are obtained. Mogok is also used to a small extent as a hill station.

KATHAK, one of the four classical dance styles of India. It is the leading dance art of northern India and, like other art expressions of that region, shows the effect of the frequent invasions by foreign peoples. Unlike the dances of the south, which were dedicated to worship. the northern Kathak is performed purely for the entertainment of the spectator.

Originally performed exclusively by men. Kathak is composed of short mimed passages alternated with passages of pure dance It is in the pure-dance passages that the virtuoso excels, for these passages comprise rapid beating and slapping of the feet in complicated counter-rhythms and are embroidered with fast turns. A complete knowledge of the rhythmic forms is indispensable to the Kathak dancer, for he must indicate to his drummer through a sentence of rhythmic syllables the design of the dance passages he will perform.

The dance is bright and extroverted, without stylized facial expression *(see* KATHAKALI) and with few hand poses. The costume consists of long trousers; from 100 to 300 bells on each ankle; a full-skirted coat; and, generally, a round cap of Persian origin

(R. M. Hs.)

KATHAKALI, an ancient dance form indigenous to southwestern India. The technique is based on Bharata's *Natya-sastra.* Kathakali has always been an adjunct of the temple and is performed exclusively by men. Young boys are dedicated to its practice throughout their lives.

Kathakali is a danced drama, its subject matter taken from the Ramayana, the hfahabharata and stories from Saiva literature. Enacted out-of-doors and on bare ground or a rude platform lit by pots of burning oil, the presentation is an all-night function. During the action voices chant the story as mimed by the dancers; incidental dances, accompanied by ear-splitting drumbeats, stud the performance. Roles of women are taken by young boys.

The style of movement is vigorous and florid. Stylized gestures and facial expressions follow the rules of Bharata. The make-up. which takes several hours to apply, is a rice paste used to change the shape of jaw and nose and overlaid with painted designs. Beneath this semimask the quivering brows, vibrating chin and twitching nose and cheeks express the strong emotions of the characters. Gestures are wide and strong, the pointing of a finger being preceded by a sweep of the body and a great circling of the arms.

The advanced artist of Kathakali may improvise his mime within the strict rules of the art.

The costume consists of a full skirt, not unlike a crinoline; a heavy, long-sleeved jacket; numerous garlands and necklaces; and a towering headdress of carved and painted wood.

(R. M. Hs.)

KATHMANDU (KATMANDU), the capital of Nepal. bordering on India. situated on the bank of the Bishanmati river at its confluence with the Baghmati, in 27° 36' N., 85° 24' E. The town. which is said to have been founded about 723, contains a population (1954) of 105,247, occupying houses made of brick and usually from two to four stories high. Many of the houses have large projecting wooden windows or balconies, which are often elaborately carved. The town contains numerous temples. One of these, which is a wooden building, gives to the town its name *(kath,* wood).

KATIB CHELEBI (Arabic, HAJJI KHALIBA; full name, MUSTAFA IBN ABDULLAH KATIB CRELEBI HAJJI KHALIFA) (1608–1657), Turkish historian, bibliographer and scholar. was the forerunner of westernization in the liberal and critical thought of Turkey. Born in Istanbul in 1608. the son of a soldier, he became an army clerk and took part in many campaigns in the east, collecting valuable material for his historical works. He had an irregular education, attending various lectures between campaigns. From 1638 onward he settled in Istanbul and devoted all his time to collecting books, studying and compiling his many works. An industrious scholar and prolific writer. his chief works are: *Fezleke,* a reliable history of the Ottoman empire covering the years 1592–1654; *Tuhfet-ül-kibar fi Esfar-il-bihar,* a history of the Ottoman navy; *Cihannüma,* a geographical work which made use, for the first time in Turkey, of European sources; *Mizan-ül-hak fi ihtiyar-il-ehak,* a small but important treatise in which the positive sciences are defended and fanaticism criticized; and *Kashf al-Zunun,* his masterpiece. a bibliographical encyclopaedia, in Arabic. and an invaluable source of information on Arabic, Persian and Turkish books up to his own time.

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KATKOV, MICHAEL NIKIFOROVICH (1818–1887), Russian journalist. born in Moscow, sympathized with the liberal reaction and strong reform movement which characterized the earlier years of Alexander II's reign (1855–81), and for some time he advocated the introduction of liberal institutions; but when the agitation assumed a socialistic and nihilist tinge. and indulgence was shown to Polish national aspirations, he changed his attitude. From 1863 to 1887 he controlled the Moscow *Gazette.* During these 24 years he voiced the conservative spirit of Moscow in opposition to the liberal and cosmopolitan spirit of St. Petersburg.

KATO, TAKA-AKIRA (1859–1926), Japanese statesman, was born at Nagoya and began his career as an employee in the great firm of Mitsubishi. In 1887 he became private secretary to Marquess Okuma, minister of foreign affairs. Subsequently he served as director of a bureau in the finance department, and from 1894 to 1899 represented his country at the court of St. James's. He received the portfolio of foreign affairs in the fourth Ito cabinet (1900–01), which remained in office only a few months. Appointed again to the same position in the Kimmochi Saionji cabinet (1906), he resigned after a brief interval, being opposed to the nationalization of the private railways. He then remained without office until 1908. He was Japanese minister in London from 1894 to 1899 and ambassador from 1908 to 1913. Returning to Japan, he joined Taro Katsura's third cabinet as foreign minister for the third time but resigned soon after. He then reorganized the Doshikai party, created by Katsura, and renamed it the Kenseikai or Constitutionalist party, of which he became chairman in 1913. In April 1914 he joined the Okuma cabinet as foreign minister, resigning in 1915. It was during his incumbency that Japan sent the so-called 21 demands to China. In Aug. 191 j he was elected a crown member of the house of peers and in the following year was created a viscount. The following decade proved a quiet period for Kato, but in June 1924 he became premier of the coalition cabinet of the Kenseikai, the Seiyukai and the Kakushin club. His administration was made historic by the passage of the universal manhood suffrage law. Because of dissensions among members of the cabinet, Kato reorganized his ministry on Aug. 1, 1925, forming it exclusively with members of the Kenseikai party. On Jan. 28, 1926, he died in Tokyo while in office.

KATONA, JÓZSEF (1791–1830), Hungarian playwright whose historical tragedy *Bdnk bdn* achieved its great reputation only after his death, was born at Kecskemét, Nov. 11, 1791. A lawyer, he was interested in the stage and wrote a number of plays of little literary merit. In 181j Katona wrote *Bdnk bán,* which, though he entered it for a literary prize and in 1820 had it printed, remained unnoticed until the mid-1830s. By then, Katona, having abandoned his literary ambitions and become at-

torney general of his native town, had died there on April 16, 1830.

Bdnk *bán* is reckoned among the best Hungarian dramas. Its central figure, Bánk, the highest dignitary (*bán*) at the court of Andrew II (1205–35) tries, in the king's absence, to prevent a rebellion against the German-born Queen Gertrudis. Meanwhile her brother Otto tries to seduce Bánk's wife. Bánk unjustly suspects the queen of connivance, and kills her. Bánk's tragic act is motivated by the sight of his wife's madness and by the bitter complaints of the serf Tiborc, victim of exploitation by the queen's German entourage. The conflict between duty and personal grief makes it a poignant drama.

See his selected works, *Katona József, Vdlogatott müvei* (1953); *see* also Gyulsi Pál, *Katona József és Bdnk bdnja* (1883; rev 1956).
(Ds Sr.)

KATOWICE (Kattowitz). a city of Poland in the *wojewodztwo* of the same name, on the Rawa, 5 mi. S.E. from Beuthen by rail. Pop. (1960) 268,900.

There are large ironworks, foundries and machine shops in the town, and near it zinc and anthracite mines. The town's growth was very rapid, as a result of the development of the mineral resources of the neighbourhood. In 1815 it was a mere village, and became a town in 1867.

As a result of the partition of Upper Silesia between Germany and Poland in 1921 (see Silesia) it was transferred to Poland. The city was occupied by Germany during World War II.

KATRINE, LOCH, a fresh-water lake in Scotland, lying almost entirely in Perthshire. The boundary between the counties of Perth and Stirling runs from Glengyle. at the head of the loch, down the centre to a point opposite Stronachlachar ("the mason's nose"), from which it strikes to the southwestern shore toward Loch Arklet. Loch Katrine. which has a southeasterly trend, is about 8 mi long and 1 mi. broad at its widest part. It lies 364 ft. above sea level, and the greatest depth is 495 ft. The scenery has been immortalized in Sir Walter Scott's "The Lady of the Lake." though the Silver strand on the north shore, opposite Ellen's isle, is now submerged. The surrounding hills culminate in Ben Venue (2.393 ft.).

The loch is fed by Glengyle water and numerous burns. After 1859 it formed the chief source of the water supply of Glasgow. The level of'the loch was raised on three occasions, and Glasgow has the right to draw on 17 ft. from top water level—a total storage of 14,212,000,000 gal. Loch Arklet, also part of Glasgow's water supply, is connected to Loch Katrine by an aqueduct.

At the eastern end of the loch are the Trossachs, and Glengyle, at its head. was a fastness of the MacGregors, where Robert MacGregor (Rob Roy) was born in 1671.

KATSINA, a province of the Northern Region of Nigeria. The area is 9,466 sq.mi. and the population (1960 est.) 1,704.057. Its northern boundary marches with Niger, and it lies away from the main trade routes. The Nigerian railway touches it only at Funtua in the extreme south.

The countryside varies between dry. sandy conditions in the north, where the rainfall averages 25.14 in. (April to October), and the more fertile and wooded region of the south. A harmattan wind blo s during much of the dry season. The inhabitants, predominately Moslem, are a mixture of Fulani and Hausa.

The province depends entirely on agriculture for its wealth, producing millets for the home market and peanuts and cotton for the export trade. Large herds of cattle, sheep and goats are grazed, and several agricultural and veterinary centres have been set up at which farmers and cattle owners can seek advice. Industries include dyeing, weaving and tanning.

The emirates of Katsina and Daura, which together form the province, were among the original seven Hausa states resulting from the fabled union of Bayajidda of Baghdad with a prehistoric queen of Daura. By the 16th century, under Islamic influence, they had a well-organized fiscal and judicial system and by the 18th century, after a period of subservience to the Sudanic empire of Songhai, Katsina had reached a position of great importance both as a seat of learning and as a commercial centre for the trans-Saharan trade. Both emirates were conquered by the Fulani during the holy war of the 19th century and both surrendered to the British in 1903 without fighting. In Katsina the Fulani dynasty was retained, but in Daura the former Habe dynasty was restored and the emir of Daura is traditionally regarded as the head of the Hausas in Nigeria. The emirs, assisted by advisory councils, rule through district heads. The town of Katsina probably grew up on its modern site in the 16th century. It is surrounded by a mud wall partly in ruins, and most of the buildings, including the emir's palace, also are made of mud. The market is a small one, its former place as the collecting and distributing centre for northern Nigeria having been taken by Kano. The tradition of learning, however, was kept up by the establishment of two training centres for Moslem teachers for the higher elementary and elementary schools of the Northern Region. There is a senior primary school in Katsina and there are primary schools in the larger villages and towns of the two emirates. Medical facilities include a government hospital at Katsina and health centres and dispensaries throughout the province.

KATSURA, TARO, Prince (1847–1913), Japanese army officer and statesman, was born in 1847 in Choshu. He fought under the imperial banner in the civil war of the restoration, and he displayed such talent that he was twice sent at public expense to Germany (in 1870 and 1884) to study strategy and tactics. In 1886 he was appointed deputy minister of war, and in 1891 the command of division devolved on him. He led the left wing of the Japanese army in the campaign of 1894–95 against China, and made a memorable march in the depth of winter from the northeast shore of the Yellow sea to Haicheng, finally occupying Newchwang and effecting a junction with the and army corps which moved up the Liaotung peninsula. For these services he received the title of viscount. He held the portfolio of war from 1898 to 1901, when he became premier and retained office for 4½ years, a record in Japan. In 1902 his cabinet concluded the first entente with Great Britain, an event which procured for Katsura the rank of count. He also directed state affairs throughout the war with Russia, and concluded the Anglo-Japanese alliance of 1905. Raised to the rank of marquess, he resigned the premiership in 1906 to Kimmochi Saionji, but was again invited to form a cabinet in 1908. Katsura might be considered the chief exponent of conservative views in Japan. Adhering to the doctrine that ministries were responsible to the emperor alone and not at all to the diet, he stood aloof from political parties, only his remarkable gift of tact and conciliation enabling him to govern on such principles. In Aug. 1911 he again resigned the premiership in favour of Saionji. after completing the work of financial reform and treaty revision which he had undertaken, and received the rank of prince. On Dec. 20, 1912, he again accepted office as premier, resigning seven weeks later. He died in Tokyo on Oct. 10, 1913.

KATSURA TREE: see Cercidiphyllum.

KATYDID, a name given to large North American insects (*Pterophyllinae*) of the orthopterous family Tettigoniidae. Their loud syllabic stridulation, suggesting the words "Katy did." is produced by friction of a file on the underside of the left forewing over a ridge on the upperside of the right. By extension the name is used in America for all tettigoniids (see Orthoptera).
(T. H. Hl.)

KAUFBEUREN, a town in the Land of Bavaria, Ger., on the Wertach, 55 mi. S.W. of Munich. Pop. (1959 est.) 34,407. It is said to have been founded in 842 and is first mentioned in chronicles of 1126. It appears to have been a free imperial city from about 1288 until 1803. when it passed to Bavaria. It was formerly a resort of pilgrims, and Roman coins have been found in the vicinity. It is surrounded by medieval walls. It has a town hall with fine paintings, and an old tower. The chief industries are cotton spinning. weaving, bleaching, dyeing, printing and machine building, and there is trade in wine, beer and cheese.

KAUFFMANN, (MARIA ANNA) ANGELICA (1741–1807), Swiss-born historical and portrait painter, one of the original members of the Royal Academy, was born at Coire (Chur), Switz., on Oct. 30. 1741. Her father, John Joseph Kauffmann. was a painter. She was a very gifted child and showed

marked talents as a musician and painter at an early age; in her 12th year she had become a notability. In 1754 her father took her to Milan; in 1763 she visited Rome, and then passed to Bologna and Venice. where she was feted as much for her personal charms as for her talents. She was induced by Lady Wentworth, wife of the English ambassador, to accompany her to London, and arrived there in 1766. One of her first works was a portrait of David Garrick, exhibited in the same year at "Mr. Moreing's great room in Maiden Lane." She was well received wherever she went, and was particularly favoured by the royal family.

One of her great friends was Sir Joshua Reynolds, with whom her name was romantically linked. In 1766 he painted her, and she returned the compliment with her "Portrait of Sir Joshua Reynolds," aged 46. In 1767 she married an adventurer who posed as a Swedish count (the count de Horn), from whom she was soon separated. During 1766–67 she contributed to the Free Society of Artists a number of pastoral and mythological compositions, and her name is found among the signatories to the famous petition to the king for the establishment of the Royal Academy. In its first catalogue of 1769 she appears with "R.A." after her name (an honour she shared with another lady and compatriot, Mary Moser); and she contributed "The Interview of Hector and Andromache" and three other classical compositions. From this time until 1782 she was an annual exhibitor In 1773 she was appointed by the Academy, together with Reynolds, George Dance, Benjamin West, James Barry and G. Cipriani, to decorate St. Paul's. and it was she who, with Biagio Rebecca, painted the Academy's old lecture room at Somerset house.

In 1781, after her first husband's death, she married Antonio Zucchi (1728–95), a Venetian artist then resident in England. Shortly afterward she retired to Rome, where her numerous friends included Goethe and J. G. von Herder. She continued to contribute to the Academy until 1797. She died on Nov. 5, 1807, and was honoured with an elaborate funeral under the direction of Antonio Canova. The entire Academy of St. Luke, together with numerous ecclesiastics and virtuosos, followed her to her tomb in S. Andrea delle Fratte. and, as at the burial of Raphael, two of her best pictures were carried in the procession.

During the 1770s, Angelica was one of a team of artists who supplied the painted decorations for Adam-designed interiors, and it is for this work that she is chiefly remembered. She painted numerous portraits and self-portraits, of which the best are to be seen in Munich, in the Uffizi, Florence, and in the National Portrait gallery, London. Her life has been used as the basis of a romance by Léon de Wailly, 1838, and it prompted the charming novel contributed by Mrs. Richmond Ritchie to the *Cornhill Magazine* in 1875 under the title of "Miss Angel."

See Giovanni de Rossi, *Angelica Kauffmann* (1810); Adeline Hartcup, *Angelica* (1954). (AA. B.)

KAUFMANN, KONSTANTIN PETROVICH (1818–1882), Russian general of Baltic German extraction, the conqueror of Bukhara, Khiva and Kokand, was born at Majdany, near Deblin, in Poland, on May 3 (new style; April 21, old style), 1818. He received his training in the engineering school in St. Petersburg and then served in the Caucasus. During the Crimean War he commanded a sappers' battalion and participated in the siege of Kars in Turkish Armenia in 1855. Thereafter he held important offices in the war ministry. In 1865 he succeeded the elder M. N. Muraviev as governor general in Lithuania, where he continued the policy of "depolonization" already inaugurated. In 1867 he became governor general of Turkistan. As governor he enjoyed remarkable freedom of action in his dealings with the central Asian states, and his administration marked the completion of the Russian absorption of the area. His first advance was against the khanate of Bukhara, and in 1868 he captured the city of Samarkand. In 1873 the khanate of Khiva and in 1875 that of Kokand were reduced to vassalage. These conquests brought Russia close to the British colonial interests in Afghanistan and occasioned strong protests from Great Britain, particularly since the Russian government had previously given assurances that Khiva lay outside the Russian sphere of influence. Although Alexander II refused to sanction further plans for advance supported by Kaufmann, little was done to prevent local Russian commanders from proceeding on their own account. Thus Kaufmann was still engaged in expansionist activities when he died, at Tashkent, on May 16, 1882. (B. J.)

KAULBACH, WILHELM VON (1805–1874), German painter and illustrator who gained his greatest fame as a muralist, was born in Arolsen, Oct. 15. 1805. From 1822 he studied under Peter von Cornelius at the Diisseldorf Art academy. When Cornelius became director of the Bavarian Academy in Munich in 1825 he brought Kaulbach with him. In 1849 Kaulbach succeeded Cornelius in the directorship of the academy, an office held until his death in Munich on April 7. 1874. His prodigious output included melodramatic illustrations to *Reynard the Fox* (1841) and the poetry of F. Klopstock, Goethe and Shakespeare. As a muralist, he had facility in covering acres of walls in Munich and Berlin. His vast history paintings, such as the "Destruction of Jerusalem," the "Battle of the Huns," the "Crusaders" and the "Reformation," make up in heroic pose what they lack in artistic imagination. The fact that he was one of the most renowned artists of his time testifies more to the capriciousness of the history of taste than to the intrinsic merit of his work.

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KAULBARS, ALEKSANDR VASILIEVICH (in German, WILHELM, FREIHERR VON KAULBARS) (1844–1929), Russian general and explorer of central Asia, was born of Baltic German extraction in St. Petersburg on May 23 (new style; May 11, old style), 1844, the younger brother of N. V. Kaulbars (*q.v.*). As a general staff officer he traveled in central Asia between 1869 and 1873. He explored the Tian-Shan and was a member of Count Agenor Goluchowski's expedition in the Amu Darya region. His important contributions to the knowledge of these regions were published in the *Proceedings* of the Russian Geographical society (1874–88). From 1882 to 1883 Kaulbars was war minister in Bulgaria under Alexander (*q.v.*) of Battenberg. In 1894 he was commander of the Plock army corps in Poland, but three years later he was given the command of a cavalry corps. In 1900 he served in China. In 1904 he became commander of the Odessa army corps. In 1904–05 he held an army command in the Russo-Japanese War, after which he returned to the Odessa command, retiring in 1909. He died in Paris in 1929.

KAULBARS, NIKOLAI VASILIEVICH (in German, REINHOLD, FREIHERR VON KAULBARS) (1842–1905), Russian general of Baltic German extraction, chiefly remembered for his role in the affairs of Bulgaria (*q.v.*), was the elder brother of A. V. Kaulbars (*q.v.*). He was born in St. Petersburg on June 3 (new style; May 22, old style), 1842. During the Russo-Turkish War of 1877–78 he served on a divisional staff. After the congress of Berlin he was a member of the Turkish-Montenegrin boundary commission. In 1881 he was appointed military attaché in Vienna. In 1886 he was sent to Bulgaria, in fact in order to consolidate Russian interests there after the fall of Alexander of Battenberg, but ostensibly in order to assist the Bulgars. He tried to postpone the election of Ferdinand of Saxe-Coburg-Gotha as prince of Bulgaria by the national assembly, but his tactless behaviour merely alienated the Bulgars. He was put in command of the Warsaw army corps in Poland in 1889, but was transferred to the Helsinki army corps in Finland in 1891. In 1899 he was appointed the head of the intelligence department of the Russian general staff. He died in St. Petersburg on Dec. 3, 1905.

KAUNAS, a town of Lithuania, situated in the hollow formed at the confluence of the Nemunas and Viliya (Neris) in 54° 54' N., 23° 54' E. After the Polish occupation of Vilnius, Kaunas was the provisional Lithuanian capital. Pop. (1959) 214,000. In spite of Russian fortifications, the town fell easily to the Germans in 1918, when factories and churches were razed. Again in 1941 the German armies marched into the town following Russian occupation in 1940. Lying on the high road to the east and at a vital navigation point, Kaunas has many times been attacked since its foundation in the 11th century, reportedly being reduced to ashes on 13 occasions. Napoleon, while passing through Kau-

nas on his way to Moscow, is said to have used the red brick Lithuanian-Gothic church of Vytautas (15th century) as a stable. After Lithuania gained its independence in 1918, much money was spent to improve the town; a municipal electric plant. a national war museum and other buildings were constructed. Kaunas is the Lithuanian educational centre with a university, an academy of agriculture and conservatory of music. Industrial products include metal goods and bone meal. Important as an entrepdt for river trade with east Prussia, trade was increased when Memel mas united with Lithuania in 1923. It was formerly called Kovno.

KAUNITZ-RPETBURG, WENZEL ANTON, PRINCE VON (1711–1794), Austrian chancellor and diplomatist, was born at Vienna Feb. 2, 1711, son of Max Ulrich, third count of Kaunitz, and Maria Ernestine Franziska von Rietburg. Wenzel Anton. being a second son, was designed for the church, but on the death of his elder brother was trained for the law and for diplomacy. at Vienna. Leipzig and Leiden, and by travel. His family's influence soon obtained him employment, and by 1735 he was a *Reichshofrath.*

When the emperor Charles VI died in 1740, he is said to have hesitated before deciding to support Maria Theresa. If so, his hesitation did not last long, and left no trace on his loyalty. From 1742 to 1744 he was minister at Turin, and in the latter year was sent as minister with the archduke Charles of Lorraine, the governor of Belgium. In 1748 Maria Theresa sent him as representative of Austria to the peace congress of Aix-la-Chapelle. His tenacity and dexterity established his reputation as a diplomatist. He confirmed his hold on the regard and confidence of the empress by insisting in 1749, contrary to the views of most of her advisers: that Austria's true enemy was Prussia, and the traditional policy of alliance with the maritime powers must be exchanged for alliance with France and Russia, directed exclusively against Prussia. The empress eagerly accepted views which were already her own. and entrusted the adviser with the execution of his. own plans, clearly recognizing that his ideas and principles were in harmony with her own.

From 1750 till his retirement in 1792 Kaunitz was the leading figure in the politics of eastern and central Europe. His governing principle was to forward the interests of "the august house of Austria," a phrase sometimes repeated at every few lines of his despatches. In internal affairs he helped to promote simplification of the Austrian administration. Rut his main concern was always with diplomacy and foreign policy. Here he strove with untiring energy, and some success, to extend the Austrian dominions. After the Seven Years' War he endeavoured to avoid great risks, and sought to secure his ends by alliances. exchanges and claims professing to have a legal basis, and justified at enormous length by arguments both pedantic and hypocritical. Of the French Revolution he never understood the full meaning. Yet his despatch of July 17, 1791, contains the first outlines of Prince Metternich's policy of "legitimacy," and the first proposal for the combined action of the powers, based on the full recognition of one another's rights, to defend themselves against subversive principles. Kaunitz died at his house, the Garten Palast, near Vienna, on June 27, 1794. He married on May 6, 1736, Maria Ernestine von Starhemberg, who died Sept. 6, 1754.

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KAURI PINE, *Agathis australis* (Coniferae), a native tree of New Zealand, where it is abundant in forests in the North Island between the North cape and 38° S. lat. The forests are rapidly disappearing because of use of the trees as timber and destruction by fires. It is a tall resiniferous tree, usually ranging from 80 to 100 it. in height, with a trunk 4 to 10 ft. in diameter, but reaching 150 ft., with a diameter of 1j to 22 ft.; it has a straight columnar trunk and a rounded bushy head. The thick resiniferous bark falls off in large flat flakes. The leaves, which persist for several years, are very thick and leathery; on young trees they are lance-shaped 2 to 4 in, long and ¼ to ½ in. broad, becoming on mature trees linear-oblong or obovate-oblong and ¾ to 1½ in. long. The ripe cones are almost spherical. erect and 2 to 3 in. in diameter; the broad. flat, rather thin cone scales fall from the axis when ripe. Each scale bears a single compressed seed with a membranous wing. The timber is remarkable for its strength, durability and the ease with which it is worked. The resin, kauri gum. is an amberlike deposit dug in large quantities from the sites of previous forests, in lumps generally varying in size from that of a hen's egg to that of a man's head. The colour is of a rich brown or amber yellow, or it may be almost colourless and translucent. Because of its peculiar qualities, Kauri gum is of value for varnish making.

KAUTSKY, KARL (1854–1938), German Marxist and historian of socialism, was born Oct. 16, 1854, at Prague. In 1883 he founded the Socialist paper *Die Neue Zeit,* issued at first (1885–88) from London and later (1890–1917) from Stuttgart. He was a friend and disciple of Karl Marx and. after the death of Friedrich Engels, universally regarded as the most important interpreter of Marx's philosophy. Kautsky, one of the creators of the Erfurt program of 1891, led the resistance to the modification of Marxian doctrine by Eduard Bernstein, under the title of "revisionism." Bernstein, arguing from the increase of small fortunes (largely the result of the increase of shareholding in joint-stock companies), deduced that the concentration of capital and the intensilication of class conflict were not proceeding as Marx had predicted, and in consequence advocated a reformist policy. Kautsky dissented from his interpretation of the figures and defended the thesis of the necessity of revolution. At the outbreak of war in 1914 Kautsky took up a pacifist attitude and in 1917 joined with Hugo Haase in organizing the Independent Social Democratic party. He was strongly opposed to the Russian Revolution, and declined to follow the majority of his party into the ranks of the United German Communist party (V.K.P.D.). He eventually, with others, rejoined the Social Democratic party. Kautsky, who had settled in Vienna, was still regarded as the most distinguished theorist of the party. Of his considerable controversial literature against Nicolai Lenin, Lev Trotsky and others, the most important is his *Dictatorship of the Proletariat* (1918, Eng. trans. 1920), in which he attacks the Leninist doctrine and the application of the dictatorship of the proletariat and claims that the Russian Revolution is only a bourgeois revolution whose chief achievement is the importance of the transfer of land to the peasants. He agreed that the new Russian organization of industry might pave the way for socialism. Kautsky was joint editor of official documents in 1919 that tried to show the war guilt of the kaiser and exonerate the new government from charges of continuing the prewar policy. (See The *Guilt of William Hohenzollern* [1920].) In 1934 Kautsky became a citizen of Czechoslovakia, but he continued to live in Vienna and direct activities of the Austrian Socialist party. He barely escaped to Czechoslovakia when the German army entered Austria in March 1938 The nazis, however, imprisoned his two sons. Six months later. when Germany was about to absorb the Sudetenland, he was obliged to flee once more, this time to Amsterdam, Neth., where he died in poverty Oct. 17, 1938.

His other works include *Der Einfluss der Volksvermehrung auf den Fortschritt der Gesellschaft* (1880), *Thomas More und seine Utopie* (188;. 6th ed. 1926); *Karl Marx, Ökonomische Lehren, gemeinverständlich dargestellt* (1887, 14th ed., 1912); *Das Erfurter Programm in seinrm grundsätzlichen Teil erlautert* (1892, 17th ed. 1922) ; *Bernstein und das sozialdemokratische Programm* (1899); *Der Ursprung des Christentums* (1908, 13th ed. 1923); *Der Weg zur Macht* (1909); *Vorläufer des Sozialismus,* 4 vol. (1909–21); popular edition of *Das Kapital* (1913); *Der politische Massenstreik* (1914). (FR. BR.)

KAVA (CAVA or AVA), an intoxicating, but nonalcoholic beverage, produced principally in the islands of the South Pacific, from the roots of leaves of a variety of the pepper plant *(Piper latifolium* or *P. methysticum).* The preparation is peculiar. The roots or leaves are first chewed by young girls or boys, care being taken that only those possessing sound teeth and excellent general health shall take part in this operation. The chewed material is then placed in a bowl; water or coconut milk is poured over it; the whole is well stirred; and subsequently the woody

matter is removed by an ingenious but simple mechanical manipulation. The resulting liquid, which has a muddy or *café-au-lait* appearance or is of a greenish hue if made from leaves, is now ready for consumption. The taste of the liquid is at first sweet, and then pungent and acrid. The usual dose corresponds to about two mouthfuls of the root. Intoxication (but this apparently only applies to those not inured to the use of the liquor) follows in about 20 min. The drunkenness produced by kava is of a melancholy, silent and drowsy character. Excessive drinking is said to lead to skin and other diseases, but per contra many medicinal virtues are .ascribed to the preparation. There appears to be little doubt that the active principle in this beverage is a poison of an alkaloidal nature. It seems likely that this substance is not present as such (*i.e.*, as a free alkaloid) in the plant, but that it exists in the form of a glucoside, and that by the process of chewing, this glucoside is split up by one of the ferments in the saliva into the free alkaloid and sugar.

KAVADH, a Persian name which occurs first in the mythical history of the old Iranian kingdom as Kai Kobadh (Kaikobad). Other forms of Kavadh are Kabades and Kanades. It was borne by two kings of the Sassanid dynasty.

1. KAVADH I, son of Pērōz, crowned by the nobles in 488 in place of his uncle Balash, who was deposed and blinded. At this time the empire was utterly disorganized by the invasion of the Ephthalites, or White Huns, from the east. After one of their victories against Pērōz, Kavadh had been a hostage among them for two years, pending the payment of a heavy ransom. In 484 Pērōz had been defeated and slain with his whole army. Balash was not able to restore the royal authority. The hopes of the magnates and high priests that Kavadh would suit their purpose were soon disappointed. Kavadh gave his support to the communistic sect founded by Mazdak, son of Bamdad, who demanded that the rich should divide their wives and their wealth with the poor. His intention evidently was, by adopting the doctrine of the Mazdakites, to break the influence of the magnates. But in 496 he was deposed and incarcerated in the "Castle of Oblivion (Lethe)" in Susiana, and his brother Jamasp (Zamaspes) was raised to the throne.

Kavadh took refuge with the Ephthalites, whose king gave him his daughter in marriage and aided him to return to Persia. In 499 he became king again and punished his opponents. He bad to pay a tribute to the Ephthalites and applied for subsidies to Rome, which had before supported the Persians. But now the emperor Anastasius refused subsidies, expecting that the two rival powers of the east would exhaust one another in war. At the same time he intervened in the affairs of the Persian part of Armenia. So Kavadh joined the Ephthalites and began war against the Romans. In 502 he took Theodosiopolis in Armenia, in 503 Amida (Diarbekr) on the Tigris. In 505 an invasion of Armenia by the western Huns from the Caucasus led to an armistice, during which the Romans paid subsidies to the Persians for the maintenance of the fortifications on the Caucasus. When Justin I (518–527) came to the throne, the conflict began anew. The Persian vassal Mondhir of Hira laid waste Mesopotamia and slaughtered the monks and nuns. In 531 Belisarius was beaten at Callinicum. Shortly afterward Kavadh died, at the age of 82, in Sept. 531.

During his last years Kavadh's favourite son, Chosroes, had had great influence over him and had been proclaimed successor. He also induced Kavadh to break with the Mazdakites, whose doctrine had caused great social confusion throughout Persia. In 529 they were refuted in a theological discussion held before the throne of the king by the orthodox Magians, and were slaughtered and persecuted everywhere; Mazdak himself was hanged. Kavadh evidently was, as Procopius (Pers., i, 6) calls him, an unusually clear-sighted and energetic ruler. Although he could not free himself from the yoke of the Ephthahtes, he succeeded in restoring order in the interior and fought with success against the Romans. He built some towns which were named after him, and began to regulate the taxation.

2. KAVADH II. SHEROE (Siroes), son of Chosroes II, was raised to the throne in opposition to his father in Feb. 628, after the great victories of the emperor Heraclius. He put his father and 18 brothers to death, began negotiations with Heraclius, but died after a reign of a few months. (ED. M.)

KAVAFES (KAVAFIS, sometimes CAVAFY), **KONSTANTINOS PETROU** (1863–1933), Greek poet, developed an individual style in his poetry which struck a new lyric note not only for Greece, but for the whole of Europe. He remained uninfluenced by the main currents of contemporary Greek literature. In his evocations of the Greek and, in particular, of the Hellenistic past he blended reflection, sensuality and irony and gave them the solidity and variety which he found in his own cosmopolitan surroundings, for he was born at Alexandria on April 17, 1863, and spent most of his life there. He wrote much, but published little—about zoo poems in all.

The work of Kavafes falls into two groups, poems written before 1910, when he was still absorbing the influence of the romantics, the Parnassians and the Symbolists; and those written after 1910, which represent the most important part of his output. Thus he could say with some justification: "I am a poet of old age." His language is a strange mixture of the refined and stilted Greek, the Katharevousa, inherited from the Byzantines, and the Demotic or spoken tongue. His style is relaxed, almost conversational; it avoids exaggerated imagery and is realistic. In honouring courage and character he draws his examples from history, religion and politics. The dramatic handling of his material enables him to enter strange recesses of the human soul, but his skepticism was not morbid and his poetry does not preach the futility of life. He died in Alexandria on April 29, 1933. After his death his influence became strongly felt in Greece.

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KAVALLA, a walled town and seaport on the Bay of Kavalla, the capital of Kavalla *Nomos* of Greek Macedonia. Kavalla is built on a promontory stretching south into the bay, and opposite the island of Thasos. There is a harbour on each side of the promontory. The immediate hinterland is a rich tobacco-growing country. Kavalla is connected by a branch line to the railway from Salonika to Dedeagatch (Alexandroupolis) at Drama, 22 mi. inland from the coast. Kavalla passed to Greece after the Balkan War of 1912–13. It was coveted by Bulgaria as a maritime outlet, and during the negotiations over the peace treaty of Neuilly (*q.v.*) with Bulgaria, M. Venizelos offered to connect Kavalla with the already existing narrow-gauge railway in the Struma valley, which runs from the Bulgarian side of the frontier to Sofia. This would have contributed to the fulfillment of article 48 of the treaty, in which the principal Allies assured to Bulgaria an economic access to the Aegean sea; but no action was taken. In 1941 Kavalla was occupied by Bulgaria after the axis invasion of the Balkans. Pop. (1961) 44,406.

Mehemet Ali was born at Kavalla in 1769, and founded a Turkish school which still exists. His birthplace can be distinguished by the tablet which the municipal authorities have affixed to its front wall. Numerous Roman remains have been found in the neighbourhood, of which the chief is the large aqueduct on two tiers of arches which still serves to supply the town and dilapidated citadel with water from Mt. Pangeus.

Kavalla has been identified with Neapolis, at which St. Paul landed on his way from Samothrace to Philippi (Acts xvi, 11).

KAVANAGH, ARTHUR MACMORROUGH (1831–1889), Irish politician, son of Thomas Kavanagh, M.P., who traced his descent to the ancient kings of Leinster, was born in Co. Carlow, Ireland, on March 25, 1831. He had only the rudiments of arms and legs, but in spite of these physical defects had a remarkable career. He learnt to ride in the most fearless way, strapped to a special saddle, and also fished, shot, drew and wrote. He travelled extensively, in Egypt, Asia Minor, Persia and India between 1846 and 1853, and after succeeding to the family estates in 1853 he married in 1855 his cousin, Frances Mary Leathley. He was a philanthropic landlord, and an active county magistrate and chairman of the board of guardians. A

Conservative and a Protestant, he sat in parliament for Co. Wexford, 1866–68, and for Co. Carlow, 1868–80. He was opposed to the disestablishment of the Irish Church, but supported the Land act of 1870, and sat on the Bessborough commission. In 1886 he was made a member of the privy council in Ireland. He died on Dec. 25, 1889, in London.

See S. L. Steele, Arthur MacMorrough Kavanagh (1891).

KAVASS, a Turkish name for an armed police officer; also for a courier such as it is usual to engage when traveling in Turkey. (Adapted from the Turkish *qawwas,* a "bow maker"; Arabic *qaws,* a "bow").

KAVIRONDO, the general name of two distinct groups of tribes, one Bantu and the other Nilotic, who dwell in the valley of the Nzoia River, on the western slopes of Mount Elgon, and along the north-east coast of Victoria Nyanza. Both groups are immigrants, the Bantu from the south, the Nilotic from the north, the Bantu the first comers. The Nilotic tribes appear to have crossed the lake to reach their present home, the country around Kavirondo Gulf. The Bantu "are practically the most northerly representatives of that race" (Hobley). Their further progress north was stopped by the southward movement of the Nilotic tribes, who in turn were checked by Elgumi people from the east, themselves probably of Nilotic origin. Both groups of Kavirondo are physically fine, the Nilotic stock appearing more virile than the Bantu. The Bantu Kavirondo are divided into three main groups —the Awa-Rimi, the Awa-Ware and the Awa-Kisii. By the Nilotic Kavirondo their Bantu neighbours are known as Ja-Mwa. The generic name for the Nilotic tribes is Ja-Luo. The Bantu Kavirondo call them Awa-Nyoro. The two groups have many characteristics in common. A characteristic feature of the people is their nakedness. Among the Nilotic Kavirondo married men who are fathers wear a small piece of goat-skin, even when European clothing is worn. Among the Bantu Kavirondo married women wear a short fringe of black string in front and a tassel of banana fibre suspended from a girdle behind, this tassel having at a distance the appearance of a tail. Hence the report of early travellers as to a tailed race in Africa. The Nilotic Kavirondo women wear the tail, but dispense with the fringe in front. Some of the Bantu tribes practise circumcision, the Nilotic tribes do not. Patterns are tattooed on chest and stomach for ornament. Men, even husbands, are forbidden to touch the women's tails, which must be worn even should any other clothing be wrapped round the body. The Kavirondo are independent and honest. They practice polygamy. Among the Bantu tribes a man has the refusal of all the younger sisters of his wife as they attain puberty. The Nilotic Kavirondo practise exogamy. Girls are betrothed at six or seven, and the husband-elect continually makes small presents to his father-in-law-elect till the bride reaches womanhood. Premarital intercourse is permitted. Among the Bantus if the girl be not found a virgin on her wedding day, she is sent back to her parents, who have to return the marriage price, and pay a fine. The wife's adultery was formerly punished with death, and the capital penalty was also inflicted on young men and girls guilty of unchastity. Among the Bantu Kavirondo the usual minimum price for a wife is forty hoes, twenty goats and one cow, paid in instalments. The Nilotic Kavirondo pay twenty sheep and two to six cows. If a woman dies without bearing children, the amount of her purchase is returnable by her father, unless the widower consents to replace her by another sister. The women are prolific and the birth of twins, a lucky event, is celebrated by feasting and dances. Among the Bantu Kavirondo the mother of twins must remain in her hut for seven days. Among the Nilotic Kavirondo the parents and the infants must stay in the hut for ten days. If a Bantu mother has lost two children in succession the next child born is taken out at dawn and placed on the road, where it is left till a neighbour, usually a woman friend who has gone that way on purpose, picks it up. She takes it to its mother who gives a goat in return. A similar custom prevails among the Nilotic tribes. Names are not male and female, and a daughter often bears her father's name.

The Kavirondo bury their dead. Among one of the Bantu tribes, the Awa-Kisesa, a chief is buried in the floor of his own hut in a sitting position, but at such a depth that the head protrudes. Over the head an earthenware pot is placed, and his principal wives have to remain in the hut till the flesh is eaten by ants or decomposes, when the skull is removed and buried close to the hut. Later the skeleton is unearthed, and reburied with much ceremony in the sacred burial place of the tribe. Married women of the Bantu tribes are buried in their hut lying on their right side with legs doubled up, the hut being then deserted. Men of the Bantu tribes are buried in an open space in the midst of their huts; in the Nilotic tribes, a man may not be buried in the same house as his wife if she has pre-deceased him. A child is buried near the door of its mother's hut. A "mourning." a cord of banana fibre, is worn round the neck and waist. The chief chooses, sometimes years before his death, one of his sons to succeed him, often giving a brass bracelet as insignia. A man's property is divided equally among his children.

The Kavirondo are an agricultural people: both men and women work in the fields with large iron hoes. In addition to sorghum, *Eleusine* and maize, tobacco and hemp are both cultivated and smoked. Both sexes smoke, but the use of hemp is restricted to men and unmarried women, as it is thought to injure child-bearing women. The Kavirondo cultivate sesamum and make an oil from its seeds which they burn in little clay lamps. These lamps are of the ancient saucer type, probably introduced into the country by the coast people. Some tribes live in isolated huts, others in the north have strongly walled villages. The walls are of mud and formerly, among the Nilotic tribes, occasionally of stone. Their huts are circular with conical thatched roof, and fairly broad verandah all round. A portion of the hut is partitioned off as a sleeping-place for goats, and the fowls sleep indoors in a large basket. Skins form the only bedsteads. In each hut are two fireplaces, about which a rigid etiquette prevails. Strangers or distant relatives are not allowed to pass beyond the first, which is near the door, and is used for cooking At the second, which is nearly in the middle of the hut, sit the hut owner, his wives, children, brothers and sisters. Around this fireplace the family sleep. Cooking pots, water pots and earthenware grain jars are the only other furniture. The food is served in small baskets. Every full grown man has a hut to himself, and one for each wife. The huts of the Masaba Kavirondo of west Elgon have the apex of the roof surmounted by a carved pole obviously a Phallus. Among the Bantu Kavirondo a father does not eat with his sons, nor do brothers eat together. Among the Nilotic tribes father and sons eat together, usually in a separate hut with open sides. Women eat apart and only after the men have finished. The Kavirondo keep cattle, sheep, goats, fowls and a few dogs. Women do not eat sheep, fowls or eggs, and are not allowed to drink milk except when mixed with other things. The flesh of the wild cat and leopard is esteemed by most of the tribes. From *Eleusine* a beer is made. The Kavirondo are plucky hunters, capturing the hippopotamus with ropes and traps, and attacking with spears the largest elephants. Fish, of which they are very fond, are caught by line and rod or in traps. Bee-keeping is common, and where trees are scarce the hives are placed on the roof of the hut. Among the Bantu Kavirondo goats and sheep are suffocated, the snout being held until the animal dies. The Kavirondo fight well. Their weapons are spears with rather long flat blades and broad-bladed swords. Some use slings, and most carry shields. Bows and arrows are also used; firearms are however displacing other weapons. Kavirondo warfare was mainly defensive and intertribal. When a man had killed his enemy in battle special rites were necessary to defend him from the spirit of the dead man. Kavirondo industries are salt making, effected by burning reeds and water plants and passing water through the ashes; the smelting of iron ore (confined to the Bantu tribes); pottery and basketwork.

The Bantu Kavirondo have many exogamous totemic divisions. Their religion appears to be a vague ancester worship, but the northern tribes have two gods, Awafwa and Ishishemi, the spirits of good and evil. To the former cattle and goats are sacrificed. They believe in witchcraft and practise trial by ordeal. They dress mounds uith butter and leaves, and for inflammation of the lungs or pleurisy pierce a hole in the chest. There are no medicine-

men—the women are the doctors. Certain of the incisor teeth are pulled out. If a man retains these he will, it is thought, be killed in warfare.

Among certain tribes the women also have incisor teeth extracted; otherwise misfortune would befall their husbands. For the same reason the wife scars the skin of her forehead or stomach. A Kavirondo husband, before starting on a perilous journey, cuts scars on his wife's body to ensure him good luck. The Kavirondo have four dances—the birth dance. the death dance, that at initiation and one performed in seasons of drought. They use a large lyre-shaped instrument and various drums.

The Nilotes call their supreme being Nyasi who is to he found in large trees. Sickness is attributed to magic or ghostly visitation.

The Ja-LUOwomen use as ear ornaments small beads which are ancient. being generally blue, occasionally yellow or green. The beads are picked up in certain districts after heavy rain. and are supposed to come down with the rain. They are identical in shape and colour with ancient Egyptian beads.

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KAW (AKHA), a tribe of Kengtung, one of the southern Shan states of Burma. In 1931 they numbered 40,407. They belong to the Lolo-Muhso group and are closely related to the Lahus, Lisaws and Ako. They are employed as labourers by the more enterprising Shans. Promiscuous sexual intercourse is permitted before marriage and every Kaw village has its *deh hkawng* or public courting place. They practise a form of ancestor worship, bury their dead in coffins. eat dogs and are opium addicts.

See J. G. Scott. *Burma and Beyond* (London, 1900); and *Census* of *India,* vol. xi (Delhi, 1931). (C. C. D.)

KAWAHLA: *see* ARABS.

KAWARDHA, a town and *taluka* (administrative subdivision) of Durg district. Madhya Pradesh, India. The town (pop., 1951, 11,642) is the headquarters of the Kabirpanthi sect *(see* KABIRPANTHIS).

KAWARDHA TALUKA (area 339 sq.mi.; pop., 1951, 89,830) comprises the former feudatory state of that name merged into Rladhya Pradesh on Jan. 1. 1948. Under British paramountcy Kawardha had been controlled through the Chhattisgarh subagency of the Eastern States agency. Half the area consists of hill and forest; the rest produces millet, wheat, cotton and rice. The former ruler was a Rajgond *(see* GONDWANA).

KAY, JOHN (1742–1826), Scottish caricaturist, was born near Dalkeith, Midlothian. in April 1742. An amateur miniaturist and draughtsman. but by trade a barber, he became a professional caricaturist only in 178j. His satirical etchings of Edinburgh eccentrics and worthies; though of the most primitive kind. were immensely popular; the one of Adam Smith is the only contemporary likeness of the economist. A collection of Kay's drawings is at the Royal Scottish academy. He died in Edinburgh, Feb. 21, 1826.

See *Kay's Edinburgh Portraits,* text *by J.* Paterson (ed. by J. Maidment), autobiog. note by J. Kay (London and Glasgow, 1885).

KAY, JOSEPH (1821–1878), English economist. was born at Salford, Lancashire, on Feb. 27, 1821. Educated at Trinity college. Cambridge, he was called to the bar in 1848. and in 1869 became queen's counsel. He is best known for his works on the social conditions of the poor in various European countries. He died at Dorking, Surrey, on Oct. 5. 1878. His works include: *The Education of the Poor in England and Europe* (1846); *The Social Condition of the People in England and Europe,* 2 vol. (1850); *The Condition and Education of Poor Children in English and German Towns* (1853); *The Law Relating to Land* (1879).

KAYAK or CAYAK, an Eskimo word for a fishing boat. in common use from Greenland to Alaska. It has been erroneously derived from the Arabic *caique,* supposed to have been applied to the native boats by early explorers. The boat is made by covering a light wooden framework with sealskin. A hole is pierced in the centre of the top of the boat, and the kayaker (also dressed in sealskin) laces himself up securely when seated to prevent the entrance of water. The kayak is propelled like a canoe by a double-bladed paddle. The name "kayak" is properly only applied to the boat used by an Eskimo man; that used by a woman is called an umiak.

KAYAN. The Kayan, one of the dominant tribes of Sarawak and Indonesian Borneo, originated in the Apo Kayan district of the central highlands and are now found mainly on the middle reaches of the rivers. They are fine craftsmen. Their culture closely resembles that of the Kenyah (*q.v.*), with whom they are usually associated.

Villages. which usually consist of several long houses, are independent; but neighbouring villages co-operate and warfare between them was infrequent. The Kayan were head-hunters. and resumed the practice during the Japanese occupation in World War II. Heads were required to complete funerary ceremonies for chiefs. A warrier's equipment consists of a short sword (*parang ilang),* spear and shield. Blowguns, the darts poisoned with *ipoh,* are used mainly for hunting. The *parang* is also used as a tool for clearing forest and general woodworking. Their religion is animistic. consisting mainly in propitiation and control of spirits: these vary from remote, powerful and anthropomorphically conceived beings who may be regarded as gods. to spirits of ancestors and natural objects. Omens. usually in the form of the cries and flight of birds, are consulted before any important undertaking.

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KAYASTH, the "writer" caste of Bengal. They claim to be Kshatriyas who took to clerical work. They secured many offices under Mohammedan and more under British rule.

KAYE, NORA (NORA KOREFF) (1920–), U.S. dramatic ballerina, is noted for her penetrating interpretations of the leading roles in Antony Tudor's *Pillar of Fire* and *Lilac Garden,* Agnes de Mille's *Fall River Legend* and Jerome Robbins' *The Cage.*

Born in New York city, she studied at the Metropolitan Opera Ballet school and danced in the opera ensemble. After further training under Michel Fokine and George Balanchine, she joined the Ballet Theatre at its formation (1939). Her first major success came in 1942 with her creation of the role of Hagar in *Pillar of Fire.* As a dramatic dancer Kaye is unrivaled. (LN. ME.)

KAYSER, HEINRICH GUSTAV JOHANNES (1853–1940), German physicist who studied the spectra of the elements, was born at Bingen on the Rhine on March 16, 1853. He was educated at Strasbourg and Berlin and held the following posts: assistant in the Physical institute, Berlin (1878–85); professor in the Technische Hochschule, Hanover (1885–94); and professor of physics at Bonn (1894–1920). His early research work was on sound, and he published papers on the determination of the ratio of the specific heats of air by measuring the velocity of sound in air, effect of intensity on the velocity of a sound wave, the velocity of sound in wood and other similar subjects. His name, however, is associated with his later work on spectroscopy; a good deal of this work was done in conjunction with C. D. T. Runge. They carefully mapped a large number of spectra of the elements, using a Rowland grating, and discovered the existence of series in the spectra of the elements. They developed a formula connecting the wave length of the lines with constants depending on the element. About the same time J. R. Rydberg used the data of other workers and developed a similar formula. Kayser died at Bonn on Oct. 14, 1940.

Kayser wrote *Lehrbuch der Spectralanalyse* (1883); *Lehrbuch der Physik fur Studierende* (1890; 6th ed., 1921); *Handbuch der Spectroskopie,* 8 vol. (1900–34); *Tabelle der Schwingungszahlen* (1925); and *Tabelle der Hauptlinien der Linienspektra aller Elemente nach Wellenlunge geordnet* (1926).

KAY-SHUTTLEWORTH, SIR JAMES PHILLIPS, 1ST BART., cr. 1849 (1804–1877), English politician and educationalist. was born at Rochdale. Lancashire. on July 20, 1804, the son of Robert Kay. He qualified in medicine at Edinburgh university and practised in a poor district of Manchester. In 1839 he was appointed first secretary of the committee formed by

the privy council to administer the Government grant for the public education in Great Britain. He founded at Battersea. London. nith E. Carleton Tufnell, the first training college for school teachers (1839–40).

He died in London on May 26, 1877.

KAZAKHSTAN (officially KAZAKH S.S.R), a Soviet Socialist Republic of western Asia, bounded west by the Caspian sea and the European part of the Russian Soviet Federated Socialist Republic, or rather its lower Volga *oblasti* of Astrakhan. Volgograd and Saratov: north by the Orenburg *oblast* lying across the conventional boundary between Asia and Europe, and farther east by the Siberian *oblasti* of Chelyabinsk. Kurgan, Tyumen. Omsk and Novosibirsk; northeast by the Altai *krai* and the Gorno-Altai autonomous *oblast;* east by China; and south by Kirghiz S.S.R.. Uzbek S.S R., the Aral sea and Turkmen S.S.R.

PHYSICAL GEOGRAPHY

Kazakhstan is essentially a steppe area in a region of increasing dessication. Much of it is characterized by salt lakes. some temporary and rapidly drying. by closed inland drainage basins and by rivers which lose themselves in the desert sands. The country can be divided into three natural regions :—the low Caspian depression and Turan lowlands in the west, higher uplands in the centre, and a high mountain helt in the east and southeast.

Western Kazakhstan comprises the Caspian depression and the Turan lowlands separated by the Mugodzhar hills, the southernmost spur of the Urals. with Mt. Boptyhai (1.152 ft.) as the highest peak. Although the level of the Caspian sea is about 85 ft. below that of the Black sea. in the southwestern corner of Kazakhstan there are two even lower depressions, one of 230 ft. and another of 433 ft. This part of the country comprises also the western half of the Ust-Urt plateau, a waterless and desolate desert. The Turan lowlands lying east and north of the Aral sea include the Turgai tableland. Western Kazakhstan is watered by the Ural (Yaik) and Emba rivers emptying into the Caspian. and the Irgiz and Turgai rivers which flow into the salt lake of Chelkar-Tengiz. The latter is separated from the Aral sea by the Kara Kum (Black Sands) desert, not to be confused with a desert of similar name in Turkmenistan. The rivers, frozen from November to mid-March, are full in spring. but otherwise are shallow and not navigable. The Tobol river, in the northern part of rvestern Kazakhstan. with the Ubagan, its right-bank tributary. flows northward and is one of the left-bank tributaries of the Irtysh river. The Uhagan and the Turgai thus flow in opposite directions although together their valleys form a long, narrow depression called the Turgai gates, the highest point of which is only about 300 ft. above sea level. This suggested to Soviet engineers the idea of huilding a dam on the Irtysh river north of Tobolsk to divert the huge masses of water otherwise lost in the Arctic ocean toward the Turgai steppe and the Aral sea (*q.v.*). During the glacial period the Turgai steppe was covered by the Caspian-Aral sea.

Cenfrnl Kazakhstan is part of the Hercynian upland consisting of a series of moderately high. deeply eroded short ranges and a few separated granite, porphyry or slate hill formations, Kyzylrai (5,115 ft.) and Chinghiz-Tau (3.970 ft.). north of Lake Balkhash (*q.v.*), being the highest. The Ishim river has its source in the centre of the upland. flows west, then north: and empties into the Irtysh; the Nura discharges into Lake Tengiz. In the south, between the lower Syr Darya river and Lake Balkhash, lies the vast Bet Pak Dala or Hungry (Golodnaya) steppe. a plateau 450 ft. above sea level, the surface of which consists of cracked clay. Two rivers. the Sary-Su in the west of Bet Pak Dala. and the Chu in the south, flow respectively to the southwest and to the west, but lose so much water through evaporation and ground permeability that they disappear without reaching the Syr Darya. South of the Chu lies a smaller Muyun Kum desert. Across the Kyzyl Kum (Red Sands) desert. lying south of the Syr Darya, passes the Kazakh-Uzbek boundary.

Eastern and Southeastern Kazakhstan is composed of parts of four higher mountain massifs of central Asia extending westward, and three wide valleys lying between them. On the north is the Altai massif, and farther south the Tarbagatai range, reaching 9.813 ft. Farther south still is the Dzungarian Ala-Tau range rising to 14.642 ft. and the Tienshan system. Between Altai and Tarbagatai lies Lake Zaisan, 1.266 ft. above sea level. through which flows the Irtysh; between Tarbagatai and the Ala-Tau are the Ala-Kul and Sasyk-Kul lakes on the route from the Dzungarian gates. the historic main invasion route from Mongolia and China. Farther south! between Ala-Tau and the Tienshan, flows the Ili river, one of the "seven rivers" with their sources in the Ala-Tau and Tienshan which discharge into Lake Balkhash. The rivers of eastern Kazakhstan are suitable for hydroelectric power stations and irrigation. However, only the Irtysh is suitable for navigation. although frozen for five months. In the north is a narrow belt of black earth, covering about 7% of the country, where agricultural settlements on a larger scale are possible.

Climate. — The climate is everywhere continental and dry. The January temperatures. except in the extreme south. are below freezing point. At Uralsk. in the west. the average January temperature is 3° F., and the July temperature 73° F. At Semipalatinsk. in the east, frosts of —44° F. are not uncommon, while in the summer the temperature may reach 122° F. In western and central Kazakhstan the average July temperatures vary between 67° F. in the north and 82° F. in the south. The temperature of the sand in the deserts sometimes reaches 158° F. In the eastern mountain valleys the climate is more healthful and Alma-Ata (2,405 ft.) has an average temperature of 17° F. in January and 74° F. in July. Precipitation varies according to seasons and regions. From November to March it is about 12 in. in the north, from 2 in. to 3 in. at Aralsk and almost disappearing in the south; from April to October it is about 10 in. in the north and from 1.2 in. to 3 in. in the south; in the mountainous eastern areas, it is from 12 in. to 16 in. in the winter and from 28 in. to 32 in. in the summer.

Flora and Fauna. — There are forests of fir. pine and spruce in the mountains. birch and aspen groves in the lower altitudes and clusters of poplar, willow and pseudo-acacia along the streams. Shrubs such as the wild cherry and dwarf almond grow on the hilly slopes. wormwood covers the clayey soil of the centre and saxaul, an odd-shaped. gnarled and apparently leafless tree, grows in the sandy steppes. In the forests there are bears. and wild boars exist in the thickets surrounding the lakes. There are also the caracal lynx (*Felis caracal*), Pallas's cat (*F. manul*), the steppe fox, the sable. the saiga antelope, the jerboa and two kinds of marmot. Among the characteristic birds are woodcocks and owls in the forests, pheasants and eagles in the steppes, wild geese. cranes! herons and lapwings around the lakes. There are many locust-breeding grounds. also scorpions and tarantulas. in the deserts. In the Aral and Balkhash lakes fish are abundant, especially sturgeon and carp in the former and white perch and a carplike fish called *marinka* in the latter.

HISTORY

The Kazakhs are a branch of the Turkic peoples (*see* TURKS OR TURKIC PEOPLES) which led the nomadic life of herdsmen until World War I. Many were fugitives from the Turkic states of Khorezm (Khiva) and Bukhara and their name in Turkish means "homeless." "adventurer" or "outlaw." In the 13th century they came under the sway of Jenghiz Khan and were allotted to Juji, his eldest son. They later became a part of the Golden Horde, a western Mongol empire founded by Batu, a grandson of Jenghiz. After three centuries of mastery in eastern Europe and western Asia the Golden Horde declined and by the beginning of the 16th century was divided into a number of khanates. but the Kazakhs continued in the steppes of Turkistan. At that time they were divided into three confederacies known as the Little or Younger, Middle, and Great or Elder *zhuz* or hordes. The Little horde spent the winters on the shore of the Caspian and Aral seas while in summer it moved northward to the southern slopes of the Crals. The Middle horde wintered on the Syr Darya river and in summer used the grazing grounds beside the upper Tobol. Ishim and Irtysh rivers. The Great horde's winter quarters were south of Lake Balkhash, in the Dzhety Su. or "land of the seven rivers" (Russian *Semirechye*), the summer months being spent in the high valleys of the Tienshan,

Dzungarian Ala-Tau, Tarbagatai and Altai massifs.

When not on the move the Kazakhs lived in small settlements or *auls* comprising a number of tents or *yurts*, a *yurt* on wheels being known as a *kibitka*. Men rode on horseback from early infancy, keeping flocks of sheep, goats and camels. Though the Kazakhs were nominally Sunni Moslem after the 16th century, their mode of life prevented the strict observance of rules. The Kazakhs were supplied with their staple food and their clothing by their herds; their main drink was *kumyss* (fermented mare's milk). They developed a patriarchal social system with khans or princes, sultans or relatives of khans. *biys* or judges, *bays* or proprietors of big herds and *aksakals* or family patriarchs. They were forbidden to marry within the same clan and paid the *kalym* for women taken as wives.

Between 1511 and 1523 Kasym Khan tried to unite the three hordes into one confederacy; two of his successors. Khaknazar (d. 1580) and Tevekkel (d. 1598) vainly continued this endeavour. At the end of the 17th century the last Mongol invasion came from China across the Dzungarian gates. an incursion by the Kalmucks, a remnant of the Oirat Mongol confederacy (*kalmak* meaning in Turkish "to survive"). As they move westward Abulkhair. khan of the Little horde. submitted in 1731 to Russia. The Russians had already built three fortresses on the Irtysh river. The bitter fighting which went on between Kazakhs and Kalmucks weakened both and facilitated further Russian penetration. In 1734 the fortress of Orenburg was erected at the confluence of the rivers Ob and Ural; later it was renamed Orsk. In 1743 the fortress was moved down the Ural river about 165 mi. westward. The fortress of Petropavlovsk on the Ishim river was built in 1753. Some of the Kalmucks crossed the lower Volga and remained there while the rest moved back into China in 1771. Their progress was a major military operation because of continuous battles with the Kazakhs. During this 80 years' struggle for grazing grounds the Kazakhs were constantly abducting Kalmuck women and this explains why they, more than any other Turkic people. acquired a sturdy Mongol appearance.

The Kazakhs of the Little horde rose against the Russians in 1783–97. "Batyr" (hero) Srym Datov led the rising against both the Russians and Nur Ali Khan. son of Abulkhair. who mas pro-Russian. When the Russians recovered from the Napoleonic wars, they continued their conquest of the land of the Kazakhs (whom they still erroneously called Kirghiz, while the true Kirghiz they described as Kara-Kirghiz). In 1830 the Russians built a fortress at Akmolinsk, and settled Russian and Ukrainian peasants on Kazakh land. This was resisted by the Little horde which rose under Isatay Taymanov and Mukhambet Utemisov (1836–38), again against both the Russians and their own khan Janghir. The Middle horde. on the other hand, was led against the Russians by the sultan Habaydulla Valikhanov (1824–30), while the leader of the Great horde. Kine Sari (Kenesary), son of Kasym Khan. was able to resist from 1836 to 1847. He was slain by the Kirghiz near the Issyk-Kul lake. In 1853 the Russians took Ak-Mechet, a Kazakh town on the Syr Darya river, and in 1854 founded the fortress of Verny ("the faithful"). The country was divided into four provinces: Uralsk, Turgai, Steppe (later divided into Akmolinsk and Semipalatinsk) and Semirechinsk. By 1900 about 110,700,000 ac. of arable land was declared state property and used for a planned peasant colonization.

As the Russians did not otherwise interfere in the Kazakhs' nomadic way of life and did not show any interest in their education, no more than 2% of the Kazakhs were literate. There was, however, a small national renaissance movement and, after the 1905 revolution, Kazakh deputies were elected to the first and second *Duma* (parliament). The first Kazakh newspaper, *Aikan*, appeared in 1910, followed by *Kazakh* in 1913. When, in 1916, the tsarist government ordered the mobilization of all males between 19 and 43 ior auxiliary service, the Kazakhs rose under Abdulghaffar and Amangheldy Imanov and the governor general of Turkistan sent troops against the rebels. Shortly after the Russian revolution of March 1917, Kazakh Nationalists led by Ali Khan Bukey Khan (Bukeykhanov). D. Dos-Mukhamedov and others, asked for full antonomy for Kazakhstan. The civil war which followed the Communist coup d'état of Nov. 1917 created chaos and famine. When, in 1919–20, the Red army deieated the "White" Russian forces and occupied Kazakhstan, Imanov's detachment fought in the Red ranks against the Nationalist *Alash Orda* government formed on Nov. 17, 1917, by Ali Khan Bukey Khan.

On Aug. 26, 1920, a Kazakh (still described as Kirghiz) Autonomous Soviet Socialist Republic within the Russian S.F.S.R. was organized with a temporary capital at Orenburg. In 1925 the name of the republic was changed to Kazakh and the capital was moved to Ak-Mechet, renamed Kzyl Orda or ("red capital"). In 1929, however, the capital was moved farther east, to Verny, renamed Alma-Ata ("father of apples"). In 1927 the Kazakh section of the Communist party decided that the Kazakhs must have priority in their country in the matter of land distribution. After this nationalist manifestation the section was purged. A Russian, F. I. Goloshchokin, was appointed party first secretary at Alma-Ata and the section proclaimed the absolute equality of nationalities in respect of land distribution. Goloshchokin started the policy of rapid transformation of the nomads into a settled population and of Russian and Ukrainian colonization. U. D. Kulumbetov, a Kazakh deputy premier, who protested against this, was executed in 193j together with 18 other leading Kazakhs for "bourgeois nationalism."

Sot until Dec. j, 1936, did Kazakhstan qualify ior the iull status of a Soviet Socialist republic. In June 1937, when the Kazakh Communist party had 51,440 members, it held its first congress; by Sept. 1952 the membership had risen to 231,610. including candidates. During World War II a Kazakh, Zhumabai Shayakhmetov, was appointed first secretary of the Kazakh Communist party. In Feb. 1954, he was succeeded by a Russian, P. K. Ponomarenko, who in May 1955 was replaced by another Russian, L. I. Brezhnev.

POPULATION

The area of the republic is 1,064,092 sq.mi. Its total population was 6,073,979 in 1926, including 3,717,000 Kazakhs (61.1%), 1,280,100 Russians (21.1%), 861,000 Ukrainians (14.2%) and 213,500 Czbeks (3.5%). The total number of Kazakhs in the U.S.S.R. in 1926 was 3,968,289. The 1939 census revealed that the total population of Kazakhstan amounted to only 6,145,937, an increase of 1%, while the total population of the U.S.S.R. rose 15.9% between 1926 and 1939. The total number of Kazakhs in the U.S.S.R. in 1939 was given as 3,098,764, an absolute loss of 869,525 (21.9%). No breakdown by nationalities was published of the population of Kazakhstan in 1939, but, even supposing that all the Kazakhs were then living in the republic, they would constitute only a half of the total population. There are two reasons for the decrease of the Kazakh people, one being an excess of deaths over live births and the other emigration. The Kazakhs resisted collectivization, and there was an enormous reduction oi livestock between 1928 and 1934, with a loss of 73% of the cattle, 87% oi the sheep and goats and 83% oi the horses. For a nomadic people whose whole economy was based on livestock breeding this meant death from hunger ior many thousands. There was also an important exodus of Kazakhs into Sinkiang, thus further reducing their numbers in the U.S.S.R.

With the progress of industrialization and forced colonization during and after World War II, the population in 1939 was 9,309,817. Kazakhs being less than half the total. The urban population in 1959 amounted to 4.085.866, or 43.9% of the total population. Alma-Ata, the capital. had 45.395 inhabitants in 1926, 230,528 in 1939 and 457,709 in 1959.

Other chiei towns mere (pop. 1959) Karaganda 398,000; Semipalatinsk 155,000; Petropavlovsk 135,000; Chimkent 153,000; Dzhambul 67,000; Uralsk 105,000.

Education.—In 1926 about 77% oi the population above nine years of age was illiterate. In Nov. 1949 Nurtas Undasynov, chairman of the council of ministers, claimed that everybody in the republic was literate. In the mid-1950s there were 8,494 primary and secondary schools with about 1,200,000 pupils; 89 vocational schools: and 23 institutions of higher education. including the Kazakh state university at Alma-Ata opened in 1929, which in 1953 had about 3,000 students. 4 Kazakh Academy oi Sciences was founded in 1945. In Kazakh schools the language of teaching is Kazakh, from 1941 written in the Russian alphabet.

ECONOMICS

Agriculture.— In 1913 only 10,374,000 ac. of arable land were under cultivation; by 1940 this area had increased to 16,796,000 ac., and by 1953 to 22,724,000 ac. Because of the shortage of food in the U.S.S.R.. the Soviet government decided to treble the cultivated area of Kazakhstan. In 1954 about 19,760,000 ac. of former virgin and fallow land were said to be under grain. Weather conditions, difficulties of transport and "forcible volunteering" of farm workers were hazards

Livestock in Kazakhstan, 1928–50

	1928*	1934†	1936†	1950 (Plan)
Sheep and goats	17,450,000	2,269,000	3,494,200	19,050,000
Cattle	5,900,000	1,593,000	2,246,300	4,400,000
Horses	2,600,000	442,000	464,700	1,516,000
Pigs		140,000	545,000	392,000

*Estimated. †*Bolshaya Sovietskaya Entsiklopedia*, vol. 30 (Moscow, 1937).

By 1953 the republic had 3,218 *kolkhozy* (collective farms), 268 *sovkhozy* (state farms), and 385 machine and tractor stations.

of this enterprise. In 1945 there were about 3,250,000 ac. of irrigated land. New works started in 1946 in the Syr Darya and Chu valleys, irrigated an additional 375,000 ac. Until 1928 livestock breeding was the country's most important industry. No reliable data as to its position were published after 1936 *(see* Table).

Communications. — In 1914 Kazakhstan had within its present frontiers 1,355 mi. of railways. This line, completed in 1905, crossed the whole country in a southeasteily direction from Orenburg through Aktyubinsk, Aralsk and Ak-Mechet to Tashkent. By 1938 the system had been extended to 5,395 mi. Before World War I the tsarist government had surveyed the building of the trunk line now known as the "Turk-Sib," joining the Central Asian system to the main Trans-Siberian line through Alma-Xta and Semipalatinsk to Tatarsk, but this was not completed until 1930. As part of their industrialization policy under the prewar five-year plans, the Soviet government built the Orsk-Guryev and Magnitogorsk-Akmolinsk-Karaganda-Balkhash lines. After World War II new lines totaling j93 mi. were added, the Mointy-Chu line linking Karaganda with Tashkent, and the Akmolinsk-Pavlodar-Kulunda line, which became a further link in the "Yuzh-Sib" or South-Siberian line. By 1952 there were about 68,200 mi. of roads, including 1.488 mi. of hard-surfaced strategic roads, the most important being the Tashkent-Frunze-Alma Ata-Sary Ozek-Panfilov (near the Chinese frontier).

Mining and Industry. — The country is rich in mineral deposits. Coal production at Karaganda rose from 85,000 metric tons in 1920 to 4,150,000 tons in 1938 and an estimated 16,400,000 tons in 1950. Oil production in the Ural-Emba basin was 117,600 tons in 1913 and 649,500 tons in 1938; it was planned to extract 1,200,000 tons in 1950. There are extensive copper deposits at Dzhezkazgan (Jezkazgan) and Kounradsky, and of lead and zinc at Leninogorsk, Zaryanovsk and in the Kara-Tau range, which is also rich in phosphates. There are large deposits of chromite, near Aktyubinsk. of nickel at Batamshinsky (Kimpersai) and of manganese at Dzhezdy. There are big steelworks at Temir-Tau, copper foundries at Balkhash and Karsakpai and lead foundries at Leninogorsk and Cbimkent. A large hydroelectric power station at Ust-Kamenogorsk, on the Irtysh, started production in 1953.

Finance. — While the budget in 1954 was balanced at 5,325,318,000 roubles, that of 1955 was almost doubled, reaching 10,122,318,000 roubles, probably because of increased investment in agriculture.

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(K.SM.)

KAZAN (called by the Cheremisses, Ozon), the chief town of the Tatar Autonomous Soviet Socialist Republic, R.S.F.S.R., U.S.S.R., situated on the Kazanka river, at jj0 50′ N., 49° 10′ E., 3 mi. from the Volga, which reaches the town in the spring floods only. Pop. (1959) 643,000, mainly Russian, though the Tatar element is rapidly increasing. It is a flourishing river port and has railway communication westward and eastward. The ancient leather industry, dating back to the Bolgar empire on the Volga, is important and there are many leather factories in the town, a number making morocco leather goods. It is famous for its soap, glycerine and toilet article factory. There are also copper smelting, machinery, tobacco, felt boot, textiles, especially woolens, and brewing industries. Since World War II petroleum exploitation and refining have become important. The Kazan fair was formerly a great centre for trade between western Russia and Persia and Turkestan, and was held on an island in the Volga opposite to the town.

Kazan was a centre of Mohammedan culture in pre-1914 times, and had an important printing press. This press now issues Tatar magazines, newspapers, school textbooks and a bulletin of research into Tatar culture. Among the educational institutions are the Communist Tatar university, an Oriental Pedagogical institute, a department of agriculture and a clinical observatory. The House of Tatar Culture was opened in 1926. Kazan is of peculiar interest as a place where waves of Slav influence from the west have alternated with Mongol influences from the east, the latter being predominant culturally today, while the former still has the political supremacy. The 13 mosques of the Islamic faith (where, though the Revolution has had some effect, the muezzin still calls the faithful to prayer five times a day) stand side by side with the numerous churches of the Slav Greek Orthodox faith. The ancient Kremlin or citadel, founded in 1437, within which were many beautiful churches and monasteries, and the red brick Suyumbeka tower (246 ft.) the reputed burial place of a Tatar saint, also contained an arsenal.

During the civil war following the 1917 revolution, Kazan, as a military centre, became the headquarters of the Bolshevist command in the district, after the fall of Simbirsk (Ulianovsk). The Czech army captured it in Aug. 1918, but it was recaptured by Trotsky in September, and was attacked by Kolchak's army in 1919. Much of the town was damaged or destroyed during this period, the Kremlin, as an arsenal, suffering specially. The 1921 famine was particularly severe in the Tatar Autonomous Soviet Socialist Republic. One of the first activities since its revival was an effort to restore as far as possible, the damaged Kremlin buildings. The treasures of the cathedral of the Annunciation (1562) have been removed to museums, but the cathedral itself still stands. The famous miracle working image of the Black Virgin of Kazan used to he housed in the Bogoroditski convent, built for its reception in 1579, but was moved to Moscow in 1612 and St. Petersburg (Leningrad) in 1710. The city of Kazan originally stood 30 mi. N.E. of its present position, where traces of it can still be seen and 60 mi. S. of Kazan are the ruins of Bolgary *(see* TATAR REPUBLIC). Kazan was the capital of the kingdom founded by Clugh Mohammed (Clu Makhmet), khan of the Golden Horde, in 1438, but was captured by Ivan the Terrible of Russia in 1j52, thus opening the Volga to Russian trade and settlement. Pugachev laid the city waste in 1774 and it was afterward frequently destroyed by fire.

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KAZANTZAKES (KAZANTZAKIS), **NIKOS** (1885–1957), Greek writer, achieved his greatest success as a novelist. Born in Crete on Dec. 2, 1885, he was educated in Athens and later in Paris, where he read law. Endowed with unusual breadth of vision, Kazantzakes read and wrote a great deal, leaving an impressive volume and variety of work. He published philosophic essays (the most important is the *Salvatores Dei),* tragedies, travel books and epic and lyric poetry. His *Odyssey,* a philosophic poem of 33.333 lines, which contains many striking passages, is an outline in epic form of the author's spiritual journey through life. He translated into Greek certain western classics, notably Dante's *Divine Comedy* and Goethe's *Faust.* With his novels he won an international reputation and a number of his books *(Alexis Zorbas, Christos Xanastavronetai, Kapetan Michales, Phtochoules tou Theou* and *Telephtaios Peirasmos)* have been translated into many European languages. It is possible to follow in his writings influences varying from primitive mysticism to the most advanced realism, kneaded together by the power of Kazantzakes' personality; a vein of pessimism, occasionally amounting almost to nihilism, can be traced. Kazantzakes is one of the great masters of the modern Greek language, the vigour and variety of which he illustrated with remarkable skill. He died at Antibes in the south of France on Oct. 18, 1957, and was buried in Crete.

Alexis Zorbas was translated as *Zorba the Greek* by C. Wildman (1952) and *Christos Xanastavronetai* as *Christ Recrucified* (U.S. ed., *The Greek Passion)* by J. Griffin (1954). The *Odyssey* was translated by Kimon Friar (19j8). (CE. A. T.)

KAZBEK (Georgian, *Mkin-vari;* Ossetian, *Urs-khokh),* one of the chief summits of the Caucasus, situated at lat. 42° 48′ N., long. 44° 29′ E., altitude 16,558 ft. It rises on the range which runs north of the main water parting and which is pierced by the gorges of the Ardon and the Terek. It represents an extinct volcano, built up of trachyte and sheathed with lava, and has the shape of a double cone, whose base lies at an altitude of 5.800 ft. Because of the steepness of its slopes, its eight glaciers cover an aggregate surface of not more than 8 sq.mi., though one of them, Maliev, is 36 mi. long. The heights of the lower terminations of these glaciers vary from 7,532 ft. for Devdorak, the best known, to 9,793 ft. for the Shau glacier. The Ardon and Terek rivers are glacial in origin. Many primitive legends gathered around its naked, austere sides, with the vast snowy dome above them, and in

monastic times its treasures were reputed to include the tent of Abraham and the cradle of Christ. It has a great literature and has left a deep mark in Russian poetry. At its foot lies the village and posting station of Kazbek. Antiquities dating from the Iron Age have been found at the village and at a site 2,000 ft. above it.

KAZERUN, a town of Iran, in the ostan of Fars (ostan 7) situated in the midst of a plain, among lofty limestone ridges. at an elevation of 2.800 ft. Pop. (1956) 30,659. The town is surrounded by tobacco fields. Other products of the district are rice, cotton and opium. Wild almopd trees are very numerous. In former times a special kind of cotton stuff called shatawi was made at Kazerun.

To the south (20 mi.), are the ruins of Shapur (Sabur) where are Sassanian bas-reliefs and, in a cave, a statue of that monarch. About two miles north of the town are the imposing ruins of a marble building said to stand over the grave of a Shaikh Amin ed Din Muhammad (d. A.D. 1339) and southeast on a high mound are the ruins of buildings with underground chambers known as Qala i Gabr. or the castle of the fire worshippers, and there is the famous Sassanian rock carving showing the defeated Roman emperor Valerian kneeling before Shapur I.

KAZINCZY, FERENC (1759–1831), Hungarian man of letters whose reform of the language and attempts to improve literary style had great influence. was born at Érsemlyén, Oct. 27, 1759, of a well-to-do family of the nobility. He learned German and French as a child and entered the famous Protestant college at Sárospatak in 1769. While there he published his first book, a small geography of Hungary (1775). Later he studied law. and became a civil servant. Imbued with the ideas of the Enlightenment, he was at home in the progressive administration introduced by Joseph 11, but during the reactionary period under Francis I, he joined the opposition. Although he played only a minor part in the conspiracy organized by the liberal abbot Ignáz Martinovics, he was arrested (Dec. 1794) and condemned to death. His sentence was commuted to imprisonment and he was released in June 1801, a middle-aged man standing on the threshold of a new life which it was his intention to devote entirely to the improvement of Hungarian literature. He had already tried his hand at translations, including Salomon Gessner's Idylls (1788), Hamlet (1790) and works by such varied authors as Metastasio, Lessing, Klopstock, Molière and Goethe.

Kazinczy gradually realized that only by creating a demand for quality and by teaching authors how to satisfy it could Hungarian literature be raised to contemporary European standards. The task was difficult, as political and social conditions were not such as to encourage the development of a living culture and the tastes of even the small reading public were unrefined. Although attempts to remedy this had been made by others; and by Kazinczy himself before his imprisonment — he had launched two short-lived periodicals: *Magyar Museum* (1788) and *Orpheus* (1790) — these had been unsuccessful. His longing for progress. denied political outlet, was now turned wholly to the service of literature and; living with his wife and seven children on the small income from his estate. he tried, through a voluminous correspondence with other writers and his own writings — biting epigrams, published in *Tövisek és virágok* (1811) and many sonnets, a poetical form which he introduced into Hungary — to banish from literature everything vulgar and uncouth. He also had a strong dislike of popular poetry.

His position as self-styled censor involved Kazinczy in endless controversies. His most famous battle was fought to improve the language: he initiated reforms of grammar, spelling and style which made Hungarian an outstanding medium for literary expression. He was one of the committee set up in 1828 to found the Hungarian academy. and was elected a member in 1830.

Although the development of Hungarian literature was not ultimately in line with Kazinczy's ideas, and by the time of his death at Szkphalom, Aug. 21, 1831, the leadership had already passed to Károly Kisfaludy, representing the ideals of romanticism, his influence cannot be overestimated. Without him, modern Hungarian would never have evolved as a literary medium, and later writers, who drew their strength from the untapped reserves of peasant life, would have lacked their essential equipment of language and style.

Of many editions of Kazinczy's works, the first, in five volumes, edited by L. Abafi, appeared in 1879–84. His letters were ediied in 21 volumes by J. Váczy (1890–1921). (Ds. Sr.)

KAZVIN (Qazvin), a former ostan and town of Iran. The province was bounded north by Gilan and Mazanderan, west by Khamseh, east by Tehran and south by Hamadan and was preeminently a grain and fruit producing district.

Kazvin town, in the ostan of Tehran (Central Ostan), is 93 mi. from Tehran: at the foot of the southern slope of the Elburz range at an altitude of 4.165 ft. Pop. (1956) 66,386. It is a market for the raw silk, rice and fish of Gilan, and for carpet weaving. The city, founded by Shapur II, was a strong place in early Persian times and flourished under the Moslems. Harun al-Rashid built a mosque there, of which traces remain, and showed the town distinguished marks of favour. Though ruined later by the Mongol invasion at the beginning of the 13th century, it revived again under the Safavis. Tahmasp I (1524–76) made it his capital, and Abbas I adorned it with several buildings but transferred the seat of government to Isfahan. In 1723 its inhabitants drove back the Afghans.

KEA, a parrot allied to the nestor (*q.v.*) and. like it, confined to New Zealand. Originally feeding on carrion. grubs, fruits and seeds, the kea (*Nestor notabilis*) came to rely more upon the offal of slaughterhouses on the sheep runs. This taste for flesh led it to acquire the habit of attacking living sheep occasionally when pressed by hunger. It is particularly fond of the fat about the kidneys, which it obtains by pecking through the flesh of the back. It is large. chiefly dull green, with orange-red rump and underwing. In summer it inhabits rocky summits of snow-capped mountains on South Island to 6,000 ft. above the forests and lower levels in winter seeking food. Its four or five white eggs are placed in a crevice among the rocks. (G. F. Ss.)

KEAN, EDMUND (1787–1833), one of the greatest English actors, was born in London. March 17, 1787. His father is presumed to have been Edmund Kean. an architect's clerk, and his mother Ann Carey, an actress. He made his first stage appearance in his fourth year as Cupid in J. G. Noverre's ballet of Cymon. At seven he was sent to school, but ran away to sea. Liking this even less: however, he got free from his ship by counterfeiting deafness. His uncle Moses Kean, a general entertainer, encouraged him to study Shakespeare, and Miss Tidswell, an actress who had known him from infancy. taught him to act, taking entire charge of him when his uncle died. He was adopted by a wealthy couple, but ran away to the stage. When only 14 he played leading characters such as Hamlet, Hastings and Cato at York for 20 nights. He then joined a strolling company attached to Richardson's show and had the honour of reciting before George III. He joined Saunders' circus. where as an equestrian he broke both his legs. However. he learned music from Charles Incledon, dancing from D'Egville and fencing from Angelo. In 1807 he played at Belfast opposite Mrs. Siddons. who disliked him but thought he played well. In 1808. while a member of Beverley's strolling players. he married Mary Chambers of Waterford, Ire. Kean and his family endured a life of privation for years, until in 1814 he went to Drury Lane theatre as an experiment to try and mend his fortunes. There, on Jan. 26, 1814, as Shylock, he roused the audience to uricontrollable enthusiasm. His subsequent appearances as Richard III, Hamlet. Othello and Macbeth established him as the greatest tragedian of his day and perhaps of any other. He appeared for the first time in New York on Nov. 29, 1820, and his North American tour was an immense success. On his return to England his wildness of character got him into difficulties. After he had been corespondent in the divorce case of Cox v. Kean his wife left him and the public attacked him violently both at home and in the United States. where he returned in 1825. His last performance in New York city was on Dec. 5, 1826, and after his return to England the public hostility had vanished. But his great powers were failing, and the process was hastened by his irregular habits. His last appearance on the stage was at Covent Garden, on March 25, 1833, when he played Othello

to the Iago of his son Charles. At the words, "Villain, be sure," in scene 3 of act iii. he suddenly broke down, and crying in a faltering voice. "O God. I am dying. Speak to them. Charles." fell insensible into his son's arms. He died at Richmond, Surrey, on May 15, 1833.

It was in the impersonation of the great Shakespearean characters that the varied beauty and grandeur of the acting of Kean were displayed in their highest form. although probably his most powerful performance was in the part of Sir Giles Overreach in Massinger's *A New Way to Pay Old Debts,* the effect of his first impersonation of which was such that the pit rose en masse. and even the actors and actresses themselves were overcome by the terrific dramatic illusion. His only personal disadvantage as an actor was his small stature. Kean specially excelled as the exponent of passion. In Othello, Iago. Shylock and Richard III, his identification with the personality. as he had conceived it, was as nearly as possible perfect. Coleridge said. "Seeing him act was like reading Shakespeare by flashes of lightning." The range of character in which Kean attained supreme excellence was narrow, but no one except Garrick has been so successful in so many great impersonations.

Kean's eccentricities at the height of his fame were numerous. Sometimes he would ride recklessly on his horse Shylock throughout the night. He was presented with a tame lion with which he might be found playing in his drawingroom. The prizefighters Mendoza and Richmond the Black were among his visitors. The Irish statesman Henry Grattan (*q.v.*) was his devoted friend.

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CHARLES JOHN KEAN (1811–1868), younger son of Edmund Kean, was born at Waterford, Ire.. Jan. 18. 1811. Educated at Eton, he was offered in 1827 a cadetship in the East India company's service. which he would have accepted if his father had agreed to settle an income of £400 on his mother. On his father's refusal, the son, too, became an actor. making his first appearance at Drury Lane theatre. Oct. 1, 1827, as Norval in Home's *Douglas.* He visited the United States in 1830 and on returning to London made a success at Covent Garden in 1833 as Sir Edmund Mortimer in Colman's *The Iron Chest.* He then devoted his activities to the provinces. Returning to Drury Lane in Jan. 1838 he made an outstanding success as Hamlet. In 1842 he married the actress Ellen Tree (*see* KEAN, ELLEN) and with her visited the United States again, during 1845–47. In England once more, he appeared with much success at the Haymarket theatre. In 1850, in partnership with Robert Keeley, he became lessee of the Princess' theatre. London. There he rose to the head of his profession and added much to the artistic production of both Shakespearean and modern plays. Never a great tragic actor. Kean was at his best in melodramatic roles such as the king in Boucicault's adaptation of *Louis* XI and in *The Corsican Brothers.* He returned to London in 1866 in broken health, after an extended tour abroad, and died on Jan. 22, 1868. (W. J. M.-P.)

KEAN, ELLEN (née **TREE**) (1805–1880), English actress, considered one of the finest actresses of her day (her best part having been that of Gertrude in *Hamlet*), was born of English parents in southern Ireland in Dec. 1805. She first appeared as an actress in Covent Garden in May 1823, as Olivia in Shakespeare's *Twelfth Night.* From 1824 to 1826 she performed at Bath, from 1826 to 1829 at Drury Lane and from 1829 to 1836 at Covent Garden. During 1836–39 she traveled in America. playing in Covent Garden again on her return (1839–42). In 1842 she married the actor Charles John Kean, and the two were closely associated for the remainder of his life. In 1845 they returned to America, touring the country and taking the leading roles in many of the plays in their extensive repertory. In 1850 Kean and a friend leased the Princess' theatre, where he and his wife filled most of their engagements thereafter. In 1868, when Kean died, his wife retired from the stage. She died in London. Aug. 20, 1880.

Mrs. Kean created numerous roles, most notably the feminine leads in several of the plays of James Sheridan Knowles.

KEANE, AUGUSTUS HENRY (1833–1912), Irish anthropologist. was born at Cork on June 1, 1833. He was educated at Dublin and in Rome for the Roman Catholic priesthood, but he declined to enter the church, and devoted himself instead to geographical and ethnological research. He registered and classified almost every known language and from the data worked out a system of ethnology. He was professor of Hindustani at University college, London, from 1882 until 1885. He died on Feb. 3, 1912.

Among his published works were *Man, Past and Present* (1899); *Ethnology* (1896 and later editions); *The* Gold *of Ophir* (1901).

KEANE, JOHN JOSEPH (1839–1918), U.S. Roman Catholic archbishop and educator, was born in Ballyshannon, County Donegal, Ire.. on Sept. 12. 1839. When he was seven years old his family settled in the United States. In 1866 he was ordained a priest and made a curate of St. Patrick's, Washington, D.C.; in 1878 he was consecrated bishop of Richmond. Va. During service at Washington and Richmond, Bishop Keane founded churches and schools for Negroes and established the Confraternity of the Holy Ghost. From 1887 to 1896 he was rector of the Catholic University of America. Washington, D.C., which he did much to build. He was then called to Rome and raised to archiepiscopal rank. serving in 1897–99 as canon of St. John Lateran, assistant at the pontifical throne, and consultor to the Congregations of Propaganda and of Studies. In 1000 he was appointed archbishop of Dubuque. Ia.. resigning this see in 1911. Archbishop Keane actively participated in the Catholic temperance movement and in the Americanism and Cahenslyism controversies. A selection of his writings, largely on educational subjects. edited by M. F. Egan. was published under the title *Onward and Upward,* in 1902. He died in Dubuque on June 22, 1918.

See Patrick H. Ahern, *The Life of John J. Keane (1955).*

(P. H. A.)

KEARNEY, a city of Nebraska. U.S., and the seat of Buffalo county, is located 135 mi. If'. of Lincoln. the capital. in the south-central portion of the state just north of the Platte river at an altitude of 2,146 ft. The east–west transportation route provided by the Platte river valley attracted the railroads as it had the overland wagon trails. and Kearney owes its origin to the junction of the Burlington with the Union Pacific railroad. Kearney Junction was established at the meeting point in 1872 and incorporated as Kearney in Dec. 1873.

The town was named for Fort Kearny. a military post that had been maintained 6 mi. S.E. of the present city on the Oregon trail from 1848 until 1871. The fort had been named for Gen. Stephen Watts Kearny. Popular usage added an "e" to the spelling.

Kearney had some of the aspects of a cow town in the 1870s and was the scene of an occasional conflict between cowboys and townspeople. An abortive movement was launched to locate the national capital at Kearney on the strength of its midway position between the Atlantic and Pacific oceans. The surrounding area developed into farming communities and Kearney grew slowly until the latter 1880s when promoters created a short-lived "boom." In a frantic period of expansion, factories, including a cotton mill. were built and an electric street railway was constructed. The projects collapsed in the 1890s.

Kearney is in a productive agricultural region in which many of the farms are irrigated. Corn, alfalfa, soybeans. sugar beets, potatoes, small grains and livestock are shipped from there. A growing industrial development produces a variety of products, many related to agriculture. The Burlington and Union Pacific railways pass through the city, and Kearney is also served by national and state highways and a commercial airline. The state tuberculosis hospital, the state industrial school for boys and Kearney State Teachers college are located there. (*See* also NEBRASKA: *Education.*) Public and parochial school systems are maintained. Harmon park provides swimming, playgrounds and picnic and other recreational facilities.

For comparative population figures *see* table in *NEBRASKA: Population.* (D. F. D.)

KEARNY, PHILIP (1815–1862), U.S. soldier, was horn in New York on June 2, 1815. He graduated from Columbia uni-

versity (1835), and in 1837 obtained a commission in the cavalry. In 1839 he was sent to France to study cavalry training and before his return in 1840 he had served, on leave, in Algeria. He inherited a large fortune, but remained in the service in the headquarters staff of the army. After six more years' service he left the army, but almost immediately rejoined with a company of cavalry he had raised and equipped. chiefly at his own expense, for the Mexican War. In Dec. 1846 he was promoted captain. In leading a brilliant charge at Churubusco he lost his left arm, but remained at the front. and won the brevet of major. In 1851 he again resigned in order to travel. He saw further active service with the French cavalry in the Italian War of 1859, and received the cross of the Legion of Honour for his conduct at Solferino. Up to the outbreak of the American Civil War he lived in Paris, but early in 1861 he hastened home to join the Federal army. As a brigade commander and as a divisional commander of infantry in the Army of the Potomac, he infused into his men his own spirit of dash and bravery. At Chantilly (Sept. 1, 1862), after repulsing an attack of the enemy, he rode out in the dark too far to the front and mistaking the Confederates for his own men was shot dead. His body was sent to the Federal lines with a message from General Lee and was buried in Trinity churchyard. New York. His commission as major general of volunteers was dated July 4, 1862, but he never received it.

See J. W. de Peyster, *Personal and Military History of Philip Kearny* (1869).

KEARNY, a town of Hudson county, N.J., U.S.located between the Passaic and Hackensack rivers at the head of Newark bay, 9 mi. W. of New York city and situated between Jersey City on the east and Newark on the west. It was originally settled by the Scots as a part of the area of New Barbados in 1668 and later became a part of the town of Harrison; in 1867 it was separated from Harrison and became known as the township of Belgrove. In 1898 it was incorporated as a town and named Kearny in honour of Maj. Gen. Philip Kearny, a resident, who led the first New Jersey troops into the American Civil War.

It is a major industrial centre with ready access to the sea through the ports of Newark and New York city. Leading industries produce chemical products, pharmaceuticals and ferrous and nonferrous metals; others engage in refining of precious metals, oil refining; meat packing, railway maintenance and machinery manufacture. Kearny was a major shipbuilding centre during World War II. For comparative population figures *see* table in NEW JERSEY: *Population.* (D. N. A.; M. P. M.)

KEATE, JOHN (1773–1852), English schoolmaster, was born at Wells, Somersetshire, in 1773, the son of Prebendary William Keate. He was educated at Eton and King's college, Cambridge, and was headmaster of Eton from 1809 to 1834. His partiality for the birch became a by-word, but beneath an outwardly rough manner the little man concealed a really kind heart, and when he retired the boys presented him with a handsome testimonial. A couple of years before he had publicly flogged eighty boys on one day. Keate died on March 5, 1852, at Hartley Westpall, Hampshire, of which parish he had been rector since 1824.

See Maxwell Lyte, *History of Eton College* (3rd ed., 1899); Collins, *Etoniana;* Harwood, *Alumni Etonienses; Annual Register* (1852); *Gentleman's Magazine* (1852).

KEATS, JOHN (1795–1821), English poet, was born in London on Oct. 29 or 31, 1795. His father, Thomas Keats, had come to London from the West Country, and was at this time managing a livery stable, having married the daughter of the proprietor, Frances Jennings. John Keats was their eldest son, and was born prematurely. He was sent to a school kept by the Rev. John Clarke at Enfield, and soon after lost his father, aho was killed by a fall from his horse on April 16, 1804. His mother married again within the year, but was soon separated from her new husband, and went to live with her mother, Mrs. Jennings, at Edmonton; this was Keats' home for the next few years. At school, Keats was not remarkable for anything very much except an intense pugnacity. vented frequently even on his brother George, then and afterwards one of the closest of his friends. Tom, the youngest brother, was already delicate, and had to be looked after by the other two; the family sentiment between them was always strong, and only his brothers were allowed to see the strain of melancholy that lay beneath his surface high spirits. With the school as a whole he was very popular. Towards the end of his time, in his fourteenth and fifteenth years, he suddenly turned to study, and read widely in addition to his school work, particularly in mythology. He also started a translation of the *Aeneid* into English prose. In February his mother, to whom he was passionately attached, died of consumption His grandmother put the boys under the care of two guardians, Rowland Sandell and Richard Abbey. At the end of 1810 Mr. Abbey had Keats apprenticed to Hammond, a surgeon of Edmonton. About this time he finished his translation of the *Aeneid.* He used often to walk over to the school at Enfield to see Cowden Clarke, the son of the headmaster, and one of the books Clarke lent him was the *Faerie Queene.* This inspired him to his first efforts at poetry, though it was not till two years later, in 1815, that he showed any of his work to Clarke.

In the summer or autumn of 1814 he quarrelled with Hammond, and went to live in London, studying at St. Thomas's and Guy's Hospitals. He lodged, first in the Borough by himself, then in St. Thomas street with fellow-students; in the summer of 1816 he joined his brothers in the Poultry, and in spring 1817 they moved to Cheapside. He worked steadily at first, and passed his examination as licentiate in July 1816. But his real inclinations were beginning to appear, and it seems to have been at some time in the winter 1816–1817 that he decided to devote himself entirely to poetry. In literature his passion, then as always, was for the Elizabethan age, but his early verses written at this time. such as *On Death* (1814), *To Hope* and *To Apollo* (Feb. 1815), are in a typically 18th century style, full of personified abstractions of the Passions and the like. Early in 1815 Clarke came to live in London, and it was after a night spent in the study of Chapman that Keats sent him the famous sonnet *On First Looking into Chapman's Homer,* the first poem in which he unmistakably finds his voice.

Soon after this Clarke introduced him to Leigh Hunt, who had a profound influence on him, as he had on other men far greater than himself. Hunt's critical aim was the sound and valuable one of overthrowing the "classical" school and inaugurating a return to the natural freedom of the great age of English poetry; this cause prevailed, however much or little Hunt may have had to do with it, as everybody knows, and the Return to Nature, or the Romantic Revival, won the day. At the same time Hunt tried to put his own specific ideas of verse construction, the central point of which was the freer form of the heroic couplet, into practice in *Rimini,* and whatever his critical gifts Hunt was no poet. Keats adopted the same method, and while the free form of the heroic couplet was fertile of good results in his hands, he also seems to have been infected with Hunt's worst fault, the tendency to lapse into a casual pertness of diction that at times gives some colour to the gibes of *Blackwood* about the "Cockney school." This tendency is occasionally noticeable in Keats' earlier work, but is far more disastrous when it intrudes, as it does once or twice, into the splendour of his maturity; it is such lines as

"Good-bye, I'll soon be back"; "Good-bye," said she,

in *Isabella,* and

That Lycius could not love in half a fright

in *Lamia,* for which we have a serious grudge against Hunt. In addition to his influence on Keats' style, Hunt had a considerable effect on his fortunes; it was Keats' friendship with Hunt that was his real crime in the eyes of the Reviews.

Hunt's house was the centre of a circle of men of literary tastes, and here Keats met J. H. Reynolds and James Rice, who both became friends of his; Shelley, to whom Keats did not take as kindly as Shelley did to him; and Haydon, with whom he at once became intimate. Hunt had already (May 16 and Dec. 1, 1816) printed verse of Keats' in the *Examiner,* and the circle decided that a volume must be published. The Olliers firm undertook its production, and it came out in March 1817 as *Poems,* by

John Keats. It is a collection of youthful work, full of promise but not of much else, though in *Sleep and Poetry* there is an interesting passage that expresses the aspirations of the new school of poetry. The substance of the book is six poems in heroic couplets, three of them poetic epistles. They are more interesting for their style than for their matter, and show various methods of varying the monotony of the measure, such as frequent use of overflow, dissyllabic rhymes, the shortening of. the second line, and so on.

In April 1817 Keats went away by himself to the Isle of Wight, urged especially by Haydon to solitude and concentration. He took rooms at Carisbrooke, and began to work at *Endymion*. In May he moved to Margate, where he received an advance payment on the poem from Taylor and Hessey. After a stay in Canterbury with Tom, the two brothers came to Hampstead early in the summer, where they settled down. Hunt lived near, and Keats made two new friends near by, Charles Wentworth Dilke and Charles Brown. By the late summer, when he went to stay in Oxford, he had reached the third book of *Endymion*. He returned to Hampstead in the autumn, to find that the attack in *Blackwood* on the "Cockney school" had just begun; there were also dissensions between Reynolds and Haydon, and Haydon and Hunt, which distressed him. At Christmas he took Reynolds's place as dramatic critic on the *Champion* for a while, and on Dec. 28 he was at Haydon's famous dinner party, with Wordsworth, Lamb and Monkhouse. In the first two months of this year he had a burst of poetic activity, and at one time wrote a new poem nearly every day. This period includes *Hence Burgundy Claret and Port, When I have fears that I may cease to be,* and the sonnet on the Nile. At this time also he and Reynolds had the idea of publishing a book of tales from Boccaccio, which was the origin of *Isabella*. In March he went to Teignmouth to look after Tom, George having decided to marry and go abroad, and there *Isabella* was written. He and Tom came back to Hampstead in May, and about this time *Endymion* was published *(1818)*. Of this poem all that need be said in criticism has been said by Keats himself in the preface. The basis of it is the story of Endymion and the moon-goddess, but it has been allegorised and mixed with other myths, and incidents of his own invention, till it becomes something entirely new. The metre is again the heroic couplet, treated with the same freedom as before, and relieved with incidental lyrics. The strength and weakness of the poem lie in the same feature, his intense and luxuriant imagination, that is ever bursting with new beauties, but, being more or less undisciplined, has the poet at its mercy, and leads to a certain dissipation of interest and lack of cohesion in the poem as a whole.

In the summer of this year Keats went with Brown on a walking tour in the north. George Keats and his wife were starting for America, and the two friends went with them to Liverpool, and thence to Lancaster, where the tour started. They walked through the Lake district to Carlisle, took a coach to Dumfries, and wandered about the coast for some time, finally crossing to Ireland for a day or two. Then they went on up the coast to Ayr, and so by Glasgow and Inverary to Oban. Exertion and exposure were already affecting Keats's throat, and when, after climbing Ben Nevis, they reached Inverness, a doctor advised him to go home, and he sailed from Cromarty for London. This throat trouble brought on by the hardships of the tour was the first sign of the consumption that killed him. Simultaneously with his return the attacks in the Reviews developed in earnest; the August number of *Blackwood's* contained No. IV. of the "Cockney school" articles, devoted entirely to Keats this time, probably by Wilson or Lockhart; in September followed the review of *Endymion* in the Quarterly, in the same strain. Perhaps it should be added that there is no foundation for the belief that Keats' death was hastened by the treatment he received in the Reviews. He took it quite calmly, and at this time was quite preoccupied with a more personal trouble He returned to find his brother Tom much worse. and the rest of the year was devoted to nursing him. He died in the first week in December. After Tom's death Keats went to live with Brown at Wentworth Place, Hampstead, and was soon settled to work on *Wyperion*.

And now a new distraction was to come into his life, and never to leave it. Fanny Brawne was the eldest daughter of a lady who had taken Brown's house while they were away in the north, and was now living close by. Keats met her at the Dilkes', and was soon completely enslaved. She was an attractive girl, and constant to Keats through the troubles that were to follow; his friends thought that she was no fit mate for him, but what woman would have been? The effect of this passion, to which Keats gave himself up with all the violence of an extraordinarily ardent nature, seems in the end to have been further to strain a constitution already giving way under incipient consumption, but at the moment it only stimulated his poetic energies. During a visit to Sussex with Dilke in January he finished *The Eve of St. Agnes,* and began the unfinished *Eve of St. Mark;* he came back to Hampstead in February, and that spring saw another burst of activity. Between now and June all but one of the great *Odes* were written; *On Indolence* can be dated from his correspondence to about March 19, *On a Grecian Urn* was sent to his brother on April 15, and *To a Nightingale* a week or two later. Yet just at this time his prospects, darkened by his reception by the Reviews, seemed so bad that he was thinking of giving up poetry altogether; Brown dissuaded him, and lent him enough to live on through the summer. In July he went to stay with Rice in Shanklin, and later Brown came and Rice left. He and Brown now collaborated in *Otho the Great,* Brown outlining the scenes and Keats working them out, until they came to the fourth act, when Keats took entire command. At the same time he was writing *Lamia.* From August to September they stayed at Winchester, where, in the last good days of his life, he finished *Lamia,* added to and abandoned the *Eve of St. Mark* and *Hyperion,* and wrote the *Ode to Autumn*. He also started *King Stephen,* which he left unfinished.

Early in October he returned to London, determined to take lodgings by himself and look for work on the Press; a single visit to the Brawnes broke down his resolution, and he was soon back at the Browns' house again, unable to think of anything else. Though his disease was still undisclosed, his genius was now declining under the double strain, as the rest of his work shows. Kean accepted *Otho,* but his manager proposed too long a delay to suit Keats and Brown, and the plan dropped. Keats now started the *Cap and Bells,* but the plan of the work was never congenial to him; he was not designed for a satirist. Later he attempted to recast *Hyperion* in the form of a vision. The new versioh is not on the level of the old, but throws interesting light on the state of his thoughts at the time, and his conception of the function of poetry:

> Only the dreamer venoms all his days
> Bearing more woe than all his sins deserve.

On February 3, 1820, he had the first attack of consumption; Brown has left an account of how he realised from the first moment that it was his death-warrant. From then on the disease ran the usual course of rally and relapse until the end. In April he was better, and in May he moved to Kentish Town, near Leigh Hunt. In July the last great volume came out, *Lamia, Isabella, The Eve of St. Agnes and other Poems,* which contains all his work of major importance, except *On Indolence, The Eve of St. Mark,* and *La Belle Dame sans Merci,* which first appeared in the *Indicator,* May 20. He was nursed through the summer, first by the Hunts and then by the Brawnes, and his doctor said he must go south for the winter. Shelley wrote asking him to Pisa, but eventually Severn, who was going to Rome, offered to take him. They sailed on Sept. 18, and on the way down Channel they landed for a while near Lulworth, where he wrote his last poem, *Bright Star, would I were stedfast as thou art.* From Naples they went to Rome, where on Dec. 10 he had a final relapse; he was carefully tended by Severn to the last, and died on Feb. 23, 1821.

With the contents of the 1820 volume everyone is familiar; here we have the true measure of his powers, and though some faults remain, the early weakness is quite left behind. In *Isabella,* a story taken from Boccaccio, but, needless to say, given a wholly personal romantic colouring, there are still occasional slipshod

phrases, and the old tendency to follow idly the chance suggestion of a rhyme, but with all his old colour and music there is a new depth of passion and tragedy. The metre is the octave stanza, recently popularised by Byron. In *Hyperion,* a fragment of a blank verse epic, the influence of Milton is clear, and in the end he found the Miltonic note too unnatural to sustain. The theme is Greek, though the treatment is Gothic; it tells of the supplanting of the old deities by the Olympians. *St. Agnes' Eve* is romantic narrative at its height; its enchanted atmosphere and blaze of colour are such that one never pauses to ask whether the characters are anything more than a formal foreground to the setting Of *Lamia* much the same can be said; the story of the serpent-lady, dissolved before her lover's eyes by the "sophist's eye, keen, cruel, perceant, stinging," comes through Burton from Philostratus. The metre is rhymed heroics, but more in Dryden's manner than *Endymion,* with less use of the overflow. The great *Odes* stand alone in literature, new'in form and spirit, and owing nothing to any predecessor. They are too well known for description and too perfect for criticism. As a dramatist Keats is hard to judge; he died too young to accomplish anything great in that sphere; *Otho* is not a success. *Stephen,* so far as it goes, has far more promise, being full of stir and action.

The first life of Keats was R. M. Milnes' (Lord Houghton) *Life, Letters and Literary Remains of John Keats* (2 vols., 1848). The standard life is *Keats* by S. Calvin, in the *English Men of Letters* series (1887). The standard edition of the poems is by H. B. Forman; *Poetical works and other Writings* (4 vols., 1883); *Poetical Works* (1884); there have been several subsequent editions of this, the 1915 edition containing the new sonnets first printed in *The Times,* May 18, 1914, and discussed in the *Literary Supplement,* May 21. Both this edition and Calvin's *Keats* contain a full bibliography.

KEBLE, JOHN (1792–1866), English poet and divine, the author of the *Christian Year,* was born on April 25, 1792, at Fairford, Gloucestershire, the second child of the Rev. John Keble. He became a scholar of Corpus Christi college, Oxford, in 1807, and in 1810 obtained double first class honours, a distinction which had been obtained only once before, by Sir Robert Peel. After his election to an Oriel fellowship in 1811 Keble gained the University prizes, both for the English essay and also for the Latin essay. Oriel College was, at that time, the centre of all the finest ability in Oxford. Copleston, Davison, Whately, were among the fellows who elected Keble; Arnold, Pusey, Newman, were soon after added to the society. In 1815 Keble was ordained deacon, and priest in 1816. His real bent and choice were towards a pastoral cure in a country parish; but he remained till 1823 in Oxford, actinn first as a public examiner in the schools, then as a tutor, when he-returned to Fairford to assist his father, and with his brother to serve one or two small and poorly endowed curacies in the neighbourhood of Coln.

In 1827 he published anonymously the *Christian Year* (2 vols., Oxford). The poems which make up that book had been the silent gathering of years. There is one for each Sunday and for each Saint's day and festival observed by the Church of England. Keble had purposed to keep them beside him, correcting and improving them, as long as he lived, and to leave them to be published only "when he was fairly out of the way." This resolution was at length overcome by the importunities of his friends, and by the desire of his father to see his son's poems in print before he died. Between 1827 and 1872 one hundred and fifty-eight editions appeared, and it has been largely reprinted since.

In 1831 Keble succeeded Milman as professor of poetry at Oxford. He delivered a series of lectures, printed as *Praelectiones academicae,* clothed in excellent idiomatic Latin (as was the rule), in which he expounded a theory of poetry which was original and suggestive. He distinguished between what he called primary and secondary poets—the first employing poetry to relieve their own hearts; the second, poetic artists, composing poetry from some other and less impulsive motive. Of the former kind were Homer, Lucretius, Burns, Scott; of the latter were Euripides, Dryden, Milton. His regular visits to Oxford kept him in intercourse with his old friends at Oriel. Catholic emancipation and the Reform Bill had deeply stirred, not only the political spirit at Oxford, but also the church feeling which had long been stagnant. Newman wrote, "On Sunday July 14, 1833, Mr. Keble preached the assize sermon in the University pulpit. It was published under the title of *National Apostasy.* I have ever considered and kept the day as the start of the religious movement of 1833." The occasion of this sermon was the suppression, by Earl Grey's Reform ministry, of ten Irish bishoprics. Against Erastianism Keble had long chafed inwardly, and he now asserted the claim of the church to a heavenly origin and a divine prerogative. About the same time, and partly stimulated by Keble's sermon, leading spirits in Oxford began a systematic course of action to revive High Church principles and patristic theology. Thus arose the Tractarian movement, a name it received from the famous *Tracts for the Times.* If Keble is to be reckoned, as Newman would have it, as the primary author of the movement, it was from Pusey that it received one of its best known names, and in Newman that it soon found its genuine leader. To the tracts Keble made only four contributions: —No. 4, containing an argument, in the manner of Bishop Butler, to show that adherence to apostolical succession is the safest course; No. 13, which explains the principle on which the Sunday lessons in the church service are selected; No. 40, on marriage with one who is unbaptized; No. 89, on the mysticism attributed to the early fathers.

In 1835 Keble married Miss Clarke, and became vicar of Hursley, Hampshire, a living to which he had been presented by his attached pupil, Sir William Heathcote, and which continued to be Keble's cure for the remainder of his life. In 1841 the tracts were brought to an abrupt termination by the publication of Newman's tract No. 90 *(see* NEWMAN, JOHN HENRY). The same year in which the ecclesiastical storm burst Keble's tenure of the professorship of poetry cldsed, and thenceforward he was seen but rarely in Oxford. No other public event ever affected Keble so deeply as the secession of Newman to the Church of Rome in 1845. It was to him both a public and a private sorrow, which nothing could repair. In all the ecclesiastical contests of the twenty years which followed 1845, Keble resolutely maintained those High Anglican principles with which his life had been identified. These absorbing duties, added to his parochial work, left little time for literature. But in 1846 he published the *Lyra Innocentium;* and in 1863 he completed a life of Bishop Wilson. He died at Bournemouth on March 29, 1866, and was buried at Hursley.

See J. T. Coleridge, *Memoir of John Keble* (1869). The following is a list of his writings *Christian Year* (1827); *Psalter* (1839); *Praelectiones Academicae* (1844); *Lyra Innocentium* (1846); *Sermons Academical* (1848); *Argument Against Repeal of Marriage Law,* and *Sequel* (1857); *Eucharistical Adoration* (1857); *Life of Bishop Wilson* (1863); *Sermons Occasional and Parochial* (1867); posthumous: *Village Sermons on the Baptismal Service* (1868); *Miscellaneous Poems* (1869); *Letters oj Spiritual Counsel* (1870); *Sermons for the Christmas Year,* etc. (1875–80); *Occasional Papers and Reviews* (1877); *Studia Sacra* (1877); *Outlines of Instruction or Meditation* (1880).

KECSKEMÉT, a town in central Hungary and administrative centre of Bács-Kiskun *megye* (county), lies about 105 km. (65 mi.) S.E. of Budapest. Pop. (1960) 66,819. It is surrounded by flat, sandy farming country and to the southeast is the noted Bugác *puszta,* or wasteland. with arid, salt-impregnated soils. Kecskemét dates back to the days of the Arpád dynasty *(see* HUNGARY: *History)* and in the 14th century it was one of the specially privileged towns. Part of the Franciscan church dates from Arpád times and the Reformed church was built in the 17th century by permission of Sultan Mohammed IV. The dramatist József Katona (1791–1830) was born at Kecskemét.

The town developed rapidly with the vigorous farming of the 19th century and the population steadily increased, but municipal rather than private estates became noted for certain crops. The sandy surface soils are thin and overlie fertile loess, and orchards prospered, especially apricot. The town's famous "dawn market" in the summer months begins at midnight to keep the fruit fresh Sugar beet is grown; the sandy neighbourhood also produces vines resistant to phylloxera, and from the town's vineyards wines of good quality are made. Prior to the collectivization policies of the 1950s the Kecskemét municipality owned the Bugác steppe, where the big, white Hungarian draft cattle were reared.

The railway and road from Budapest to Szeged go through

Kecskemét as does the railway from Budapest via Cegléd; good roads from the Danube and Tisza valleys converge on the town. Agricultural machinery, textiles, leather work and the distilling of apricot brandy are among its industries. (H. G. S.)

KEDAH, a state in the northwest of the Federation of Malaya with a constitutional sultan, was under Thai suzerainty until 1909 when it accepted a British adviser. Area 3,660 sq.mi Pop. (1957) 701,964. Kedah includes to its east ranges so steep and thickly forested that they are uncrossed by road or railway, isolating the state from Kelantan and south Thailand. The developed part is a lowland about 10 mi. broad between these ranges and west coast. Two short rivers (Kedah and Muda) cross the plain bringing occasional floods from the mountains. The north Kedah plain is of young alluvium in parts, with tall fresh-water swamp forest, but a few rocky "islands" of limestone jut through.

Malay agriculture developed first along the Kedah-Muda streams and then along the foothill margins, working out into the swamps which were drained and brought under paddy mostly during the 19th century by the Malays; at mid-20th century vast works were being engineered for draining and irrigating 75,000 ac. at Kubang Pasu. The sector of the lowlands round the Muda is hillier and was first used for rubber estates early in the 20th century. The western plain now contains almost the entire acreage of paddy and rubber, and produces about 190,000 tons of rice and 61,000 tons of rubber each year, carrying over 100,000 workers on the paddyfields and 38,000 workers on the rubber estates. Coconuts are grown for domestic use. The shallow coast is dangerous, yet a considerable tonnage of fish is landed by Chinese at the mouth of the Kedah river for transport by truck to Butterworth. The plain has arterial road and rail connections south into the tin and rubber region of Malay drawing this old Malay state into commerce. Some rice moves into internal trade and small Chinese rice mills stand along the highway.

The rubber-growing zone has many Tamil Indians who form 20% of the population of Sungei Patani. The state is 68% Malay in population, only 13% of the rural population being Chinese and Indian though Chinese are prominent in all the market towns. Alor Star, the state capital (pop. [1957] 52,915) lies in the centre of the paddy growing area and is unapproachable from the sea 12 mi. away. About 20 mi. offshore are the spectacular islands of Langkawi (pop. [1957] 16,617), of little commercial significance, linked to Kuala Kedah by occasional launch services.

(E. H. G. D.)

KEDGEREE, an Indian dish, composed of boiled rice and various highly flavoured ingredients (Hindustani, khichrz). Kedgeree is of two kinds, white and yellow. The white is made with grain, onions, ghee (clarified butter), cloves, pepper and salt. Yellow kedgeree includes eggs and is coloured by turmeric. Kedgeree is a favourite and universal dish in India; among the poorer classes it is frequently made of rice and pulse only, or rice and beans. In European cookery kedgeree is a similar dish usually made with fish.

KEDIRI, a residency of East Java province, Indonesia, bounded east by Malang, west by Madiun, north by Surabaya and Bodjonegara, and south by the Indian ocean. The middle parts are hilly, with high mountains, Mt. Willis, 8,409 ft., and Mt. Kelud, 5,679 ft., also the extreme south, and limestone hills of low formation shut off practically all the coast from the interior, which consists of fertile plains bordering the river Brantas, which flows from the eastern border in a westerly direction and then turns north-eastward and continues to the northern border. Area 2,556 sq.mi.; pop. (1957 est.) 3,420,451. The natives are almost entirely Javanese. Rice, sugar cane, cotton, coffee, cocoa. coca, cassava, maize, groundnuts and coconuts are grown; the principal crops are those of cassava and sugar cane, and there are tapioca and sugar factories; teak is obtained from the forests. Kediri (pop. 146,111) is the capital. It is on the banks of the Brantas and is one of the centres of the sugar industry; there are remains of Hindu temples in the neighbourhood (see JAVA). Other towns are Blitar (pop. 60,096), with the ruins of Panataram temple (Hindu) near by, Tulungagung (pop. 43,115), Kertosono and Papar. All these towns are on the railway which branches off from the main line to Surabaya at Kertosono and runs southwest to Tulungagung, and thence eastwards to Blitar, and on into Pasuruan. Steam tramways connect with Wates, Para and Kepung. The Brantas is navigable. There are no harbours on the coast. Kediri was made into a residency in 1830, just after the war in central Java. The residency was occupied by Japan. 1942–45.

KEDU (Dutch, KEDOE), a residency of Central Java province, Indonesia, bounded east by Surakarta and Jogjakarta, north by Semarang, west by Banjumas, and south by the Indian ocean. Area 2.105 sq.mi.; pop. (1957 est.) 2,758,242. Kedu is one of the most densely inhabited regions in the world, more than 1,310 per sq.mi. in 1957. The natives are almost wholly Javanese. There are high mountains all along the eastern border, in the centre, Mt. Sumbing (11,060 ft.), and north of Sumbing, where lie Mt. Sundoro (10,318 ft.) and the Dieng plateau (6,500 ft.). The population is chiefly in the fertile valley of the river Praga (there are three small rivers in the south), which runs southwards to the sea between the mountain ranges. The coast is a difficult one, with high sand ridges, and it has no harbours. Principal crops are rice, sugar cane, tobacco and coconuts; maize, rubber and groundnuts are grown, and timber woods are extracted from the forests. Magelang, pop. (1957 est.) 81,799, is the capital. Its altitude (1,250 ft.) gives it a comparatively cool climate, and it is an important military station. It is on the steam tramway which traverses Kedu from south to north, running from the main railway line at Jogjakarta northwards to Parakan, and is a convenient starting-place for Boro Budur and Mendut (see JAVA), which lie a few miles to the south. Another important town is Wonosobo (pop. [1957 est.] 13,538), altitude 3,400 ft. It is connected by steam tramway with the main railway line at Purwakerto, in Banjumas, and is the rendezvous of travelers wishing to explore the highly interesting Hindu ruins of the Dieng plateau (see JAVA). Kedu was made into a residency in the time of Sir Stamford Raffles, lieutenant-governor of Java, 1811–16; it was occupied by Japan from 1942 to 1945.

KEELER, JAMES EDWARD (1857- goo), U.S. astronomer. best known for his spectroscopic studies of Saturn's rings and his observations of nebulae using a reflecting telescope. He was born in LaSalle, Ill., Sept. 10, 1857. At an early age he developed an interest in astronomy and showed great ingenuity in constructing his own instruments and in making observations. For five years after his graduation from Johns Hopkins university, Baltimore. Md., he served as assistant to Samuel Pierpont Langly at the Allegheny observatory, with an interruption of one year for study in Germany.

From 1886 until 1891 Keeler was on the staff of the Lick observatory, first as assistant to the Lick trustees, and later as astronomer in charge of the spectroscopic program. Among the outstanding results of his work were the measurement of the line of sight velocities of the Orion nebula and 13 planetary nebulae. The measures showed that these objects have motions similar to those of the stars and are, therefore. members of our stellar system. In 1891 Keeler went to the Allegheny observatory as director, and while there he demonstrated by means of the spectroscope that the rings of Saturn revolve about the planet like a multitude of small independent satellites.

In 1898 he returned to the Lick observatory as director, and undertook photographic observations of nebulae with the recently acquired Crossley reflector. This work established the reflecting telescope as the supreme instrument for photographing faint celestial objects. Among the results of the program was the discovery that the spiral form is dominant among the nongaseous nebulae now known as external galaxies. He died on Aug. 12, 1900.

For a complete bibliography see *National Academy of Science Biographical Memoirs,* vol. v, p. 233 (1905). (C. D. S.)

KEELEY, MARY ANNE (1806?–1899), English actress, was born at Ipswich on Nov. 22, 1805 or 1806. Her maiden name uas Goward, her father being a brazier and tinman. After some experience in the provinces, she first appeared on the stage in London on July 2, 1825, in the opera Rosina. It was not long before she gave up "singing parts" in favour of the drama proper, where her poners of character acting could have scope. In June

1829 she married Robert Keeley (1793–1869), an admirable comedian, with whom she had often appeared. In 1838 she made a great success as Nydia, the blind girl, in a dramatized version of Bulwer Lytton's *The Last Days of Pompeii,* and followed this with a striking impersonation of Smike in *Nicholas Nickleby.* In 1839 she achieved a triumph as the hero of a play founded upon Harrison Ainsworth's *Jack Sheppard.* As Jack Sheppard Mrs. Keeley lived in the memory of playgoers, despite her many later successes in other parts. She managed the Lyceum (1844–47) with her husband; acted with Webster and Kean at the Haymarket; returned for five years to the Adelphi; and made her last regular public appearance at the Lyceum in 1859. She died on March 12, 1899.

See Walter Goodman, *The Keeleys on the stage and off* (1895).

KEELING ISLANDS: *see* Cocos (Keeling) Islands.

KEELUNG, Formosa: *see* Chi-lung.

KEEN, WILLIAM WILLIAMS (1837–1932), U.S. surgeon, was born at Philadelphia, Pa., Jan. 19, 1837. He graduated at Brown university (1859), and Jefferson medical college (1862); was made assistant surgeon of the jth Massachusetts regiment in 1861 and was acting assistant surgeon U.S. army (1862–64). After two years' study abroad, he started practice in Philadelphia and conducted the Philadelphia School of Anatomy (1866–75). He was a lecturer on pathological anatomy at Jefferson medical college (1866–75), professor of surgery at Woman's medical college (1884–89), professor of surgery at Jefferson medical college (1889–1907) and professor emeritus (1907). In 1909 he was made 1st lieutenant of the medical reserve corps, U.S. army, and major in 1917. A specialist in the surgery of the brain and the nervous system, he was a pioneer in performing successfully new and difficult operations in this field. He nrote several surgical and other works, and was editor of many works including Gray's *Anatomy* and Keen's *Surgery.* He died June 7, 1932.

He wrote *Reflex Paralysis* and *Gunshot Wounds and Other Injuries of Nerves* (with Weir Mitchell and Morehouse) (1864); *Keen's Clinical Charts* (1870); *History of the Philadelphia School of Anatomy* (1874); *Early History of Practical Anatomy* (1870); *Surgical Operations of President Cleveland* (1893); *Bicentenary History of the First Bapt. Church of Philadelphia* (1898); *Surgical Complications and Sequels of Typhoid Fever* (1898); *Addresses and Other Papers* (1905); *Animal Experimentation and Medical Progress* (1914); *The Early Years of Brown University, 1764–1770* (1914); *Ether Day Address* (1916); *Treatment of War Wounds* (1917); *Colver Lectures at Brown University on Medical Research and Human Welfare* (1917); *Selected Papers and Addresses* (1922).

KEENE, CHARLES SAMUEL (1823–1891), English black-and-white artist, book and magazine illustrator, was born at Hornsey on Aug. 10, 1823. His earliest known design is the frontispiece to *The Adventures of* Dick *Boldhero,* etc. In Dec. 1851 he made his first appearance in *Punch* and, after nine years of steady work, was called to a seat at the famous table. It mas during this period of probation that he first gave evidence of those transcendent qualities which make his work at once the joy and despair of his brother craftsmen. On the starting of *Once a Week,* in 1859, Keene's services were requisitioned, his most notable series in this periodical being the illustrations to Charles Reade's *A Good Fight* (afterward rechristened *The Cloister* and *the Hearth)* and to George Meredith's *Evan Harrington.* There is a quality of conventionality in the earlier of these which later disappears. In 1872 Keene made the acquaintance of Joseph Crawhall, who had been in the habit for many years of jotting down any humorous incidents he might hear of or observe, illustrating them at leisure for his own amusement. These were placed unreservedly at Keene's disposal, and inspired at least 250 of his most successful drawings in the last 20 years of his connection with *Punch.* A list of more than 200 of these subjects is given in G. S. Layard's *The Life and Letters of Charles Keene of "Punch."* In 1881 a volume of his *Punch* drawings was published as *Our People.* He died on Jan. 4, 1891. (G. S. L.; X.)

KEENE, LAURA (Mary Moss) (c. 1820–1873), English-U.S. actress, first important woman theatre manager in the United States, was born in London, and served her apprenticeship with Mme. Vestris, the singer-actress-manager. J. W. Wallack saw her at the Olympic theatre in 1851 and engaged her for his New York company. She made a successful debut at Wallack's in 1852 but soon left, first to manage a Baltimore theatre, then to tour as far as San Francisco and Australia. She returned to New York in 1855 and opened the Metropolitan theatre as Laura Keene's Varieties.

In 1856 she began eight years of management in her own theatre with a first-rate company. She was admired for her acting of elegant ladies in classical English comedy and of pathetic heroines in contemporary melodrama.

One of her successes was Tom Taylor's *Our Amerioan Cousin,* in which *E.* A. Sothern as Lord Dundreary and Joseph Jefferson as Asa Trenchard made their first great hits. Her company was playing this play at Ford's theatre, Washington, D.C., the night Pres. Abraham Lincoln was assassinated. In 1872 she helped found and edit a short-lived monthly magazine, *The Fine Arts.* Her early marriage to John Taylor ended in separation; after Taylor's death she married John Lutz, her business manager. She died at Montclair, N.J., Nov. 4, 1873. (B. Ht.)

KEEP, an English term corresponding to the French donjon for the strongest portion of the fortification of a castle, the place of last resort in case of siege or attack. It was either a single tower or a larger fortified enclosure, sometimes approximately round, and then known as a shell keep, as in Berkeley castle, or Windsor. The most famous of the Norman keeps of England is the White Tower of London of the 11th century, supposedly designed by Gundulf, bishop of Rochester.

KEEWATIN, the name given to the most easterly district of the three divisions of the North est Territories of Canada. It is bounded on the east by Hudson bay and Foxe channel, on the west by 102° W. longitude and on the south by latitude 60" N. Pop. (1956) 2,413.

The district is wholly within the Laurentian shield physiographic division, and only the extreme southwest of it is forested, and that sparsely. The remainder is a tundra area, with frequent rock outcrops and many lakes and marshes. It lies well to the north of any present area of development.

Before the present boundaries of the three prairie provinces were established the name was applied to a more extensive region.

KEF, LE (Arabic El-Kef, the rock), a town of Tunisia, Afr., is situated on the High Tell 170 km. (105.6 mi.) S.W. of Tunis and 35 km. (21.7 mi.) from the Algerian frontier. Pop. (1956) 14,743 (mun.). The town occupies the site of the ancient Sicca Veneria, a Carthaginian town which became a Roman colony, and is built in the form of an amphitheatre on the southwestern slopes of the Jebel Dyr at the foot of a rock which is crowned by a Turkish kasbah, built from ancient ruins and restored by the French. There are crumbling remains of a rampart, fragments of Roman baths and a temple and large, ancient cisterns which were fed by the same spring that now supplies the town. The Arab town contains several mosques and there are remains of a Christian basilica, excavated by the French, of which the apse is intact and the narthex serves as a church. The Roman colony extended beyond the present town to the south; its name was derived from a temple dedicated to an oriental goddess, identified by the Romans nith Venus. By the middle ages Le Kef was just a large village, but Turkish rule and the creation of a frontier between the regencies of Tunis and Algiers made it an important stronghold. It was occupied without incident by the French Logerot expedition sent from Algeria in April 1881. The town is a regional market place and a road junction occupying a position of strategic importance on the route to Algeria. The mining railway passes 30 km. (18.6 mi.) to the south.

The governorate of Le Kef (pop. [1960 est.] 269,000; area 3,112 sq.mi.) covers most of the High Tell, except for the areas round Teboursouk in the northeast and Thala in the south. It includes the wooded mountains of the Ouargla in the northwest; the grain and cattle-raising areas of the plains of the Kef, Krib, Zouarine, Sers and Siliana, with the intervening ranges; the central region of the Dorsal chain with its forests and mountain villages to the east; and the mining region of the frontier belt to the west, with iron (Djerissa), phosphates (Kalaâ Djerda) and lead.

(J.-J. Ds.)

KEIGHLEY, a municipal and parliamentary borough of the West Riding of Yorkshire, Eng., 10 mi. N.W. of Bradford by road. Pop. (1951) 56,944. Area 36.9 sq.mi. It is in a deep valley near the confluence of the Worth and the Aire and is served by the Leeds and Liverpool canal which affords water communication with both Liverpool and Hull. The parish church of St. Andrew, dating from the time of Henry II, was much modernized in 1710, rebuilt with the exception of the tower in 1805, and again rebuilt in 1878.

The grammar school was founded in 1713, and from it were established in 1871 a trade school for boys and a grammar school for girls. The technical school was founded in 1870. The principal manufactures are woolen goods, spinning machinery, looms and machine tools. The town was incorporated in 1882 and considerably extended in 1938. It includes the famous Bronte country (see HAWORTH).

KEIGWIN, RICHARD (d. 1690), British naval officer and officer of the East India company, leader of "Keigwin's rebellion," was a son of Richard Keigain of Penzance, Cornwall. On May 4, 1673, as a lieutenant in H.M.S. "Assistance," he led the assault on the Dutch-held island of St. Helena in the South Atlantic, the landing place still being known as "Keigwin's rock." In 1676 he went to Bombay as a free merchant, but soon entered the East India company's service. As commandant in 1679 he distinguished himself in battle against the Maratha navy. In 1683 discontent with the company's economies broke into revolt which Keigwin headed. For nearly a year he ruled Bombay vigorously in the king's name, but finally he surrendered the island to the company on the king's orders, in Nov. 1684, after obtaining a free pardon for himself and his followers, and returned to England in 1685. As commanding officer of H.M.S. "Assistance" he was killed on June 21, 1690, while leading the assault on the island of St. Kitts in the Leeward islands.

See ***R.*** Strachey and O. Strachey, *Keigwin's* ***Rebellion*** (1916).

(T. G P. S.)

KEI ISLANDS (KAI or EWAF), a group of islands of the Moluccas, Indonesia, on a ridge which extends southeastward from Ceram to Timor Laut They are in the residency of the Moluccas, and are separated by deep vater from the Banda Isles to the west and the Aru group to the east and are between 5° and 6° 5' S., and 131° 50' and 133° 15' E. Japanese troops occupied the group in Aug. 1942. They consist of Great Kei (Nuhu Yut), Little Kei (Nuhu Roa and Kei Dula), the Kur group, and the Tayando group. The principal island is Great Kei, which is long (64 mi.) and narrow, of Tertiary formation, and very mountainous. nith heights rising to nearly 3.000 ft. The mountains run down the centre of the island. whilst the coast is high, with steep cliffs. Kei Dula has low hills in the south and north-west, but the other islands are, comparatively, without high ground; most of them are encircled by shoals, and all are covered with dense forest, from which excellent timber is obtained. Excepting Great Kei, they are of Post-Tertiary formation, coralline limestone.

The area of the whole group is 241 sq.mi., and the population (1956 est) is 36,946. The natives are described by Wallace as typical black Papuans, but since his visit to Kei there has been a pronounced admixture of Malay blood. Originally pagans, the people today are largely Christian, the result of aork by the Mission of the Sacred Heart, which has its headquarters for Kei, Timor Laut, and New Guinea here. There are, however, many Mohammedans, the result of Malay and Arab influence, which endeavours to spread Mohammedanism. Under the new rkgime old customs are tending to disappear, but where Christianity and Islam have not displaced them the division of pata-lima and *pata-siwa* exists; as well as three classes of society, *melmel,* an upper class, which appears to have come to Kei from the west, *rinrin,* made subject by the *melmel,* and iri, the descendants of slaves brought over from New Guinea. The old form of marriage is endogamic, and society is democratic in organization, untilled land being ouned by the community, and cultivated ground by the individual. The right to the land is never alienated, so that a stranger cannot own it unless he marries into the community. Houses are built very simply, of bamboo and *atap,* sometimes on piles; and where the people are pagan there is a holy stone in the midst of a number of houses, also stone and wooden images. the "protectors" of the village: the cromlech is known in Kei. The Christian and Mohammedan people wear *baju,* or kabuyah and sarong; the loincloth is still used among the pagans. Among interesting pagan customs, now dying out rapidly, are those of maintaining quietude among near female relatives of sailors on a voyage, to ensure a calm passage; the exorcism of evil spirits by tempting them to another spot, with sacks of rice; the preservation of an infant's soul which is "deposited" in a coconut shell, the latter being hung up beside the image of a worthy ancestor; and the preservation of the navel string of an infant, which is regarded as its brother or sister and set in some spot nhere it may bring its "brother" or "sister" good fortune. At Banda Elat on the eastern side of Great Kci, midway along the coast, and also at Banda Eli in the north, there is a community of the original inhabitants of the Banda Islands, who were expelled thence by the Dutch in the time of Jan Pieterszoon Coen and who have retained the Bandanese language, now unknown in Banda. and the Bandanese customs. They are Mohammedans. and clever smiths and potters; racially they appear to be Malay-Papuan, but it is unlikely that they have kept purity of blood. The Kei islanders have a quarrelsome nature, they are not given to cleanliness and are not good agriculturists. They are, however, good at noodcarving and basketwork, and they are first-class boat builders.

The flora of the Kei islands includes the fig and the ironwood tree, various palms (sago, areng, coco-nut, the latter thriving on quite high ground, over 1,000 ft., as well as at sea level), mangrove, and in the forests orchids and arboreal Liliaceae and Pandanaceae abound. Plantain, yams, maize, rice to a small extent, and tobacco are cultivated. Fishing and hunting add largely to the native dietary, which consists mainly of sago. The fauna comprises a wild pig and a cuscus, a small green lizard, a rare species of pigeon, Carpophaga *concinna,* and red lories, a number of rare species of butterfly, including the black *Papilio euchenor,* a blue and black beetle, *Eupholus,* a fine green floral beetle, Lo*maptera papua, Therates* labia, and *Tricondyla aptera,* a wingless beetle shaped like a very large ant. There are many kinds of fish, in large quantities, and trepang and tortoise are found in great numbers on the reefs. Practically the only trade is in copra, timber, trepang and tortoise-shell. Roads are confined to the immediate vicinity of Langgur and the ports Tual (where the Gezaghebber, or resident magistrate, resides) and Elat, all of which are visited regularly by Dutch steamships. Wallace says Kei has no affinity with the Malay languages.

See ***A. R.*** Wallace, ***The*** Malay ***Archipelago*** (1890). ***(E.*** **E. L.)**

KEISER, REINHOLD (1673–1739), German composer, was born at Teuchern near Weissenfels, Leipzig, in 1673 (baptized Jan. 12, 1674). He received his early musical training from his father, a composer of church music, and afterwards went to the Thomasschule in Leipzig. In 1694 he settled in Hamburg and became the most famous composer of German opera of his day. He wrote a hundred and sixteen pieces for the Hamburg theatre, ran a successful series of "winter concerts" (which were a combination of concert and banquet), married the daughter of a Hamburg patrician, and in 1728 became cantor and canon of Hamburg cathedral. In between he held court appointments at Stuttgart and Copenhagen but Hamburg remained his home and he died there on Sept. 13, 1739. Keiser's facility in writing and gift for melody must have been extraordinary. His operas contained on an average forty airs and for forty years he remained a favourite with the public. Those were critical days for German opera, which was then in its infancy with Hamburg for its cradle, and it was Keiser, with his colleagues Mattheson and Telemann, who in the beginning enabled it to hold its own against the French and Italian schools. Unfortunately Keiser's early promise was never fulfilled. His work not only became trivial but was often—as in the opera Stortebecker und *Gödje Michael*—of unparalleled coarseness, and the attempt to establish German opera ended in failure. In his later years he turned to church music, which he seems to have approached nith due seriousness. His oratorios were dramatic, as was natural, but had earnestness and

dignity. He also wrote motets. cantatas and psalms.

For the full catalogue of his works see *Vierteljahrsschrift,* vol. vi., pp. 196–203. Examples from his operas are included in "The Age of Bach and Handel" *(Oxford History of Music,* vol. iv.). *Octavia* was reprinted as a supplement to the Handelgesellschaft edit., 1902, and *Krösus* and *Inganns fidele* are in the *Denkmaler deutscher Tonkunst,* xxxvii., xxxviii. *See* also Chrysander, *Geschichte d. Hamburger Oper,* Allgemeine Musikztg. (1878–79); Kljefeld, *Das Oper,* Internat. Musikgesellsch. (Leipzig).

KEITEL, WILHELM (1882–1946), German army officer, who was chief military adviser to Adolf Hitler in World War II, was born at Helmscherode in central Germany on Sept. 22, 1882. Keitel had staff assignments in World War I and mostly administrative duties in the *Reichswehr* thereafter. In Feb. 1938, when Hitler took personal command of the armed forces, Keitel was appointed to the new post of chief of the armed forces high command, equivalent to minister of war. He held that post until the end of the war. Keitel participated in all major conferences, dictated the armistice terms to the French in June 1940, and signed operational orders, including those requiring the shooting of hostages and other acts considered illegal under international law. He was a member of the "court of honour" which brought about the death sentences of many high-ranking officers in connection with the unsuccessful plot to assassinate Hitler, July 20. 1944. After the war he was convicted by the International Military Tribunal in Niirnberg of planning and waging a war of aggression, of war crimes and of crimes against humanity. He was hanged on Oct. 16, 1946. Keitel was generally regarded as a weak officer who had little tactical military experience and served chiefly as Hitler's lackey.

(P. N. T.)

KEITH, the name of an old Scottish family which derived its name from the barony of Keith in East Lothian, said to have been granted by Malcolm II, king of Scotland, to a member of the house for services against the Danes. The office of great marishal of Scotland, afterward hereditary in the Keith family, was confirmed, together with possession of the lands of Keith, to Sir Robert Keith by a charter of King Robert Bruce. Keith commanded the Scottish horse at Bannockburn, and was killed at the battle of Neville's Cross in 1346. At the close of the 14th century Sir William Keith, by exchange of lands with Lord Lindsay, obtained the crag of Dunnottar in Kincardineshire, where he built the castle of Dunnottar. which became the stronghold of his descendants. He died about 1407. In 1430 a later Sir William Keith was created Lord Keith, and a few years afterward earl marishal, and these titles remained in the family till 1716. William, fourth earl marishal (d. 1581), was one of the guardians of Mary queen of Scots during her minority, and a member of her privy council on her return to Scotland. While refraining from extreme partisanship, he was an adherent of the Reformation; he retired into private life at Dunnottar Castle about 1567, thereby gaining the sobriquet "William of the Tower." He was reputed to be the wealthiest man in Scotland. His eldest daughter Anne married the regent Murray. His grandson George, 5th earl marishal (c. 1553–1623), was one of the most cultured men of his time. He was educated at King's College, Aberdeen, where he became a proficient classical scholar, afterward studying divinity under Theodore Beza at Geneva. He was a firm Protestant, and took an active part in the affairs of the kirk. He acted as special ambassador to Denmark to arrange the marriage of James VI with the Princess Anne. He was subsequently employed on a number of commissions. He founded and endowed in 1593 the Marischal college in the University of Aberdeen. From an uncle he inherited the title of Lord Altrie about 1590.

WILLIAM, 7th earl marishal (c. 1617–1661), was a leader of the covenanting party in northeast Scotland, and the most powerful opponent of the marquess of Huntly. He co-operated with Montrose in Xberdeenshire and neighbouring counties against the Gordons. With Montrose he signed the Bond of Cumbernauld in August 1640. but took no active steps against the popular party until 1648. when he joined the duke of Hamilton in his invasion of England, escaping from the rout at Preston. In 1650 Charles II was entertained by the marishal at Dunnottar; and in 1651 the Scottish regalia were left for safe keeping in his castle. Taken prisoner in the same year, he was committed to the Tower and was excluded from Cromwell's Act of Grace. He was made a privy councilor at the Restoration and died in 1661. Sir John Keith (d. 1714), brother of the 7th earl marishal. was, at the Restoration, given the hereditary office of knight marishal of Scotland, and in 1677 was created earl of Kintore, and Lord Keith of Inverurie and Keith-Hall, a reward for his share in preserving the regalia of Scotland, which were secretly conveyed from Dunnottar to another hidingplace, when the castle was besieged by Cromwell's troops. From him are descended the earls of Kintore.

GEORGE, 10th earl marishal *(c.* 1693–1778), served under Marlborough, and like his brother Francis, Marshal Keith (*q.v.*), was a zealous Jacobite, taking part in the uprising of 1715, after which he escaped to the continent. In the following year he was attainted, his estates and titles being forfeited to the crown. He lived at first in Spain, and, after 1745, in Prussia, where he became, like his brother, intimate with Frederick the Great. Frederick employed him in diplomacy, and he is said to have conveyed information to Chatham, for which he received a pardon from George II. and returned to Scotland in 1759.

From the Keith family through the female line was descended George Keith Elphinstone. Baron of Stonehaven, Marishal and afterward Viscount Keith (*q.v.*), whose titles became extinct at the death of his daughter Margaret, Baroness Keith, in 1867.

See *Calendar of Documents Relating to Scotland,* ed. by J. Bain, 4 vol. (Edinburgh, 1881–88); Peter Buchan, *An Account of the Ancient and Noble Family of Keith* (Edinburgh, 1828); *Memoirs and Correspondence of Sir Robert Murray Keith,* ed. by Mrs. Gillespie Smyth (London, 1849); J. Spalding, *Memorialls oj the Troubles in Scotland, 1624–1645,* 2 vol. (Aberdeen, 1850–51); E. E. Cuthell, *The Scottish Friend of Frederick the Great* (1915). See *Dictionary of National Biography,* ed. by *L.* Stephen and S. Lee (1908, etc.).

KEITH, SIR ARTHUR (1866–1955), Scottish anatomist and physical anthropologist, a leading specialist on fossil man, was born Feb. 5, 1866, at Old Machar, Aberdeen. Educated at Aberdeen university. University college (London) and Leipzig university, he received doctoral degrees in medicine, science and law. He became professor at the Royal College of Surgeons in 1908, was president of the Royal Anthropological institute (1912–14), professor of physiology at the Royal institution (1917–23) and rector at the Cniversity of Aberdeen (1930–33). While continuing his medical research, he became expert at reconstructing early hominid forms, working particularly on fossils from Europe and north Africa, and on the important skeletal groups from Mt. Carmel, Palestine (Israel). Chiefly a morphologist, Keith tended to overemphasize the "tooth and claw" or competitive factor in his writings on evolution, and confused culturally conditioned attitudes with inherited traits in his interpretation of racial and national prejudices as inborn. Sir Arthur died Jan. 7, 1955, at Downe, Kent.

Keith's major works include *The Human Body* (1912); *Antiquity of Man* (1915; 2nd ed., 1925); *Nationality and Race* (1920); *New Discoveries Relating to the Antiquity of Man* (1931); *A New Theory of Evolution* (1948); *An Autobiography* (1950).

KEITH, FRANCIS EDWARD JAMES (1696–1758), Scottish soldier and Prussian field marshal, was the second son of William. 9th earl marishal of Scotland, and was born on June 11, 1696, at the castle of Inverugie near Peterhead. His share in the uprising of 1715 drove him from Scotland. After two years in Paris, chiefly spent in study. he took part in 1719 in the ill-fated expedition of the Pretender to the Highlands of Scotland. He then served the Spanish and the Russian armies. He had the reputation of being one of the ablest officers in the Russian service as well as a capable and liberal civil administrator. In 1747 he offered his services to Frederick II of Prussia. who at once gave him the rank of field marshal, in 1749 made him governor of Berlin, and evinced toward him, as toward his brother, the 10th earl marishal, a strong personal regard. Keith was employed in high command during the Seven Years' War. In 1756 he commanded the troops covering the investment of Pirna. and distinguished himself at Lobositz. In 1757 he commanded at the siege of Prague; later in this same campaign he defended

Leipzig against a greatly superior force, was present at Rossbach, and, while the king was fighting the campaign of Leuthen, conducted a foray into Bohemia. In 1758 he took a prominent part in the unsuccessful Moravian campaign, and the autumn campaign in the Lausitz. He was killed on Oct. 14, 1758 at the battle of Hochkirch. Keith had several children by his mistress, Eva Mertens, a Swedish prisoner captured by him in the war of 1741–43. In 1889 the 1st Silesian infantry regiment No. 22 of the German army received his name.

See K. A. Varnhagen von Ense, *Biographische Denkmale,* pt. 7 (1844); *Fragment of a Memoir of Field-Marshal James Keith, written by himself* (1714–34; ed. by Thomas Constable for the Spalding Club, 1843); T. Carlyle, *Frederick the Great, passim; V.* Paczynaski-Tenczyn, *Leben des G. F. M. Jakob Keith* (Berlin, 1889); Peter Buchan, *Account of the Family of Keith* (Edinburgh, 1878); Anon., *Memoir of Marshal Keith* (Peterhead, 1869); Pauli, *Leben grosser Helden,* pt. iv.

KEITH, GEORGE KEITH ELPHINSTONE, VISCOUNT (1746–1823), British admiral, fifth son of the 10th Lord Elphinstone, was born at Elphinstone near Stirling on Jan. 7, 1746. He entered the navy in 1761 and served as a midshipman under John Jervis, later Earl St. Vincent, who became his lifelong friend. He was promoted lieutenant in 1770 and captain in 1775. He served throughout the American Revolutionary War by land and sea, distinguishing himself at the capture of Charleston. At the outbreak of the French Revolutionary Wars he served under Lord Hood at the capture of Toulon and was rewarded by being promoted rear admiral in 1794 and vice-admiral in 1795. In that year he was sent out to capture the Cape of Good Hope and in 1796 he made his fortune with the prize money won at the capture of a Dutch squadron at Saldanha bay. On his return he was created Baron Keith in the peerage of Ireland. At the time of the naval mutinies he was sent to suppress the outbreaks at the Nore and at Plymouth (1797). In 1798 he went out to the Mediterranean as second in command to St. Vincent. He has been blamed for the escape of the French fleet under Etienne Eustache Bruix, but this was the result of circumstances beyond his control. When ill-health compelled St. Vincent to resign, Keith became commander in chief, to the annoyance of Horatio Nelson who was a junior admiral at that date. In 1800 Genoa surrendered because of Keith's close blockade, but he was compelled to withdraw after the defeat of the Austrians at Marengo. In 1801 he and Gen. Sir Ralph Abercromby drove the French out of Egypt. On the renewal of war in 1803 he was appointed to the North sea station, which extended from Selsey to Scotland. Until he resigned in 1807 he was thus primarily responsible for the defense of the shores of Great Britain against Napoleon's invasion schemes. From 1812 to 1815 he commanded the channel fleet, and it was to a ship under his command, H.M.S. "Bellerophon" (Capt. Frederick Maitland), off Rochefort, that Napoleon surrendered after Waterloo. Under Keith's personal supervision he was transferred to the "Northumberland" for the voyage to St. Helena. Keith then retired from the sea and died in 1823. He married Jane Mercer in 1787 and Hester Thrale (Samuel Johnson's "Queenie") in 1808. In 1814 he had been created a viscount of the United Kingdom. Though he never fought a pitched battle at sea, Keith reached the highest rank and occupied the most responsible posts in the navy because of his ability as an administrator.

See the *Keith Papers,* ed. by *W.* G. Perrin and C. Lloyd, published by the Navy Records Society, 3 vol. (London, 1927–55); also *A.* Allardyce, *Memoir of Viscount Keith* (London, Edinburgh, 1882). (C. C. L.)

KEITH, a small burgh of Banffshire, Scot., in Strath Isla, 49½ mi. N.W. of Aberdeen by road. Pop. (1951) 4,365. The town consists of Old Keith and New Keith, on the east bank of the Isla, linked by two bridges (one dating from 1609) to Fife-Keith, on the west bank. Old Keith, which has a charter dating from William the Lion, fell into gradual decay; New Keith was founded about 1750 by the 5th earl of Findlater; and Fife-Keith grew up after 1816. In the Roman Catholic Church there is a painting of the "Incredulity of St. Thomas," presented by Charles X of France. Keith is an important agricultural centre. The principal industry is the manufacture of tweeds and woolen goods. Oatmeal and cereals are prepared and there is a large distillery. Keith was long famous for its Summer Eve fair, a name derived from that of St. Summarius, patron saint of the town.

KEJ or KECH, the chief place in a district of the former Persian province of Makran in Baluchistan, West Pakistan. Kej gave its name to Kej-Makran, as distinguished from Iranian Makran. There is no town, but a number of small villages dominated by a fort built upon a rock, on the eastern bank of the Kej river. This fort, like many others similarly placed throughout the country, was supposed to be impregnable, but proved to be of no strength except against the matchlocks of the surrounding tribes.

Kej (or Kiz) was an important trade centre in the days of Arab supremacy in Sind, and the rulers of Kalat at various times marched armies into the province with a view to maintaining their authority. At the beginning of the 19th century it had the reputation of a commercial centre, trading through Panjgur with Kandahar, with Karachi via Bela, and with Muscat and the Persian gulf by the seaport of Gwadar, distant about 80 mi. Until 1948 it was feudatory to Kalat, but the khan of Kalat exercised only a feeble sway over this portion of his dominion. The principal tribe residing around Kej, the Gichki, claimed to be of Rajput origin, and to have settled in Makran during the 17th century, having been driven out of Rajputana. The climate during summer is hot; during winter, however, it is temperate. The principal exports consist of dates, which are considered of the finest quality. A local revolt against the khan of Kalat led to a British expedition against Kej in 1898, when the fort was captured.

(See also MAKRAN.)

KEKULÉ VON STRADONITZ, FRIEDRICH AUGUST (1829–1896), German chemist, best known for his contributions to the theory of chemical structure, was born at Darmstadt on Sept. 7, 1829. He studied architecture at Giessen and, coming under the influence of Justus von Liebig, he took up chemistry. From Giessen he went to Paris for further study in 1851. The doctorate was obtained in 1852. He spent a year in England as assistant to John Stenhause, and he enjoyed personal intercourse with the leading chemists. On his return to Germany he started a small chemical laboratory at Heidelberg, where, with very limited equipment, he carried out several important researches. In 1856 he became *Privatdozent* of chemistry at Heidelberg, and in 1858 professor at Ghent. In 1865 he was called to Bonn to fill the professorship that had been vacated by August Wilhelm Hofmann (*q.v.*). The latter once declared, "I would trade all my discoveries for one idea of Kekulé's" (viz., the benzene theory). He held this post till his death on July 13, 1896. He was given a title of nobility and took the name KekulC von Stradonitz.

Kekulé's main importance lies in the far-reaching contributions which he made to chemical theory, especially in regard to the constitution of the carbon compounds (see CHEMISTRY: *Organic).* The doctrine of atomic saturation capacity (valency) had already been enunciated (1852) by Sir Edward Frankland (*q.v.*), when in 1858 KekulC published a paper in which, after giving reasons for regarding carbon as a 4-valent element, he set forth the essential features of his famous doctrine of the linking of atoms. The quadrivalency of carbon was assumed independently by A. S. Cooper (1831–92), a Scottish chemist. His theory of molecular construction was essentially the same as Kekule's, but expressed with greater precision. (The failure of C. A. Wurtz to present it promptly to the French Academy of Sciences gave KekulC a priority of one month.)

KekulC explained that in substances containing several carbon atoms it must be assumed that some of the affinities of each carbon atom are bound by the affinities of the atoms of other elements contained in the substance, and some by an equal number of the affinities of the other carbon atoms. This conception led KekulC in 1865 to formulate his "closed-chain" or "ring" theory of the constitution of benzene (*q.v.*), which has been called the "most brilliant piece of prediction to be found in the whole range of organic chemistry." This in turn led to the elucidation of the constitution of the "aromatic compounds." These contributions to the theory of chemical structure are so important that Kekulé's other valuable work on fulminate of mercury and on unsaturated

and thio-acids appears insignificant in comparison. Professor F. R. Japp, in the Kekulé memorial lecture *(Journ. Chem. Soc.,* 1898), declared that three-fourths of modern organic chemistry is directly or indirectly the product of Kekulé's benzene theory. A great celebration was held in Berlin on May 11, 1890, to honour the *25th* anniversary of the benzene theory. An imposing monument was erected at Bonn in 1903. A rich collection of personal items is contained in the Kekulé room at the Polytechnik in Darmstadt. *(See* Berl and Oesper, *J. Chem. Educ., 1929.)*

Many of Kekulé's papers appeared in the *Annalen der Chemie,* of which he was editor. He also published an important work, *Lehrbuch der organischen Chemie,* of which the first three volumes are dated **1861, 1866** and 1882, while of the fourth only one small section was issued in 1887. Complete biographical details are given in the 2-volume work by R. Anschütz, *August Kekulé* (1929). The second volume contains all of his publications, except the *Lehrbuch. See* also *R.* Winderlich's essay in Bugge's *Das Buch der grossen Chemiker* (1930); L. Darmstaedter and R. Oesper, *Journal of Chemical Education* (1927).

KELANTAN: *see* MALAYA.

KELLER, GOTTFRIED (1819–1890), German-Swiss poet and novelist, was born at Zürich on July 19, 1819. He was apprenticed (1835) to a landscape painter and spent two years (1840–42) in Munich in the study of art. Poverty drove him home again; he then wrote a small volume of *Gedichte* (1846), which proved his real talent. The cantonal government gave him a small pension which enabled him to study philosophy at Heidelberg. From *1850* to 1855 he lived in Berlin. where he wrote the novel, *Der grune Heinrich* (1851–53; revised ed. 1879–80), remarkable for its delicate autobiographic portraiture and the beautiful episodes interwoven with the action. This was followed by *Die Leute von Seldwyla* (1856), studies of Swiss provincial life, including *Romeo und Julia auf dem Dorfe,* one of the most powerful short stories in the German language, and *Die drei gerechten Kammacher,* almost as great a masterpiece of humorous writing. From *1861* to *1867* he was first secretary of the canton. For a time his creative faculty seemed paralyzed by his public duties, but in *1872* appeared *Sieben Legenden,* and in *1874* a second admirable series of *Die Leute von Seldwyla.* In his later years appeared *Züricher Novellen* (1878), *Das Sinngedicht,* a collection of short stories (1881), *Gesammelte Gedichte* (1883) and a novel, *Martin Salander (1886).* He died on July 15, 1890, at Hottingen. Keller's place among German novelists is very high. Few have united such fancy and imagination to such uncompromising realism, or such tragic earnestness to such abounding humour. As a lyric poet, his genius is no less original; he takes rank with the greatest German poets in the second half of the 19th century.

Keller's *Gesammelte Werke* were published in 10 vol. (1889–90), to which was added another volume, *Nachgelassene Schriften* und *Dichtungen,* containing the fragment of a tragedy (1893). In English appeared, G. *Keller: A Selection of his Tales translated with a Memoir by Kate Freiligrath-Kroeker* (1891). *See* also F. Baldensperger, *G. Keller; sa vie et ses oeuvres* **(1893)**; *A.* Frey, *Erinnerungen an Gottfried Keller* (1893); *J.* Baechtold, *Kellers Leben. Seine Briefe und Tagebücher,* 3 vol. (1894–97; revised ed. by Ermatinger, 1915); A. Koster, *G. Keller* (1900; 2nd ed., 1907); Ricarda Huch, *Gottfried Keller* (1904); Mayne, *Gottfried Keller* (1923); and for his work as a painter, H. E. von Berlepsch, *Gottfried Keller als Maler* (1895). A new edition of *Der grüne Heinrich* in its original form, before Keller changed its tragic ending, was published by Ermatinger in 1913.

KELLER, HELEN ADAMS (1880–), a U.S. blind deaf-mute, whose education and training represent the most extraordinary accomplishment ever made in the education of persons so handicapped, was born at Tuscumbia, Ala., on June 27, *1880.* By severe illness, at the age of *19* months, she was deprived of sight and hearing and soon became mute. When she was about six years old her parents appealed to Alexander Graham Bell *(q.v.)* for counsel regarding her education, and as a result, Anne Mansfield Sullivan (later Mrs. John A. Macy) began on March 2, *1887,* to instruct the child. Miss Sullivan, then *20* years old, formerly blind but partially cured of blindness, was a graduate of the Perkins School for the Blind at Boston, Mass. Within a month she had imparted the gift of language to her pupil. Under Miss Sullivan's constant teaching and with instruction at the Horace Mann School for the Deaf, Boston, and the Wright-Humason Oral school, New York city, Miss Keller not only learned to read, write and talk, but became exceptionally proficient in the ordinary educational curriculum. In 1900 she entered Radcliffe college, from which she graduated *cum laude* in 1904. Miss Sullivan, whose ability as a teacher was almost as marvelous as the talent of her pupil, was a devoted companion until her death in *1936.*

Miss Keller wrote many books and articles, among the most important being *The Story of My Life* (1902), *Optimism* (1903), *The World I Live In* (1908), *Song of the Stone Wall* (1910), *Out of the Dark* (1913), *My Religion* (1927), *Midstream* (1929), *Peace at Eventide* (1932), *Helen Keller's Journal (1938)* and *Let Us Have Faith* (1940). Her best biographies are her own writings. (M. E. F.)

KELLERMANN, BERNHARD *(1879–1951),* German novelist, was born at Fürth on March *4, 1879.* His early novels, *Yester und Li* (1904), *Ingeborg* (1906), *Der Tor* (1909; English tran., *The Fool,* 1925), were subjective and emotional. *Das Meer* (1910; English tran., *The Sea,* 1925) and *Sassa Yo Sassa* (1912), a novel of Japan, were the fruit of travels. Kellermann had now acquired an excellent technique and descriptive power, and his further novels, which were very popular, dealt with social problems in a sensational fashion. These include *Der Tunnel* (1913), *Der 9. November (1920;* English tran., *The 9th November,* 1925), *Die Heiligen* (1922) and *Die Brüder Schellenberg (1925).* Kellermann became vice-resident of the Communist-sponsored East Zone Cultural league, and in *1950* received a national prize. He died at his home near Berlin on Oct. 17, 1951.

KELLERMANN, FRANÇOIS CHRISTOPHE DE (1735–1820), duke of Valmy and marshal of France, was born in Strasbourg of a Saxon family on May *28.* 1735. He entered the French army and served in the Seven Years' War and in Louis XV's Polish expedition of *1771,* after which he was made a lieutenant colonel. He became brigadier (1784), *maréchal-de-camp* (1785), and in 1791 general of the Revolutionary army in Alsace. In April 1792 he was made a lieutenant general, and in August his victory of Valmy *(see* FRENCH REVOLUTIONARY WARS) over the Prussians, in Goethe's words, "opened a new era in the history of the world."

Transferred to the army on the Moselle, Kellermann was accused of neglecting to support Custine's operations on the Rhine, but was acquitted and placed at the head of the army of the Alps and of Italy. Shortly afterward he received instructions to reduce Lyons, then in revolt against the Convention, but after the surrender he was imprisoned in Paris for *13* months. He was acquitted and reinstated in his command, maintaining the southeastern border against the Austrians until his army was merged into that of General Bonaparte in Italy. His active career then came to an end, but the hero of Valmy was never forgotten. When Napoleon came to power Kellermann was named successively senator (1800), honorary marshal of France (1803) and duke of Valmy (1808). His experience in army administration made him one of Napoleon's most valuable assistants. In *1814* he voted for the deposition of the emperor and became a peer under the royal government. After the "Hundred Days" he sat in the chamber of peers and voted with the Liberals. He died at Paris on Sept. *23,* 1820.

His son, FRANÇOIS ÉTIENNE DE KELLERMANN, duke of Valmy *(1770–1835),* French cavalry general, was born at Metz and served in his father's regiment of Hussars before entering the diplomatic service in 1791. In 1793 he again joined the army and rose in *1796* to the rank of *chef de brigade.* During the Italian campaign (1796–97) he attracted Bonaparte's notice by his brilliant conduct at the forcing of the Tagliamento. He was made general of a brigade and employed successively in the armies of Rome and Naples under Macdonald and Championnet. In the campaign of *1800* he commanded a cavalry brigade, and at Marengo *(q.v.)* he carried out one of the most famous cavalry charges of history, which, with Desaix's infantry attack, regained the lost battle and decided the issue of the war. He was promoted general of a division immediately. He was perhaps the ablest of all Napoleon's cavalry leaders, and distinguished himself at Austerlita *(q.v.)* in Portugal, at Tormes (Nov. *28,* 1809), and on many other occasions in the Peninsular War and in the campaigns of

1813–14. He retained his rank under the first Restoration, but joined Napoleon during the Hundred Days, and fought in the U'aterloo campaign, where he was again wounded. He was disgraced at the second Restoration, and maintained till the fall of Charles X in 1830 an attitude of determined opposition to the Bourbons. He succeeded his father and died June 2, 1835.

His son FRANÇOIS CHRISTOPHE EDMOND DE KELLERMANN, duke of Valmy (1802–1868), was a distinguished statesman. political historian and diplomatist under the July Monarchy.

KELLGREN, JOHAN HENRIC (1751–179j), Swedish poet and critic, an outstanding literary personality of the Gustafian period of Swedish literature, was born at Floby, Västergötland, Dec. 1, 1751. He studied at Turku (Åbo) where he was appointed lecturer in aesthetics in 1774. With Carl Lenngren, the husband of Anna Maria Lenngren, he founded in 1778 the powerful literary journal *Stockholmsposten,* of which he was editor from 1780 to 1784 and from 1788 until his death. In 1785 he became private secretary to King Gustavus III, and when Gustavus founded the Swedish Academy (1786), was one of the first 18 members. He died in Stockholm, April 20, 1795.

Kellgren's first poems (elegant odes showing French influence) appeared in 1773, but he won fame with his satiric poem *Mina Löjen* ("My Smiles"; 1778), in which, a true spokesman of the Enlightenment. he combines Voltaire's skill in mockery with Pope's power of attack. His principal poem of this period, *Våra Villor* ("Our Illusions"; 1780), while proclaiming the transience of human ideals, claims that the imagination, by providing ideals toward which men may strive, enriches life. In the 1780s he wrote a number of verse dramas, on themes suggested by Gustavus III. This collaboration culminated in *Gustaf* Vasa (1786), a successful patriotic opera in which the powerful choruses express both the king's concern for national greatness and the poet's feeling for liberty. In 1787, in a spirit of enlightened rationalism. he began his attack in both prose and verse on the superstitious practices of the court and upper classes and the vulgarized Swedenborgianism. with its emphasis on animal magnetism. which was spreading among the bourgeoisie, and achieved considerable success in purifying Swedish society. Later, his work acquired greater profundity, and Den *nya skapelsen* ("The New Creation"; 1789), his greatest poem, exalts the power of the imagination in describing a rich experience of love. Formally, its strength lies in its blend of romantic imagery and a form of classical simplicity and purity. In his prose of this later period. especially in the trenchant articles contributed to the *Stockholmsposten* after 1790, he expresses a vision of Sweden as an enlightened. unified society, and appeals to his literary contemporaries to strive for an age when their aim shall be to guide popular taste and to pursue lasting fame and honour rather than ephemeral popularity.

Kellgren's *Samlade* Skrifter in three volumes, revised by himself, appeared in 1796 (new ed., 1884–85). A critical edition. by S. Ek, A. Sjording and O. Sylwan, was begun in 1922: text in six volumes (1923–47); commentary (1936–).

See O. Sylwan, *J. H. Kellgren,* 2nd ed. (1939); S. Ek, *Skämtare och Allvarsmän* (1952), and in *Ny Illustrerad Svensk Litteraturhistoria,* II (1956). (S. E.)

KELLOGG, FRANK BILLINGS (1856–1937), U.S. diplomat and lawyer, was born at Potsdam, N.Y., on Dec. 22, 1856. In 1865 he went with his parents to Minnesota, where he studied law and was admitted to the bar in 1877.

Kellogg was elected U.S. senator from Minnesota for the term 1917–23. He was also U.S. delegate to the fifth International Conference of American States at Santiago, Chile, 1923. In 1924 he was appointed ambassador to Great Britain, succeeding G. B. M. Harvey. He resigned in Feb. 1925, to accept an appointment in the cabinet of President Coolidge as secretary of state, which office he held until April 1929.

In this capacity he protested firmly against the threatened forfeiture of U.S. rights in lands in Mexico under new laws of retroactive effect. He advocated intervention in Nicaragua to suppress a rebellion and pacify the country until a fair election could be held. He secured a treaty with Panama for co-operation in protection of the Panama canal in case of war. He made a firm stand in China for the protection of American lives and property. He received much criticism from the liberal press for many of these acts on the ground that they were too aggressive, also for his decisions as to the exclusion of certain foreigners under the undesirable alien exclusion acts. He aided the treasury department in negotiating debt-funding agreements with European countries. He aided in bringing about a conference with Great Britain and Japan on limitation of naval armaments, (Geneva, 1927), and in the discussion of the Tacna-Arica dispute between Chile, Peru and Bolivia.

In 1928, Kellogg attended the Sixth Pan American conference at Havana. Cuba. His most important achievement, doubtless, was bringing about the signing of a multilateral treaty for the renunciation of war, known as the "Pact of Paris" (*see* WAR) by 15 principal nations at Paris, Aug. 27, 1928.

The contracting parties, in the language of the treaty, "condemn recourse to war for the solution of international controversies and renounce it as an instrument of national policy in their relations with one another."

KELLOGG PACT, also known as the KELLOGG-BRIAND PACT and PACT OF PARIS, inspired by the American outlawry of war movement, originated officially in a proposal of June 20, 1927, by Aristide Briand, French minister of foreign affairs, that the U.S. and France conclude a bilateral treaty renouncing war as an instrument of national policy and agreeing not to seek the settlement of any dispute or conflict except by peaceful means. In reply, the U.S. secretary of state, Frank B. Kellogg, suggested a multilateral pact to the same effect be opened to ratification. by all nations.

The treaty was formally proclaimed on July 24, 1929, and subsequently ratified by 63 nations. See WAR; INTERNATIONAL LAW, PUBLIC.

KELLS (or *Ceanannus Mor*), a market town and urban district of County Meath, Ire., on the Blackwater, 39 mi. N.W. of Dublin by road. Pop. (1956) 2,162. The house of St. Colmcille (or Columba), originally an oratory bur later converted into a church, was built about 807. The bell tower of the present church (otherwise modern) was rebuilt in 1578. Near the church is a round tower, about 95 ft. in height, and there are several ancient crosses, the finest being that now erected in the market place. Kells was originally a royal residence; the ancient name *Ceanannus* is of doubtful derivation but *Kenlis,* whence came Kells, means head fort. There Conn of the Hundred Fights resided in the 2nd century, and there was a palace of Dermot, king of Ireland, in 544–565. The other places in Ireland named Kells are probably derived from Cealla, signifying church.

In the 6th century Kells was granted to St. Colmcille and became a centre of learning. The town owes its chief ecclesiastical importance to the bishopric founded about 807 and united to Meath in the 13th century.

The *Book of Kells* (see ILLUMINATED MANUSCRIPTS): an illuminated copy of the Gospels in Latin and containing also local records, was written there in about the 8th century and was preserved in the library of Trinity college. Dublin. It is asserted to be the finest extant example of early Christian art of its kind.

The *dun,* or fortification, of Dimor is the principal erection of a series of defenses on the hills about 6 mi. W. of Kells.

KELLY, EDWARD (1854–1880), Australian bushranger, was born at Wallan Wallan, Victoria. His father was a transported Belfast convict, and as boys he and his brothers were constantly in trouble for horse-stealing; "Ned" served three years' imprisonment for this offence. In April 1878, an attempt was made to arrest his brother Daniel on a similar charge. The whole Kelly family resisted this and Ned wounded one of the constables. Mrs. Kelly and some of the others were captured. but Ned and Daniel escaped to the hills, where they were joined by two other desperadoes, Byrne and Hart. For two years. despite a reward of £8,000 offered jointly by the governments of Victoria and New South Wales for their arrest, the gang under the leadership of Kelly terrorized the country on the borderland of Victoria and New South Wales, "holding up" towns and plundering banks. In June 1880, however. they were at last tracked to a wooden shanty

at Glenrowan, near Benalla, which the police surrounded, riddled with bullets and finally set on fire.

Kelly was severely wounded, captured and taken to Melbourne, where he was tried, convicted and on Nov 11, 1880 hanged. The total cost of the capture of the Kelly gang was reckoned at £115,000.

See F A Hare, *The Last of the Bushrangers* **(1892).**

KELLY, HOWARD ATWOOD (1858–1943), U.S. physician and surgeon, noted especially for his contributions to the practice of gynecology and for the invention of a number of useful diagnostic tools. was born at Camden N.J., on Feb 20, 1858, and received his M.D. degree from the University of Pennsylvania in 1882. He developed a gynecologic dispensary clinic at the Episcopal hospital. Philadelphia, Pa.. during his internship there. and later founded the Kensington Hospital for Women in that city. He was professor of obstetrics at the University of Pennsylvania. 1888–89, and professor of obstetrics and gynecology at Johns Hopkins university and gynecologist-in-chief to Johns Hopkins hospital from 1889 to 1919. In 1892 he established a sanatorium. later the Howard A Kelly hospital. Baltimore. Md of which he was radiologist, surgeon, physician-in-chief and superintendent.

Kelly was a pioneer in the use of radium for treatment of cancer and in the use of cocaine for local anesthesia. He devised the cystoscope the Kelly pad, rectal and vesical speculum and an operative technique, which bears his name. for fixation of the uterus to the abdominal wall. correcting retroposition A prolific writer, he contributed about 500 articles to medical journals and wrote books on various aspects of medicine. He died at Baltimore on Jan. 12, 1943.

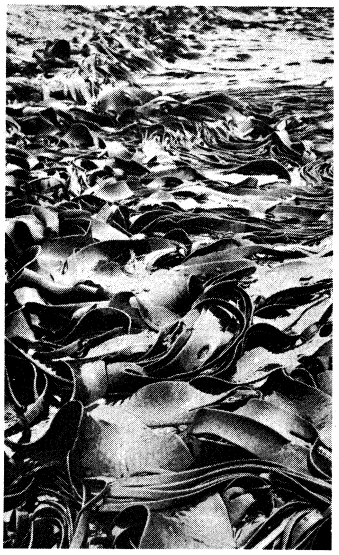
KELLY, HUGH (1739–1777), Irish dramatist and journalist, born in Dublin. Ire. was apprenticed to a staymaker by his father. a Dublin tavern keeper. He went to London in 1760 and after spending some time as staymaker and then as an attorney's clerk, he took to hack writing. After a period of great poverty in 1766 he gained notoriety by publishing *Thespis,* an offensive satire on certain actors and actresses. He also nrote one novel. *Memoirs of a Magdalen or the History of Louisa Mildmay* (1767), now deservedly forgotten He was at this time a friend of Oliver Goldsmith; but when Kelly had been taken up by David Garrick. whom he flattered assiduously, and his play *False Delicacy* had been produced in deliberate opposition to *The Good Natur'd Man,* a quarrel ensued betneen the two dramatists which soon became irreparable

False Delicacy was a sentimental comedy admirably adjusted to the taste of the time. It was an immense success, though it has no great merit. and Kelly became for a while a rich man, but he incurred unpopularity with the public because of his political writing on behalf of Lord North's ministry. and his other plays were driven from the stage or had little success. The best of them was *The School for Wives;* others were *Clementina* (a tragedy in blank verse), A *Word to the Wise, The Romance of an Hour* and *The Man of Reason. False Delicacy* nas translated into French, German, Italian and Portuguese and played in Paris and Lisbon. Some of these plays were produced under false names because of Kelly's unpopularity.

Rather unpleasant in his poverty, in success Kelly shoned himself affable and kindly. He was a man of little education. Samuel Johnson despised him as "a man who has written more than he has read." He was conspicuous for a display of extravagant grief at Goldsmith's funeral. In fact he is chiefly to be remembered as Goldsmith's unnorthy rival. He became a barrister. but relapsed into poverty, took to drink and died young (Feb. 3, 1777).

(LD)

KELP (a term of unknown derivation) is the ash produced by incineration of various kinds of coarse seaweeds (Algae). Until early in the 19th century the ash obtained from algae nas an important source of potassium and iodine; afternard, except during World War I. recovery of these elements from seaweeds mas unprofitable. The chief algae burned for their ash were brown algae belonging to the genera *Laminaria* and *Fucus.* The kelp industry centred on the coast of Brittany in France and on the west coasts of Ireland and Scotland.



EDGAR AUBERT DE LA RUE

GIANT KELP GROWING ON THE SHORE OF ONE OF THE KERGUELEN ISLANDS, ANTARCTIC OCEAN

Seaweeds burned for kelp included both those cast ashore in windrows after storms and those cut from rocks at low tide. The algae were first dried in the sun and then placed in shallow pits and burned until they formed a fused mass, which, while still hot, was sprinkled with water to break it into convenient pieces. From 20 to 22 tons of wet seaweed yield a ton of kelp in which 10% to 12% is potassium sulfate and 1% to 6% is iodine *(see* IODINE).

Kelp is also a popular name for any of the algae belonging to the order Laminariales of the brown algae (Phaeophyta). These are the largest of all algae and certain of those in the Pacific ocean, the "giant kelps." are more than 100 ft. in length.

(G. M. S.)

KELSEN, HANS (1881–), Austrian-U.S. legal scholar, creator of the "pure theory of law," was born on Oct. 11, 1881, at Prague and educated in Heidelberg, Berlin and Vienna. Author of the Austrian constitution of 1920 and judge of the Austrian supreme constitutional court (1920–30), he served for 30 years as a professor at Vienna, Cologne, Geneva and Prague German university before emigrating to the United States in 1940. Subsequently. he taught at Harvard, the University of California and the Naval War college.

Kelsen's "pure theory of lam" was first presented in his fundamental work, *Hauptprobleme der Staatsrechtslehre* (1911). Historically it has a certain relation to John Austin's "analytical jurisprudence," although Kelsen became acquainted with Austin's work for the first time in 1940. The pure theory of law is a formal-logical analysis of the law, considered as a system of norms, based philosophically on the strict distinction between "is" and "ought." It is a normative and positive doctrine, opposed both to sociologism (law as a fact) and to natural law. But it is a critical positivism, showing the limitations of the positivistic approach; hence his "basic norm" is a presupposed norm, giving validity to the whole legal order. His positivism is a formal analysis of the legal norm, of its elements and of the architecture of the legal order. It reaches a climax in a grandiose vision of unity achieved in a pluralism of legal orders through a supraordinated international law.

Kelsen's concentration on the form of law recognizes the legitimacy of sociological investigations and the study of values, in reference both to the contents and the making of law. Equally, his philosophical relativism of values is entirely compatible with his strong stand for democracy and the ideals of western culture.

A complete bibliography appears in Kelsen, *Théorie pure du droit* **(1953).** *See* also *General Theory of Law and State* (1945); *The Law of the United Nations* (1950–51); *Principles of International Law* (1952); *Society and Nature* (1943); *What is Justice?* (1957).

(J. L. Kz.)

KELSO, a small burgh and market town of Roxburghshire, Scot.. on the left bank of the Tweed by its junction with the Teviot, is 43 mi. S.E. of Edinburgh and 23 mi. S.W. of Berwick-upon-Tweed by road. The railway station is south of the town and the Tweed. Kelso lies at the head of the "Merse," the rich agricultural plain south of the Lammermuirs. Pop. (1951) 4,119. An ancient market town with a large market square. Kelso was a stop for coaches on the London-Edinburgh route. Kelso suffered like many of its neighbouring towns from border warfare. It had a burghal status quite early, and was confirmed a burgh of barony in 1634.

The abbey was founded in 1128 by David I for monks from

Tiron in Picardy, whom he transferred from Selkirk, where they had been installed 1 j years before. It was dedicated to the Virgin and St. John. The abbey, completed toward the middle of the 13th century, became one of the most powerful in Scotland, claiming precedence over the other monasteries and disputing the supremacy with St. Andrews. The abbey suffered damage in numerous English forays, was pillaged by the 4th earl of Shrewsbury in 1522, and was reduced to ruins in 1545 by the earl of Hertford (afterward the Protector Somerset). In 1602 the abbey lands passed into the hands of Sir Robert Rer of Cessford, 1st earl of Roxburghe. The transept of the abbey church was covered over and made into a parish church after the Reformation and remained as such until 1771, and one vault was long used as the town jail. The abbey was presented to the nation in 1919 by the duke of Roxburghe who retained burial rights in the cloisters. Restoration had been undertaken by the office of works. The remains include most of the tower, nearly the whole of the walls of the south transept, less than half of the west front, the north and west sides of the north transept and a remnant of the chancel. The predominant feature is the great central tower, which, as seen from a distance, suggests a Norman keep.

The Tweed is crossed at Kelso, where several great floods have taken place, by a bridge of five arches constructed in 1803 by John Rennie. It is said to have been his test for the old Waterloo bridge in London. Buildings include the burgh chambers, Tait hall (1935) and the Cross Keys hotel, a social centre in coaching days; a school occupies the site of the one which Sir Walter Scott attended in 1783. The public park lies in the east of the town, and the racecourse at Berrymoss to the north of it. Trade in Kelso is largely agricultural; the Kelso ram sales in Springwood park have a reputation far beyond the border. The ancient St. James's fair is held on August 5. James and John Ballantyne, friends of Scott, set up a press about the end of the 18th century, from which there issued, in 1802, the first two volumes of the *Minstrelsy of the Scottish Border.* James Ballantyne also founded, in 1797, the *Kelso Border Mail* as a rival to the *Kelso Chronicle.* The latter is the oldest border newspaper, founded in 1783. In 1949 the *Mail* and the *Chronicle* were amalgamated under the title *The Border Counties and Kelso Chronicle and Mail.*

On the peninsula formed by the junction of the Teviot and the Tweed stood the formidable castle and flourishing town of Roxburgh from which the shire took its name. No trace exists of the town, and all that is left of the castle are a few ruins shaded by ancient ash trees. Built by the Northumbrians, after the consolidation of the kingdom of Scotland it became a favoured royal residence; the town beneath its protection reached its most prosperous days under David I and formed a member of the Court of Four Burghs with Edinburgh. Stirling and Berwick. It possessed a court of justice, a mint, mills and. what was remarkable for the 12th century, a grammar school. Alexander II was married and Alexander III was born in the castle. During the long period of border warfare, the town was repeatedly burned and the castle captured. The castle was finally razed to the ground in 1460. During the siege the king, James II, was killed nearby by the explosion of a huge gun called "the Lion." On the fall of the castle the town was abandoned in favour of the rising burgh of Kelso.

About 1 mi. W. of Kelso is Floors or Fleurs castle, a seat of the duke of Roxburghe. The mansion as originally designed by Sir John Vanbrugh in 1718 was severely plain, but in 1849 W. H. Playfair converted it into the Tudor style.

Sandyknowe or Smailholm tower, 6 mi. W. of Kelso, dating from the 15th century, is a fine example of a border peel. Two miles northeast of Kelso is the pretty village of Ednam (Edenham, "the village on the Eden"), the birthplace of the poet James Thomson, to whose memory an obelisk, 52 ft. high, was erected on Ferniehill in 1820.

KELVIN, WILLIAM THOMSON, BARON (1824–1907), British physicist, discoverer of the second law of thermodynamics and inventor of telegraphic and scientific instruments, was born at Belfast. Ire., on June 26, 1824. At the age of 11 he entered the University of Glasgow, where his father was professor of mathematics. Leaving Glasgow without taking a degree, in 1841 he entered Peterhouse, Cambridge, and in 1845 took his degree as second wrangler and won the Smith's prize. At that time there were few facilities for the study of experimental science in Great Britain. Thomson therefore had recourse to Paris, and worked in the laboratory of Regnault *(see* REGNAULT, HENRI VICTOR), who was then engaged in his classical researches on the thermal properties of steam. In 1846, on the death of Meikleham, he accepted the chair of natural philosophy in the University of Glasgow, which he filled for 53 years.

One of Thomson's earliest papers dealt with the age of the earth. His calculations on the conduction of heat showed that at some time between 20,000,000 and 400,000,000, probably about 100,000,000, years ago the physical conditions of the earth must have been entirely different from those which now obtain. This led to a long controversy with geologists.

In 1847 Thomson first met James Prescott Joule, whose views of the nature of heat strongly influenced Thomson's mind. In 1848 Thomson proposed his absolute scale of temperature, which is independent of the properties of any particular thermometric substance, and in 1851 he presented to the Royal society of Edinburgh a paper on the dynamical theory of heat, which reconciled the work of N. L. Sadi Carnot with the conclusions of Count Rumford, Sir H. Davy, J. R. Mayer and Joule, and placed the dynamical theory of heat and the fundamental principle of the conservation of energy in a position to command universal acceptance. It was in this paper that the principle of the dissipation of energy, briefly summarized in the second law of thermodynamics (*q.v.*), was first stated.

Although his contributions to thermodynamics may properly be regarded as his most important scientific work, it is in the field of electricity, especially in its application to submarine telegraphy, that Lord Kelvin is best known to the world at large. From 1854 he is most prominent among telegraphists. The stranded form of conductor was due to his suggestion; but it was in the letters which he addressed in that year to Sir G. G. Stokes, and which were published in the *Proceedings* of *the Royal Society* (1855), that he discussed the mathematical theory of signaling through submarine cables, and enunciated the conclusion that in long cables the retardation due to capacity must render the speed of signaling inversely proportional to the square of the cable's length. Thomson set to work to overcome the difficulty by improvement in the manufacture of cables, by the production of copper of high conductivity and the construction of apparatus which would readily respond to the slightest variation of the current in the cable. The mirror galvanometer and the siphon recorder, which was patented in 1867, were the outcome of these researches. Thomson's work in connection with telegraphy led to the production in rapid succession of instruments adapted to the requirements of the time for the measurement of every electrical quantity, and when electric lighting came to the front a nevi set of instruments was produced to meet the needs of the electrical engineer.

When W. Weber in 1851 proposed the extension of C. F. Gauss's system of absolute units to electromagnetism, Thomson took up the question, and, applying the principles of energy, calculated the absolute electromotive force of a Daniel1 cell, and determined the absolute measure of the resistance of a wire from the heat produced in it by a known current. In 1861 Thomson induced the British association to appoint its first famous committee .for the determination of electrical standards. The oscillatory character of the discharge of the Leyden jar; the foundation of the work of H. R. Hertz and of wireless telegraphy, were investigated by him in 1853.

It was in 1873 that he undertook to write a series of articles for *Good Words* on the mariner's compass. He wrote the first, but so many questions arose in his mind that it was five years before the second appeared. In the meanwhile the compass went through a process of complete reconstruction in his hands, a process which enabled both the permanent and the temporary magnetism of the ship to be readily compensated, while the weight of the 10-in. card was reduced to one-seventeenth of that of the standard card previously in use, although the time of

swing was increased. Thomson also invented his sounding apparatus, whereby soundings can be taken in shallows and in deep water. Thomson's tide gauge, tidal harmonic analyzer and tide predicter are famous, and among his work in the interest of navigation must be mentioned his tables for the simplification of Sumner's method for determining the position of a ship at sea. Thomson published more than **300** original papers bearing upon nearly every branch of physical science. The firm of Kelvin and White, in which he was a partner, was formed to manufacture his inventions.

In **1866** Thomson was knighted. He was raised to the peerage in **1892** with the title of Baron Kelvin of Largs. In 1890 he became president of the Royal society and in 1902 received the Order of Merit.

Much of Kelvin's time after his retirement **(1899)** was given to writing and revising the lectures on the wave theory of light which he had delivered at the Johns Hopkins university. Baltimore, Md., in **1884** (published 1904). In 1904 he was elected chancellor of the University of Glasgow.

Kelvin died on Dec. **17,** 1907, at his residence, Netherhall, near Largs. Scot., and was buried in Westminster Abbey.

In addition to the Baltimore lectures, he published with Professor P G. Tait a standard but unfinished *Treatise on Natural Philosophy* (1867). *A* number of his scientific papers were collected in his *Reprint of Papers on Electricity and Magnetism* (1872), and in his *Mathematical and Physical Papers* (1882, 1883 and 1890), and three volumes of his *Popular Lectures and Addresses* appeared in 1889–94.

See Andrew Gray, *Lord Kelvin* (1908); S P. Thompson, *Life* of *Lord Kelvin* (1910), which contains a full bibliography.

KEMAL, NAMIK (1840–1888), Turkish writer and poet, who greatly influenced the Young Turk and nationalist movements, and the westernization of Turkish literature. An aristocrat by birth, he was educated privately and later learned French in Istanbul where, as a result of his articles in the newspaper *Tasvir-i Efkâr,* he incurred the displeasure of the authorities. He fled to London and there, with the help of the poet Ziya Pasha, published the revolutionary newspaper *Hurriyet.*

Later, returning to Istanbul, he continued his revolutionary writings in the *Ibret* and produced his patriotic play *Vatan.* This led to his imprisonment in Cyprus (1873–77). After his release and a further period of virtual exile he died as governor of Chios **(1888).** His writings comprised poems, plays, articles, historical works and novels, including *Zntibah* (1874) and *Cezmi* (1880). Patriotism and hatred of tyranny were themes common to all his writings, and his style, though more restrained in the articles, was normally passionate and romantic. (F. I.)

KEMBLE, the name of a family of English actors and actresses, of whom the most famous were Sarah Siddons (*q.v.*) and her brother John Philip Kemble, the eldest of the 12 children of ROGER KEMBLE (1721–1802), a strolling player and manager, who in 1753 married an actress, Sarah Ward.

JOHN PHILIP KEMBLE (1757–1823), the second child, was born at Prescot, Lancashire, on Feb. 1, 1757. He was educated for the Roman Catholic priesthood at a seminary near Wolverhampton and at the English college at Douai. France. But he had no vocation and on his return to England joined a theatrical company, his first appearance being as Theodosius in Lee's tragedy at Wolverhampton on Jan. **8, 1776** In **1778** he joined the York company of Tate Wilkinson, appearing at Wakefield, at Hull and at York.

Kemble played Hamlet in Dublin on Nov. 2, **1781,** and was engaged at Drury Lane theatre, where he made his debut on Sept. **30, 1783,** in the same part. The Drury Lane public was moderately enthusiastic, but his performance with his sister. Mrs. Siddons, in *Macbeth* (March 31, 1785), established him as a popular favourite. He married (Dec. **8. 1787)** Priscilla Hopkins Brereton (1756–1845), the widow of an actor and herself an actress.

Kemble's appointment as manager of Drury Lane in **1788** gave him full opportunity to dress the characters less according to tradition than in harmony with his own conception of what was suitable. In his own version of *Coriolanus,* which was revived during his first season, the character of the "noble Roman" exactly suited his powers. His tall and imposing person, noble countenance and solemn and grave demeanour were uniquely adapted for the Roman characters in Shakespeare's plays. Kemble excelled in declamation, but physically he was incapable of giving expression to impetuous vehemence and searching pathos.

Because of the eccentricities of Richard Brinsley Sheridan, the proprietor of Drury Lane, Kemble withdrew from the management, and, although he resumed his duties at the beginning of the season of 1800–01, he finally resigned connection with it at the close of 1802.

In **1803** he became manager of Covent Garden theatre, in which he had acquired a sixth share for £23,000. The theatre was burned down on Sept. 20, 1808, and the raising of the prices after the opening of the new theatre, in **1809,** led to riots, which practically suspended the performances for three months. Kemble was saved from ruin only by a loan, afterward converted into a gift, of £10,000 from the duke of Northumberland. Kemble's last performance was as Coriolanus on June **23. 1817.** His retirement was probably hastened by the rising popularity of Edmund Kean. He died at Lausanne on Feb. **26, 1823.**

See Harold H. Child, *The Shakespearian Productions of J. P. K.* (1935); Herschel Baker, *J.P.K.: the Actor and His Theatre* (1942).

GEORGE STEPHEN KEMBLE (1758–1822), the second son of Roger, was rather an indifferent actor, eclipsed by his wife and fellow player, Elizabeth Satchell Kemble (*c* 1763–1841), and a man of such proportions that he played Falstaff without padding. He managed several theatres. including Drury Lane.

CHARLES KEMBLE (1775–1854), the youngest brother of John and Stephen, was born at Brecon, South Wales, on Nov. **25,** 1775. He, too, was educated at Douai. He made his first recorded appearance at Sheffield as Orlando in *As You Like It* in 1792. His first London appearance was on April 21, 1794, as Malcolm to his brother's Macbeth. Ultimately he won independent fame. His Laertes and Macduff were hardly less interesting than his brother's Hamlet and Macbeth.

In comedy he was ably supported by his wife, Maria Theresa de Camp (1774–1838), whom he married on July 2, **1806.** His visit. with his daughter Fanny, to North America during **1832** and **1834** aroused much enthusiasm. The later period of his career was clouded by money embarrassments in connection with his joint proprietorship in Covent Garden theatre. He formally retired from the stage in Dec. **1836,** but his final appearance was on April 10, **1840.** For some time he held the office of examiner of plays. He died on Nov. 12, **1854.**

ELIZABETH WHITLOCK (1761–1836), who was a daughter of Roger Kemble, made her first appearance on the stage in 1783 at Drury Lane as Portia. In **1785** she married Charles E. Whitlock, went with him to America and played with much success there. She had the honour of appearing before President Washington. She retired about **1807** and died on Feb. **27, 1836.**

FRANCES ANNE KEMBLE (Fanny Kemble; 1809–1893), actress and author, was Charles Kemble's elder daughter; she was born in London on Nov. **27, 1809,** and educated chiefly in France. She first appeared on the stage on Oct. **25, 1829.** as Juliet at Covent Garden. Her attractive personality at once made her a great favourite, her popularity enabling her father to recoup his losses as a manager. She played all the principal women's parts, notably Portia, Beatrice and Lady Teazle; Julia in Sheridan Knowles's *The Hunchback,* especially written for her, was perhaps her greatest success. In **1832** she went with her father to North America, and in **1834** she married there a southern planter, Pierce Butler. They were divorced in **1848.** In **1847** she returned to the stage, and later, following her father's example, appeared with much success as a Shakespearean reader. In 1877 she returned to England, where she lived until her death in London on Jan. 15, **1893.**

Fanny Kemble was a popular figure in London society. Besides her plays, *Francis the First,* unsuccessfully produced in **1832,** and *The Star of Seville* (1837), a volume of *Poems* **(1844)** and a book of Italian travel, *A Year of Consolation* (1847), she published a volume of her *Journal* in **1835** and another (dealing with life on the Georgia plantation) in **1863,** and also a volume of *Plays* (1863), including translations from Dumas and Schiller. Her various volumes of reminiscences contain much valuable material for the social and dramatic history of the period.

See M. A. Armstrong, *Fanny Kemble: a Passionate Victorian* **(1938).**

ADELAIDE KEMBLE (1814–1879), Charles Kemble's second daughter, was an opera singer of great promise, whose first London appearance was made in *Norma* on Nov. 2, 1841. In 1843 she married Edward John Sartoris, a wealthy Italian, and retired after a brief but brilliant career. She wrote *A Week in a French Country House* (1867).

Mention may also be made of Charles Kemble's grandson, HENRY KEMBLE (1848–1907), a popular London actor.

KEMÉNY, ZSIGMOND, BARON (1814–1875), Hungarian novelist whose difficult style has prevented full appreciation of his gifts as a portrayer of character and of atmosphere. He was also prominent as a journalist and politician. He was born at Alvinc in June 1814 of a family which included among its ancestors a prince of Transylvania. By his father's early death he lost many of the advantages of his birth; but his private means and title gave him easy access to political life. This he approached through journalism, first in his native Transylvania, and from 1847 on the staff of the *Pesti Hirlap*. In 1855 he became editor of the *Pesti Napló* and made it influential in Hungarian politics. A partisan of Ferencz Deák, Kemény prepared the way for the compromise (1867) between Hungary and the Habsburgs. His mind, always eccentric, became unbalanced, and in 1868 he had to abandon the editorship of his paper. He died at Pusztakamarás, Dec. 22, 1875.

Kemény wrote a number of historical novels: *Gyulai Pál* (1847), *Özvegy és leánya* (1855; "The Widow and her Daughter"), *A rajongók* (1858; "The Fanatics") and *Zord idö* (1862; "Grim Times"). These were praised by critics, but little appreciated by the public. They make heavy reading, since emphasis is on description rather than action and the style is difficult. Their atmosphere is, moreover, depressing. His heroes, entangled in personal and historical conflicts, move, inexorably, toward destruction. Kemény's masterly motivation and fine evocation of the historical background are not enough to make his novels popular. His social novels, *e.g., Férj ds no* (1852; "Husband and Wife"), show an exaggerated romanticism, but are also, basically, works of minute psychological analysis. (Ds. Sr.)

KEMMERER, EDWIN WALTER (1875–1945), U.S. economist, whose principal contributions were in monetary matters. As adviser to 14 governments reorganizing their currencies, he was known as the "money doctor." Born at Scranton, Pa., on June 29, 1875, and educated at Wesleyan university, Middletown, Conn. (A.B., 1899) and Cornell university, Ithaca, N.Y. (Ph.D., 1903), he taught economics at Purdue university (1901–03), at Cornell (1906–12) and Princeton (1912–43). He served as financial adviser to the U.S. Philippine commission in 1903 and was chief of the division of currency, Philippine Islands, 1904–06. He was financial adviser to the governments of Mexico, 1917, and Guatemala, 1919; U.S. trade commissioner in South America, 1922; chairman of the Commission of American Financial Advisers in Colombia, 1923, Chile, 1925, Poland, 1926, Ecuador, 1926–27, Bolivia, 1927 and China, 1929. He served on the Gold Standard Inquiry committee for the Union of South Africa, 1924–25, and as expert on currency and banking to the Dawes committee, 1925. He died at Princeton, N.J., on Dec. 16, 1945.

The best known of his many books is *The* ABC of *the Federal Reserve System* (1918). (FK. L. K.)

KEMP, JAMES FURMAN (1859–1926), U.S. geologist, who specialized in the study of ore deposits, was born in New York city on Aug. 14, 1859. He graduated from Adelphi academy, Brooklyn (1876), and later studied in Amherst and at Columbia university. After studying at Leipzig and Munich, he returned to the U.S. to become a member of the teaching staff at Cornell university (1886–91). In 1891 he was called to Columbia university, where he remained until his death, at Great Neck, L.I., on Nov. 17, 1926.

While at Cornell, Kemp was one of a group of 13 who organized the Geological Society of America and was president in 1921. He was considered a leading authority on ore deposits, and was the author of a number of textbooks and many scientific papers.

KEMPE, JOHN (*c.* 1380–1454), English cardinal, archbishop of Canterbury and chancellor, was born about 1380 near Ashford, Kent, and educated at Merton college, Oxford. Having become doctor of laws, he practised as an ecclesiastical lawyer with such distinction that in 1415 he was made dean of the court of arches. After several diplomatic missions in the royal service, Kempe was made chancellor of the duchy of Normandy. He was consecrated bishop of Rochester at Rouen on Dec. 3, 1419. In 1421 he was transferred to Chichester and then to London. During the minority of Henry VI, Kempe held a prominent position in the English council as a supporter of Henry Beaufort. In 1426 he was appointed archbishop of York and succeeded Beaufort as chancellor. His main task as chancellor was to keep Humphrey of Gloucester in check, and his resignation, Feb. 28, 1432, was a concession to Gloucester. Still enjoying Beaufort's favour, he was sent in 1435 to the congress of Arras, where a settlement with France was unsuccessfully attempted under the auspices of the papal legates. Kempe continued to support the peace treaty and led a second embassy to the conference of Calais in 1438. In 1439 he was created cardinal. Although he supported Suffolk over the king's marriage with Margaret of Anjou, they later fell out over the nomination of Kempe's nephew to the bishopric of London. In 1450 Kempe was again chancellor and pronounced final sentence on Suffolk. He suppressed Cade's rebellion and for four years maintained the king's authority against the Yorkists. In July 1452 he was rewarded with a promotion to Canterbury, receiving the title of cardinal bishop of Santa Rufina from Pope Nicholas V. His political influence declined with the rise of Richard of York, and his fall seemed imminent when he died on March 22, 1454. He was buried at Canterbury in the choir.

BIBLIOGRAPHY.—Williams, *Lives of the English Cardinals* **(1868)**; Hunt, *The English Clergy in the Middle Ages* (1901); J. Gairdner, *Prejace to the Paston Letters* **(1872).** (T. L. C.)

KEMPENER (KEMPENEER), **PETER DE** (PEDRO CAMPAÑA) (1503–1580), Flemish religious painter and designer of tapestries, was chiefly active in Seville, Spain, where he was called Pedro Campaiia.

Born in Brussels, he traveled in Italy and was in Bologna in 1529, working on a triumphal arch for the entry of Charles V; he visited Venice and probably Rome, where he must have studied the works of Michelangelo and Raphael.

By 1537 Kempener had settled in Seville and apparently remained there until shortly before 1563, when he was appointed director of the tapestry factory in Brussels, Kempener's most important works are in Seville cathedral — the "Descent from the Cross" (1547) and the "Purification of the Virgin," an altarpiece with portraits of the donor and his family (1555). His style, combining Italianate composition with Flemish realism and genre, considerably influenced the school of Seville. He was greatly admired by Francisco Pacheco, master of Velázquez, who described him as an architect and sculptor as well as a painter.

See D. Angulo Iñiguez, *Pedro de Campaña* (1951). (E. Hs.)

KEMPENFELT, RICHARD (1718–1782), British rear-admiral, son of Magnus Kempenfelt, a Swede said to have been in the British army, was born at Westminster in 1718. He went into the navy and saw his first service in the West Indies, taking part in the capture of Portobello. In 1746 he returned to England, and from that date to 1780, when he was made rear-admiral, saw active service in the East Indies with Sir George Pocock and in various quarters of the world. In 1781 he gained, with a vastly inferior force, a brilliant victory over the French fleet under De Guichen, fifty leagues south-west of Ushant. In 1782 he hoisted his flag on the "Royal George," which formed part of the fleet under Lord Howe. In August this fleet was ordered to refit at top speed at Portsmouth and proceed to the relief of Gibraltar. The shifting of weights on the "Royal George" to facilitate the repairs of a leak, caused a large piece of her bottom to fall out and she sank with 800 persons on board. Kempenfelt perished with the rest. Cowper's poem, the "Loss of the Royal George," commemorates this disaster. A painting of the loss of the "Royal George" is in the Royal United Service Institution, London. Kempenfelt effected radical alterations and improvements in the signalling system then existing in the British navy.

See Charnock's *Biog. Nav.*, vi. a46, and Ralfe's *Naval Biographies*, i. 215.

KEMPTEN, a town in the *Land* of Bavaria, Ger., on the Iller, 81 mi. S.W. of Munich. Pop. (1950) 39,821. Kempten, identified with the Roman Cambodunum, consisted in early times of two towns, the old and the new, whose rivalry was intensified by the welcome given by the old town, a free imperial city since 1289, to the Reformed doctrines, the new town keeping to the older faith. The Benedictine abbey of Kempten, said to have been founded in 773 by Hildegarde. the wife of Charlemagne, was an important house, and in **1360** its abbot was promoted to the dignity of a prince of the empire. The town and abbey passed to Bavaria in **1803.** The town contains a castle. the old palace of the abbots of Kempten, dating from the end of the 17th century, now partly used as barracks, and the abbey church. The industries include cotton spinning and weaving and the manufacture of paper, beer, machines, cement and soap. As the commercial centre of the Algau. Kempten carries on trade in timber and dairy produce.

KEN, THOMAS (1637–1711), English divine, the most eminent of the English nonjuring bishops and one of the fathers of modern English hymnology, was born at Little Berkhampstead. Herts. He was the son of Thomas Ken of Furnival's Inn; his mother was a daughter of the now forgotten poet John Chalkhill. Ken's stepsister, Anne. married Izaak Walton in 1646. Ken was educated at Winchester college and Hart hall, Oxford, and became fellow (1657) and subsequently tutor of New college. He was ordained in **1662,** and after holding several preferments returned in **1672** to Winchester as a prebendary of the cathedral, chaplain to the bishop and a fellow of Winchester college. He remained there for several years, preparing his *Manual of Prayers for the Use of the Scholars of Winchester College* **(1674)** and composing hymns. At this time he wrote, primarily for the scholars, his morning, evening and midnight hymns, the first two of which, "Awake. My Soul, and With the Sun." and "Glory to Thee, My God, This Night," are household words in the English-speaking countries. In 1674 Ken visited Rome with young Izaak Walton. In **1679** he was appointed by Charles II chaplain to the princess Mary, wife of William of Orange. But he incurred the displeasure of William, and gladly returned to England in **1680,** when he was immediately appointed one of the king's chaplains. He was once more residing at Winchester in **1683** when Charles came to the city, and Ken's residence was chosen as the home of Nell Gwyn. Ken stoutly and successfully objected. In August of the same year he accompanied Lord Dartmouth to Tangier as chaplain to the fleet, and in **1684** was appointed bishop of Bath and Wells. It is said that, upon the occurrence of the vacancy, Charles, mindful of the spirit he had shown at Winchester. exclaimed, "Where is the good little man that refused his lodging to poor Nell?" and determined that no other should be bishop.

In **1685** he published *Exposition on the Church Catechism*, perhaps better known by its subtitle, *The Practice of Divine Love.* In **1688,** when James reissued his "Declaration of Indulgence," Ken was one of the "seven bishops" who refused to publish it. They were committed to the Tower on June **8, 1688,** on a charge of high misdemeanour. With the revolution which speedily followed their acquittal, new troubles encountered Ken; for, having sworn allegiance to James, he thought himself thereby precluded from taking the oath to William of Orange. He stood firm to his refusal and was, in Aug. **1691,** superseded in his bishopric by Richard Kidder, dean of Peterborough. From this time he lived mostly with Lord Weymouth, his friend from college days, at Longleat, Wilts; and though pressed to resume his diocese in 1703, upon the death of Bishop Kidder, he declined. He died at Longleat on March **19,** 1711. Ken lives in history, apart from his three hymns, mainly as a man of unstained purity and invincible fidelity to conscience, weak only in a certain narrowness of view which is a frequent attribute of the intense character which he possessed.

The closing verse of his morning and evening hymns, beginning "Praise God from whom all blessings flow," is one of the most familiar stanzas in the English language, being widely sung as a doxology.

See the edition of his *Poetical Works*, 4 vol. (1721), ed. by W. Hawkins; and of his *Prose Works* (1838), ed. by J. T Round.

See also J. Lavicount Anderdon, *The Ltfe of Thomas Ken, Bishop of Bath and Wells, by a Layman* (1851; 2nd ed., 1854); Dean Plumptre, *Life of Thomas Ken*, 2 vol. (1888), rev. (1890); F. G. Gilman, *The Evolution of the English Hymn* (1927).

KEN, a river of north India. It rises in the Vindhya hills, about 50 mi. N. of Jubbulpore, Madhya Pradesh and after a 230-mi. course falls into the Jumna 85 mi. W.N.W. of Allahabad, Uttar Pradesh. The weir and canal near Panna, and the dam at Gangae in the upper course, together irrigate about **470,000** ac.

KENA: *see* QENA.

KENDAL, DUKEDOM OF. The English title of duke of Kendal was first bestowed in May **1667** upon Charles (d. 1667), the infant son of the duke of York, afterward James II. Several persons have been created earl of Kendal, among them being John, duke of Bedford, son of Henry IV; John Beaufort, duke of Somerset (d. 1444); and Queen Anne's husband, George, prince of Denmark.

In 1719 Ehrengarde Melusina (1667–1743), mistress of the English king George I, was created duchess of Kendal Melusina was the daughter of Gustavus Adolphus, count of Schulenburg (d. 1691), and was born at Emden on Dec. 2j, 1667. Her father held important positions under the elector of Brandenburg; her brother Matthias John (1661–1747) won great fame as a soldier in Germany and was afterward commander in chief of the army of the republic of Venice. Melusina was attached to the household of the electress Sophia, and became George's mistress about 1690. She followed him to England in 1714 and ousted her principal rival, Charlotte Sophia, baroness von Kilmannsegge (*c.* 1673–1725), afterward countess of Darlington, as his first favourite. In 1716 she was created duchess of Munster, then duchess of Kendal, and in 1723 the emperor Charles VI made her a princess of the empire. The duchess was avaricious and obtained large sums of money by selling public offices and titles; she also sold patent rights, one of these being the privilege of supplying Ireland with a new copper coinage. This she sold to a Wolverhampton iron merchant named William Wood (1671–1730), who flooded the country with the coins known as "Wood's halfpence," which occasioned Swift's *Drapier's Letters.* After George's death she lived at Kendal house, Isleworth, Middlesex, until her death on May 10, 1743. The duchess was by no means a beautiful woman, and her thin figure caused the populace to refer to her as the "maypole." By the king she had two daughters: Petronilla Melusina (c. 1693–1778), who was created countess of Walsingham in 1722, and who married the great earl of Chesterfield; and Margaret Gertrude, countess of Lippe (1703–73).

KENDAL, WILLIAM HUNTER (WILLIAM HUNTER GRIMSTON) (1843–1917), English actor who, with his wife, MARGARET (MADGE) BRUNTON ROBERTSON (1849–1935), did much as an actor, manager and trainer to raise the standards of the profession. He was born in London on Dec. **16, 1843,** the son of a painter. He made his first stage appearance in Glasgow in **1862,** and joined the Haymarket company in London in **1866,** playing in everything from burlesque to Shakespeare.

In London he met Madge Robertson. the sister of the dramatist T. W. Robertson and a splendid actress with a distinguished career. After their marriage in **1869** the Kendals played together and were inseparable. Their joint management with Sir John Hare at the St. James's brought fame and prosperity to that theatre, and during those years (1879 to 1888) many of their notable successes were made, such as *The Squire, Impulse, The Ironmaster, A Scrap of Paper* and *The Elder Miss Blossom.* For many years they toured the provinces and the United States and trained many actors and actresses who afterward attained eminence. Mrs. Kendal was a better actress than her husband was an actor, but they made a wonderful pair. He died in London in 1917; she was made a dame of the British Empire in **1926** and died in 1935. (W. J. M.-P.)

KENDAL, a market town and municipal borough in the Westmorland parliamentary division of England, 22 mi. N. of Lancaster by road. Pop. (1951) **18,541.** Area **5.8** sq.mi. The largest town in the county and its administrative centre, Kendal stands on the main road from London to Scotland via Carlisle and on the river

Kent about 3 mi. S.E. of the Lake District National park. Four road bridges cross the river at Kendal, which is irregularly built of gray limestone. The unusually large parish church, the oldest part dating from 1200, has five aisles and a square tower. The county hall was opened in 1939. In the clock tower of the town hall is a carillon, and in the mayor's parlour are paintings by George Romney, who died in Kendal, and the book of devotions that belonged to Catherine Parr. The museum has a good geological collection. The grammar school was founded in 1525, and Sandes hospital for widows was built in 1659. Castle dairy, in Wildman street, was rebuilt in 1564 and is preserved as a Tudor house.

The outline of a Roman fort is traceable at Watercrook. On Castle How, an artificial mound probably of pre-Norman origin, an obelisk was raised in 1788 in memory of the revolution of 1688. The barony and castle of Kendal, held by Turold, were granted by William I to Ivo de Taillebois, but the barony was divided into three parts in the reign of Richard II, one part with the castle passing to Sir William Parr, ancestor of Catherine Parr who mas born there. After the death of Catherine's brother, William, his share of the barony reverted to Elizabeth I. The castle, which is east of the town, was in ruins by 1586. Burgesses in Kendal are mentioned in 1345, and the town received charters in 1472 and 1484; it was incorporated in 1575 and further charters were granted in 1636 and 1684. A weekly market on Saturday, granted by Richard I to Roger Fitz Reinfred, was bought by the corporation from the lords of the manor in 1885 and 1886. There were many fairs recorded from the 14th century onward. The woollen manufactures of Kendal have been noted since 1331 when a Flemish weaver settled there; the present borough motto, *Pannus mihi Panis,* commonly translated "Wool is My Bread," recalls the former importance of wool. Although the coarse cloth known to Shakespeare as "Kendal green" is no longer made, carpets and cards for wool and cotton are manufactured and there are woollen and paper mills outside the town. Other industries include boots and shoes, water turbines and pumps, laundry machinery and a quarry and limeworks. There has been a tobacco and snuff trade since the 16th century, when cotton goods were exchanged for tobacco with America and the West Indies; Kendal mint cake, eaten particularly by mountaineers and explorers on their expeditions, has been made there since 1869.

The Elizabeth Levens hall with topiary gardens is 5½ mi. S., and 3 mi. S. is Sizergh castle with a 14th-century peal tower and a Tudor great hall.

KENDALL. EDWARD CALVIN (1886–), U.S biochemist, who, with Philip S. Hench (*q.v.*), isolated cortisone, was born March 8, 1886, at South Norwalk, Conn. He received his Ph.D. in 1910 from Columbia university. From 1910 to 1914 he made investigations concerning the thyroid, and in the latter year joined the Mayo clinic staff as head of the section of biochemistry. From 1915 to his retirement in 1951, Kendall was head of the division of biochemistry in the Mayo clinic acting also as head of the laboratory of biochemistry from 1945 to 1951. Later he was visiting professor of chemistry at Princeton.

Prior to his work with cortisone Kendall had isolated the active constituent (thyroxin) of the thyroid gland and had crystallized glutathione and established its chemical nature. From the thyroid gland he turned his attention to the adrenal cortex, and in 1948 he achieved partial synthesis of the adrenal hormone cortisone. Another of his products from the adrenal cortex was hydrocortisone. For their work in isolating cortisone and applying it clinically in the treatment of rheumatoid arthritis, Kendall and Hench received the Nobel prize in physiology and medicine in 1950, jointly with Tadeusz Reichstein (*q.v.*) of Switzerland. See also ADRENAL GLANDS; HORMONES. (J. R. EN,; X.)

KENDALL, (THOMAS) HENRY (CLARENCE) (1839–1882), one of the first Australian poets to find inspiration in his country's landscape, was born at Kirmington, New South Wales, April 18, 1839, and baptized Thomas Henry, but seems to have later taken the name Clarence. He began to publish poems in 1857 and his first collection appeared in 1862. He entered the civil service in 1863, and was transferred to the colonial secretary's office in 1866 through the interest of Henry Parkes (*q.v.*), a lifelong friend. After Parkes lost office, Kendall moved to Melbourne to make his living by writing. He struggled against poverty and alcoholism, but after a period of homeless wandering (1872–73) and breakdown began to succeed. In 1881 he became inspector of forests but died at Sydney, Aug. 1, 1882.

Leaves from an Australian Forest (1869) and Songs from the Mountains (1880) contain his best work: despite unevenness, it sometimes achieves high lyrical quality. His poems were edited with introduction by P. J. Holdsworth (1886); selections were edited by T. Inglis Moore (1957). (C. M. H. C.)

KENILWORTH, an ancient town and urban district in the Warwick and Leamington parliamentary division of Warwickshire, Eng., on a tributary of the Avon 5 mi. N. of Warwick and 6 mi. S.S.W. of Coventry by road. Pop. (1951) 10,741. Area 9.3 sq.mi. The town is famous for the ruins of its castle, begun in the 12th century, whose walls originally enclosed an area of seven acres. The 16th-century gatehouse is now used as a dwelling house; Caesar's tower in the keep, the only portion built by Geoffrey de Clinton in the 12th century and still extant, has walls 16 ft. thick. Remains of the outer walls with four towers, the great hall built by John of Gaunt, and the Leycester buildings, added for domestic purposes by Robert Dudley, earl of Leicester, who also built the gatehouse, also survive. Sir Walter Scott's novel Kenilworth describes the castle in the time of Elizabeth I. Near the castle are the ruins of an Augustinian priory founded in 1122 and afterward made an abbey. The Norman doorway of St. Nicholas' church is thought to have been the entrance of the former abbey church. The Abbey fields (60 ac.) are a public pleasure ground.

Kenilworth (Chinewrde in Domesday Book) was granted by Henry I to Geoffrey de Clinton, a Norman whose son probably built the castle and whose grandson released his right to King John. The castle remained with the crown until Henry III granted it to Simon de Montfort, earl of Leicester, then governor. The "Dictum of Kenilworth" was proclaimed there in 1266. After the battle of Evesham the rebel forces rallied at the castle, which after a siege of six months was surrendered. It was in the great hall that Edward II was made to resign the crown in 1327. Through John of Gaunt the castle came to Henry IV and remained in royal hands until granted by Elizabeth I in 1562 to Robert Dudley; on his death in 1588 it again reverted to the crown. Later it was held by the Careys and the Hydes. During the civil wars the castle was dismantled by the soldiers of Oliver Cromwell and from that time abandoned. It was given to the nation by Lord Kenilworth in 1937. The only mentions of Kenilworth as a borough occur in a charter of Henry I to Geoffrey de Clinton and in the charters of Henry I and Henry II to the church of St. Mary of Kenilworth. The chief local industry is agriculture, especially market gardening on the loamy soil, and there is some light engineering which superseded the 19th-century manufactures of horn combs, salts, Prussian blue and leather.

KENITES, a clan closely related to the Midianites and Amalekites (*qq.v.*), frequently mentioned in the biblical narratives about the early history of Israel. The name was derived from Cain, whose descendants they were believed to be (Gen. iv). Since small deposits of copper and iron ore occur in the area south of the Dead sea, it is probable that Israelite traditions connected them with the archaeologically attested metalworking in that area.

Egyptian reliefs of the 19th century B.C. picture Asian nomads with blacksmiths' tools arriving in Egypt. It is probable that Kenites were a pariah people who eked out a livelihood as shepherds and traveling tinkers.

After Moses' murder of an Egyptian overseer, he took refuge with Reuel (or Jethro), "the priest of Midian," and married his daughter, Zipporah. Judg. i, 16 identifies the father-in-law of Moses as a Kenite (see Ex. ii, 11–22; iii, 1). Jethro subsequently established peaceful relationships with the Israelites, and suggested a legal organization which Moses accepted (EX. xviii).

Kenites accompanied the Israelites in the desert (Num. x, 29–32), but refused to join them in the occupation of Palestine.

Judeans, Amalekites and Canaanites had Kenites living in their midst (Judg. i, 16; I Sam. xv. 6; Judg. iv, 11, 17).

In view of the close relationship indicated, suggestions have been made that Yahweh, the God of Israel, was originally the Kenite tribal deity, but this is highly speculative. It is possible that the narrative about Cain in Gen. iv indicates a tradition that the Kenites were under the protection of Yahweh. though not under Israelite religious law.

By the time of David, Kenites seem to be almost a part of Judah (I Sam. xxvii, 10; xxx, 29), and in subsequent history disappear entirely, though I Chron. ii, 55 seems to connect them with the Rechabites (*q.v.*). (G. E. ME.)

KENMURE, WILLIAM GORDON, 6TH VISCOUNT (d. 1716), Jacobite leader, son of Alexander, 5th viscount (d 1698), was descended from the same family as Sir John Gordon of Lochinvar (d. 1604), whose grandson, Sir John Gordon (d. 1634), was created Viscount Kenmure in 1633 The family had generally adhered to the Presbyterian cause, but Robert, the 4th viscount, had been excepted from the amnesty granted to the Scottish royalists in 1654, and the 5th viscount. who succeeded his kinsman Robert in 1663, after some vacillation, joined the court of the exiled Stuarts. The 6th viscount's adherence to the Pretender in 1715 is said to have been attributable to his wife, Mary Dalzell (d. 1776), sister of Robert, 6th earl of Carnwath.

The 6th earl raised the royal standard of Scotland at Lochmaben on Oct. 12, 1715, and was joined by about zoo men. This small force received some additions before Kenmure reached Hawick, where he learned the news of the English rising. He effected a junction with Thomas Forster and James Radclyffe, 3rd earl of Derwentwater, at Rothbury. Their united forces of about 1,400 men were reinforced at Kelso by a brigade under William Mackintosh. Threatened by an English army under Gen. George Carpenter, they eventually crossed the English border to join the Lancashire Jacobites, and the command was taken over by Forster. Kenmure was taken prisoner at Preston on Nov. 14. In Jan 1716 he was tried with other Jacobites before the house of lords, when he pleaded guilty and appealed to the king's mercy. At his execution on Tower hill on Feb. 24 he reiterated his belief in the claims of the Pretender. His estates and titles were forfeited, but in 1824 an act of parliament repealed the forfeiture, and his descendant, John Gordon (1750–1840), became Viscount Kenmure. On the death of the succeeding peer, Adam, 8th viscount, without issue in 1847, the title became dormant.

KENNEDY, the name of a famous and powerful Scottish family long settled in Ayrshire, derived probably from the name Kenneth. John Kennedy of Dunure obtained Cassillis and other lands in Ayrshire about 1350. John's descendant, Sir James Kennedy, married Mary, a daughter of King Robert III, and their son, Sir Gilbert Kennedy, was created Lord Kennedy before 1458. Another son was James Kennedy (c. 1406–65), bishop of St. Andrews, who founded and endowed St. Salvator's college at St. Andrews and built a large and famous ship called the "St. Salvator."

One of Gilbert Kennedy's sons was the poet Walter Kennedy (*q.v.*), and his grandson David, 3rd Lord Kennedy (killed at Flodden, 1513), was created earl of Cassillis before 1510; David's sister Janet Kennedy was one of the mistresses of James IV. The earl was succeeded by his son Gilbert, who was killed at Prestuick (Dec. 22, 1527). His son Gilbert, the 3rd earl (c. 1517–58), was educated by George Buchanan, and was a prisoner in England after the rout of Solway Moss in 1542. He was lord high treasurer of Scotland from 1554 to 1558, although he had been intriguing with the English and had offered to kill Cardinal Beaton in the interests of Henry VIII. He died at Dieppe late in 1558 when returning from Paris, where he had attended the marriage of Mary Queen of Scots and the dauphin of France. He was the father of the "king of Carrick" and the brother of Quintin Kennedy (1520–64), abbot of Crossraguel. The abbot wrote several works defending the doctrines of the Roman Catholic Church, and in 1562 had a public discussion with John Knox at Maypole. He died on Aug. 22, 1564.

Gilbert Kennedy, 4th earl of Cassillis (c. 1541–76), called the "king of Carrick," became a Protestant, but fought for Queen Mary at Langside in 1568. He tortured Allan Stewart, the commendator abbot of Crossraguel, in 1570 in order to compel him to renounce his title to the abbey lands which had been seized by Cassillis. John. 6th earl (c. 1595–1668), was one of the leaders of the Scots in their resistance to Charles I. In 1643 he went to the Westminster assembly of divines, and several times he was sent on missions to Charles I and to Charles II; for a time he was lord justice general, and he was a member of Cromwell's house of lords. His granddaughter Margaret married Gilbert Burnet, afterward bishop of Salisbury. The direct line failed with the death of John, the 8th earl, in Aug. 1759.

The titles and estates of the Kennedys were then claimed by William Douglas. afterward duke of Queensberry, a great-grandson in the female line of the 7th earl, and also by Sir Thomas Kennedy, Bart., of Culzean. a descendant of the 3rd earl; *i e.*, by the heir general and the heir male. In Jan. 1762 the house of lords decided in favour of the heir male. The 10th earl died unmarried, and the earldom then passed to a branch of the family settled in America. Archibald, the 12th earl, was created marquess of Ailsa in 1831.

See R. Pitcairn, *Historical and Genealogical Account of the Principal Families of the Name of Kennedy* (1830).

KENNEDY, SIR ALEXANDER BLACKIE WILLIAM (1847–1928), British engineer, was born at Stepney on March 17, 1847, and educated at the City of London school and the School of Mines. About 1863 he became a pupil at Dugeon's, Millwall, marine engineers, who were constructing the earliest twin-screw engines. Kennedy took a large part in designing the first compound marine engines built on the Tyne, but by the time he went to Palmer's engine works at Jarrow-on-Tyne as a draftsman (1868) the types were already beginning to be standardized. After a few years at Leith, Edinburgh and Glasgow, he was appointed, in 1874, professor of engineering at University college, London. His leading methods. founded on Reuleaux's kinematic analysis, had a wide influence in England and America. He translated Reuleaux's *Kinematics* (1876) and *The Mechanics of Machinery* (1886). In 1887 he was elected F.R S. In 1889 he set up in practice as an electrical engineer, supervising the construction of power stations in London, Edinburgh. Glasgow and elsewhere. He applied the underground conduit system to part of the London County council tramway service, and he acted as electric adviser to many companies. Kennedy was knighted in 1905. In 1913 he was a member of Lord Parker's committee on uireless telegraphy. During World War I he presided over the committee on gun sights and range finders, and took active part on other similar bodies. He published in 1921 a book, illustrated by his own photographs, entitled *Ypres to Verdun*. In 1920 he was chairman of the electric railways committee set up by the ministry of transport.

At the age of 75, in 1922, he set out to explore Petra, publishing the results of his work in an admirable monograph, *Petm: Its History and Monuments* (1925). His book was also illustrated by his excellent photographs He died on Nov. 1, 1928.

KENNEDY, BENJAMIN HALL (1804–1889), English scholar, was born at Summer Hill, near Birmingham, Nov. 6. 1804. He was elected fellow and classical lecturer of St. John's college, Cambridge, in 1828. From 1836 to 1866 he was headmaster of Shrewsbury. In 1867 he was elected regius professor of Greek at Cambridge and canon of Ely. From 1870 to 1880 he was a member of the committee for the revision of the New Testament. He died near Torquay April 6, 1889. A Latin professorship at Cambridge was founded in memory of him.

Kennedy's chief works, besides his *Latin Primer* and *Public School Latin Grammar,* are: Sophocles, *Oedipus Tyrannus* (1885); Aristophanes, *Birds* (1874); Aeschylus, *Agamemnon* (1882), with introduction. metrical translation and notes; a commentary on Virgil (1881); and a translation of Plato. *Z'heaetetus* (1881). He contributed largely to the collection known as *Sabrinae Corolla,* and published a collection of verse in Greek. Latin and English under the title *Between Whiles* (1882).

His brother CHARLES RANN KENNEDY (1808–67) became a

barrister. From 1849 to 1856 he was professor of law at Queen's college. Birmingham. In the celebrated will case *Swinfen* v. *Swinfen* (1856) he brought an action for remuneration for professional services, but the verdict given in his favour was set aside by the court of common pleas. Kennedy died in Birmingham Dec. 17, 1867.

C. R. Kennedy's works include a translation of the orations of Demosthenes, in Bohn's Classical Library (1852–63), and a blank verse translation of Virgil (1861), besides *New Rules for Pleading* (1841) and *A Treatise on Annuities* (1846).

Another brother, REV. WILLIAM JAMES KENNEDY (1814–91), was a prominent educationalist and the father of Lord Justice Sir William Rann Kennedy (1846–1915), himself a distinguished Cambridge scholar.

KENNEDY, JOHN FITZGERALD (1917–), 35th president of the United States who became the youngest man in U.S. history and the first member of the Roman Catholic faith to be elected to that office, mas born on May 29, 1917, in Brookline, Mass., a suburb of Boston. Kennedy served six years in the U.S. house of representatives and eight years in the senate before running for the presidency.

Kennedy was descended from immigrants who left Ireland a century before when that country was racked by the potato blight and other economic ills. His great-grandfather, Patrick Kennedy, emigrated from New Ross in Ireland about 1850 and settled in East Boston. Patrick became the father of four children, the youngest of whom, Patrick J. Kennedy, entered the liquor trade, started a saloon and then branched out into Democratic party politics at a time when the Irish were beginning to gain control of the political life of Boston. More successful in Boston politics was another son of Irish immigrants, John F. Fitzgerald, who steadily climbed the local political ladder from city councilman to member of congress, ultimately winning election as mayor of Boston. The two men, often allied politically, were further united in 1914 when Kennedy's eldest son, Joseph P., married Fitzgerald's daughter, Rose. The couple had nine children, the second of whom was named John Fitzgerald Kennedy.

Joseph P. Kennedy, the father of the future president, was a man of great vigour and drive. Graduating from Harvard in 1912, he decided against a political career and instead entered banking. During the 1920s he made a large fortune in the motion-picture industry, real estate and other activities. Always somewhat hostile to the conservative Republicans who dominated Massachusetts politics and business and who often ostracized Irish Catholics, Kennedy increasingly operated outside Boston, chiefly in New York and California. He supported Franklin D. Roosevelt's candidacy for president in 1932 and later served in important posts in the New Deal. In 1937 he was appointed ambassador to Great Britain.

John Kennedy began life in a lower middle-class section of Boston and gradually moved to more substantial homes in the Boston and New York city areas as his father prospered. He grew up in a happy, lively family, supervised by maids and nurses, with more and more young sisters and brothers to play with. He first attended local private schools; at the age of 13 he left home for Canterbury, New Milford, Conn., a Catholic boarding school taught by laymen. After a year at Canterbury he went to a nonsectarian school, Choate, in Wallingford, Conn. He was a normal youngster, enjoying a variety of sports, occasionally getting into small mischief and continually being urged by his father to work harder and to improve his grades. At 18 he entered Princeton but his freshman year was cut short by illness, and the following autumn he transferred to Harvard.

In his first two years at Harvard Kennedy was more interested in athletics than in his classes, but in the last two years he seemed to grow intellectually. He received better grades, took part in university club activities and as a major in government became absorbed in an undergraduate thesis on the failings of British foreign policy in the 1930s. Several things may account for the trend of Kennedy's interests at Harvard. His father had long impressed upon him the importance of history and politics by discussing current affairs at the dinner table. Too, Kennedy had done a great deal of traveling during his school and college years, culminating early in 1939 in living at the U.S. embassy in London, where he could watch the darkening war clouds at first hand, and in a long trip through eastern Europe, Russia and the near east. Finally, he was subjected to the influence of some of the leading historians and political scientists at Harvard, most of them internationally minded, at a time when Nazi aggression was forcing young men throughout the world to turn from their personal concerns to the threat of Hitlerism. Kennedy's studies and observations came to a focus his senior year in his thesis, which described Britain's slow response to German rearmament as due to the narrow self-interest of business and labour, the influence of pacifism and the excessive economizing of government budget-balancers. Shortly after the fall of France in 1940 this thesis was published in Britain and the United States as a book, Why *England Slept*, and became a best seller in both countries.

Graduating *cum laude* from Harvard in June 1940, Kennedy attended Stanford university, Stanford, Calif., graduate school of business for a few months and traveled in South America. Late in 1941 he enlisted in the U.S. navy and, as commander of a motor torpedo (PT) boat, took part in operations against the Japanese navy in the Solomon Islands in the southwest Pacific. In this area in Aug. 1943 a Japanese destroyer rammed and sank his PT boat. Kennedy and the other survivors, after a desperate swim of three miles, managed to find refuge on a small, unoccupied island, from which they were rescued several days later by friendly natives. Awarded the navy and marine corps medal and the Purple Heart, Kennedy was invalided home as a result of his injuries and a subsequent attack of malaria.

Discharged from the navy in April 1945, Kennedy had still not decided upon a career. It had been generally assumed that his older brother, Joseph P. Kennedy, Jr., would enter politics, but Joseph, a naval pilot, was killed in 1944 in an attack against German submarine pens on the Belgian coast. It was partly because of this loss that John decided on a political career. He entered political life in East Boston, where his grandfathers had been active several decades before. Early in 1946 he announced his candidacy for the Democratic nomination for congress in the 11th congressional district, a water-front area populated largely by immigrants. Backed by navy and Harvard friends, Kennedy campaigned so long and so hard that he readily defeated the veteran city politicians seeking the Democratic nomination, and he went on to vanquish his Republican opponent without difficulty in this heavily Democratic area.

Kennedy entered the house of representatives in Jan. 1947 at a time when the house was Republican for the first time in 16 years. He was only 29 years old. Representing a low-income district, from the first he supported the New Deal-Fair Deal social welfare policies of Pres. Harry S. Truman. Both in Washington and in his district he fought for public housing programs, higher federal minimum wage levels, broadened social security programs and protection for labour's right to organize. On foreign policy, however, he took a position somewhat independent of President Truman. He backed the Truman doctrine for financial and military aid to Greece and Turkey, as well as the Marshall plan authorizing aid to western Europe, but he also criticized what he felt to be Truman's indecisive interference in China, without, however, making clear just what alternative policy he favoured. He based his views not so much on an isolationist philosophy as on the belief that the European nations should make a greater contribution to recovery and defense than they were doing. During these first years in congress, however, Kennedy was less concerned about domestic and foreign policy than he was about servicing the special needs of people in his district.

So vigorous was the young congressman in his legislative and district activities that he easily won renomination and re-election to his house seat in 1948 and 1950. He felt rather limited in the lower chamber, hbwever, and he decided to run in 1952 against Republican Sen. Henry Cabot Lodge for the latter's seat in the U.S. senate. It was a daring step, for he was not well known outside the Boston area, and Lodge was a formidable campaigner. But Kenpedy entered the contest early, campaigned day after day for many months, enlisted the help of thousands of volunteers

throughout the state, including his own large and personable family and narrowly defeated Lodge in Nov. 1952. He won in the face of a heavy vote for Dwight D. Eisenhower for president in Massachusetts and in the nation.

During his early years in the senate Kennedy followed much the same legislative course as he had in the house. He paid special attention to the interests of textile workers, longshoremen, fishermen and other major groups in Massachusetts; as a member of the senate committee on education and public welfare he worked hard on social and economic legislation; and he continued to keep in close touch with his Massachusetts constituents. In Sept. 1953 he married Jacqueline Lee Bouvier, of a wealthy Rhode Island family. The following year the senator was compelled to enter the hospital for treatment of a war-aggravated spinal disorder that had been giving him increasing pain. Surviving two dangerous operations, Kennedy was laid up for over six months. During his convalescence he wrote *Profiles* in *Courage* (1956), a study of American politicians who had shown exemplary political courage in taking positions that were unpopular with their constituents. Kennedy contended that in choosing legislators the voters consciously wanted leaders who would not simply work for the voters' narrow interests but who would rather do the right thing for the nation's long-term good. The book sold widely and was awarded the Pulitzer prize for biography in 1957.

Recovering from his illness by the spring of 1955. Kennedy, like the politicians he described in his book, seemed to become more concerned with problems of the nation and the world and less preoccupied by state and sectional matters. Some of his critics, however, contended that Kennedy lacked the courage of the heroes of his book. They cited in particular his failure to take a position on a motion before the senate to censure Sen. Joseph R. McCarthy of Wisconsin for certain activities that were deemed harmful to the dignity of the senate. Actually, Kennedy had been prepared to speak and vote for censure, but he was in the hospital with his back injury when the vote finally was taken. For some time afterward the senator refused to state how he would have voted, but eventually he went on record retroactively as favouring the censure motion.

Kennedy's entrance onto the national political scene came in Aug. 1956 shortly after Adlai E. Stevenson was nominated for the second time to run against President Eisenhower. When Stevenson decided to throw the choice of his running mate open to the delegates instead of making it himself, Kennedy, who had been conducting a halfhearted campaign, redoubled his efforts. In a contest witnessed by millions of television viewers, Kennedy almost won the vice-presidential nomination, only to be defeated by a fellow senator, Estes Kefauver of Tennessee.

Not long after the defeat of Stevenson and Kefauver by Eisenhower and his running mate, Richard M. Nixon, Kennedy decided to run for the presidency in 1960. Once again he used his tested formula of starting early and campaigning hard. Each weekend after the senate completed its deliberations he flew to some city to make appearances. Even during his campaign for re-election as senator from Massachusetts in 1958, which he won by 874,608 votes (the largest margin ever accorded to any candidate in either party in Massachusetts), he found time to stump for Democratic candidates in other states. Kennedy did a great deal of writing for magazines and newspapers; countless articles were written about him as an unusually young and vigorous candidate; and pictures of his attractive wife and himself appeared on the covers of popular periodicals. He also drew special notice because of his Catholicism. The only previous major party Catholic nominee, Alfred E. Smith, had been defeated in 1928, and there was wide speculation that Kennedy's religion was an insurmountable barrier to his nomination and election as president. Although Kennedy's candidacy was unannounced, it was plain for all to see; between 1956 and 1960 he became one of the best-known political figures in the United States.

In the senate during this period, Kennedy took an increasingly liberal and internationalist position. While continuing to back expanded social welfare programs, he spoke up more strongly in favour of civil rights and individual liberty. In 1957 he supported a civil rights bill that would authorize the federal government to enforce the racial desegregation of all-white schools. He urged the repeal of provisions requiring certain persons seeking federal aid or services to sign noncommunist affidavits. He also showed himself to be something of a traditionalist as to procedure; for example, he aroused the opposition of some civil rights supporters when he refused to vote to enable the bill to bypass an anti-civil rights senate committee, and again when he supported an amendment to the civil rights bill requiring jury trials in certain criminal contempt cases.

Kennedy was especially active and articulate in foreign policy during these years. He adhered sufficiently to the Democratic party foreign policy line to gain a position on the senate committee on foreign relations; he supported foreign economic and military programs; and like other Democrats he urged the expansion of aid programs in the underdeveloped nations of Asia, Africa and South America. On other matters he followed a more independent course. Perhaps the most notable example was his speech to the senate criticizing French policy in Algeria and urging, in effect, that the French grant independence to the Algerians—a speech received with dismay by leading Democrats as well as by Republicans. The Massachusetts senator showed a particular interest in the intensifying problems of Asia and Africa. He urged that the United States grant extensive economic aid, especially to India, as a means of demonstrating that democratic societies could develop their economies more effectively and humanely than could communist nations. Other important foreign policies favoured by Kennedy included: development of closer economic and cultural relations with Poland and other communist satellite nations, more emphasis on the UN and other world agencies for administering aid programs in underdeveloped nations and more generous economic aid to Latin America. On the issue of negotiating with the Russians he contended that the U.S. must negotiate with Moscow but could do so effectively only from a position of economic, military, technological and educational strength.

By the time Kennedy formally announced his candidacy for the Democratic nomination for president, in Jan. 1960, he had become the acknowledged front-runner among the several aspirants. He never lost his leading position. He won all the presidential primary contests in which his name was entered, and gained the endorsement of many state conventions. His selection on the first ballot of the Democratic national convention in Los Angeles in July 1960 testified to the enormous work that Kennedy and his workers had accomplished in four years, to his arresting political personality and to the tremendous publicity he had won in magazines and newspapers. Above all, his nomination was a tribute to his ability at political organization—an ability that was soon tested in a broader arena. In the presidential campaign Kennedy benefited from the wider popularity of the Democratic party and from the aid of thousands of political volunteers. In the Nov. 8 election. Kennedy won a plurality of fewer than 150,000 of the nearly 70,000.000 popular votes cast. He carried most of the traditionally Democratic southern states and most northern industrial areas but lost nearly all the western states. In the electoral college he received 303 votes to 219 for Republican Richard M. Nixon. Sen. Harry F. Byrd of Virginia, who had not been a candidate in the election, received 15 electoral votes. Kennedy was inaugurated on Jan. 20, 1961.

BIBLIOGRAPHY.—Most of Kennedy's speeches will be found in the *Congresstonal Record* (1947–60). Allan Nevins (ed.), *The Strategy of Peace* (1960) is a collection of his major foreign-policy pronouncements; James M. Burns, *John Kennedy: a Political Profile* (1960), covers his life through 1959; Joseph McCarthy, *The Remarkable Kennedys* (1960) deals with the whole family. (J. MACG. B.)

KENNEDY, JOHN PENDLETON (1795–1870), **U.S.** author and statesman, was born in Baltimore, Md., on Oct. 25, 1795, the son of a prosperous merchant. He attended Sinclair's academy and Baltimore college, graduating from the latter in 1812. In 1816 he was admitted to the bar and entered law practice. He was never fond of the law, however, and several years later, when he attained some financial independence through a legacy, he began gradually withdrawing from practice. In 1832 *Swallow Barn*, a group of charming sketches of Virginia life, was published. This

was followed by *Horse-Shoe Robinson* (1835), a novel of the Revolutionary War; *Rob of the Bowl* (1838), a novel of colonial Maryland; *Quodlibet* (1840), a lively political satire; and *Memoirs of the Life of William Wirt* (1842). He also wrote many pamphlets and newspaper articles and was active in politics for many years.

Kennedy entered the house of re'presentatives in 1838 and was twice re-elected. In 1852 he was secretary of the navy under Pres. Millard Fillmore but left political office permanently the next year. He died on Aug. 18, 1870.

See H. T. Tuckerman, *The Life of John P. Kennedy* (1871); E. M. Gwathmey, *John P. Kennedy* (1931).

KENNEDY, WALTER (*c.* 1460–*c.* 1508), Scottish poet, was the third son of Gilbert. 1st Lord Kennedy, of Dunure. in Ayrshire. He took his B.A. degree at Glasgow university in 1476, his M.A. degree in 1478, and in 1481 he was nominated one of the examiners for the faculty. The Kennedys of Dunure were hereditary bailies of Carrick. and Walter seems to have acted as deputy for Lord Kennedy in 1491. He is best known for his share in *The Flyting of Dunbar and Kennedie,* in which he and the poet William Dunbar (*q.v.*) abused each other. Since this combat of wits is in a traditional form, there is no need to take their accusations literally; the poem expresses the antagonism between the "English" of the Lothians and the "Irish" (*i.e.,* Gaelic), at that time the language not only of the Highlands but also of Ayrshire and the southwest. Dunbar taunts his rival with his "Erse" speech, while Kennedy defends Gaelic literature. Kennedy's poems were praised by his contemporaries; the surviving ones are chiefly religious.

See J. Schipper, *Poems of Walter Kennedy,* with introduction, life and bibliography (Leipzig, Vienna, 1902); W. Mackay Mackenzie (ed.), *The Poems* of *William Dunbar* (Edinburgh, 1932); J. W. Baxter, *William Dunbar* (Edinburgh, 1952). (M. J. C. H.)

KENNEL, a small hut for a dog; also a group of buildings for a pack of hounds (*see* DOG) (*cf.* French *chenil,* from popular Latin *canile,* "place for a dog," *canis*). The word "kennel." a gutter in a street, is a corruption of the M.E. *canel, cannel,* in modern English "channel."

KENNETH, the name of two kings of the Scots.

KENNETH I, MACALPIN (d. *c.* 860), often described as the first king of Scotland (kingdom of Scone), was the son of Alpin, called king of the Scots, a descendant of Conall Gabhrain of the old Dabriadic Scottish kingdom. His father was slain in 832 or 834. while endeavouring to assert his claim to the Pictish throne, and Kenneth is said to have succeeded him in the kingdom of the Scots. The region of his rule is a matter of conjecture. though Galloway seems the most probable suggestion, in which case he probably led a piratic host against the Picts. Their chief support seems to have been found in Fife. In 841 he took advantage of a Danish invasion of the Pictish kingdom to attack the remaining Picts, whom he finally subdued in 846. He is said also to have carried out six invasions of Northumbria, in the course of which he burned Dunbar and took Melrose. According to the *Scalacronica* of Sir Thomas Gray he drove the Angles and Britons over the Tweed, reduced the land as far as that river. and first called his kingdom Scotland. He died in 860 at Forteviot.

KENNETH II (d. 995), son of Malcolm I. king of Alban, succeeded Cuilean, son of Indulph, who was slain by the Britons of Strathclyde in 971 in Lothian. Kenneth began his reign by ravaging the British kingdom. Soon afterward he attacked Eadulf, earl of the northern half of Northumbria. and ravaged the whole of his territory. He fortified the fords of the Forth and again invaded Northumbria, carrying off the earl's son. About this time he gave the city of Brechin to the church. In 9j7 he is said to have slain Amlaiph or Olaf, son of Indulph, king of Alban, perhaps a rival claimant to the throne. According to the English chroniclers, Kenneth paid homage to King Edgar for the cession of Lothian, but these statements are probably attributable to the controversy as to the position of Scotland.

Kenneth's chiefs were continually engaged in a contest with Sigurd the Norwegian, earl of Orkney, for the possession of Caithness and the district of Scotland north of the Spey, but the Scots attained no permanent success. The central districts of Scotland. however. were consolidated during his reign. In 995 Kenneth was slain treacherously by his own subjects. according to the later chroniclers at Fettercairn in the Mearns through an intrigue of Fenella, daughter of Cunchar, a mormaor of the earl of Angus. He was buried at Iona.

See *Chronicles of the Picts and Scots,* ed. by *W.* F. Skene (Edinburgh, 1867); W. F. Skene. *Celtic Scotland* (Edinburgh, 1876).

KENNETT, WHITE (1660–1728), English bishop and antiquary, was born at Dover and was educated at Westminster school and at St. Edmund's hall. Oxford. where as tutor and vice-principal he gave considerable impetus to the study of antiquities. He became rector of St. Botolph's, Aldgate. London (1700), archdeacon of Huntingdon (1701), dean of Peterborough (1707) and bishop of Peterborough (1; 18). He joined the Low Church party, opposed the Sacheverell movement, and in the Bangorian controversy supported with zeal and considerable bitterness the side of Bishop Hoadly. He died at Westminster in Dec. 1728.

Kennett wrote the third volume (Charles I–Anne) of the composite *Compleat History of England* (1706), and a more detailed and valuable *Register and Chronicle* of the Restoration. He was one of the founders of the Society for the Propagation of the Gospel in Foreign Parts.

BIBLIOGRAPHY.—W. Newton, *Life of Bishop White Kennett* (1730); J. Nichols, *Literary Anecdotes of the Eighteenth Century,* 9 vol. (1812–15); I. Disraeli, *Calamities of Authors,* 2 vol. (1812), new ed. by the earl of Beaconsfield (1881).

KENNEY, GEORGE CHURCHILL (1889–), U.S. air force officer. commander of the Allied air war against Japan in the southwest Pacific. was born in Uarmouth, Nova Scotia, Aug. 6, 1889. He flew with the U.S. air service in France during World War I and distinguished himself as a combat pilot. In the years between World Wars I and II, he held a variety of staff and command positions in the U.S. army air corps. From July 1942 until the end of World War II he led the Allied air forces in the southwest Pacific, including the U.S. far east air forces, which he also commanded, in the campaigns that reconquered New Guinea and the Philippines from the Japanese.

Kenney's daring tactical and technical innovations, including skip bombing and low-level bombing, played an important part in many brilliant offensive actions: of which the battle of the Bismarck sea in March 1943 was perhaps best known.

After the war he became the first commander of the U.S. strategic air command. Kenney retired, as general, in Aug. 1951. (A. GG.)

KENNICBTT, BENJAMIN (1718–1783), English divine and Hebrew scholar, was born at Totnes. Devonshire. on April 4, 1718 He studied at Wadham college, Oxford, where he distinguished himself in Hebrew and divinity. In 1747 he was elected fellow of Exeter college and in 1767 keeper of the Radcliffe library. He was also canon of Christ Church (1770) and rector of Culham (1753), Oxfordshire. He died at Oxford on Sept. 18, 1783.

KENNINGTON, a district in the south of London, Eng., within the borough of Lambeth. It is an overcrowded area containing, however. Kennington Oval, the ground of the Surrey County Cricket club; and Kennington park, anciently the common, the site of a gallows until the end of the 18th century and meeting place of the Chartist demonstrators in 1848. No trace remains of the ancient royal palace of Kennington where the Black Prince is supposed to have lived. Viscount Montgomery of Alamein was born in St. Mark's vicarage in 1887.

KENO: *see* BINGO.

KENORA, a town and port in Ontario. Can., and chief town of Kenora district! situated at an altitude of 1.087 ft. Pop. (1956) 10,278. It is 125 mi. E. of Winnipeg, on the main line of the Canadian Pacific railway, and at the outlet of the Lake of the Woods. It is connected by motor highway with Minnesota and by air lines with the northern gold fields. The Winnipeg river has at this point a fall of 16 ft., which, with the lake as a reservoir, furnishes abundant water power.

The industrial establishments comprise reduction works, saw-

mills and flourmills, one of the latter being the largest in Canada. It is the distributing point for the gold mines of the district. and during the summer months steamboat communication is maintained on the lake.

There is important commercial fishing and an extensive tourist industry.

KENOSHA, a city of southeastern Wisconsin, U.S., situated on Lake Michigan at the estuary of the Pike river, about 30 mi. S. of Milwaukee; the seat of Kenosha county. The city was founded in 1835 at the time of the first main American settlement of southeastern Wisconsin.

The population was mainly of New England and New York derivation. After being known both as Pike Creek village and Southport, it was incorporated as a city with the name Kenosha (an Indian word meaning "pike" or "pickerel") in 1850, by which time about one-third of its population of 3.448 was foreign born. One hundred years later its population had grown to 54,368 and in 1960 it was 66,381. The population of the Kenosha standard metropolitan statistical area (Kenosha county) in 1960 was 98,-327. Most of its relatively large foreign-born population came from Italy, Germany, Poland, Lithuania, Russia. Denmark and Czechoslovakia.

Kenosha in the 1840s pioneered in creating the first effective free public-school system in Wisconsin, and it mas the first Wisconsin city to adopt the council-manager form of government, in effect from 1922 to 1958.

The city is an important industrial centre, producing automobiles, furniture, mattresses. hosiery, tools and brass, copper and various other metal products. Three-fourths of all wage earners in the city work in manufacturing plants. The city is the location of an extension centre of the University of Wisconsin. It has a pleasant location overlooking Lake Michigan and possesses a fine city centre and a substantial recreational area. For comparative population figures see table in WISCONSIN: Population. (RE. H.)

KENSETT, JOHN FREDERICK (1816–1872), U.S. painter of the Hudson river school, who established a reputation as one of the country's leading landscape painters. was born on March 22. 1816. at Cheshire, Conn. He was trained as an engraver by his father. Thomas Kensett, and his uncle Alfred Daggett of New Haven. Conn. In 1838 he went to New York city to work for a bank note company; but tno years later, in company with Asher B. Durand. John W. Casilear and Thomas P Rossiter. he went to Europe to study painting. He remained abroad for seven years, traveling and studying in England, France, Germany and Italy. Returning to America in 1847, he nas elected to the National Academy in 1849. He made his home in New York city but spent much time on painting trips to the mountains of New York and New England, the New England coast and once as far afield as Colorado. He died in New York city on Dec. 14, 1872. The contents of his studio were sold at auction soon after his death for $150,-ooo. Many of his works are in the Metropolitan museum, New York city.

See F. A. Sweet, *Hudson River School and the Early American Landscape Tradition* (1945) (*D. H* W)

KENSINGTON, a western metropolitan borough of London, Eng.. bounded northeast by Paddington. east by the city of Westminster, southeast by Chelsea. southnest by Fulham, northwest by Hainmersmith and extending north to the boundary of the county of London. Pop. (1951) 168,160. Area 3.6 sq.mi. By grant of Edward VII in 1901 it is known as the royal borough of Kensington. It includes the districts of Kensal Green (partly) in the north, Notting Hill in the north-central portion, Earl's Court in the southwest and Brompton in the southeast. A considerable area adjoining Brompton is called South Kensington: but the area known as West Kensington is nithin the borough of Fulham. Kensington High street is a well-known shopping centre.

The name appears early as Chenesitun and Kenesitune. and has been connected with a Saxon royal residence (King's Town), a family of the name of Chenesi and the word cam, meaning "wood." from the forest which originally covered the district and was still traceable in Tudor times. The most probable derivation, however, finds in the name a connection with the Saxon tribe or family of Kensings. The history of the manor is traceable from the time of Edward the Confessor, and after the Conquest it was held of the bishop of Coutances by Aubrey de Vere. Soon after it became the absolute property of the De Veres, subsequently earls of Oxford. The memory of the manorial courts is preserved in the name Earl's Court. There were also three submanors, one of which was given by the first Aubrey de Vere early in the 12th century to the abbot of Abingdon. whence the present parish church is called St. Mary Abbots In another, Knotting Barnes, the origin of the name Notting Hill is found.

The period of history for which Kensington is famous may be dated from the settlement of the court there by William III. A mansion on the west flank of the present Kensington gardens had been the seat of Sir Heneage Finch lord chancellor and afterward earl of Kottingham. It was known as Kottingham house. but when bought from the second earl by William (1689), who wished to avoid residing in London as he suffered from asthma, it became known as Kensington palace. The additions and alterations made by Christopher Wren resulted in a severely plain edifice of brick; the orangery. added in Queen Anne's time, is by the same architect. The palace is open to the public and since 1951 has been the temporary home of the London museum. It was damaged, but not seriously, in World War II.

Kensington square, south of High street in the vicinity of St. Mary Abbots church, still preserves some picturesque houses. Holland house was built by Sir Walter Cope, lord of the manor, in 1607. and obtained its present name on coming into the possession of Henry Rich. earl of Holland, through his marriage with Cope's daughter. Gen Thomas Fairfax and Gen. John Lambert are mentioned as occupants after his death, and later the property was let, William Penn of Pennsylvania being among those who leased it. Joseph Addison, marrying the widow of the 6th earl of Warwick, lived there until his death in 1719. During the tenancy of Henry Fox, third Baron Holland (1773–1840), the house gained a European reputation as a meeting place of statesmen and men of letters. Unfortunately this fine Jacobean mansion mas very badly damaged in World War II.

The parish church of St. Mary Abbots, High street (an ancient site), was built from the designs of Sir George Gilbert Scott in 1869 The Oratory of St. Philip Neri is a nell-known Roman Catholic church in Brompton road. South Kensington has become a great centre of museums and institutions of learning, with the British Museum of Natural History, the Victoria and Albert museum. the Geological museum. the Science museum and library, the Imperial institute nith its museum galleries (within the bounds of Westminster), the Imperial College of Science and Technology, the Royal College of Art, the house of the Royal Geographical society. the Royal Albert hall, etc. Kensington gardens, originally the private gardens of Kensington palace, were laid out in about 1725 with beautiful avenues of trees and a small ornamental lake known as the Round pond In 1954 the great elms along the Broad walk were cut down, having become unsafe. Among the statues is one of Peter Pan which stands on the west bank of the Serpentine. The gardens were the site of the Great exhibition of 1851. In Holland Park road is the house of Lord Leighton (d 1896), acquired by the borough in 1926 and open, with its art collection, to the public. Kensington is a bishopric suffragan in the diocese of London. The parliamentary borough of Kensington has north and south divisions, each returning one member.

KENT, EARLS AND DUKES OF. The first holder of the English earldom of Kent mas probably Odo, bishop of Bayeux (c. 1030–97), but he was deprived of the title in 1088. In the next century William de Ypres (d. 1165?) held most of the county for Stephen but without being called earl of Kent. The regent Hubert de Burgh obtained this honour in 1227. In 1321 it was revived in favour of Edmund Plantagenet. the youngest brother of Edward II Edmund (1301–30), who was born at Woodstock on Aug. 5, 1301, fought in Scotland and France and steadily supported his brother until 1326, nhen he joined Queen Isabella in France, returned with her and next year supported the deposition of Edward II Soon at variance with Queen Isabella and her

lover, Roger Mortimer, Edmund was involved in a conspiracy to restore Edward II. who he was led to believe was still alive; he was arrested. and beheaded on March 19, 1330. Although he had been condemned as a traitor his elder son, Edmund (c. 1326–31), was recognized as earl of Kent, the title passing on his death to his brother John (1330–52).

The Holand Earls.—After John's childless death the earldom appears to have been held by his sister Joan, "the fair maid of Kent," and in 1360 Joan's husband. Sir Thomas de Holand, or Holland, was summoned to parliament as earl of Kent. Holand. who was a soldier of some repute, died in Normandy on Dec. 26 or 28. 1360, and his widow married Edward the Black Prince. by whom she was the mother of Richard II. The next earl was Holand's eldest son, Thomas (1350–97), who was marshal of England from 1380 to 1385 and was in high favour with his half-brother, Richard II.

The 3rd earl of Kent of the Holand family was his son Thomas (c. 1371–1400). In Sept. 1397, a few months after becoming earl of Kent, Thomas was made duke of Surrey as a reward for assisting Richard II against the lords appellant (see ENGLISH HISTORY); but he was degraded from his dukedom in 1399 and was beheaded in January of the following year for conspiring against Henry IV. However. his brother Edmund (1383?–1408) was allowed to succeed to the earldom, which became extinct on his death in Brittany in Sept. 1408.

The **Nevilles.**—In 1461 the title was revived in favour of William, a younger son of Ralph Neville, 1st earl of Westmorland, and through his mother, Joan Beaufort, a grandson of John of Gaunt, duke of Lancaster. William (*c.* 1405–63), who held the barony of Fauconberg in right of his wife, Joan, fought for the Yorkists during the Wars of the Roses, and was chiefly responsible for the victory of Edward IV at Towton (March 1461); in November he was created earl of Kent and admiral of England. At his death the title became extinct. Neville's natural son Thomas. "the bastard of Fauconberg" (d. 1471), was a follower of Warwick, the "Kingmaker."

The Greys.—The long connection of the family of Grey with this title began in 1465, when Edmund. Lord Grey of Ruthin, was created earl of Kent. Edmund (1416–90) was the eldest son of Sir John Grey; his mother, Constance, was a daughter of John Holand, duke of Exeter. During the earlier part of the Wars of the Roses Grey fought for Henry VI; but by deserting the Lancastrians during the battle of Northampton in 1460 he gave the victory to the Yorkists. He was treasurer of England and held other high offices under Edward IV and Richard III. His son and successor. George, 2nd earl of Kent (d. 1503), also a soldier, married Anne Woodville, a sister of Edward IV's queen, Elizabeth, and was succeeded by his son Richard (c. 1478–1523). In 1j06 Henry. the 12th earl, was created earl of Harold and marquess of Kent, becoming duke of Kent four years later. His titles became extinct at his death in 1740.

Royal Dukes.—In 1799 Edward Augustus (1767–1820), fourth son of George III. was created duke of Kent and Strathearn by his father. He served in the British army in Korth America and elsewhere, becoming a field marshal in 1805. In 1818 he married Victoria Mary Louisa (1786–1861), widow of Emich Charles, prince of Leiningen (d. 1814), and sister of Leopold I, king of the Belgians; his only child was Queen Victoria (*q.v.*).

On Oct. 9, 1934, George Edward Alexander Edmund (1902–42), fourth son of George V, was created duke of Kent. In 1934 he married Marina (1906–). youngest daughter of Prince Nicolas of Greece. He was killed on Aug. 25, 1942, on military duty when an R.A.F. bomber crashed in Scotland. His son. Edward George Kicholas Paul Patrick (1935–), succeeded to the title.

See G. E. C.(okayne), *Complete Peerage,* vol. vii (London, 1929).

KENT, JAMES (1763–1847), U.S. jurist, whose decisions and written commentaries on U.S. law strongly influenced Anglo-American legal development, was born in Fredericksburgh, N.Y., July 31, 1763. On his graduation from Yale college in 1781 he studied law at Poughkeepsie, N.Y., where he practised from 1785 to 1793. In 1793 he moved to New York city, where in the same year he was made a professor of law at Columbia college through recognition of his ability by John Jay and Alexander Hamilton He lectured at Columbia until 1798. when he became a justice of the supreme court of New York. He became chief justice of this court in 1804 and chancellor of the New York court of chancery in 1814. a position he held until compulsory retirement in 1823. Kent's opinions appear in William Johnson's Reports *for* New York (1799–1823). Because Kent undertook to base all decisions possible on the learning of the old English common law, these reported cases were used as the basis of law in other states Kent was an admirer of Lord Mansfield (*q.v.*). and his own commercial cases reported in Johnson's reports reflect Mansfield's influence.

On his retirement from the chancellorship in 1823. Kent resumed his professorship at Columbia. Out of these lectures came Kent's *Commentaries* on American Law, 4 vol. (1826–1830), which ran into six editions under his own editorship and won for him a high and influential place wherever Anglo-American law was studied. Kent's Commentaries were cited by English courts and counsel as much as by U.S. courts and counsel.

He admired the Roman or civil law system; and in topics in his Commentaries uhere common law precedent was weak or lacking, Kent turned to Roman law for first principles. Common law courts citing Kent thus adopted many Roman law principles. Thus the statement in the Napoleonic code concerning the water rights of riparian owners was stated as a basic principle by Kent, and this was adopted as the English common law in such cases as Embrey v. *Owen* (6 *Ex* 353 [1851]).

Kent's Commcntarzes substantially differed from Blackstone's Commentaries on *the* Laws of England, 4 vol (1769) in content and organization Blackstone, for example. devoted only 45 pages to business contracts. whereas Kent devoted almost one of his four volumes to commercial contract subjects

Kent was a militant Federalist and a strong conservative both in politics and law. He expressed his own position best in his criticism of the attempt of his friend Edward Livingston (q v) to prepare a penal code for Louisiana, on the lines of the humanitarian reforms proposed in England by Jeremy Bentham: "I think Lord Hardwicke or Lord Mansfield or Burke or Pitt possessed ten times as much practical good sense and sound wisdom as William Godwin and Jeremy Bentham." Kent died at New York on Dec 12. 1847.

See J. H. Horton, *James Kent, a Study in Conservatism* (1939).

(A. DM.)

KENT, ROCKWELL (1882–). U.S. painter, whose starkly realistic paintings and dramatic illustrations made him one of the best-known artists of his time, was born at Tarrytown Heights. N.Y., on June 21. 1882. He studied architecture at Co-



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"THE TRAPPER" BY ROCKWELL KENT. IN THE WHITNEY MUSEUM OF AMERICAN ART, NEW YORK

lumbia university but turned to painting and was a pupil of William M. Chase, Robert Henri, Kenneth Hayes Miller and Abbott Thayer. In the course of a varied career he worked as an architectural draftsman, as a lobsterman and carpenter on the coast of Maine and as a ship's carpenter. He explored the waters about Tierra-del Fuego in a small boat, and lived in Newfoundland, Alaska and Greenland. He drew upon these experiences for his paintings and travel books.

Among his notable works in public collections are "Snow Roller" (Phillips gallery. Andover, Mass.), "The Trapper" (Whitney museum. New York city), "Maine Winter" (Metropolitan Museum of Art, New York city), "Deer Season" (Art Institute of Chicago) and "Mother and Children" (Brooklyn museum). He illustrated works of Melville, Shakespeare. Chaucer and many others.

His writings include *Wilderness* (1920), *Voyaging* (1924), N *by* E (1930), *Rockwellkentiana,* with Carl Zigrosser (1933), *This Is* My **Own** (1940) and an autobiography, *It's Me O Lord* (1955). (D. *H.* W.)

KENT, WILLIAM (c. 1686–1748), a major English architect, interior designer, painter and landscape gardener, was born at Bridlington, Yorkshire. in 1686. Said to have been apprenticed to a coach painter in Hull. at the age of 20 he came to London. Various Yorkshire patrons, impressed by his talent, sent him to study painting in Rome, where he stayed from 1709 to 1719, and where he met his future patron and friend, the earl of Burlington. Burlington brought Kent back to England in 1719 and employed him in decorative painting at Burlington house, Piccadilly, London. Through Burlington's influence he was commissioned to decorate the Cupola room at Kensington palace. London. In 172 j his patron secured him the post of master carpenter in the office of works. In 1735 he was appointed master mason and deputy surveyor and in 1739 portrait painter to the king.

Kent's development as an architect began about 1724, when he undertook to edit *Designs of Inigo Jones,* which included designs by Burlington and himself and was published in 1727. This book shows that Kent's early work was confined to designing features of interior decoration, and it was in this capacity that he worked at Burlington house and Chiswick house, London (1727), and Houghton hall, Norfolk (1726–31).

Kent's architecture accords with the strictest principles of Burlington's Palladianism; and although the style had already been formalized before the start of Kent's career, he became its most brilliant exponent. English Palladianism looked back to classical Roman architecture and sought its model in the work of the 16th-century north Italian architect Andrea Palladio (*q.v.*) and that of his English follower Inigo Jones. Burlington, aided by Kent, determined to restore English taste to sound and moral classical principles, which he considered lost since the time of Jones. A major part of their scheme was to rebuild London's public architecture, thereby setting an example which would raise both the taste and the prestige of the nation. The royal mews, Trafalgar square (1732); the treasury buildings. Whitehall (1734–36); and the Horse Guards building, Whitehall, executed between 17jo and 1758, after Kent's death, were all part of this plan, together with designs for other important buildings never executed, such as those for the houses of parliament (1732–39), a national memorial temple and a royal palace in Hyde park. Among other public buildings built by Kent and later demolished were the queen's library, St. James's palace, London (1737), and Kew palace, Surrey (1730).

Kent's domestic architecture was largely inspired by Palladio's villas in the neighbourhood of Vicenza, Italy, depending for its effect on good proportion and grouping, the solidity of the buildings being emphasized but given life by the use of niches, recessed windows and rusticated stonework. No. 44 Berkeley square, London (1742–44), shows in its interior Kent's ability to create a palatial effect in a comparatively small house. Holkham hall, Norfolk, started in 1734 for Thomas Coke, earl of Leicester, was Kent's masterpiece. Kent designed not only the house but also the interior decoration and the furniture, being the first English architect to plan a house in one unified scheme. Kent's furniture, in an Italianate baroque style, heavily cawed and gilded with boldly exaggerated motifs, was perfectly suited to the heavy magnificence of his architectural interiors. Though later neoclassic architects, such as Robert Adam, were to criticize Kent's work as "immeasurably ponderous," his influence on them was considerable, and the splendour of Holkham is an overwhelming answer to such criticism, both in its general conception and final detail.

Despite the inconsistency with Palladian principles, Kent was one of the first architects of the 18th-century Gothic revival. He made alterations and additions in the Gothic style to Esher place, Surrey (c. 1730), to Rousham hall, Oxfordshire (1738–41), and built the east range of the clock court at Hampton court, Surrey, in the Tudor style (1732).

As a landscape gardener, Kent freed the English garden from formality. introducing a new romantic design, in which the wildness of nature was contrasted with the classical severity of his architecture. His gardens at Rousham hall, Oxfordshire, and Stowe house, Buckinghamshire, where winding paths and open vistas lead to small classical temples scattered informally in wooded glades. show how Kent sought to bring the natural landscape within the garden.

Kent's versatility as a designer included a number of monuments, Gothic screens at Westminster hall (1739) and Gloucester cathedral (1741), stage scenery, a royal state barge, and illustrations for Spenser's *The Faerie Queene* and John Gay's *Fables.* Kent died on April 12, 1748, and was buried at Chiswick, London.

See Margaret Jourdain, *The Work of William Kent (1948);* *H.* M. Colvin, *A Biographical Dictionary of English Architects* (1954).

(J. E. LE.)

KENT, one of the kingdoms of Anglo-Saxon Britain, the dimensions of which seem to have corresponded with those of the present county. According to tradition it was the first part of the country occupied by the invaders, its founders, Hengest and Horsa, having been employed by the British king Vortigern against the Picts and Scots. Their landing, according to English tradition, took place between 450 and 455, though in the Welsh accounts the Saxons are said to have arrived in 428 (cf. *Hist. Britt.,* 66). According to *The Anglo-Saxon Chronicle,* which probably used some lost list of Kentish kings, Hengest reigned 455–488 and was succeeded by his son Aesc (Oisc), who reigned till 512; but little value can be attached to these dates. Continuous history begins with Aethelbert, the great-grandson of Aesc, who reigned probably 560–616. He is famous as the author of a code of laws which is the oldest document of its kind written in any Germanic language. He married Berta, daughter of the Frankish king Haribert, or Charibert, an event which no doubt was partly responsible for the success of the mission of Augustine, who landed in 597. Aethelbert was at this time supreme over all the English kings south of the Humber. On his death in 616 he was succeeded by his son Eadbald, who renounced Christianity and married his stepmother, but was shortly afterward converted by Laurentius, the successor of Augustine. Eadbald was succeeded in 640 by his son Erconbert, who enforced the acceptance of Christianity throughout his kingdom, and was succeeded in 664 by his son Egbert, the latter again by his brother Hlothhere in 673. The early part of Hlothhere's reign was disturbed by an invasion of Aethelred of Mercia. He issued a code of laws, which is still extant, together with his nephew Eadric, the son of Egbert, but in 685 they quarrelled and Eadric called in the South Saxons. Hlothhere died of his wounds. and was succeeded by Eadric, who reigned less than two years.

The death of Eadric was followed by a disturbed period in which Kent was under kings whom Bede calls *"dubii vel externi."* An unsuccessful attempt at conquest seems to have been made by the West Saxons. but there is some evidence for a successful invasion by the East Saxon king Sigehere in 687. A king named Osaine, who apparently belonged to the native dynasty, seems to have obtained part of the kingdom in 688. The other part came in 689 into the hands of Swefheard, probably a son of the East Saxon king Sebbe. Wihtred, a son of Egbert, succeeded Oswine about 690 and obtained possession of the whole kingdom before 694. From him also there is extant a code of laws. At Wihtred's death in 72j the kingdom was divided between his sons Aethelbert,

Eadbert and Alric, the last of whom appears to have died soon afterward. Aethelbert reigned till 762; Eadbert, according to the *Chronicle,* died in 748, but some doubtful charters speak of him as alive in 761–762. Eadbert was succeeded by his son Eardwulf, and he again by Eanmund. while Aethelbert was succeeded by a king named Sigered. From 764 to 779 there was a king named Egbert. who in the early part of his reign had a colleague named Heabert. At this period Kentish history is very obscure. Another king named Aethelbert appears in 781, and a king Ealhmund in 784, but there is some reason for suspecting that Offa annexed Kent about this time. On his death (796) Eadbert Praen made himself king. but in 798 he was defeated and captured by Coenwulf of Mercia. who made his own brother Cuthred king in his place. On Cuthred's death in 807 Coenwulf seems to have kept Kent in his own possession. His successors Ceolwulf and Beornwulf likewise appear to have held Kent, hut in 825 we hear of a king Baldred who was expelled by Egbert, king of Wessex. Under the West Saxon dynasty Kent, together with Essex. Sussex and Surrey. was sometimes given as a dependent kingdom to one of the royal family. During Egbert's reign it was entrusted to his son Aethelwulf, on whose accession to the throne of Wessex: in 839, it was given to Aethelstan, probably his son. who lived at least till 851 From 855 to 860 it was governed by Aethelbert son of Aethelwulf. During the last years of Alfred's reign it seems to have been entrusted by him to his son Edward. Throughout the 9th century we hear also of two earls, whose spheres of authority may have corresponded to those of the two kings whom we find in the 8th century. The last earls of whom there is any record were the two brothers Sigehelm and Sigewulf, who fell at the Holm in 905 when the Kentish army was cut off by the Danes, on Edward the Elder's return from his expedition into East Anglia. At a later period Kent appears to have been held, together with Sussex, by a single earl.

The internal organization of the kingdom of Kent seems to have been peculiar. Besides the division into West Kent and East Kent, which probably corresponds to the 8th-century kingdoms, there were a number of lathes. apparently administrative districts under reeves, attached to royal villages. In East Kent there were four of these, namely. Canterbury, Eastry, Wye and Lymne, which can be traced back to the 9th century or earlier. In the 11th century two lathes are known in West Rent, those of Sutton and Aylesford.

The social organization of the Kentish nation was wholly different from that of Mercia and Wessex. Instead of two "noble" classes there was only one, called at first eorlcund, later as in Wessex, gesithcund. Again, below the ordinary freeman are found three varieties of persons called *laetas,* probably freedmen, to whom there is nothing analogous in the other kingdoms. Moreover the wergeld of the ceorl, or ordinary freeman, was two or three times as great as that of the same class in Wessex and Mercia, and the same difference of treatment is found in all the compensations and fines relating to them. It is not unlikely that the peculiarities of Kentish custom observable in later times, especially with reference to the tenure of land, are connected with these characteristics. An explanation is probably to be obtained from a statement of Bede, that the settlers in Kent belonged to a different nationality from those who founded the other kingdoms, namely the Jutes (*q.v.*).

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KENT, a southeastern county of England, bounded north by the Thames estuary, east and southeast by the English channel, southwesr by Sussex and west by Surrey. In the northwest the administrative county of London encroaches upon the geographical county of Kent, the area of which is 1,525.0 sq.mi. The county is divided from west to east by the chalk hills of the North Downs, which near Westerham reach a height of more than 800 ft. but are lower toward the east. Toward the north the chalk is covered by the Eocene Woolwich beds and London Clay, which dip toward the north. The Weald (*q.v.*) lies between the North and South downs. At three points the chalk downs have been cut right through by rivers. In the west the Darent, flowing to join the Thames at Dartford, pierces the hills north of Sevenoaks. The Medway, after traversing the Vale of Kent, composed mainly of Weald clay, forces its way through the downs near Maidstone to enter the Thames at Sheerness. In the east the Stour cuts its way through the downs between Ashford and Canterbury. The isles of Sheppey and Grain are formed of clay beds and alluvium; the former is divided from the mainland by the Swale (bridged at Kingsferry bridge); the latter by the old Medway channel. Along the Thames the coast is alluvial and generally low and marshy, embankments being in several places necessary to prevent inundation. At a few points, however, as at Gravesend, spurs of the North Downs descend directly upon the shore.

In the estuary of the Medway there are a number of low marshy islands, but Sheppey, with its clay beds along the north coast, presents to the sea a range of slight cliffs. The marshes extend along the Swale to Whitstable, whence stretches a low line of clay and sandstone cliffs toward the Isle of Thanet, a chalk outlier, when they become lofty and grand, extending round the Foreland southnard to Pegwell bay. The coast from Sheppey round to the South Foreland is skirted by numerous flats and sands, the most extensive of which are the Goodwin sands off Deal. The whole valley of the Stour and the depression from Sarre to Reculver is composed of alluvium and marks the course of the channel (Wantsum) which used to separate Thanet from the mainland. South of Deal the coast rises again into chalk cliffs. the eastward termination of the North Downs. These cliffs continue round the South Foreland to Folkestone. where they fall away and are succeeded west of Sandgate by a flat, shingly shore. To the south of Hythe this shore borders the wide expanse of Romney marsh. which, immediately west of Hythe, is overlooked by a line of abrupt hills, but for the rest is divided on the north from the drainage system of the Stour only by a slight uplift. From Folkestone to Hythe, gault and lower greensand emerge from beneath the chalk, and these formations run across the county to Westerham as bands of varying width. To the south of Sevenoaks is the Lower Greensand; the Ragstone ridge is more than 600 ft. high. Romney marsh, drained by many channels, seldom rises more than a dozen feet above sea level. At its southeastern extremity, and at the extreme south of the county, is the shingly promontory of Dungeness. Within historic times much of this marsh was covered by the sea, and the valley of the river Rother, which forms part of the boundary of Kent with Sussex, entering the sea at Rye harbour, was represented by a tidal estuary for a considerable distance inland. The southwest of the county is crossed by a line of hills, the continuation of the Forest ridge of Sussex, which have a height varying from 200 ft. to 500 ft. and consist of the Hastings beds, the oldest rock formations exposed in the county.

Archaeology.——Kent, from its commanding geographical position facing the continental landboard, has from the earliest times attracted invasion, settlement and transit. Large-scale commercial excavations for brick earth, chalk and gravel have disclosed abundant relics of its prehistory. Particularly important are the Palaeolithic flint tools from the stratified Thames river terraces and the skull of Swanscombe man, who lived in the great interglacial oeriod. Manv thousands of Neolithic flint tools testifv to an agricultural population which was widespread except in the forested Weald. Field antiquities of this period include the well-known Kits Coty and other megaliths of the Medway valley and a long barrow at Chilham in east Kent, all of which have affinities uith the Netherlands and north Germany. Continental influences are seen again in the distribution of Beaker pottery and in the types of late Bronze Age pottery and implements. An interesting feature of the Bronze Age is the gold ornaments, probably in transit from Ireland. The Belgic invaders left their mark in the notable hill fort of Oldbury and at Bigbury, the predecessor of Roman Canterbury, while the Aylesford and Swarling urn fields have given their name to a recognized Iron Age culture. The coast of Kent came into history from the earliest of the Roman expeditions until the very end of the occupation, when

the Saxon shore forts at Reculver, Richborough, Dover and Lympne were in existence. The countryside was primarily agricultural, served by a good subsidiary road system with easy access to the main traffic artery of Watling street, which linked the coast with London. Many Roman cemeteries of much interest are known. (X.)

History.— Kent contains the greater part of two dioceses, Canterbury founded in 597 and Rochester in 604. In 1291 the archdeaconries were coextensive with the dioceasan boundaries and continued to be so till 1845 when a large part of Rochester diocese was formed into Maidstone archdeaconry and transferred to Canterbury diocese. In 1904 there was a reversion almost to the old boundaries, though some parishes in the vicinity of London became part of Southwark diocese and the deanery of Croydon was transferred to Canterbury.

The shire organization of Kent dates from the time of Aethelstan, the name as well as the boundary being that of the ancient kingdom, apart from a small detached portion of the county in north Woolwich across the river Thames. This and other parts of Kent near London were incorporated in the newly formed county of London in 1888, and other slight adjustments to the county boundary have been made from time to time. At the time of the Domesday survey Kent, outside the Wealden area and Romney marsh, was divided into five full and two half lathes and 60 hundreds. During the mediaeval period six lathes are mentioned (the five modern lathes of Aylesford. St. Augustine, Scray, Shepway and Sutton at Hone, and also Hedeling, which after the mid-16th century was permanently incorporated in St. Augustine). The number of hundreds fluctuated as new ones were created and old ones combined. By the 18th century there were 64 hundreds and a number of extra hundredral areas.

The county has been divided for the administration of justice by the justices of the peace since the late 15th century into two divisions, and separate quarter sessions are still held at both Canterbury and Maidstone for East and West Kent. The shire moot and later the county court met on Penenden heath. Assizes were held at various places in the county in mediaeval times, separate assizes being held for privileged areas such as the lowy of Tonbridge. In more modern times Maidstone has become the assize town, though Rochester was also used in the 18th century. The Cinque Ports of Dover, Hythe, New Romney and Sandwich are in Kent, and each had various "limbs" and "members" attached to it which were exempt from the normal administrative and judicial arrangements of the county, the Cinque Ports having their own quarter sessions and also not attending the assizes held for the county. Canterbury in 1461 was given the status of a separate county which the city retained till made a county borough in 1888, the only one in Kent. Formerly separate assizes were held for the city. The drainage area of Romney marsh also formed a separate judicial liberty until 1889.

Between the Conquest and the 14th century the earldom of Kent was held at various times by Odo, bishop of Bayeux, Hubert de Burgh (sheriff of the county in the reign of Henry III) and Edmund of Woodstock, youngest son of Edward I, who bestowed the title on him. It subsequently passed to the families of Holland and Neville (see KENT. EARLS AND DUKES OF). In Norman and Plantagenet times its castles and particularly the "key" fortresses of Dover and Rochester were primary objects of attack by foreign invaders or in time of civil war; thus Rochester was captured by William Rufus during the rebellion of Odo of Bayeux, by John in 1213, by the dauphin of France in 1216 and by Gilbert de Clare during the war of Henry III with his barons; while Dover was captured for King Stephen and blockaded by the dauphin in 1216. and it was near Dover that John submitted to the papal legate in 1213. Archbishop Thomas Becket was murdered at Canterbury in 1170. In the peasants' risings of 1381 the archbishop's palace at Canterbury was plundered. In 1450 Kent took a leading part in John Cade's rebellion; and in 1554 the insurrection of Sir Thomas Wyat, who was born at Allington castle. began at Maidstone. Greenwich was the birthplace of three Tudor sovereigns. Sir Philip Sidney was born at Penshurst Boughton Malherbe was the seat of the Wottons, and Hever castle of the Boleyns. Sir Francis Walsingham was born at Chislehurst, where his family had long flourished. On the outbreak of the Great Rebellion feeling was much divided, but after capturing Dover castle the parliament soon subdued the whole county. In 1648 a widespread insurrection was organized on behalf of Charles, and was suppressed by Lord Fairfax. In 1667 the Dutch fleet under M. A, de Ruyter levelled the fort at Sheerness and burned the ships at Chatham. In 1797 a naval mutiny broke out at Sheerness and continued for almost a month.

In 1290 Kent returned two members to parliament for the county, and in 1295 Canterbury, Rochester and Tonbridge were also represented; Tonbridge, however, made no returns after this date. The Cinque Ports of Sandwich, Dover, Hythe and New Romney were each represented by four members (or barons) at the parliament of 1265, and from 1322 regularly sent two representatives. Maidstone's ancient privilege of sending two burgesses to parliament was forfeited after Wyat's rebellion, but was restored by Elizabeth I in 1559 Queenborough acquired representation in 1571. Under the act of 1832 the county returned four members in two divisions, Chatham was represented by one member and Greenwich by two, while Queenborough lost its member. Under the act of 1868 the county returned six members in three divisions, and Gravesend returned one member. By the act of 1885 the county returned eight members in eight divisions, and the representation of Canterbury, Maidstone and Rochester was reduced to one member each. By the Representation act of 1918 the county was divided into 11 divisions; these were increased to 19 in 1949. (Fx. H.)

Architecture.— As was to be expected from its connection with the life of the continent. Kent possessed a larger than average number of monastic foundations. The earliest were the priory of Christ's Church and the abbey of St. Peter and St. Paul, now called St. Augustine's, both at Canterbury, founded by St. Augustine and his monks. Other Saxon foundations were the nunneries at Folkestone (630), Lyminge (633, also a monastery), Reculver (shortly after 669), Minster-in-Thanet (c. 670) and Minster-in-Sheppey (670) and the priory of St. Martin at Dover (before 640), all belonging to the Benedictine order. Some of these were refounded, and the principal monastic remains now existing are those of the Benedictine priories at Rochester (1080), Folkestone. Dover (1137); the Benedictine nunneries at Malling (1090), Minster-in-Sheppey (before 1186), Higham (c. 1150) and Davington (1153); the Cistercian abbey at Boxley (1145); the Cluniac abbey at Faversham (founded by Stephen in 1147) and priory at Monks Horton (time of Stephen); the preceptory of Knights Hospitallers at Swingfield (c. 1180); the Premonstratensian abbey of St. Radegund's, near Dover (1192–93); the first house of Dominicans in England at Canterbury (1236–37); the first Carmelite house in England, at Aylesford (1241); and the only house in England of Dominican nuns at Dartford (1346).

Other houses of which there are remains are Lesnes abbey, near Erith, and Bilsington priory near Ashford, established in 1178 and 1253 respectively, and both belonging to the Augustinian canons; and the house of Franciscans at Canterbury (1225). Little exists of the priories of Augustinian canons at Canterbury (St. Gregory's, 1080), Leeds, near Maidstone (1119), Tonbridge (1180) and Combwell, near Cranbrook (time of Henry II); the nunnery of St. Sepulchre at Canterbury (about 1100) and West Langdon abbey, near Walmer (1189), the former being Benedictine and the latter Premonstratensian; the Trinitarian priory of Mottenden near Headcorn, the first house of Crutched Friars in England (1335), where miracle plays were presented in the church by the friars on Trinity Sunday; the Carmelite priories at Sandwich (1272) and Lossenham, near Tenterden (1242); and the preceptory of Knights of St. John of Jerusalem at West Peckham near Tonbridge (1408?).

Apart from the cathedral churches of Canterbury and Rochester, the county possesses a number of churches of the highest interest. In the church of Lyminge, as well as the monastic remains. there may be seen portions of the church founded by Ethelburga and rebuilt, with considerable use of Roman material, in 965 by St. Dunstan. Among Norman examples is the small but important

church at Barfreston. The churches of St. Margaret-at-Cliff, Patrixbourne and Darenth and the toner of New Romney church are notable. Early English churches are Hythe church, SS. Mary and Eanswith, Folkestone, Minster-in-Thanet, Chalk, Faversham and Westwell. Stone church, near Dartford, is a late example of this style. transitional to Decorated; and among Decorated buildings may be included Chartham church. Among Perpendicular churches is the imposing collegiate church of Maidstone, and the fine glass of this period in Nettlestead church may be noticed. The church of Cobham contains one of the richest collections of ancient brasses in England.

Great houses include Knole, Penshurst place and Leeds castle, while Ightham Mote is a fine example of a moated manor house, whose oldest parts date from early in the 14th century. (X.)

Agriculture. — The Domesday survey, besides testifying to the agricultural activity of the county, mentions more than 100 salt-works and numerous valuable fisheries, vines at Chart Sutton and Leeds, and cheese at Milton. The hundred rolls of the reign of Edward I frequently refer to wool, and Flemish weavers settled in the Weald in the time of Edward III. Tiles were manufactured at Wye in the 14th century. Valuable timber was afforded by the vast forest of the Weald, but the restrictions imposed on the felling of wood for fuel did serious harm to the ancient iron trade and, after the statute of 1558 forbidding the felling of timber for iron smelting within 14 mi. of the coast. the industry steadily declined. Cherries are said to have been imported from Flanders and first planted in Kent in the reign of Henry VIII. and from that period the culture of fruits (especially apples and cherries) and of hops spread rapidly over the county. Thread making at Maidstone and silk weaving at Canterbury existed in the 16th century. and before 1590 one of the first paper mills in England was set up at Dartford. The statute of 1630 forbidding the exportation of wool, followed by the plague of 1665, led to a serious trade depression, while from the former enactment resulted a vast smuggling trade.

The total acreage under crops and grass in 1955 was 643,570, and of this 437,585 ac. (253,915 ac. in 1939) was arable land. Wheat covered 62.168 ac. and oats 34,909 ac. Barley, much of high quality for malting, covered 51,877 ac. Potatoes occupied 21,121 ac., and there were 86.799 ac. for mowing grass and 197.318 ac. for grazing. Orchards of all kinds. found chiefly in the Medway valley and in north Kent. covered 81,448 ac. and small fruit occupied 5,150 ac. The hop acreage. 11,332, was 56% of the total for the country. Market gardening is extensively practised, mainly for London markets, and occupies 26.816 ac. Cattle (124,422 in 1955) are grazed in considerable numbers on the marshlands, and dairy farms are numerous. Kent is one of the chief counties in England for sheep rearing (549,903, including lambs, in 1955). A breed peculiar to the district. known as Kent or Romney Marsh, has been exported to many countries. The farming is generally intensive and 37,319 workers were employed in 1955.

The county is well wooded (98,240 ac. in 1946). New plantations of conifers and hardwoods are replacing the older oak and beech woods. Important research and educational centres are East Malling Research station, Faversham (National Fruit trials), Wye college and farm institutes at Sittingbourne and Swanley. (R. DN.)

Industries. — Among the principal modern industries are paper-making. carried on along the Darent. Medway, Cray and neighbouring streams; engineering, chemical and other works along the Thames: manufactures of plastics. bricks, tiles. pottery and cement, especially on the lower Medway and the Swale; chalk and ragstone are quarried. There are large oil refineries on the Isle of Grain, and at Xshford is the works of the Southern Region railway. A variety of industries is connected with the government establishments at Chatham and Sheerness. Shipbuilding is carried on there and at Gravesend. Dover and other ports.

Deep-sea fishing occurs all around the coast. Shrimps, soles and flounders are taken in great numbers along the north coast and off Ramsgate. The principal oyster beds, some of which were known in Roman times, are near Whitstable, Faversham. Queenborough and Rochester. The existence of coal' deposits beneath the secondary rocks had been known for a long time, but it was only after World War I that extensive operations were begun. The coal area runs inland from south of Ramsgate to near Canterbury, and thence southward to the coast again east of Folkestone. The area of the field is about 206 sq.mi., of which 36 are under the sea, but workable. The National trust owned 1,438 ac. in Kent in 1955 and 76 ac. were protected.

Communications. — The county is served by British railways (Southern Region), whose lines radiate from London? one to Tunbridge Wells, another to Maidstone and Folkestone and a network along the north coast to Rochester and on to Canterbury, a junction for Thanet and Dover. Dover and Folkestone are ports for traffic with the continent. There were 4.022 mi. of roads in 1955. All around the coast are a number of seaside resorts, and Tunbridge Wells is an inland watering place. The influence of London in converting villages into outer residential suburbs is to be observed at many points, whether seaside, along the Thames or inland. The county is practically without inland water communications, excluding the Thames. There are municipal airports at Ramsgate and Rochester and several privately owned fields such as that at Ferryfield near Lydd.

Administration and Population. — The area of the administrative county is 1,517.6 sq.mi. Population, including the county borough (1951), was 1,564,324. Being in the track of enemy air raiders in World War II, the county suffered considerably from bombing, and evacuation of civilians caused a decline of 11% in the population between Sept. 1939 and Feb. 1941. The county contains two cities. Canterbury (a county borough) and Rochester, 22 other municipal boroughs. 13 urban districts and 18 rural districts. It is in the southeastern circuit and has two courts of quarter sessions. In the administrative county, nine boroughs have separate commissions of the peace and seven have separate courts of quarter sessions. The boroughs of Beckenham, Bexley. Bromley and Erith and the urban districts of Chislehurst and Sidcup, Crayford. Orpington and Penge are within the metropolitan police district. Kent is mainly in the dioceses of Canterbury and Rochester but has parts in those of Southwark and Chichester. The county is divided into 6 borough and 13 county parliamentary constituencies, each returning one member. (Fx. H.)

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KENTIGERN, ST., or MUNGO ("dear friend." a name given to him, according to Jocelyn, by St. Servanus), a Briton of Strathclyde, called by the Goidels In *Glaschu*, "the Grey Hound." is said to have been of royal descent. His mother when with child was thrown down from a hill called Dunpelder (Traprain Law, Haddingtonshire), but survived the fall and escaped by sea to Culross on the farther side of the Firth of Forth, where Kentigern was born. Kentigern lived for some time at Glasgow, near a cemetery ascribed to St. Ninian, and was eventually made bishop of that region by the king and clergy. Subsequently he was opposed by a pagan king called Morken, whose relatives after his death succeeded in forcing the saint to retire from Strathclyde. He thereupon took refuge with St. David at Menevia (St. David's), and eventually founded a monastery at Llanelwy (St. Asaph's), for which he received grants from Maelgwn, prince of Gwynedd. After the battle of Ardderyd in 573 in which King

Rhydderch, leader of the Christian party in Strathclyde, was victorious, Kentigern was recalled. He fixed his see first at Hoddam in Dumfriesshire, but afterward returned to Glasgow. He is credited with missionary work in Galloway and north of the Firth of Forth.

The meeting of Kentigern and Columbia probably took place soon after 584, when the latter began to preach in the neighbourhood of the Tay.

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KENT'S CAVERN, a large limestone cave near Torquay, Eng., which yielded some of the earliest evidence of man's coexistence with extinct animals. The Rev. J. McEnery, who investigated the upper deposits (1825–29), was perhaps the first man to proclaim this fact In 1840 Godwin Austin confirmed McEnery's view; and excavations (1865–80) carried on by William Pengelly. on behalf of the British association, completed the proof. Excavations were resumed in 1926. Collections are in the British museum and the Natural History museum London, and in the museum of the Natural History society, Torquay.

The deposit has been divided into six layers from top to bottom, as follows: layer (1), Roman, Iron and Bronze Age shards; layer (2), stalagmite with Neolithic pottery; layer (3), Black Band of burned bones and ash; layer (4), red cave earth; layer (5), stalagmite floor; and layer (6), bone and pebble breccia. The implements have been classified typologically into five stages: Acheulean, Mousterian, Middle Aurignacian, proto-Solutrean and Magdalenian (see ARCHAEOLOGY. Prehistory for a description of these culture periods). There appears to be little doubt that the hand axes and several of the flakes belong to a Levalloisian facies of the Mousterian, widespread over northern France and eastern and southeastern England. The Middle Aurignacian stage depends on a group of not very typical implements. whose resemblance to the Middle Aurignacian of western France is somewhat superficial. At Solutré. near Mâcon, there is an "evolved Solutrean" overlying a typical Middle Solutrean, and it is to this material that the Kent's Cavern should be referred rather than to the classic regions of western France. The last group, the Magdalenian occurs mainly, but not solely, in the Black Band; one harpoon comes from the Black Band, and two from the upper part of the red cave earth (layer 4). These implements and a small bone needle are typical of a late stage of the Magdalenian. The flint implements from the Black Band and immediately below it consist mainly of small blades with blunted backs or oblique blunted ends. This blade assemblage occurs in several other British caves, such as Aveline's hole in the Mendips and at Creswell crags (*q.v.*) in Derbyshire, and is typical of the late Magdalenian of the regions of northern Germany, the Netherlands and Belgium.

The animals, apart from the bones of cave bear found in layer 6, appear to have come mainly from the red cave earth and are Upper (Late) Pleistocene. Among the species represented are the mammoth, woolly rhinoceros. bison, reindeer and giant deer (*Megaceros*). Several human fragments have been found but it is not possible to equate them with the archaeological phases

See D. A. E. Garrod, *The* Upper *Palaeolithic Age in Britain* (1926), with a full bibliography. (Jo. W.)

KENTUCKY, a south central state of the United States! is popularly known as the "Bluegrass state" because of the abundance of bluegrass found in the central part, but officially known as the Commonwealth of Kentucky. Situated immediately west of the Allegheny mountains, it is bounded northwest and northeast by the Ohio river, which separates it from Illinois, Ohio and (except for a small sliver of land southeast of Evansville, Ind.) from Indiana; east by Virginia and by the Big Sandy river and its east fork, the Tug, which separates Kentucky from West Virginia; southeast and south by Virginia and Tennessee; and west by the Mississippi river, which separates it from Missouri. Area, 40,395 sq.mi.; of this, 532 sq.mi. are water surface. Kentucky ranks 37th among the states in size and 22nd in population.

On June 1. 1792. Kentucky became the 15th state of the union, the second after Vermont to be joined with the original 13; Frankfort has been the capital city since Dec. 1792. The official state bird is the cardinal: the state flower is the goldenrod; and the state tree is the tulip tree (yellow poplar). The state flag displays the state seal with the motto, "United We Stand, Divided We Fall," on a field of blue. The name, of Indian origin. is from the Kentucky river, which flows about 250 mi. into the Ohio in the north central part of the state. The state song is Stephen Collins Foster's "My Old Kentucky Home."

PHYSICAL GEOGRAPHY

Physical Features.—From mountain heights on the east the surface is largely a much furrowed plain, sloping gently to the west and declining toward the Ohio river. The state lies within the Mississippi basin and within the special division of the Ohio valley between the extremes of approximately 36" 30' and 39° 6' N. and 82° and 89° 33' W. A small part in the southeast contains the Cumberland and Pine mountains. The highest point in the state is Big Black mountain (4,145 ft.) in Harlan county; the lowest point is on the Mississippi river (257 ft.) in Fulton county. The average elevation is about 750 ft. The entire eastern quarter of the state, conterminous with the eastern coal field, is the region of the mountains, but properly speaking almost all except the Cumberland and Pine mountains of the disturbed region of the Alleghenies belongs to the Allegheny plateau province, a rugged region with narrow valleys and sharp ridges seldom more than 1,500 ft. above sea level. The remainder of the area east of the Tennessee river is comprised of the eroded bluegrass region and. to the south, the Highland Rim plateau, which covers one-half of the state. It slopes from an elevation of 1,000 to 1,200 ft. or more on the east to about 500 ft. on the northwest and is less rugged than the Allegheny plateau. One feature of the southern portion is the numerous "sink holes" and caves, the best known being Mammoth cave and the Flint Ridge cave system, including Colossal cavern, cut in beds of limestone. The Highland Rim plateau drops 200 ft. or more to the bluegrass region, in which erosion has developed on limestone a gracefully undulating surface resembling a park marked by rounded hills and dales. Especially within a radius of 20 mi. around Lexington bluegrass (Poa *compressa* and Poa *pratensis*) adds to the unusually luxuriant vegetation. About the middle of June the bluegrass blooms and the hue of its seed vessels gives the landscape a bluish tinge. A small part of the state west of the Tennessee river at the Tennessee boundary forms another lowland area, once a part of the coastal plain, with an elevation below 500 ft. The chief rivers wholly within the state are the Licking, Kentucky, Rockcastle, Salt, Green and Tradewater. The Cumberland, after flowing through the southeast and south central parts of the state, enters Tennessee at a point near the centre of the southern border of the state. In the extreme southwest the Cumberland, which re-enters Kentucky, and the Tennessee with only a short distance between them cross Kentucky and enter the Ohio river at Smithland and Paducah respectively. The major hydroelectric power sites are Kentucky dam, Dix river and the Wolfe Creek dam on the Cumberland. The drainage of the region under which the caverns lie is mostly underground. Some traces of the last glacier period are visible in Boone and Clark counties.

Climate.—The climate is milder and more even than that of some of the neighbouring states. The mean annual temperature, about 50° F on the mountains of the southeast and 60" west of the Tennessee, is about 55° for the entire state; the thermometer seldom registers as high as 100° F or as low as −10° F. The mean annual precipitation ranges from about 38 in. in the northeast to 50 in. in the south, and is about 46 in. for the entire state with normally even distribution throughout the year and with comparatively little moisture as snow. The prevailing winds blow from the west or southwest, as do most rain-bearing winds, and the cold waves, often destructive of early orchard blooms and the fruit industry, come from the north or northwest.

Soil.—Except for the strips of alluvial land along the rivers,

Kentucky soils developed from the decay of underlying rocks; hence, they have more of a local character than soils north of the Ohio, where glaciers brought new material. The best soils are the alluvium along some of the larger rivers and the soils of the blue or Ordovician limestone in the bluegrass region. Within a radius of 20 mi. of Lexington it is especially rich and enduring. Next in fertility is the subcarboniferous, or "cavern limestone," found over much of the central and western part of the state. The soils of the Highland Rim plateau and of the lowland west of the Tennessee river vary greatly, but the commonest are a clay containing some carbonate of lime and a sandy loam. On the escarpment around the bluegrass region the soils are largely cherty or stiff with clay and of inferior quality. On the mountains and the Allegheny plateau much of the soil is very light and thin.

(E.T.; W. W. Js.; T.D.C.)

Vegetation. — The eastern mountains present the greatest variety of plant life with rhododendron (including azalea and great laurel, or mountain rosebay), blueberry and huckleberry, magnolia and many ferns. Dogwood, redbud and the tulip tree are native to the state; trillium, bloodroot, birdsfoot violet, Jack-in-the-pulpit and dozens of other wild flowers, reeds and grasses (including bluegrass, mentioned above) range from mountain varieties to those native to the Mississippi river swampland. Lying in the great eastern hardwood forest region, three-fourths of the state once was covered with sycamore, oak, hickory, chestnut, walnut and the tulip tree.

Animal Life. — The animal life, like the plant life, ranges from the subboreal in the mountains to the marsh in the river-bottom forests. Bison, once plentiful on Kentucky's central plains, and puma have disappeared. Small mammals — rabbits, squirrels. fox, woodchuck, raccoon and opossum, for example — exist in considerable numbers. The wild turkey has been re-established in some places and egrets, great blue herons and other waterfowl find breeding grounds in the marshes along the Kentucky-Tennessee border. Migration routes for waterfowl follow the Mississippi, Ohio and Tennessee rivers while land birds follow a route through central Kentucky and many song birds reside in the state. The many species of fish include the muskellunge (called the jackfish or jack salmon), bass and channel and blue catfish and there are several species of blind and semiblind cave fish.

Parks and Recreation. — Kentucky maintains more than 50 parks and historic sites. The state park system has been designed largely as a recreational facility. In many instances both recreational and historic interests are served on a single site. Largest of the parks is that one bordering on the big Kentucky lake created by the Tennessee Valley authority's Kentucky dam. Cumberland Falls park at the Great falls of the Cumberland is a large natural recreational centre where, on moonlight nights, the famous moonbow of the falls, is clearly visible above the mist of the cataract.

Among the historic sites are the battlefield of the Blue Licks, the Butler home in Carroll county, the Wilderness Road park and the Columbus battlefield on the Mississippi. Three of the interesting historic sites not in the park system are Big Bone lick in Boone county, the Buried City near Wickliffe, and Indian Fort mountain near Berea. The Big Bone lick was one of the best known early landmarks in the state. There huge prehistoric animals came to lick the salty earth and were mired up and died. The monstrous bones about the lick were curiosities for Indian and white alike. The Buried City near Wickliffe is an opened Indian burial mound and the Indian Fort mountain site is that of a prehistoric encampment and possibly a battleground.

One of the most popular parks is Federal hill at Bardstown. This home was the family seat of the Rowan family who were related to Stephen Foster. Legend has grown up that Foster composed "My Old Kentucky Home" at this beautiful house and grove. However, there is no highly dependable evidence to prove that Foster ever visited Federal hill. Possibly the most accurate thing that can be said is that the house and grounds are a fitting tribute of the people of Kentucky to the composer.

More than 10,000 ac. of the Cumberland Gap National Historical park, established in 1955, are in Kentucky. The traditional birthplace cabin of Abraham Lincoln is in the Abraham Lincoln National historical park at Hodgenville.

Annual events held in Louisville are the Kentucky State fair and the Kentucky derby run at Churchill Downs in May (see LOUISVILLE). See also MAMMOTH CAVE; FLINT RIDGE CAVE SYSTEM.

HISTORY

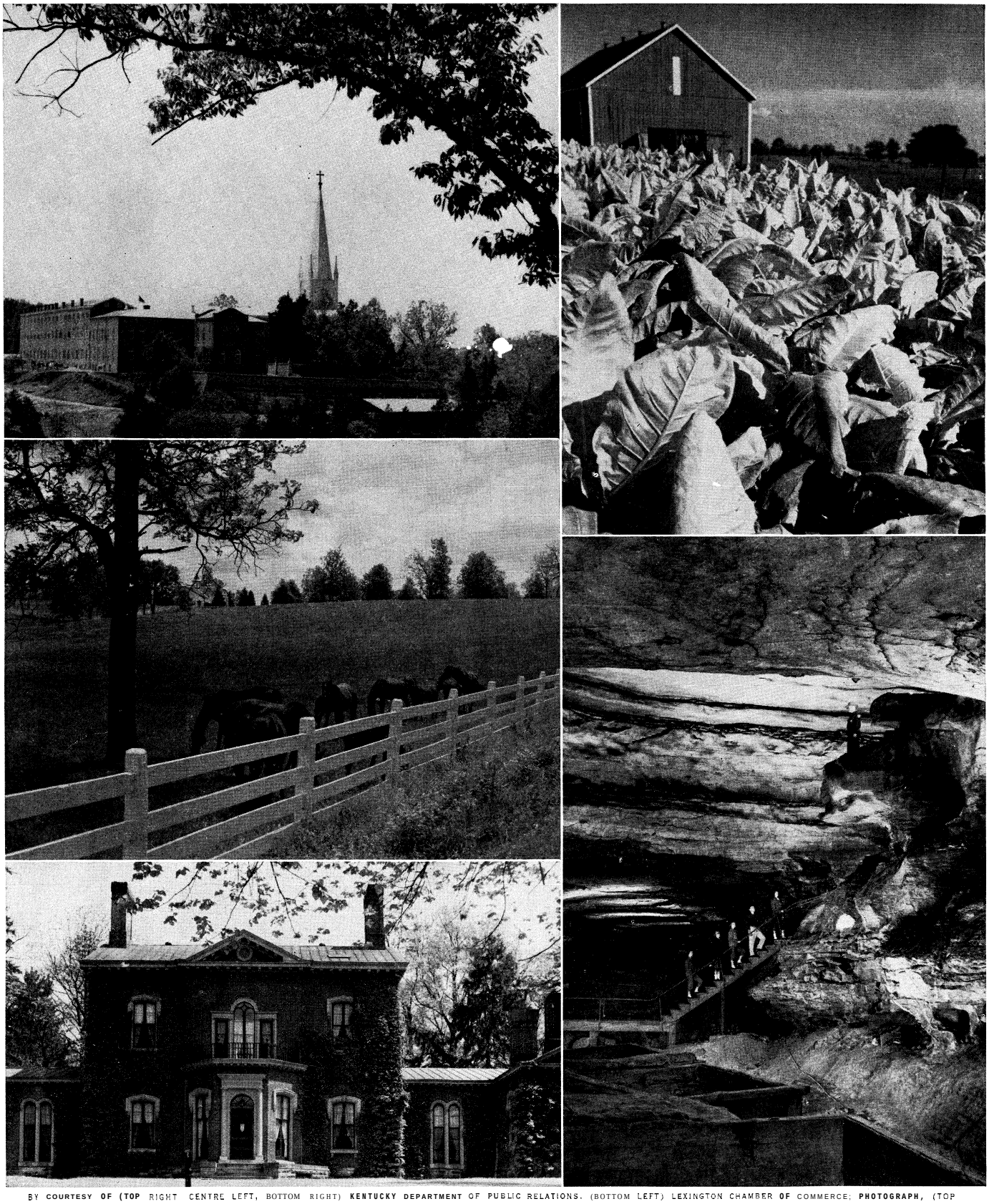
Early History. — Archaeologists and anthropologists have uncovered evidence that there were two if not three. layers of culture existing before the arrival of the first settlers. An ancient agricultural and hunting civilization left kitchen middens and burial mounds. Indians of a later period hunted in the region, and on the fringes of present Kentucky established small villages and trading posts. The Shawnees and their neighbours from above the Ohio hunted in the region, and the Cherokees came up from the south. The great Warrior's Trace ran diagonally across the state from near Portsmouth, O., to Cumberland gap. Kentucky was largeley a no-man's land for the Indians of both regions. They hunted and warred back and forth for its possession.

Exploration. — French and Spanish explorers no doubt saw the region at an early date, but the often repeated statement that René Robert Cavelier, sieur de la Salle, explored the Ohio rim must be discounted as legend. He no doubt saw that part of the state bordering on the Mississippi. In 1671 Thomas Batts and a small party of Virginians crossed over into the Ohio valley in search of the great western river and John Peter Salling visited the region in 1742. The baron de Longueuil came across country to the Ohio in 1739 when he visited some of the landmarks described by Indians.

It was not until near the middle of the 18th century that the Kentucky country experienced a dawning of its European phase of history. In 1749 Céloron de Blainville came from Montreal to make formal claim to lands along the Ohio. While Frenchmen were burying leaden plates at the mouths of the Ohio tributaries as evidence of their claims. Virginians and others were preparing to enter Kentucky. No doubt both Virginia and Pennsylvania traders previously had visited the region. In 1749 the Ohio company (*q.v.*) was organized to lay claim to a large block of Ohio valley lands; a year later the Loyal Land company of Virginia was ready to begin its search for lands. Thomas Walker traveled down the Appalachian range in April 1750 to discover the Cumberland gap. His journey into Kentucky, however, was confused and he left the area without reaching the rich bluegrass plateau. In Oct. 1751 Christopher Gist came by way of the Ohio and Miami rivers scouting for the Ohio company. He too was deterred by confusing geography and Indians and left the state without seeing the central plateau.

Further exploration of Kentucky was delayed by the French and Indian War (*q.v.*). John Finley, a Virginian trader, had visited the region before the war began, and in 1755 he was able to describe it to Daniel Boone while the two were serving as wagoners on the Braddock expedition to the head of the Ohio. Boone was not to forget this land, and in 1767 he undertook to explore it alone and became lost. Finley visited Boone in North Carolina, and in 1769 he and Boone with a small party crossed the mountains on a long hunt. For two years Boone wandered in the region, much of the time alone. Behind the mountains settlers were moving down the valleys. Already they had broken through the Appalachian barrier to Tennessee and had established a settlement on the Watauga, a headstream of the Tennessee river. Boone had already left Kentucky in 1771 when the "long hunters," so-called because of their extended trips, from the Yadkin valley of North Carolina were crossing the mountains to raid the territory for skins and furs.

Settlement. — Land hunters were as persistent as those who hunted for game, and by 1774 surveyors were already platting lands in at least three locations in the state. One party was at the falls of the Ohio, later the site of Louisville, another was in the bluegrass area, and James Harrod, a Pennsylvania trader, led a party to the headwaters of the Salt river to begin the first permanent settlement. A brief interruption caused by an Indian outbreak known as Lord Dunmore's war forced Harrod to leave Kentucky, but the following year settlers returned to the station.

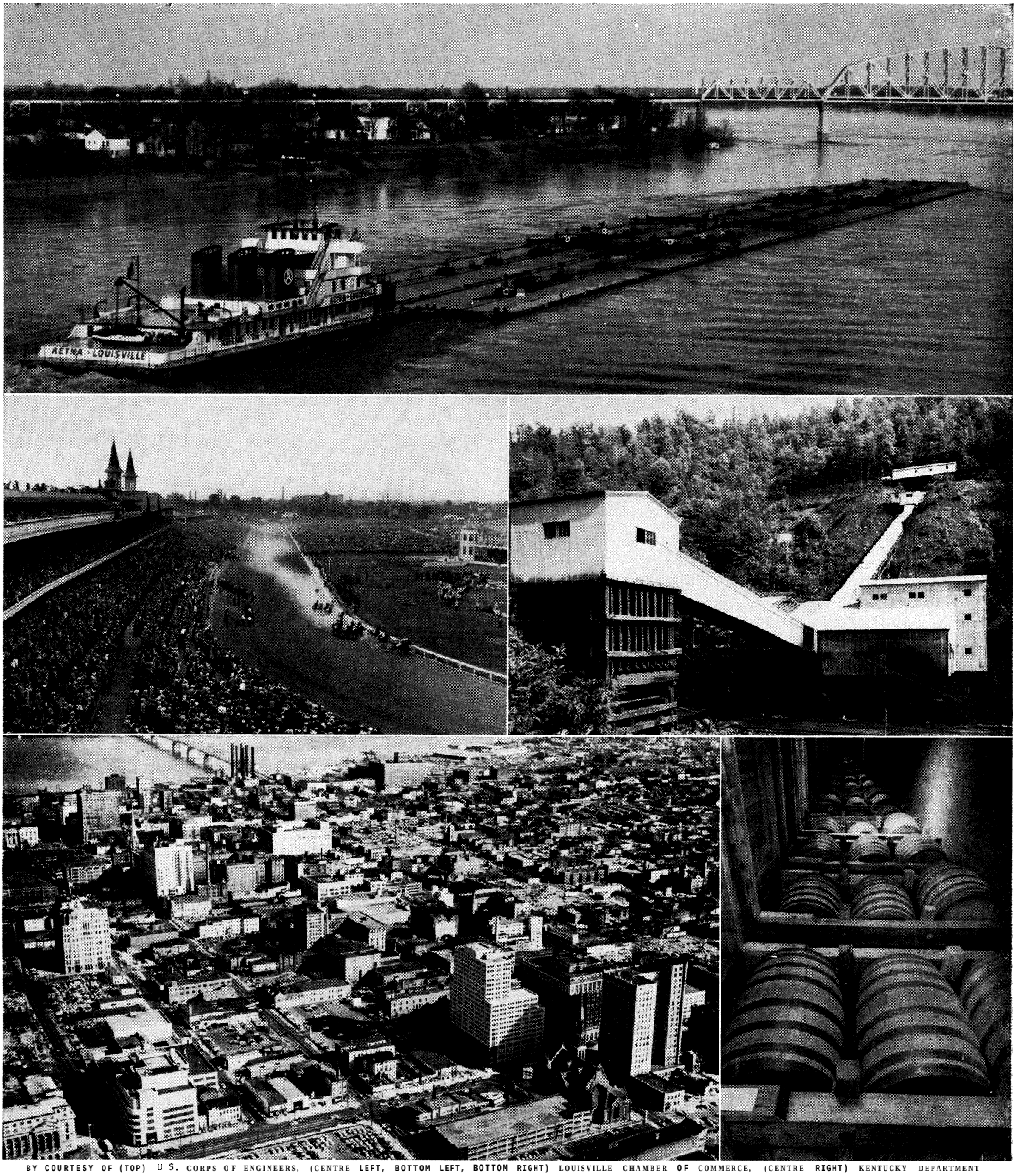


BY COURTESY OF (TOP RIGHT, CENTRE LEFT, BOTTOM RIGHT) KENTUCKY DEPARTMENT OF PUBLIC RELATIONS. (BOTTOM LEFT) LEXINGTON CHAMBER OF COMMERCE; PHOTOGRAPH, (TOP LEFT) JOHN E. THIERMAN FROM F.F G

SCENES IN CENTRAL KENTUCKY

Top left: Our Lady *of* Gethsemane, a Trappist abbey in Nelson county, founded in 1848
Top right: Burley tobacco growing on a farm near Lexington
Centre left: Thoroughbred horses grazing in the bluegrass on a stock farm
Bottom left: Ashland, the home of Henry Clay (1777–1852), Kentucky statesman and orator. The home was built on the outskirts of Lexington
Bottom right: A chamber in Mammoth cave, Edmonson county

KENTUCKY



BY COURTESY OF (TOP) U S. CORPS OF ENGINEERS, (CENTRE LEFT, BOTTOM LEFT, BOTTOM RIGHT) LOUISVILLE CHAMBER OF COMMERCE, (CENTRE RIGHT) KENTUCKY DEPARTMENT OF PUBLIC RELATIONS

VIEWS OF KENTUCKY

Top: Barges carrying crude oil up the Ohio river from Louisville to Ashland

Centre left: Kentucky Derby, an annual racing event at Churchill Downs since 1875

Centre right: Loading equipment, typical of underground coal mines in eastern Kentucky. The state is a leading producer of bituminous coal

Bottom left: Aerial view of Louisville with the Ohio river in the background

Bottom right: Barrelled bourbon on open-rack storage in a Louisville distillery

Richard Henderson had purchased a claim to the land south of the Ohio and between the Kentucky and Tennessee rivers from the Cherokee Indians in the treaty of Sycamore Shoals, and it was at the signing of this treaty that the disgruntled young Cherokee chief Dragging Canoe assured Henderson that the land would be "a dark and bloody one." The land was named Transylvania and in 1775 Daniel Boone and Henderson led a band of settlers across the mountains to establish Boonesboro on the south bank of the Kentucky river. Soon other forts and stations were established in the region. Already the pressure of the American Revolution was being felt in the west, and British-inspired Indian raids almost destroyed the infant Kentucky settlements. From 1775 to 1782 Kentuckians fought Indians from Detroit to Kaskaskia. George Rogers Clark launched his campaign from Harrodsburg and Corn Island in the Ohio river above the falls. (See CLARK, GEORGE ROGERS.) While Clark was in the northwest fighting British and Indians, Boone and his fellow settlers repulsed the Shawnee chieftain Black Fish and his British ally, A. D. DeQuindre, from the settlement at Boonesboro. The last of the Indian raids on Kentucy occurred when Estill's fort and Bryan station, near Lexington, were raided by a band led by the renegade Simon Girty, and the settlers were defeated in an ill-advised skirmish at the Blue Licks on Aug. 19, 1782.

Toward Statehood.— Internally another struggle had gone on; Virginia and North Carolina maintained rival claims over Kentucky. The Virginia assembly, which in 1776 created Kentucky county, practically conterminous with the present state, annulled Henderson's claim in 1778, Henderson and his associates receiving 200,000 ac. of land to be located in present Henderson county as compensation, and all sales to actual settlers were confirmed. In 1780 Kentucky county was divided into Fayette, Jefferson and Lincoln counties and in 1783 the name Kentucky was revived and given to the judicial district which was then organized for these three counties.

From 1775 to 1784 population increased from 100 to almost 30,000. Following the American Revolution the roads swarmed with immigrants from east of the mountains, largely from Virginia, Maryland, Pennsylvania and the Carolinas. These were predominantly of English, Scottish, Irish, German and French backgrounds. There were also some Negro slaves. The pioneers came over the famous "Wilderness road" which led from Cumberland gap to Boonesboro, Harrodsburg, Danville, Lexington and the Ohio. Many came down the Ohio by canoe and flatboat to land at Limestone Creek (now Maysville), at the mouths of the Licking and Kentucky rivers and at the falls of the Ohio. This tide of settlement continued to rise until the last quarter of the 18th century. Quickly towns like Lexington, Harrodsburg, Louisville, Paris, Maysville, Georgetown and Stanford gained respectable populations.

Historically, Kentuckians have made a special point of the ruggedness of their pioneer background and of their heritage of strong individualism. Pioneering in Kentucky was a rugged experience, but whether more so than elsewhere is open to question. Influences of the frontier were deeply ingrained in the lives of the people, a fact which can still be noted. Hardly had the last Indian warrior fled across the Ohio in 1782 before settlers were expressing varying degrees of dissatisfaction with the management of political affairs. By 1784 this unrest had developed into the beginning of a separation movement. Nine conventions were called in Danville to discuss separation from Virginia, an act which did not occur until 1792.

Several interesting personalities were present at the great debate which took place in the Danville conventions. Among them were James Wilkinson, Caleb Wallace, George Nicholas, Issac Shelby, Benjamin Logan, Samuel McDowell and David Rice. Wilkinson was in communication with the Spanish governor Esteban Miro in New Orleans and he stood to profit considerably by a friendly decision on the part of Kentucky toward the Spanish authorities. No historian knows fully the truth about the Spanish conspiracy, but it did disturb the proceedings at Danville.

On June 1, 1792, Kentucky was admitted to the union. Its constitution had been drafted in April and May in a short convention, in contrast to the interminable separation meetings. Kentucky's first constitution had the virtue of being brief. Men 21 years of age could vote without property qualifications; the government was to be elected by an electoral commission; no provisions were made for a lieutenant governor; and the court system was badly confused among three separate courts (court of appeals, of quarter sessions and oyer and terminer). Fortunately a provision was written into the document to permit its reappraisal at the end of five years. Possibly one of the most interesting facts about this early frontier document was that it contained a verbatim copy of the bill of rights from the second Pennsylvania constitution of 1790. Isaac Shelby was chosen the first governor, and the state government was organized in the Sheaf of Wheat tavern in Lexington. A special committee chose Frankfort on the Kentucky river to be the permanent site of the capital.

Internal Turmoil.— By the time Kentucky was admitted to the union its fields were producing large quantities of farm products. Grain, meat, flour, hempen goods, hides, tallow and distilled spirits were major stocks in trade. Thousands of tons of these products were drifted by flatboats to market in New Orleans each year. There was, however, a constant restlessness over the interference of the Spanish with this trade. Actually there was constant danger that Spanish officials would close the Mississippi river to Kentucky traffic. As a result Kentucky frontiersmen developed a more-than-usual interest in national politics. There arose, because of the proposed Jay treaty (*q.v.*) of 1794, a distinct dislike and suspicion of New Englanders. In the rivalry between Thomas Jefferson and the Federalists, the Kentuckians quickly sided with Jefferson. Possibly their state of mind was more clearly revealed in their resistance to the Alien and Sedition laws of 1798 (see UNITED STATES [OF AMERICA]: History). In Lexington, George Nicholas and Henry Clay campaigned successfully against the federalist laws. John Breckinridge brought from Virginia, and largely from the hand of Jefferson, the Kentucky resolutions (adopted by the general assembly in 1798) which, briefly, proposed the nullification of the distasteful federal laws. Kentuckians were stimulated in this early protest partly by the so-called French conspiracy. In 1793 agents had visited Kentucky in behalf of Edmond Genet, French minister to the United States, in an effort to arouse opinion in favour of the French Republicans in the Ohio valley.

Hardly had the Alien and Sedition argument developed before Kentuckians were aroused over the issue of reviewing and possibly redrafting their constitution. A political division was to occur over this issue which has largely characterized Kentucky politics ever since. The slaveholders and businessmen were aligned against the farmers and the antislavery forces who favoured rewriting the document. Finally the conservative forces saw they would lose, and assumed leadership of the campaign for a new convention and proscribed the changes which could be made. On June 1, 1800, the state began operation under its second constitution.

The 19th century brought many changes. The state matured rapidly. Already it was prosperous. Rich lands had paid big bounties and society in the more populous areas was rapidly losing its raw frontier character. Concern over the use of the Mississippi was settled by the purchase of Louisiana. Beyond the Ohio, the British in the northwest posts were accused of stimulating Indian troubles. William Henry Harrison (*q.v.*) was helping to open Indian lands to the settlers who were flocking across the river and Chief Tecumseh of the Shawnees, who looked upon this pressure as one of life or death for tribesmen, attempted to organize the Ohio valley and southern Indians into a confederacy. While he was away in Alabama, Harrison marched against the Shawnees and engaged them in battle at the mouth of Tippecanoe creek on the Wabash (Nov. 7, 1811). This was for Kentucky the beginning of the War of 1812.

The War of 1812.— Since 1805 Henry Clay had stimulated anti-British sentiment in Kentucky. By 1811 he and his fellow "war-hawk" Richard M. Johnson of Georgetown, had stirred public sentiment to a boil in the state. Kentuckians played a major role in the fighting around Detrcit and on the Great Lakes. Among the

officers who fought with General Harrison in that area were Isaac Shelby, Green Clay and Richard M. and James Johnson. Almost as many native sons fought with General Jackson at New Orleans under the command of Gen. John Adair as in the northwest.

The War of 1812 was to have an enormous bearing on the history of Kentucky. There mas an urgent need for supplies in the war and farmers and manufacturers produced huge quantities of goods. Prices were inflated and a period of speculation endangered the entire economy of the state. People lost all reason and caution. When British goods were dumped on the U.S. market after the war the Kentuckians were brought close to bankruptcy. In 1818 the general assembly had passed a law permitting the chartering of approximately 50 branches of the Bank of Kentucky, and each branch was permitted to issue its own currency. By 1819 deflation caused such a serious devaluation of state bank paper that almost everybody was ruined financially. To correct its original mistake the legislature passed two moratoriums to permit debtors either to pay their obligations with state bank currency or to delay payment for a period of two years. This came at the time the U.S. supreme court was handing down its famous *Dartmouth College* v. *Woodward* decision which involved the right of contract. The Kentucky court of appeals upheld a district court that found the state lams unconstitutional, and in a struggle known as the "Old Court-New Court" fight the legislature repealed the laws establishing the court of appeals and established a new court. Partisans were divided betneen those who opposed relief of delinquent debtors (the "Old Court" supporters) and those who favoured it (the former eventually winning), and in time this division nas to mark the difference between the Whig and Democratic parties. Henry Clay became the major Whig leader. with various relief partisans and Jacksonians leading the Democrats.

1820–1860. — Possibly the most disturbing single social and political issue in Kentucky from 1820 to 1860 was that of slavery. The history of slavery in Kentucky has its distinctive phases. Farmers in the fertile bluegrass and in the productive lands of the Pennyroyal in western Kentucky were the major slaveholders, but there mere few large slaveholders in the state, and in some counties there were few slaves. From 1820 until slavery was abolished in 1865, the interstate slave trade yielded a fairly large income to both farmers and slave traders. Located on the Ohio river as it was, Kentucky slaveowners suffered from the activities of the underground railroad (*q.v.*). Too, antislavery critics, including Harriet Beecher Stowe, often saw slavery first in Kentucky and they aimed their criticisms at the state. The Kentucky slaves were finally freed by the adoption of the 13th amendment in 1865.

Since 1820 efforts to call a new constitutional convention had been resisted by conservative proslavery forces, who were afraid that a new convention would destroy their property. The issue of revising the constitution rose again in 1849 and a convention was called. The slavery issue was made the central argument in the election of delegates and only proslavery men were elected. One liberalization of the constitution was made: an educational clause was written into the document for the first time.

In 1820–60 a major economic shift occurred. Capt. Nicholas Roosevelt brought the first steamboat, the "New Orleans," downstream from Pittsburgh in Nov. 1811, and by 1820 there was a thriving traffic between New Orleans and the falls of the Ohio. This trade throttled Lexington's economic life and Louisville became the major city of the state. Too, Kentucky trade was centred on the Ohio. It was not until the coming of the railroad, the first one in the 1830s, and the development of new transportation lines across the state after the Civil War that a trade balance within the state was restored.

A Border State in the Civil War. — Kentucky was a border state. It had about as much intercourse with the states north of the Ohio as nith those in the lower south. In 1850–60 Kentucky businessmen faced the distressing dilemma of possible civil war. Definitely war was not to their advantage. It would disrupt their trade and would possibly bring complete ruin. Politically the leadership in Kentucky was shifting. Henry Clay died in 1852 and the place of honour which he had long held was taken by John Jordan Crittenden, James Guthrie and John C. Breckinridge. The Whig party disintegrated and in its place came the confusion of the Know-Nothing era. Breckinridge, a Democrat, was elected to the vice-presidency of the United States and Crittenden became a senatorial leader.

In the presidential election of 1860, two of Kentucky's native sons were candidates: Breckinridge, nominated by the proslavery Democrats who seceded from the national party convention, and Abraham Lincoln. The people, however, cast a majority vote for the John Bell-Edward Everett Constitutional union party ticket. Lincoln and Hamlin, the Republican nominees, received only 1,366 votes in Kentucky. The state was divided in sentiment between the Union and the South, and had the general assembly been in session at the proper moment in 1861 the state might have been stampeded into seceding. This did not occur, and the reasons why Kentucky adopted a policy of neutrality are numerous and complicated. Gov. Beriah Magoffin, though a Democrat, saved the state from seceding. President Lincoln in Washington also approached the problem of Kentucky with great care and understanding. Neutrality did not prevent invasion of Kentucky by both sides, first by the Confederate general Leonidas Polk at Columbus, and then by the Unionists distributing "Lincoln guns." The Confederate army occupied western Kentucky until Feb. 1862, and Grant's army moved down the Cumberland from Paducah.

In 1862 Braxton Bragg and Kirby Smith, generals of the Confederate army, invaded Kentucky. Smith pushed up from the Cumberland gap, winning the battle of Richmond en route. Bragg invaded from the Nashville area and pushed toward Frankfort, where he attempted to swear in a Confederate governor. Bragg was pursued by Gen. Don Carlos Buell, and the two commands engaged in a battle near the village of Perryville in Boyle county on Oct. 8, 1862, where the Confederates were defeated. John Hunt Morgan's raiders entered Kentucky on three different occasions and there was skirmishing in many places, but after the battle of Perryville the major part of the war was fought in other states. By the end of the Civil War, Kentucky had supplied approximately 73,000 men to the Union army, and about 35.000 men to the Confederacy. Almost immediately upon the end of hostilities the state became pro-Confederate in sentiment. (*See* AMERICAN CIVIL WAR.)

More Strife. — The process of reconstruction did not leave Kentucky altogether untouched. The free Negro proved to be an issue for three or four years, and there was some Ku Klux Klan activity. The race issue in the Reconstruction period was quickly settled, the Negro was allowed to vote and the former slaves settled down to a life of tenant farming or working in the towns and industries as wage hands. Too, the patterns of Kentucky economic development changed. Tobacco supplanted hemp as a major field crop and with the introduction of the new burley-type tobacco this industry came to be a mainstay for farmers. Railroads were built across the state from north to south, and the rich eastern coal fields were opened by the extension of rail lines into the rugged mountain valleys of Harlan, Bell and Pike counties.

Marked social strides made in the postwar years included the organization of a public-school system with state support, the founding in 1865 of the Agricultural and Mechanical college (which evolved into the University of Kentucky) in Lexington, and the establishment of a fairly effective public health department. The cities of Lexington, Louisville, Covington, Owensboro and Paducah grew rather rapidly, and some industry was located in the major towns, especially in Louisville. Kentucky wholesale merchants found a prosperous trade in the lower south and drummers from their business houses canvassed the region with great diligence.

Kentucky was not to escape the panics and agrarian turmoil of the latter half of the 19th century. Agrarian forces undertook to dominate the state government with near disastrous results in the 1880s. Nevertheless there continued a bitter fight between the corporations and the farmers. In 1899 the railroads, textbook companies and bankers joined with the Gold Democrats, who had seceded from the Democratic party, to support the gold standard (see MCKINLEY, WILLIAM) and Republicans against the farmer-

Greenbackers in a bitter gubernatorial campaign. Republican William S. Taylor seemed to have won but the election was disputed and the legislative committee on contests decided in favour of the Democratic candidate, William Goebel. Goebel, shot by an assassin on Jan. 27, 1900, died after being sworn into office on Feb. 3 and Lieutenant-governor J. C. W. Beckham filled out the term and was re-elected in 1903.

Delegates to a fourth constitutional convention had drafted the present constitution in 1891, but Kentucky was not to see peace within its borders for a long time to come. Mountain feuds raged in the east, some of them caused by friction of a state divided in the Civil War. At the same time farmers in western Kentucky were frustrated by the repeated failures of tobacco prices to pay cost of production and from 1903 to 1910 they carried on the so-called "night riders" war against the big companies and farmers who refused to co-operate in controlling the production and marketing of tobacco. Farmers' barns were burned or their crops destroyed and armed bands invaded market towns to burn warehouses of the "tobacco trust."

In a more constructive manner an able cluster of writers and newspapermen were able to bring distinction to their state. Henry Watterson, editor of the *Louisville Courier-Journal* from 1868 to 1918, made that paper nationally famous. James Lane Allen, John Fox, Jr., Annie Fellows Johnston, Alice Hegan Rice, Madison Cawein, Irvin Cobb and Eleanor Mercein Kelly produced books and poetry of more than local importance. Alben Barkley (1877–1956) of Paducah served as vice-president of the United States, and as majority leader of the U.S. senate.

In the 20th century control of the state government shifted back and forth between Democrats and Republicans. The Democrats, however, predominated. The fact that Republicans could muster enough strength to be elected reflected two facts: the ranks of Republicans in the rising urban centres were increasing, and there were sharp divisions in the Democratic party.

World War I ushered in an era of change. Although the eastern coal fields were opened much earlier, this period saw marked expansion of the industry. Between 1918 and 1945 this industry grew rapidly. Its history, however, was marred by strikes called by the United Mine Workers. The eastern fields were again torn by labour strife in the years 1957–59. Mechanization of the mining industry gradually reduced the human factor in coal production.

The depression of the 1930s followed by the impact of World War II went far to bring major changes in Kentucky's social and economic conditions. The construction of better roads, the generation of cheap electrical current and the improvement of educational facilities revolutionized Kentucky life. Since 1920 major changes have occurred in the population base, with more than half of the state's 120 counties losing people to the industrial northwest and the rising urban centres. (T. D. C.)

GOVERNMENT

The fourth constitution was adopted in 1891. It provides for a large number of elective officials and denies eligibility for immediate re-election. A convention to revise the constitution or to draft a new one meets on the call of two successive legislatures, ratified by a majority of the popular vote if that majority is at least one-fourth of the votes cast at the preceding general election. Ordinary amendments require a three-fifths majority in each house and popular approval. The chief executive officers are: governor, lieutenant governor, treasurer, auditor of public accounts, register of land office, commissioner of agriculture, labour and statistics, secretary of state, attorney general, and superintendent of public instruction. If a vacancy occurs in the governor's office in the last two years of his term, the lieutenant governor serves out the term. The legislature can repass over the governor's veto any measure by a simple majority of the total membership in each house.

Senators serve four years, one-half retiring every two years; representatives serve two years. There are 38 senators and 100 representatives. The senate sits as a court for the trial of impeachment cases. A majority of either house constitutes a quorum, but ordinary bills, on the third reading, must receive a majority of the quorum which must be at least two-fifths of the total membership of the house. A majority of the total membership of each house is necessary for appropriation bills and bills creating debts. All revenue measures must originate in the house of representatives, but the senate may introduce amendments. There are many detailed restrictions on local and special legislation.

The judiciary consists of a court of appeals, circuit courts, county courts, justice of the peace courts and police courts. The court of appeals, composed of seven judges, one from each appellate district, serves for eight years. The senior judge presides as chief justice. Judicial circuits consist of groups of counties with those containing more than 150,000 people constituting separate districts. Each district has a judge and a commonwealth's attorney. The elective county officials—judge, clerk, attorney, sheriff, jailer, coroner, surveyor and assessor—serve four years.

The municipalities are divided into six classes according to population, a classification which permits much special local legislation despite constitutional inhibition. The division lines are 100,000 or more for class one; 20,000; 8,000; 3,000; 1,000; and under 1.000 respectively.

Finance.—The Reorganization act of 1936 brought about a considerable realignment of Kentucky's administrative system. One of the major units created at that time was the department of finance, which is divided into five major divisions—budget, accounts, personnel, purchase and services. The division of the budget is under the direction of the commissioner of finance and the governor. The commissioner of finance has wide powers, even to seeing that the local branches of government conform to an established budgetary practice. Kentucky draws its tax income from selected sales excises, licence fees, taxes on individual incomes, on property, and on corporations, death and estate taxes, severance levies and documentary and transfer fees. The largest sources are sales, motor fuels and individual income taxes. Motor fuel and motor licence fees are appropriated to highway maintenance.

POPULATION

The population of Kentucky in 1790 was 73,677; in 1820 it was

Kentucky: Places of 5,000 or More Population (1960 Census)*

Place	Population				
	1960	1950	1940	1920	1900
Total state	3,038,156	2,944,806	2,845,627	2,416,630	2,147,174
Ashland	31,283	31,131	29,537	14,729	6,800
Bellevue	9,336	9,040	8,741	7,379	6,332
Bowling Green	28,338	18,347	14,585	9,638	8,226
Campbellsville	6,996	3,477	2,488	1,535	1,341
Corbin	7,119	7,744	7,893	3,406	1,544
Covington	60,376	64,452	62,018	57,121	42,938
Cynthiana	5,641	4,847	4,840	3,857	3,257
Danville	9,010	8,686	6,734	5,099	4,285
Dayton	9,050	8,977	8,379	7,646	6,104
Elizabethtown	9,641	5,807	3,667	2,530	1,861
Erlanger	7,072	3,694	2,416	711	453
Florence	5,837	1,325	776	268	258
Fort Thomas	14,896	10,870	11,034	5,028	—
Frankfort	18,365	11,916	11,492	9,805	9,487
Franklin	5,319	4,343	3,940	3,154	2,166
Georgetown	6,896	5,516	4,420	3,903	3,823
Glasgow	10,069	7,025	5,815	2,559	2,019
Harrodsburg	6,061	5,262	4,673	3,765	2,876
Hazard	5,958	6,985	7,397	4,348	—
Henderson	16,892	16,837	13,160	12,169	10,272
Hopkinsville	19,465	12,526	11,724	9,696	7,280
Lexington	62,810	55,534	49,304	41,534	26,369
Louisville	390,639	369,129	319,077	234,891	204,731
Ludlow	6,233	6,374	6,185	4,582	3,334
Madisonville	13,110	11,132	8,209	5,030	3,628
Mayfield	10,762	8,990	8,619	6,583	4,081
Maysville	8,484	8,632	6,572	6,107	6,423
Middlesborough	12,607	14,482	11,777	8,041	4,162
Mount Sterling	5,370	5,294	4,782	3,995	3,561
Murray	9,303	6,035	3,773	2,415	1,822
Newport	30,070	31,044	30,631	29,317	28,301
Owensboro	42,471	33,651	30,245	17,424	13,189
Paducah	34,479	32,828	33,765	24,735	19,446
Paris	7,791	6,912	6,697	6,310	4,603
Pleasure Ridge Park	10,612	—	—	—	—
Princeton	5,618	5,388	5,389	3,689	2,556
Richmond	12,168	10,268	7,335	5,622	4,653
Russellville	5,861	4,529	3,983	3,124	2,591
St. Matthews	8,738	—	—	—	—
Shively	15,155	2,401	1,273	—	—
Somerset	7,112	7,097	6,154	4,672	3,384
Valley Station	10,553	—	—	—	—
Winchester	10,187	9,226	8,594	8,333	5,964

*Populations are reported as constituted at date of each census.
Note: Dash indicates place did not exist during reported census, or data not available.

564,317; in 1860, 1,155,684; in 1900, 2,147,174; in 1950, 2,944,806; and in 1960, 3,038.156. This last figure represented an increase of 3.2% over the population in 1950. The population per sq.mi. in 1960 was 75.2, as compared with 72.9 in 1950, and with 49.6 for the United States in 1960.

Of the 1960 population, 1,353,215 or 44.5% were classed as urban as compared with 36.8% in 1950. The state has two standard metropolitan statistical areas, Louisville and Lexington. These areas had a total population of 857,045 or 28.2% of the total population of the state in 1960.

The number of households in 1950 was 779,608, as compared with 698,538 in 1940. The average population per household had declined from 4.1 in 1940 to 3.8 in 1950.

The population of the state was distributed by colour and nativity as follows: 92.6% native white; 0.5% foreign-born white; and 6.9% nonwhite, almost all Negro. There were 100.6 males per 100 females in the native white population, and 96.9 in the Negro population; 8.0% of the population were 65 years old or over; and 48.5% of the population 14 years old and over were in the labour force. Of the total number of employed males, 31.9% were engaged in agriculture, 7.0% in construction, 14.8% in manufacturing and 19.8% in transportation and trade.

EDUCATION

Public Schools. — The third constitution (1849) provided for the creation and support of a public-school system. This program was interrupted by the Civil War, and from 1865 to the first decade of the 20th century the general assembly gave the schools most meagre financial aid. The great "whirlwind campaign" of 1908, conducted by school people and interested citizens to call attention to the public schools and to bring about their improvement, brought about the reorganization and revitalization of the public school movement. The state assumed a larger share of public-school support and required local districts to levy a school tax and to make a maximum effort to finance schools. State funds were used to aid public schools in their operation throughout the state. The Reorganization act of 1908 established two teachers colleges, provided for a department of education in the Kentucky State college (University of Kentucky) and provided for a series of teacher qualifications. Kentucky led the southern states in the passage of a compulsory school law (1898), and from 1900 on it encouraged consolidation of small schools into larger and more efficient units.

A series of legislative acts and constitutional amendments have brought about revisions of the administration of the public schools. Historically Kentucky has had a meagrely supported school system. The state has had limited tax resources from which to draw funds and people in many areas have made only minimum efforts to support their schools. In 1941 a constitutional amendment was adopted to permit the distribution of funds in excess of the per capita appropriation, but not more than 10% of the general state school funds to equalize educational opportunities in the poorer districts. This plan was revised in 1953 by a second constitutional amendment to permit the adoption of a minimum foundation plan. In this latter provision emphasis is placed upon a minimum standard of educational effort rather than making a dole appropriation to schools. In addition, appropriation of state funds is made to local districts on the basis of children enrolled in schools instead of children counted in the school census. Increased state appropriations provide that under the minimum foundation program law, no school district receives less than $80 in state aid per child maintaining an average daily attendance. About three times as many children are enrolled in the 1st grade as there are in the 12th. The scale breaks sharply after the fifth and eighth grades.

Desegregation. — A federal district court decision, *Johnson* v. *University of Kentucky* (1948), opened the doors of the graduate and specialized schools of the University of Kentucky to Negroes. In essence this decision nullified the Day law of 1904-which had prohibited coracial education in Kentucky. The subsequent supreme court decision in *Brown* v. *Topeka School Board* in 1954 removed the last of the racial barriers in the public-school system. Gov. Lawrence Wetherby stated immediately that Kentucky would respect the decision of the supreme court and many local school boards began making plans to desegregate their schools. By 1960, of the 215 school districts in the state, about 170 had Negro students, and there were approximately 220,000 white students and 30,000 Negro students enrolled in desegregated schools. In these districts approximately 5,500 white and 170 Negro teachers instructed about 133,000 white and 12,000 Negro students in mixed classes. Total enrollment in all public schools in the state was about 640,000, about 40.000 of whom were Negro. Except for some difficulty in the villages of Clay and Sturgis. and a momentary threat of disturbance in a school on the outskirts of Henderson, this radical change took place without an unhappy incident. Subsequently Gov. A. B. Chandler took a positive stand in favour of desegregation and this no doubt helped to ease the school system through its change.

Higher Education. — In the field of higher education, Kentucky maintains eight four-year colleges including a university. At the head of the educational system is the University of Kentucky, located in Lexington. This school was chartered in 1865, but did not open its doors in its present location until 1881. It was first the Kentucky Agricultural and Mechanical college, and after a series of name changes it became the University of Kentucky in 1918. The university is a land-grant institution maintaining a rather strong liberal-arts tradition. There are 11 colleges, including the professional schools of law, medicine, pharmacy, dentistry and nursing. In addition, there are the experiment station and the agricultural extension service.

Of the state colleges there is Western Kentucky State college (founded 1906) at Bowling Green; Murray State college (1922) at Murray; Morehead State college (1923) at Morehead; Eastern Kentucky State college (1906) at Richmond; and Kentucky State college, formerly Kentucky State Normal School for Colored Persons (1886), at Frankfort. Four of these were teachers colleges until changes in their titles and organization made them general colleges. Besides these schools Kentucky maintains two junior colleges and vocational schools in Paintsville (Mayo State) and Covington (Northern Kentucky State). Degree-granting colleges supported either by municipal or private funds include the University of Louisville, established as Jefferson seminary in 1798, at Louisville; Asbury (1890), nonsectarian, at Wilmore; Berea (1855), nonsectarian, at Berea; Centre (1819), Presbyterian and United Presbyterian, at Danville; Georgetown (1787), Southern Baptist, at Georgetown; Transylvania (1780), Disciples of Christ, at Lexington; Pikeville (1955), United Presbyterian, at Pikeville; Union (1879), Methodist, at Barbourville; and Kentucky Wesleyan (1858), Methodist, at Owensboro. Roman Catholic colleges include Nazareth (1920), for women, Ursuline (1938), for women, and Bellarmine (1950), for men, all at Louisville, and Villa Madonna (1921), coeducational, at Covington. Besides these, there are the Southern Baptist Theological seminary, the College of the Bible, the Presbyterian seminary and the Asbury seminary granting graduate degrees in theology.

Among the junior colleges are the University of Kentucky centres at Covington and Ashland, Bethel Woman's college at Hopkinsville, Campbellsville college, Caney Junior college at Pippa Passes, Lee at Jackson, Cumberland at Williamsburg, Lindsey-Wilson at Columbia, Sue Bennett at London and Paducah Junior college at Paducah.

HEALTH, WELFARE AND CORRECTIONS

The benevolent, charitable, corrective and penal institutions of the state are under the supervision of the department of welfare created in 1936. The institutions include: Eastern State hospital, Lexington; Central State hospital, Lakeland; Western State hospital, Hopkinsville; Kentucky Training home, Frankfort; Kentucky Children's home, Lyndon; Kentucky State hospital, Danville; Kentucky Houses of Reform, Greendale; Kentucky State reformatory, La Grange; Kentucky State penitentiary, Eddyville; and Women's prison, Pewee Valley. They, like the public schools, lack adequate support and suffer from overcrowding. For administrative purposes the department of welfare in 1948 fell under four major divisions, each headed by a director—correc-

tions, probation and parole, hospitals and mental hygiene; public assistance; child welfare; and division of engineering. The 1948 general assembly established a state tuberculosis sanatoria commission. The commission also has supervision of Hazelwood sanatorium at Louisville. The 1948 general assembly also transferred to a new department of economic security the division of public assistance (administering aid to the aged, blind and disabled and aid to dependent children), formerly parts of the welfare department. At the same time it transferred the division of engineering to the Kentucky building commission.

The annual prisoner population, about 3,000, represents a rate of about 100 prisoners per 100,000 population. Slightly more than a third of all prisoners released during a typical year are released by parole. Juveniles retained in correctional institutions numbered about 5,500.

THE ECONOMY

Agriculture. — No phase of Kentucky economic life has changed more rapidly than its agriculture. Trends — decreasing number of farms and acres in cultivation, increasing size and value per farm and per acre, the shifting of ownership and the drop in tenancy — reflect the changes brought about by increasing mechanization of farms. Each year there has been a shrinkage in the farm population. In 1930 there were 246,000 farms; within 25 years the number had dropped to fewer than 200,000. At the same time the number of acres in cultivation dropped from more than 19,225,000 to about 18,034,000 while the land valued at $871,449,000 in 1930 had more than doubled in value in the second half of the 20th century. During and after World War II the average size per farm increased from 80.2 to 93.2 ac. and value per farm rose from $3,070 to $8,900, with an increase in acre value from $38.26 to $95.49. The number of full owners of farms at the end of World War II was more than 143,000 and decreased to about 126,000 and the number of tenants decreased from about 49,000 to less than 39,000.

In spite of these changes Kentucky is still characteristically rural. In 1950 out of a population of 2,944,806 persons, 1,084,070 were urban, 886,566 rural nonfarm and 974,170 rural. Both urban and nonfarm represent a strong mixture of rural inhabitants. Since 1950 a further shifting of the population base has occurred with a greater number of people being classified in the rural nonfarm and urban columns. Reasons for shifting of the farm base in Kentucky are many. Restrictions on tobacco acreage has pushed tenants off farms and mechanization of both the cultivating and harvesting operation has reduced substantially the need for farm labour. The growth of industry in many parts of the state and in the middle west has robbed the submarginal farms of their labour, as has an expanding urbanization about Louisville, Owensboro, Paducah, Lexington, Covington and Ashland. By the 1940 census out of a population of 2,845,627,849,327 were urban, 738,401 rural nonfarm and 1,257,889 rural (*see* also Population, above).

Farm crops have become more highly diversified than at any time in the state's history. The total annual farm crop income in the second half of the 20th century was about $400,000,000; of this amount tobacco yielded more than $200,000,000; corn returned more than $80,000,000 and hay more than $50,000,000. These three crops represented about 90% of the total income from sale of farm produce.

In the second half of the 20th century Kentucky farmers were cultivating about 4,339,000 ac. with 1,836,000 ac. being planted in corn; 1,653,000 in hay; and 242,000 ac. in tobacco. Other crops were fruits, vegetables, small grains, soy beans and potatoes.

Livestock farming increased after 1950, the value of all livestock on Kentucky farms reaching more than $200,000,000 before 1960. Again Kentucky assumed the lead in livestock production in the southeast. Cattle constituted the major gain, totaling more than $165,000,000, and hogs were valued at more than $25,000,000. To indicate the remarkable change that came over Kentucky agriculture in the 1950s, all horses and mules were valued at only $14,000,000, although there were still large thoroughbred breeding farms in the bluegrass region. The American Thoroughbred Breeders association, which operates a research program to obtain knowledge of probability in horse-breeding, has its headquarters in Lexington.

The mule is on his way to extinction in a state which once received a big income from the breeding industry. The Kentucky experiment station made no provision for horses and mules on its new Eden Shale Belt farm, and were it not for sentimental reasons it is doubtful that the Kentucky State fair would any longer exhibit jacks, jennets and mules. A more shocking fact in Kentucky agricultural history is that farm proprietary income has dropped below 10% of the entire state income since 1950.

Manufacturing. — Although its population is still rural, and its basic economic tradition is agrarian in origin, nevertheless Kentucky is rapidly developing a rich manufacturing industry.

By the second half of the 20th century there were about 2,500 manufacturing industries employing more than 150,000 individuals who earned annual wages in excess of $550,000,000. These industries made annual capital expenditures of about $125,000,000 and yielded a cash return of more than $1,225,000,000. This latter figure has greater significance when compared with the total annual return for agricultural livestock products of about $500,000,000. Not only is industry yielding a bigger income in the state, it is becoming more highly diversified. Producing 22% of U.S. manufactured cigarettes, the old tobacco industry, centred largely in Louisville (ranked as the second largest cigarette manufacturing centre in the nation) and Lexington is expanding its manufacturing facilities.

Among new industries are the chemical plants located along the Ohio river, the aluminum industry in Louisville, the smaller metal factories about the state and the electrical typewriter industry in Lexington. While manufacturing is still located along the Ohio shoulder, industries are moving into other areas of the state. The larger industrial centres are Ashland, Bowling Green, Covington, Frankfort, Lexington, Louisville, Newport, Owensboro and Paducah (*qq.v.*). The leading industries are foods, tobacco, metals, chemicals, farm machinery, typewriters and printing and publishing. Other manufacturing industries include lumber, textile and apparel and beverages of all types, largely distilled liquors.

Minerals. — Leading mineral products are bituminous coal, petroleum, natural gas, stone, fluorspar and clays. In the second half of the 20th century Kentucky ranked second among the states in the production of ball clay (about 25% of the U.S. total), third in bituminous coal production and fourth in fluorspar production. Once settlers obtained their own salt from salt licks and processed saltpetre deposits in Mammoth cave and elsewhere for gunpowder. Some lead was mined for local consumption and iron was mined commercially in the eastern part of the state, near Ashland, as late as the 1870s. Coal mining began early in the 19th century, continuing in the second half of the 20th century in the western, Big Sandy, Kentucky river and Cumberland river regions.

Trade. — A good share of Kentucky's income is derived from the retail and distributive business. In the second half of the 20th century about 25,000 retail establishments with payrolls amounting to more than $200,000,000 yielded a gross annual sales income in excess of $2,000,000,000. Sales in the Ashland and Covington urban areas are associated with the incomes of Huntington, W.Va., and Cincinnati, O. About 2,500 wholesale establishments yielded a gross return of about $1,500,000,000. Services such as automobile repairs, recreation, business services, and hotels and motels increasingly yielded substantial additional income.

Transportation. — The transportation system of Kentucky perhaps began by the marking of a trail through Cumberland gap by Daniel Boone in 1775. This developed into the Wilderness road which, with the Ohio river, served the early settlers. Streams and turnpikes afforded fair service until the railroad era. The first short railway, started in 1830, was in partial operation in 1835. Growth of steam railways was slow until 1880, when mileage was only 1,530. In the second half of the 20th century the mileage in operation was about 3,500, all diesel. Most of the lines run south or southwest from Cincinnati, O. and Louisville.

Highway construction and maintenance has always been a difficult undertaking for Kentucky, largely because of the state's

rugged terrain and numerous stream crossings. The state, however, sits across the main north-south and east-west lines of travel In the second half of the 20th century Kentucky had a total nonsurfaced mileage of roads of 40,000 mi. and a total rural mileage of all kinds of roads of almost 60,000 mi. In all there were 63,000 mi. of roads. Support for highways comes from a gasoline tax of five cents per gallon plus two cents for maintenance of rural farm-to-market roads, and from funds appropriated by the federal aid program. Three major interstate routes cross Kentucky.

Again the Ohio river has become a major channel of transportation, with barges serving as a chief transport for petroleum products, coal and other bulk materials. Pipelines crisscross the state bearing natural gas and oil to market. Truck and tank car lines also transport large quantities of gas and oils. See also Index references under "Kentucky" in the Index volume.

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(E T; W W Js.; T D C.)

KENTUCKY BLUE GRASS: see BLUEGRASS.

KENTUCKY COFFEE TREE (Gymnocladus dioica), a North American tree of the family Leguminosae (*q.v.*), called also Kentucky mahogany and nickertree, found, though nowhere common, in alluvial woods from western New York through Ontario to South Dakota and southward to Tennessee and Oklahoma. It is a handsome forest tree, 75 to 110 ft. high with a trunk diameter of 2 to 3 ft., bearing large, bipinnately compound leaves, 1 to 3 ft. long, composed of numerous ovate leaflets and showy white flowers in terminal clusters, followed by thick, leathery pods (legumes), 6 to 10 in. long. The pods contain large seeds, three-fourths of an inch long, embedded in sweet reddish pulp, that were formerly used as a substitute for coffee.

KENYA, a British colony and protectorate in East Africa, bounded on the north by Ethiopia and Sudan, on the west by Uganda, on the south by Tanganyika and on the east by the Indian ocean and the Somali Republic. Including parts of the great African lakes, it has an area of 224,960 sq.mi. (land area 219,789, water area 5,171). Included in Kenya are the northeastern shores of Lake Victoria and nearly the whole of Lake Rudolf. Part of the coast lands—from the Tanganyika frontier to Kipini—to a depth of 10 mi. inland, together with Mombasa, Lamu and other small islands, are held on lease from the sultan of Zanzibar, and form the Kenya protectorate as distinct from the colony. For nearly all purposes the distinction is in name only.

The coastline extends from the mouth of the Umba river in the south to Dicks Head in the north; it has a few deep indentations. The northern part of the colony, representing three-fifths of the whole, is arid and almost waterless. All economic production, as well as the area of white settlement, is in the southern part. From the low coastal plain the land rises to a broad plateau 3,000 to 10,000 ft. in altitude, covered for the most part by volcanic rocks. This belt is cut by the trough of the eastern rift valley; west of the rift the ground sinks to the level of Lake Victoria, about 3,700 ft. above sea level. In the north, and east of Lake Rudolf, a well-defined escarpment marks the frontier with Ethiopia. The Tanganyika and Somalia (Italian) frontiers are arbitrary straight lines. The colony takes its name from Mount Kenya (a corruption of the native name Kilinyaa), the second highest mountain in Africa after Kilimanjaro.

The coastal strip or Temborari varies from 2 mi. to 10 mi. in width, except in the valleys of the main rivers. The shoreline is broken by bays and branching creeks, often cutting off islands from the mainland. Such islands include Mombasa in 4° 4′ S. and the larger islands of Lamu, Manda and Patta (the Lamu archipelago) between 2" 20′ and 2° S. Beyond the coastal plain the country rises in generally well-defined steps to an altitude of about 1,000 ft. forming the thorn scrub country known as the Nyika, which increases gradually in altitude westward. The western edge of the Nyika is bounded by extensive hill areas composed of ancient metamorphic rocks, their height varying from 5,000 to 8,000 ft. Farther inland extensive grassy plains such as those of Kapiti and Athi stretch to the eastern edge of the rift valley between 1° and 2° S. A broad belt of volcanic rocks extends from the region of Lake Magadi to Lake Rudolf which in the south forms the Kenya highlands. To the east of the rift valley rises the volcanic pile of Mount Kenya (17,058 ft.) and the Aberdare range whose highest points are Sattimma (13.004 ft.) and Kinangop (12.816 ft.). At the foot of the Aberdares in the south lies the Kinangop plateau with a general elevation of about 8,000 ft. The rift valley varies in width from 30 to 40 mi. and its floor is 2,000 to 3,000 ft. lower than the level of the country on either side. In it are a chain of lakes, mostly without outlets, whose basins are separated by a series of extinct volcanoes, such as Suswa (7,732 ft.) and Longonot (9,111 ft.). To the north of Longonot is Lake Naivasha, a fresh-water lake 6,150 ft. above sea level measuring about 10 mi. by 5 mi. Its basin is separated from the small soda lake of Elmenteita (5,850 ft.) by the dormant volcano Eburru. To the north of Lake Elmenteita lies Lake Nakuru (5,765 ft.), flanked to the east by another ancient volcano, Menengai. Farther north again are Lakes Hannington and Baringo, beyond which the valley is drained northward into the Suguta swamp in 2° N. The valley becomes somewhat less well-defined in the region of Lake Rudolf (*q.v.*), which extends beyond the Ethiopian frontier.

While the eastern wall of the rift is marked by steep escarpments, such as that of Kikuyu in the south and Laikipia farther north, the western wall rises more gradually to the Mau escarpment (10.165 ft.) between 1° S. and the equator. Between the equator and 1° N. the Elgeyo escarpment (about 9,000 ft.), finely forested, falls to a longitudinal valley separated from Lake Baringo by the ridge of Kamasia. To the west of Elgeyo is the treeless Uasin Gishu plateau, a wide plain with a general altitude of about 6,000 to 8,000 ft. and the Kericho highlands (7,000 ft. average). On the border between Kenya and Uganda is the great mountain mass of Elgon (*q* v.) 14,178 ft., while to the south of the Kavirondo gulf of Lake Victoria are Gwasi and Homa mountain.

East of Lake Rudolf is an extensive waterless steppe underlain by volcanic rocks from which rise Mounts Kulal (7,520 ft.) and Marsabit (5,593 ft.), both volcanic piles. In the south of this arid region, strewn with lava boulders, are the Rendille plains which afford pasturage for thousands of camels. Running from northwest to southeast between Lake Stefanie in Ethiopia and the Daua tributary of the Juba is the Goro escarpment, whose eastern portion forms the boundary between Kenya and Ethiopia.

The main watershed of Kenya runs close to the eastern wall of the rift valley. Within the rift the drainage is internal into the chain of lakes; to the west of it, rivers drain into Lake Victoria, while to the east the drainage is toward the Indian ocean. The

two largest rivers in the colony are the Sabaki and Tana, both noticed in separate articles. The Guaso Nyiro rises in hills northwest of Mount Kenya and flows in an easterly direction. After a course of more than 350 mi. the river at about 1° N., 39° 30′ E., enters a marshy expanse known as the Lorian swamp, from which issues an intermittent stream, the Lak Dera, nominally a tributary of the Juba.

Towns. — Nairobi, the capital, and Mornbasa, the port, are considered in separate articles. On the mainland, nearly opposite Mombasa, is the settlement of freed slaves named Freretown, after Sir Bartle Frere. Freretown (called by the natives Kisaoni) is the headquarters in East Africa of the Church Missionary society. It was the residence of the bishop of the diocese of Mombasa, but the bishop's seat has been moved to Nairobi. Lamu (pop., 1948, 5,868), on the island of the same name, 150 mi. N.E. of Mombasa, is an ancient settlement and the headquarters of the coast Arabs. Here are some Persian and Portuguese ruins, and a large Arab city is buried beneath the sands. Other towns on the coast are Malindi (3,292), Patta and Kipini. At Malindi, the "Melind" of Paradise Lost, is the pillar erected by Vasco da Gama when he visited the port in 1498. The harbour is very shallow. Of towns founded by the white settlers (besides Nairobi), h'aivasha, 64 mi. N.N.W of Nairobi. lies in the rift valley close to Lake h'aivasha, and is 6,230 ft. above the sea. It is the centre of a European agricultural settlement (white pop., 442). Nakuru (17,625), 57 mi. by rail northwest of Naivasha. and finely situated on the shores of a salt lake, is the headquarters of the Kenya Farmers association. At Eldoret (8,193) on the Uasin Gishu plateau is a settlement of Afrikaans-speaking South Africans. Kisumu (10,899) is a port on Lake Victoria with railway and steamer services; up to 1928 it was the entrepôt for the trade of Uganda. Fifteen miles north of Nairobi is Kikuyu, a noted missionary station; Limuru (7,340 ft. high), 10 mi. N. of Kikuyu, has a reputation as a health resort.

Other towns founded by white settlers are Gilgil, Kitale, Thika, Fort Hall, Nanyuki and Nyeri.

Geology. — According to the main physiographical features, Kenya may be broadly divided into the following regions: (1) the coastal plains and hills, consisting of sedimentary deposits; (2) the Nyika or scrub country and hills to the west of it, consisting of rocks of the Basement system; (3) a broad belt of Tertiary to Recent volcanic rocks comprising the highlands; (4) the rift valley, an area of volcanic rocks and Quaternary lake deposits; (5) the country to the west of the highlands consisting of Pre-Cambrian rocks together with some granite intrusions and isolated volcanic mountains; and (6) the desert regions of the Northern province, consisting mostly of volcanic rocks. The whole country is underlain by rocks of the Basement system (*i.e.*, rocks of the oldest period, gneisses and schists metamorphosed from various types of sediment) though these are only exposed in central Kenya where the later volcanic rocks which covered them have been removed by erosion. For the most part these very ancient rocks consist of gneisses and schists, and they are often associated with minerals of commercial value such as kyanite, graphite, asbestos and mica found mainly round the area of Sultan Hamud, Mtito Andei and Tsavo. Steep-sided tors or inselbergs, residual mountains of metamorphic rocks, rise up from the characteristic dry plains associated with rocks of the Basement system in the Ukamba country. The coastal plain is made up of Recent sand dunes and coral limestone, bounded to the west by a strip of Jurassic limestones and shales. These Jurassic deposits overlie unconformably the Duruma sandstones and other sediments of Permian to Triassic age, which occur in a strip about 35 mi. wide. The northeastern corner of the colony is occupied by Jurassic limestones, sandstones and shales, covering an area of several thousand square miles. The Nyika peneplain lies west of the coastal hills and increases westward in altitude from about 800 to 5,000 ft. The sediments of its eastern portion give way to rocks of the Basement system in the west.

The volcanic belt stretches from Lake Magadi to Lake Rudolf and includes the highlands of Kenya. This huge area, covered by Tertiary to Recent volcanic rocks and their associated fertile soils, is most favourable to European settlement. Most of the lavas are alkaline and include phonolites, nephelinites, rhyolites and basalts. During the Miocene period. plateau basalts and phonolites were erupted which gave rise to the Kapiti plains. After these plateau eruptions, widespread volcanic activity caused the formation of Mount Kenya and Mawenzi, the older and lower peak of Kilimanjaro. Further plateau eruptions ensued, and these rocks have decomposed into the rich soils of the Kikuyu country, the forested highlands of Nandi and Lumbwa, the grassy Uasin Gishu plateau and most of Laikipia. The nephelinite of Mount Elgon also appeared about this time. Toward the end of the middle Pleistocene, intense earth movements resulted in the formation of the present rift valley which cuts right through the volcanic belt. This great trough, bounded to the east by the Aberdares range and to the west by the Mau escarpment, varies in width from about 30 to 80 mi., and its floor varies in altitude from 2,000 ft. at Magadi to over 7,000 ft. at Longonot near Naivasha, sinking again to below 1,500 ft. near Lake Rudolf. The chain of shallow lakes occupying the trough of the rift valley were deeper and more extensive at various times during the Pleistocene when thick deposits of diatomite accumulated. The rift valley area today is one of dormant volcanism, and hot springs and steam jets issue from it in several places.

In western Kenya, two systems of Pre-Cambrian rocks, together with granite intrusions, are associated with the gold fields. The older Nyanzian system in Northern and central Kavirondo is made up of a great thickness of lava flows, while in Southern Kavirondo ancient sediments and banded ironstones outcrop in the Migori gold belt. Bands of grits and sandstones of the younger Kavirondian system cover wide areas in Northern and Central Kavirondo. In the southwestern part of the colony the Pre-Cambrian rocks are overlain by lavas and quartzites of the Kisii series which are probably of Palaeozoic Age. The Northern province, forming a considerable portion of the colony, is occupied by desert and semidesert soils, from which rise volcanic piles such as Kulal (7,812 ft.) and Marsabit (5,561 ft.).

Climate. — The equator passes through the centre of Kenya. The greater part of the region north of the equator has a hot, dry climate, and in some districts, as in the Lake Rudolf area, rain does not fall for years at a time. There are few data for this part, except on the coast, where the climate is hot and damp and the rainfall variable, but rarely more than 15 in. a year. In the southern half of Kenya three climatic zones are recognized, the coast, the highlands and the lake region. The coast zone is hot and damp. February, March and April are the hottest months, when the temperature of Mombasa reaches a mean of 82° F.; June and July are the coolest months (76" F. at Mombasa). Owing to the humidity, the range of temperature is normally small, with an annual mean of 11° F., but in the same month (March) at Mombasa extremes of 98° F. and 60° F. have been registered. At Mombasa January and February are the driest months, the rains arriving with the southeast monsoon in April and May. The yearly average is about 48 in. Humidity ranges from 89% in April to 74% in December.

In districts 4,500 ft. above sea level, *e.g.*, Fort Hall, the mean temperature is about 66° F. (but with days when the thermometer registers over go° F.), the most favourable altitudes being 5,000 to 7,000 ft. The mean temperature decreases with altitude by about 2.5° F. per 1,000 ft. Thus the mean at 3,000 ft. is 73° F., at 5,000 ft. it is 68" F. and at 7,000 ft. it is 63° F. The minimum temperature rarely falls below 38° F., but has fallen in places, *e.g.*, the Eldama ravine to 30° F. Rainfall in the highlands is heavy, varying from 40 to 100 or more inches a year. There are two rainy seasons: April–June and October–December, the driest months being January and July–September. In general, the atmosphere is bracing, with cool breezes, but thick fogs may be experienced in July–September. At Nairobi the mean maximum temperature is 79° F., the mean minimum 56° F. The rainfall is about 32 in. a year. The highlands intercept the rain, thus accounting for the dryness of the country to the north. In the lake region — that is the country bordering Victoria Nyanza, the climate is typically tropical and resembles that of Uganda (*q.v.*).

Flora and Fauna.— The characteristic trees of the coast zone are the mangrove (which forms dense forests) and the coconut palm. Patches of forest containing sandalwood. the copal tree and teak also occur along the coast. The lowlands, up to about 3,000 ft., are mostly covered with thorn bush, interspersed with isolated candelabrum, euphorbia trees, baobab and a flat topped acacia. Rubber vines are found both in the coast and lowland regions. The country from about 3,000 to 6,000 ft. is either grassland or parkland, with acacia forest along the water courses, and papyrus swamps in places. The grassy belt often extends right up to the dense forest, with no transitional phase. Forest reserves total 5,526 sq.mi., 92% of which are in the highlands. The forests, which clothe the mountains between 6,000 and 10.000 ft., are of two kinds: the rain forest, generally on the eastern and southeastern slopes, and the dry forest, usually on the western slopes of the mountains. The rain forests contain the great camphor tree, hardwood trees and yellow wood. The highest zone of these wet forests is marked frequently by a growth of giant bamboos. The characteristic tree of the (relatively) dry forest is the so-called African cedar, really a juniper. The moorland or alpine zone covers regions from 11,000 ft. up to 14,500 ft. Tree heaths, giant Senecios and Lobelias characterize this zone.

Kenya is noted for its big game, and the large carnivores include lion, leopard, cheetah and wild dog. Elephants seemed to be on the increase at mid-20th century while rhinoceroses, though by no means rare, were possibly getting scarcer. The commonest animals are herbivorous, and immense herds of zebras, antelopes and gazelles roam the open plains. Among these may be mentioned wildebeests, hartebeests, impalas, eland, oryx and Grant's and Thomson's gazelles. Bongos, roan antelope, greater and lesser kudus, bushbucks, waterbucks and duikers prefer bush or forest country. Hippopotamuses and crocodiles are common in most of the larger rivers, swamps and lakes. Hyaenas and jackals play the useful role of scavengers. Large troops of baboons live in open country, while Sykes' monkeys, black-faced and colobus monkeys are to be found in the forests. Domestic animals kept by Africans include cattle, sheep, goats, donkeys and (in the northern desert) camels. In addition to cattle and sheep, Europeans keep horses and pigs. There are more than 100 species of snakes in Kenya, including the mamba, cobra, puff adder, python and the beautiful but deadly garter snake. Birds include ostriches, storks, bustards, secretary birds, several kinds of eagle, five kinds of vulture, guinea fowl, francolins and spur fowls, pigeons, weavers and hornbills. By the lake shores there are pelicans, flamingoes, herons and the sacred ibis. More than 100 species of migrants from Europe reach Kenya.

National Parks and Reserves.—A board of trustees was appointed in 1945 to control national parks in Kenya. The Nairobi national park (area 40 sq.mi.) was the first to be proclaimed, in Dec. 1946. The Tsavo national park (area 7,000 sq.mi.) situated halfway between the coast and the highlands, was established early in 1948 and became the main refuge for Kenya's game animals. Game reserves include the Marsabit reserve (9,000 sq.mi.) in the Northern province and the Southern reserve bordering on Tanganyika. No shooting is permitted in the national parks and reserves. Two smaller national parks are those of Gedi, 12 mi. S. of Malindi on the coast, and Olorgesailie, 40 mi. E. of Nairobi, which have been created to protect ancient monuments. National parks are being developed on Mount Kenya and the Aberdares range, chiefly for the sake of the flora. (S. M. C.)

HISTORY

The earliest recorded history of the area now known as Kenya concerns the coastline which for centuries has had trading relations with southern Arabia. The power of the Arabs who, helped by the monsoon winds, had made trading voyages across the Indian ocean and had established posts on the East African coast, was overthro n by the Portuguese in the 16th century. The Portuguese made their headquarters at Mombasa where their stronghold, Fort Jesus, still stands. Bitter struggles took place between the Portuguese and the Arabs, however, and the former were driven from the country in the late 17th century by the forces of the imam of Oman. After his victory the imam returned to Arabia, leaving the government of the coastal towns in the hands of a number of Omani families among whom the Mazrui were the most important. The independence of the Mazrui gave much trouble to their overlords in the 18th century, and it was not until 1837 that a strong imam, Seyyid Said, was able to curb their power. Seyyid Said moved his capital to Zanzibar and by that action gave a great impetus to the trade in ivory and slaves which had been the chief attraction to the Arabs.

After the departure of the Portuguese, European contact with the east coast was slight, the ports being regarded almost exclusively as calling stations on the way to India. Concern for the abolition of the slave trade led Great Britain to enter into an agreement with Seyyid Said in 1822 which authorized British warships patrolling the coast to search Arab vessels for slaves. But the first Europeans to penetrate into the interior were the German agents of the Church Missionary society, Johann Ludwig Krapf and Johannes Rebmann. These two men set up a mission station at Rabai, a short distance inland from Mombasa, in the territory of the Wanyika. In 1848 Rebmann became the first European to see Mount Kilimanjaro, and in 1849 Krapf ventured still further and saw Mount Kenya.

It was nearly 30 years before the society followed up this opening, and meanwhile slavers were the most active explorers of the interior. Arab and Swahili slave caravans, largely financed by Indian merchants living in Zanzibar and on the coast, carried the name of Seyyid Said to the great lakes, though the authority which the Seyyid exercised beyond a narrow coastal belt was nebulous. Two factors contributed to the unpopularity of the northern caravan route in comparison with the southern road from Bagamoyo through what later became German East Africa. First, a five days' march from Mombasa brought a caravan to the edge of the waterless Taru plain which could be crossed only with the greatest hardship. Second, to penetrate further inland was to run the risk of an encounter with the warlike Masai.

The Power of the Masai.—The pastoral Masai probably moved into the upland area of what is now Kenya from the north in the middle of the 18th century. Their further progress southward was checked by the Wagogo and Wahehe about 1830. Shortly afterward there were internal conflicts between the Wakwavi, an important section of the Masai, and other branches of the tribe which led to the Wakwavi's moving from their grazing grounds near Mount Kilimanjaro to the rich pasture of Laikipia and Uasin Gishu. The political structure of the tribe which, under the leadership of the *laibon,* a medicine man, placed great power in the hands of the moran, or warriors, made the Masai a constant menace to their neighbours. The raiding parties ranged far and wide, and in 1859 the Masai even reached the coast south of Mombasa. Their chief victims were the Bantu agriculturalists who inhabited the fertile northeastern shores of Lake Victoria, and the Wakamba to the east. The former offered no resistance, but the Wakamba, although wary of encounters with the *moran,* often raided Masailand when the Masai war parties were engaged elsewhere. The Nandi who inhabited the escarpment to the west of the Masai were equally warlike and remained undisturbed by their predatory neighbours. To the east, the Wataveta in their forests and the Wateita in their bare mountains used their natural strongholds to defy the Masai raiders. Near neighbours of the Masai, the Kikuyu had expanded southward from their home in the Fort Hall area. cutting down valuable timber in their search for the new land required by their shifting methods of agriculture. By the late 19th century they had expanded almost as far south as Ngong and were still pushing westward into the forests of the Aberdares. Their cultivated land was protected by a fringe of forest which even the Masai could not penetrate. Famine and smallpox, however, caused many of the Kikuyu to withdraw northward again in 1899 leaving much of their expansion area vacant. The Kikuyu had no form of central government and when not engaged in fighting other tribes were prone to indulge in raids between one Kikuyu village and another.

An outbreak of cattle disease, probably pleuropneumonia, ravaged the Masai cattle in 1883, and rinderpest folloaed by smallpox

in 1889–90 struck another severe blow at Masai wealth and power. At the same time as the second outbreak, the death of the great *Eaibon*, M'Batian, resulted in a split in the tribe which persisted until M'Batian's younger son Lenana was able to restore order after a struggle with his elder brother Sendeyo. From this time the power of the Masai waned rapidly although their raids continued until the 1890s, and the legend of their menace lingered on into the 20th century.

The decline of the Masai coincided with the arrival of European traders and administrators and greatly facilitated their work. In the 1860s the explorer K. K. von der Decken had been turned back from the borders of Masailand by bands of warriors. In 1883 Joseph Thomson, the first European to pass through the Masai country, was struck by the arrogance of the *moran*, but the Europeans who followed found the Masai inclined to friendship.

The Imperial British East Africa Company. — The earliest attempts to open up the land to the west of Mombasa were the work of the Imperial British East Africa company. In 1877 Sultan Barghash offered a concession of the customs and administration of the territory of Zanzibar to Sir William Mackinnon, chairman of the British India Steam Navigation company which had established a regular service of steamships between East Africa, England and India in 1872. The British government was not interested in colonial expansion, however, and without the support of the foreign office Mackinnon refused to accept the sultan's offer. In 1885 the German emperor's grant of a charter of protection to certain East African tribes, with whose chiefs the German explorer, Karl Peters, had made dubious treaties, induced Great Britain, in the interests of the sultan of Zanzibar, to join with Germany and France in a commission which in Nov. 1886 defined the limits of the sultan's territories. Simultaneously, an agreement between Great Britain and Germany recognized the territory between the rivers Rovuma and Tana, with the exception of a 10-mi. coastal strip over which the sultan exercised authority, as a British and German sphere of influence. The British took the area north of a line running from the mouth of the Umba river, opposite Pemba Island, and skirting north of Mount Kilimanjaro to a point where the 1° S. lat. cuts the eastern shore of Lake Victoria. The German sphere was south of that line. The British government was not anxious to accept responsibility for territory in East Africa and was therefore glad when Sir William Mackinnon, whose British East Africa association had in 1887 accepted responsibility for the sultan's mainland territories north of the Umba river, agreed to administer the British sphere on the government's behalf. On April 18, 1888, the association was incorporated by charter as the Imperial British East Africa company.

The Uganda Railway. — For a time the British sphere of influence became of secondary importance as interest centred on the fertile country of Buganda where British and French missionaries had been active since 1877 and 1879 respectively. When Karl Peters attempted to extend German authority into Buganda, British opinion called for counteraction. The British government, however, expected the Imperial British East Africa company to act on its behalf in Uganda, in spite of the company's wholly inadequate funds. Only the threat of withdrawing the company's agents to the coast brought the government to a realization of its responsibilities. Then, in order to maintain control over the strategically important headwaters of the Nile and to fulfil obligations with regard to the suppression of the slave trade which it had incurred at the Brussels conference in 1889–90, Lord Salisbury's government considered the possibility of constructing a railway from the coast to the lake. In the face of strong opposition from anti-imperialists the preliminary survey was begun by Capt. J. R. L. Macdonald in Dec. 1891 and a final report was submitted to parliament in March 1893. The factor which made the construction of a railway inevitable was the decision made by Lord Rosebery's Liberal government in June 1894 to act on the advice of its commissioner, Sir Gerald Portal, and declare a protectorate over Buganda. Work on the railway began at Mombasa in Dec. 1895 and the first locomotive reached Kisumu on Lake Victoria in Dec. 1901. The line was not completed, however, until 1903, by which time it had cost the British treasury £5,317,000. The greater part of the construction had been carried out by Indians brought to East Africa for that purpose.

Indians in East Africa — In 1902 nearly 20,000 Indian labourers were engaged in work on the railway, the greatest number employed at any one time. In all, 31,983 labourers had crossed from India, and when the construction work ended 6,724 decided to remain in East Africa in accordance with the agreement made on their behalf by the government of India. No attempt was made either by the protectorate government or by the railway company to find them new employment, however, and while some took up market gardening or became artisans, the majority became petty traders. In spite of criticism of their behaviour, there is no doubt that through low profits, made possible by their low standard of living, they were able, even in remote parts of the country, to introduce trade goods to Africans and to spread the use of money instead of barter. These were not the men to develop the farm lands of East Africa, but they played an invaluable part in establishing the economy of the country on a working basis.

The East Africa Protectorate. — In his report, Sir Gerald Portal had recommended that the Imperial British East Africa company should lose its charter since it had failed to fulfil its responsibilities. The government therefore approached the company in Nov. 1894 with the request that it should surrender its charter and concession in return for £250,000 compensation. The company, which had run at a loss, regarded this treatment as unjust but accepted the government's proposal in March 1895. The East Africa protectorate was proclaimed at Mombasa on July 1, 1895, and Arthur Hardinge became the first commissioner with his headquarters at Zanzibar.

The first few months of the new administration were occupied in subduing a rising of Mazrui chiefs. This held up other developments, but it ensured British supremacy on the coast. In 1896 and 1897 punitive measures had to be taken against the Kikuyu and the Wakamba and a revolt of Sudanese troops also caused trouble at Eldama ravine in the latter year. The Nandi were only brought to order in 1905 after a number of military expeditions into their territory had met with varying success. They were moved into a reserve in 1906.

Owing to the lack of any strong indigenous political organization indirect rule was impossible in the new protectorate. Indeed, any form of effective administration was out of the question until communications had improved. The importance of the East Africa protectorate was still thought to reside solely in its value as a corridor to the fertile country round Lake Victoria. This view was strengthened by the fact that the Kedong river formed the western boundary of the protectorate. As a result the fine highland pastures further west fell outside the jurisdiction of the protectorate administration. The foreign office had no plans for the development of the country, and although land regulations were issued in 1897 authorizing the lease to Europeans of land which was not cultivated or regularly occupied by Africans, there were few requests for concessions and no encouragement was given to settlers. There was, however, no thought of the paramountcy of native interests. European civilization appeared to the British government so preferable to the simple life of the African tribes that it would have seemed foolish deliberately to check European expansion. Moreover, it was thought that great areas of land were wholly unoccupied, so that there could be little danger of intruding upon the affairs of the African people. In these circumstances, the British government in 1899 accepted the view that by proclaiming a protectorate over East Africa it had assumed sovereign rights over all the land subject to the recognition of existing private rights.

The Settlers and the Land Problem. — Sir Charles Eliot, who succeeded Sir Arthur Hardinge as commissioner in 1900, believed that an effort must be made to develop the East Africa protectorate in order to recover some of the cost of constructing the railway. The British government was still paying annual grants-in-aid to the administration, and African subsistence agriculture and nomadic pastoral pursuits held out no hope of assisting the economy of the protectorate. European settlers nere needed to develop the country to the full, and the railway had given them easy access

to the richest farm land in East Africa. Eliot was strengthened in his views by the fact that in April 1902 the western highlands were transferred to the East Africa protectorate from Uganda. The third Lord Delamere, who had first seen the highlands in 1897 and had conceived a plan for their colonization by Englishmen, returned to East Africa in 1903 to try to put his scheme into effect. A few settlers were already arriving in the country in response to a series of orders in council, published in 1901 and 1902, which offered land to Europeans on favourable terms. Settlers were also encouraged to come from South Africa and in 1904 their response was such that the newly established land office could not deal sufficiently rapidly with all their requests. In an endeavour to meet the demand an administrative officer was ordered to survey the limits of the Kikuyu land in the Kiambu area. His task was made difficult by the scattered nature of Kikuyu agriculture and by the fact that much land had been vacated in 1899 as a result of the smallpox epidemic. He did not, therefore, appreciate that part of the apparently unoccupied land was looked upon by the Kikuyu as an expansion area. In consequence, its allocation to white settlers became a source of grievance when orderly government and improved medical facilities gave the Kikuyu population an opportunity to expand. The Masai also had cause for complaint. Sir Charles Eliot, who was opposed to the policy of placing Africans in reserves, resigned in 1904 as a result of a dispute with the foreign secretary. His successor, Sir Donald Stewart, immediately made an agreement with the Masai limiting them to two reserves linked by a half-mile corridor. The desire to use some of the northern reserve on the Laikipia plateau for European settlement soon resulted in a request that the Masai should move to a greatly enlarged southern reserve. The Masai were not unwilling, but the vacillation of the protectorate administration coupled with the interference of the imperial government caused them great inconvenience, and the move was not completed until 1913. The Masai lodged a complaint against their treatment, but their case was dismissed by the chief justice. His decision gave rise to a feeling of insecurity which was only partly dispelled by an official announcement in 1915 that the reserves were crown lands and that the interests of the inhabitants would be protected by the crown. Indeed, relief was not felt until 1930 when an ordinance was passed setting aside the reserves for the benefit of Africans for ever.

The Settlers and the Labour Problem. — The foreign office did little to encourage British emigration to East Africa and, indeed, at the instance of Joseph Chamberlain who had visited the protectorate in 1902, offered the Zionist movement a portion of East Africa as a temporary home. The Zionist agents who visited the protectorate in 1904 were not impressed by what they saw and nothing came of the scheme. The foreign office next looked for colonists in Finland, but again without success, and it must have been with some relief that the settlers learned of the transfer of the East African protectorate to the control of the colonial office on April 1, 1905.

The change did not affect the territory's main problem, the need to balance its budget. Import duties were the main source of revenue, and although Sir Charles Eliot had introduced a native hut tax in 1902, there was no income tax until 1937. The protectorate could not become financially independent until the agricultural resources of the country were developed. This called for African labour, and the Africans, content to live with little effort at subsistence level, did not want to work for Europeans. In 1906 Sir James Hayes-Sadler became first governor and commander in chief of the protectorate. Two years later, discontent at what they conceived to be lack of official sympathy with their problems induced the settlers to demonstrate outside Government house in the new capital, Nairobi. The governor, in contrast with his earlier uncertainty, dealt firmly with the leaders of the demonstration but introduced measures to relieve the labour situation. Until the outbreak of World War I there was a steady flow of settlers to East Africa. There were signs of prosperity, and coffee, maize and wheat, as well as animal husbandry, began to show profits.

Constitutional Developments. — Under the governorship of Sir Percy Girouard, relations between the settlers and the administration were friendly. In 1913, however, the settlers' demands caused a renewal of friction. In 1905 an executive council had been appointed and in 1907 the first legislative council was convened, consisting of six official members and two unofficial members nominated by the governor. Soon afterward the number of unofficial members was increased to four, but in 1913 the settlers put forward a claim to elect their own representatives. The outbreak of war in 1914 put a check upon their hopes, but in Sept. 1915 the appointment of a war council, in which elected representatives of the settlers outnumbered the official members by six to four, offered a fair prospect of the later satisfaction of the settlers' wants.

World War I. — The outbreak of war in 1914 found the East Africa protectorate ill prepared in comparison with the German colonists to the south. Most of the European settlers flocked to Nairobi to offer their military services, and, largely through the efforts of John Ainsworth, thousands of Africans were enlisted in labour gangs or as porters. The early stages of the campaign consisted in checking German raids across the border aimed more particularly at damaging the railway. When British naval supremacy allowed reinforcements to be shipped to East Africa, however, the fighting was soon carried into German territory, and the protectorate's main problem was then to restore its agricultural prosperity. Agriculture had been crippled by the absence of the farmers in the armed forces and was still handicapped by shortage of shipping space for the export of produce to England.

Postwar Development. — After World War I an attempt was made to develop the country's resources by means of closer settlement which was to be put into effect by encouraging former soldiers to settle in East Africa with the offer of land on easy terms. The scheme met with limited success but did not solve the financial problems of the country. In June 1920 the East Africa protectorate became Kenya colony, named after the highest mountain in the country while the coastal strip leased from the sultan of Zanzibar became the protectorate of Kenya. The first task with which the new colony was faced was that of stabilizing the currency. Many expedients were proposed before the Kenya and Uganda (Currency) order came into force on Jan. 1, 1922, and put an end to the old rupee coinage which was replaced by the British East African shilling. Communications also received attention. Already in 1913 railway extensions had been opened to Thika and to the soda deposits at Lake Magadi, and during the war a link was made between the main line and the German railway system to the south. The most important postwar project was to push forward a new extension of the main line across the Uasin Gishu plateau to tap the agricultural wealth of the highlands, and thence to press onward to Uganda in order to provide a ready means of egress to the cotton crops of that protectorate. The line was eventually completed from Nakuru to Jinja in Jan. 1928 and was carried on to Kampala which it reached in Jan. 1931. Meanwhile, branch lines from Gilgil to Thomson's falls and from Kisumu to Yala were completed in Aug. 1929 and Nov. 1930 respectively.

The Development of the Legislative Council. — In 1919 the settlers were granted elected representation in the legislative council. The Indians were given two elected members in 1920. They objected that they were still not so well represented as the European community and the imperial government suggested that European and Indian representatives should be chosen on the basis of a joint electoral roll. The settlers, having with difficulty preserved their agricultural interests from Indian encroachments, objected strongly to this new threat to their political influence, and the danger of interracial rivalry induced the government to withdraw its proposal. Instead, in 1927, the number of Indian seats in the legislative council was increased to 5, while the Europeans had 11 representatives. One member was elected by the Arab community, and one European, usually a missionary, was appointed to represent African interests. The Indians were still disgruntled, however, and refused to co-operate until 1934.

Conscious of the important part they played in the colony, the settlers attempted to push their political claims still further by advocating an elected majority in the legislative council, but the

British government decided that it could not surrender its supreme authority over the administration to any elected majority in which non-Africans played the main part.

The Labour Problem and Closer Union.—The work of reconstruction and the increase in the number of settlers had revived the demand for more labour. Aware that the reserves still produced an insignificant quantity of items for export, the governor, Sir Edward Northey, agreed in 1919 to urge district officers to do all they could to encourage the transfer of labour from the reserves to European farms. The question of closer union between the three East African territories was first raised by Lord Milner soon after World War I and was stimulated by the proposed expansion of the railway system. It was raised again in parliament in 1924, and a commission was appointed, primarily to investigate the economic possibilities of East Africa, but also to report on closer union. The commission found little support for the idea and interest turned to the need for developing the native reserves. In 1925 L. S. Amery as colonial secretary instructed the new governor of Kenya, Sir Edward Grigg, to press the need for closer union when he took up his appointment, and in 1927 Amery set up a new commission to investigate the subject. The majority report was unfavourable, however, and merely advocated the more extensive use of conferences between the three governors. Closer union slipped into the background in the 1930s as attention became focused on the world financial crisis from which Kenya was beginning to emerge when the nations of the world were once again precipitated into war in 1939.

World War II and After.—The outbreak of World War II once more found Kenya ill-prepared. Again, however, there was a rush to arms on the part of the settlers. and thousands of Africans also volunteered. The Kenya forces took part in the defeat of the Italians in Ethiopia in the early part of 1941, and in 1944 they fought in the Burma campaign against the Japanese. In the same year. Kenya became the first East African territory to include an African in its legislative council. The number was increased to two in 1946, to four in 1948 and to eight in 1951. In 1948 the East Africa high commission was set up to administer certain services of mutual benefit to Kenya, Uganda and Tanganyika.

The Mau Mau Rebellion and Multiracial Government.—The outbreak of the Mau Mau rebellion in Oct. 1952, seriously hindered the development of the country. The Mau Mau, a Kikuyu secret society. believing their tribe to be unfairly restricted in its need for land and resentful of the presence of Europeans in Kenya, launched a campaign of terrorism against the settlers, the government and any Kikuyu who remained loyal to the administration.

The government proclaimed a state of emergency and army units were brought in to reinforce those already in the country. in order that effective action might be taken against the Mau Mau. By Sept. 1955 some 14,000 terrorists had been accounted for and a great many were undergoing rehabilitation. By mid-1956 the emergency was virtually over and the army withdrew from active operations.

In March 1954, the colonial secretary, Oliver Lyttelton, announced the creation of a multiracial council of ministers, with six official, six unofficial and two nominated members. In Oct. 1956 the number of African members in the legislature was increased by two to eight. Two nominated members representing agriculture and commerce and industry were also added to the nongovernment benches. The council of ministers was also increased by two—one African and one European. An Arab adviser with the status of minister was permitted to attend meetings of the council.

Legislative provision was made for a qualitative franchise for Africans based on education, experience, public service, standing and achievement. Exceptionally qualified electors were to have additional votes. Eight African electoral areas were proclaimed. After the elections in March 1957 the new African members led by Tom Mboya boycotted the Lyttelton constitution and demanded a further 15 African representative members, on the grounds that the African electorate was inadequately represented.

In Nov. 1957 the colonial secretary, A. T. Lennox-Boyd, finding agreement impossible decided to increase African representation by six seats and to create 12 seats (four for each race) to be elected by the whole legislative council sitting as an electoral college. The government majority would be maintained. A council of state was to be created to protect against discriminating legislation. (K. I.)

POPULATION

The native races of Kenya are very diverse but fall within four main groups—the Nilotics, the Bantu-speaking people, the Hamites and the half-Hamites. The principal Nilotic tribe is the Luo, who form one element of the group often loosely described as the Kavirondo. Much intermarriage has taken place between the Luo and those Bantu-speaking tribes which make up the rest of the Kavirondo. The Kikuyu represent the largest and most important group of the Bantu-speaking peoples, with the Kamba, who are related to them, standing very close in importance. The Masai are the best known of the half-Hamites. Other half-Hamites with considerable Nilotic admixture include the Nandi, Lumbwa, Suk and Turkana. The Hamites proper are represented by the Galla and Boran; part of these tribes, however, live in Somaliland and Ethiopia. There are also some important Somali groups between the Tana and Juba rivers. Several small primitive hunting tribes have survived whose affinities are little known, such as the Wanderobo, the Midgan and the Wasanye. The first group now includes few individuals of pure stock, since their numbers have been greatly augmented by renegades from other tribes. Apart from these few residual hunters, the majority of the East African tribes are agriculturalists (this applies especially to the Bantu-speaking peoples), while the half-Hamites and Hamites are essentially pastoral. East Africa has been inhabited by man from remotest antiquity; the remains of one of the earliest known Homo *sapiens* were found near Lake Victoria, while the bones and tools of Stone Age man are plentiful in the rift valley and other areas.

In the coastal zone are a number of small Bantu-speaking tribes, such as the Duruba, Wanyika and Giriama, while the interesting Wataita near Voi are linked with some of the Tanganyika tribes. The Swahili are a heterogeneous people whose origin lies in a mixture of Arabs with slaves from the interior. Their language in a debased form has become the lingua franca throughout the country. Small Arab settlements are to be found all along the coast; these people are the descendants of traders who moved into the region several centuries ago. While there were few Indian traders in the coastal zone before the British occupation, there was a vast increase in numbers after the occupation and particularly after the beginning of World War II. The European community rose in the first half of the 20th century from 400 to 29,660. The majority are of British or Afrikander origin.

According to the census of 1948, the population amounted to 5,405,966, comprising the following groups: Africans, 5,251,120; Indians 90,528; Goans, 7,159; Arabs, 24,174; Europeans, 29,666; others 3,325.

Education and Religion.—Education is compulsory for all European children of 7–15 years of age, and for Indian boys of that age in Nairobi, Mombasa and Kisumu. In 1955 the number of schools was as follows: European, 45 primary (with 6,762 pupils) and 12 secondary (with 2,283); Asian, 110 primary (with 30,871 pupils) and 20 secondary (with 5,448); African, 3,424 primary and intermediate (with 392,897 pupils) and 64 secondary (with 5,519); Arab, 9 primary (with 2,166 pupils) and 1 secondary (with 97). There are also a number of technical, trade, agricultural and teachers' training schools. The director of African education is advised by a council, appointed by the member for education, on which are represented Protestant and Catholic missions.

The Africans of Kenya are largely pagan, the indigenous beliefs being animistic; but Mohammedanism flourishes in coastal, urban and some northern communities, and there is a considerable Christian community. In 1933 the Kikuyu Independent Schools association was formed, with its own church. But the movement became involved in politics and in anti-Christian and subversive activities. Under the emergency regulations, 136 independent schools were closed by the end of 1953; of these, 58 were found

to be redundant and were not reopened while 61 had been reopened by 1954.

Government and **Administration.**—At the head of the administration is a governor, responsible to the colonial office in London. The governor is assisted by a deputy governor; by a council of ministers consisting, in 1957, of the deputy governor and eight ex officio and eight appointed ministers; and an executive council (the council of ministers with additional appointed Arab and African members). He is also president of the legislative council, where he is generally represented by the speaker who is also vice-president. The legislative council consisted in 1957 of the speaker, 8 ex officio members, 20 nominated official members (including an Arab), 29 elected members (14 Europeans, 6 Indians — including 2 Moslems — 8 Africans and an Arab) and 1 Arab representative member. The constituencies for Europeans, Indians and Arabs are separate (communal franchise). Europeans and Indians possess adult suffrage; Arabs (at their own wish) have male adult suffrage. Members are normally elected for four years, but the governor has the power to dissolve the legislative council at any time. Africans have a qualitative franchise. For administrative purposes the country is divided into six provinces and one extra-provincial district (Nairobi), each with provincial commissioners and district commissioners. A considerable measure of self-government is exercised by African councils. There are municipalities at Nairobi, Mombasa, Kitale, Kisumu, Nakuru and Eldoret, with district councils in various settled areas.

East African **High** Commission.— This body was brought into operation on Jan. 1, 1948, for the administration of services common to the three East African territories. Under the governors of Kenya, Uganda and Tanganyika, the high commission is assisted by the East African central legislative assembly, which is empowered to legislate for common services including agriculture, health, railways and harbours, customs and excise, posts and telecommunications and civil aviation. The governments of the three territories remain responsible for basic public services such as administration, police, education, etc.

ECONOMY

The prosperity of Kenya depends upon agriculture. In the highlands the white settlers cultivate, chiefly, coffee, maize and sisal. Wheat and barley, potatoes and other vegetables, fruits, sugar cane, tobacco, pyrethrum, tea and other crops are also grown. There are very extensive pasture lands, and the colony, in addition to being self-supporting in all animal products, developed an export trade in wool. hides and dairy products before World War II. All the northern half of the country, though arid, has sufficient vegetation to permit its Somali, Galla and other inhabitants to keep large herds of cattle as well as of camels. Under irrigation much of this northern region would be very fertile. Cotton plantations are successful in the Kavirondo country around Lake Victoria; in the coast lowlands coconut plantations yield copra, and there are also in these coastlands sisal, maize, sugar cane and cotton areas. There are a great variety of minor crops and products, but the principal crops — for the whole colony — in the order named are coffee, sisal, maize, tea, wattle extract and wheat. Most of the manual labour is done by Africans, but the white man must be prepared to work himself, and farms of more than 500 ac. may require more than one European to manage. The difficulty of getting sufficient labour for such crops as coffee and sisal, which need many hands, led the governor (Sir Edward Grigg) in 1926 to advocate concentration by the white settlers on work which required fewer hands — stock raising, dairying, mixed farming, wheat, maize, etc.—advice taken only to a certain extent. Plans for closer settlement and the introduction of men with small capital, or even none, began to be put into execution in 1928–29. By 1937, 6,987,498 ac. had been alienated to Europeans. Production on European farms after 1952 was seriously affected by the Mau Mau uprisings, both because of the labour shortage and because of the absence of Europeans on defense duties. Small areas are cultivated by Indians in the lowlands.

The native was at first regarded as a negligible economic factor, except as providing manual labour, but under official encouragement and the example of the natives of Uganda and Tanganyika, he became a producer of more than the food crops needed for home consumption. The chief native crops for export are maize, coffee, sisal, pyrethrum, wattle and, in Kavirondo, cotton. The dual policy of developing simultaneously native and white areas — as carried out in Nyasaland and Northern Rhodesia and also in Tanganyika — was definitely adopted by the Kenya government in 1924. It provoked criticism from a section of the whites, who considered that it conflicted with their interests. Native production increased, though not so rapidly as in the adjacent territories. In 1937 about 1,750,000 ac. were under native cultivation. After World War II, dollar-earning exports such as sisal, coffee, pyrethrum, kyanite and graphite became increasingly important. Light industries developed apace, and cement factories and an oil refinery were projected. Processing of local raw materials includes tanning, the manufacture of footwear and the production of wattle extract, of insecticides and of containers made from sisal and other fibres.

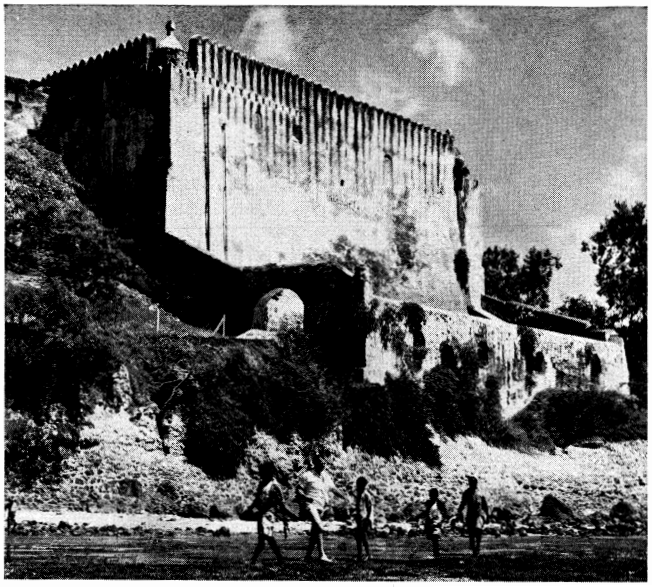
The sylvan resources of the country had been developed extensively by mid-20th century, and exports of timber had risen to 100,000 tons annually. The most valuable indigenous trees used for export are the pencil cedar and yellow wood. An extensive planting scheme was undertaken (151 sq.mi., 1951) and exotic conifers and eucalyptus meet the local demand for quick-growing timber. Mineral production was also increasing rapidly. More than 100,000 tons of carbonate of soda were being exported annually from the Magadi soda lake. Gold exploitation, from Nyanza province and the Kisii district, lessened somewhat after World War II Other minerals which were increasing in importance included kyanite and mullite (exports of which rose to 10,500 tons by 1951), diatomite and graphite.

Practically the whole of the import and export trade of Uganda passes through Mombasa, and as there is a customs union with that protectorate the trade figures did not distinguish between Kenya and Uganda imports and exports until 1950, though on analysis they could, in the main, be ascertained. Consideration of economic conditions in Kenya must, however, take account of Uganda, and this is true of other East African territories. They are engaged in similar enterprises: Tanganyika territory, for example, is the chief producer of sisal and might become a competitor with Kenya for the carrying of Uganda cotton. Tanganyika, too, has areas like Kenya, suitable for white settlement, and like Uganda has cotton interests. Zanzibar is still to some extent an entrepôt for the distribution of goods (though in this respect Kenya has become a competitor), and Nyasaland, if not Northern Rhodesia, is in the East African orbit. All these countries, except Zanzibar, had, after 1922, the same currency, the East African shilling, at par with the shilling sterling, being the standard coin. The change from rupees to sterling in Kenya, Uganda and Tanganyika indicated a new orientation. The shilling is, however, divided into 100 cents. A general East Africa currency board was established in London, and to London all these countries turn when raising loans. Obviously, a common policy has advantages in respect of transport, tariffs, agricultural and mineral development, and in regard to the fight against the tsetse fly and other tropical pests, also in combating leprosy, sleeping sickness and other diseases After World War I, when Tanganyika territory (formerly German East Africa) came under British mandate, the desire for economic co-operation became strong and was accompanied by proposals for political union (see BRITISH EAST AFRICA). As far as trade and commerce are concerned, organizations representing all the East African territories were created. A trade commissioner, appointed by the British government, deals with all the territories under British administration.

Up to 1921 an ad valorem duty of 10% was imposed in Kenya on almost all imports, with varying duties on certain exports. In 1921–23 a modified protection policy was adopted, with specific duties between 10% and 50% on certain goods, and 10% to 30% ad valorem duties on other goods Export duties were abolished, a uniform tariff was enacted for Kenya and Uganda, which also applied to Tanganyika. Free trade was established in goods, the growth, produce or manufacture of those three countries. There was, however, no uniformity of railway charges, Tanganyika pursuing a somewhat independent policy.

Although inflation was noticeable in Kenya after World War I and there were periods of acute depression (as in 1922–23), trade showed much elasticity. As between Kenya and Uganda, analyses of the trade figures showed that up to 1926 Kenya took the larger proportion of the imports, and Uganda, because of its cotton crop, supplied the larger part of the exports. Thereafter, the growth of the maize exports from Kenya began to tell, so that with a slump in the Uganda cotton crop, Kenya exports in 1927 exceeded those of Uganda. Imports dropped to £4,898,722 and exports for Kenya alone to £2,246,999 in the depression year of 1933. For 1955 the total imports for Kenya were £71,523,000, of which £31,756,212 came from the sterling area. The exports, 30.6% of which went to the U.K., were £25,667,000. From 1951, imports were restricted in defense of the monetary reserves of the sterling area; decline in the value of exports was caused by the easing of world prices and the state of emergency declared in Oct. 1952.

Communications.— With the outside world and for commercial purposes, communications are almost entirely through Mombasa with



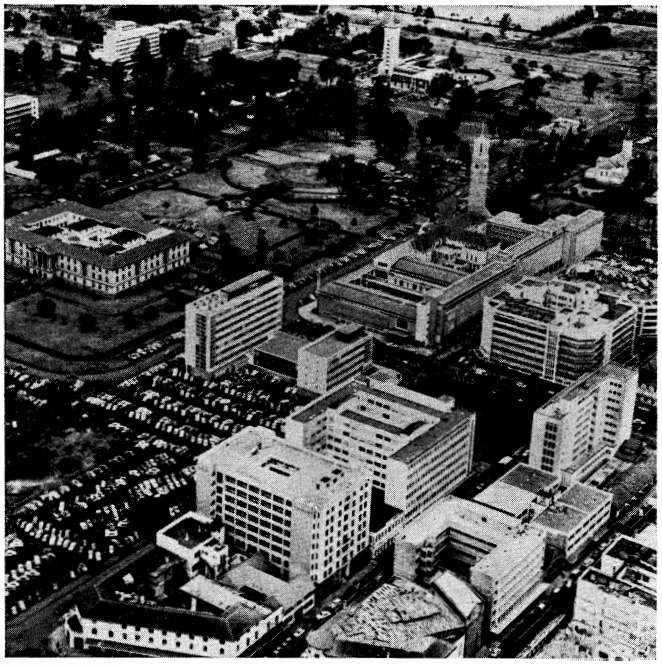
Ft. Jesus, a museum overlooking the old harbour at Mombasa. Built in 1592 by the Portuguese, it later served as a prison



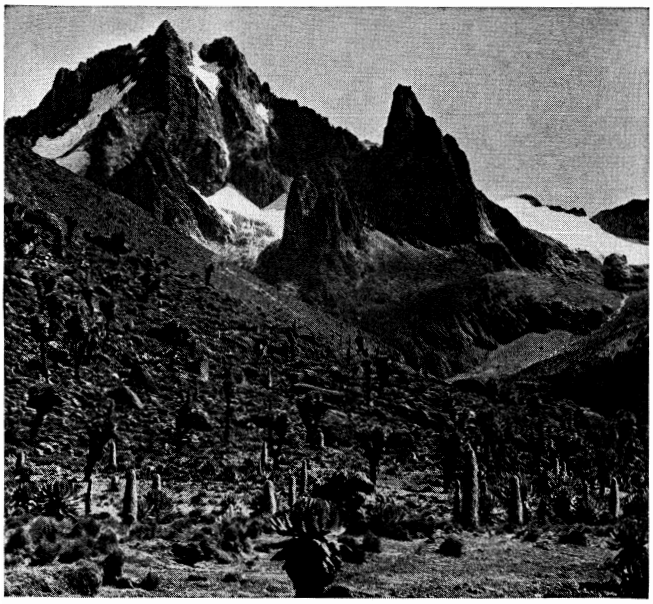
Fishermen setting sail along the shore of the Kavirondo gulf of Lake Victoria, which borders Nyanza province, Kenya



Muslim women of Mombasa peering through slits in their veils. The Persian-Arabic settlement at Mombasa dates from about the 11th century



Northern section of the city square in Nairobi. The building with the tower to the right is the city hall



Peaks of Mt. Kenya, the highest mountain in Kenya. Although near the equator, it has a permanent covering of ice and snow

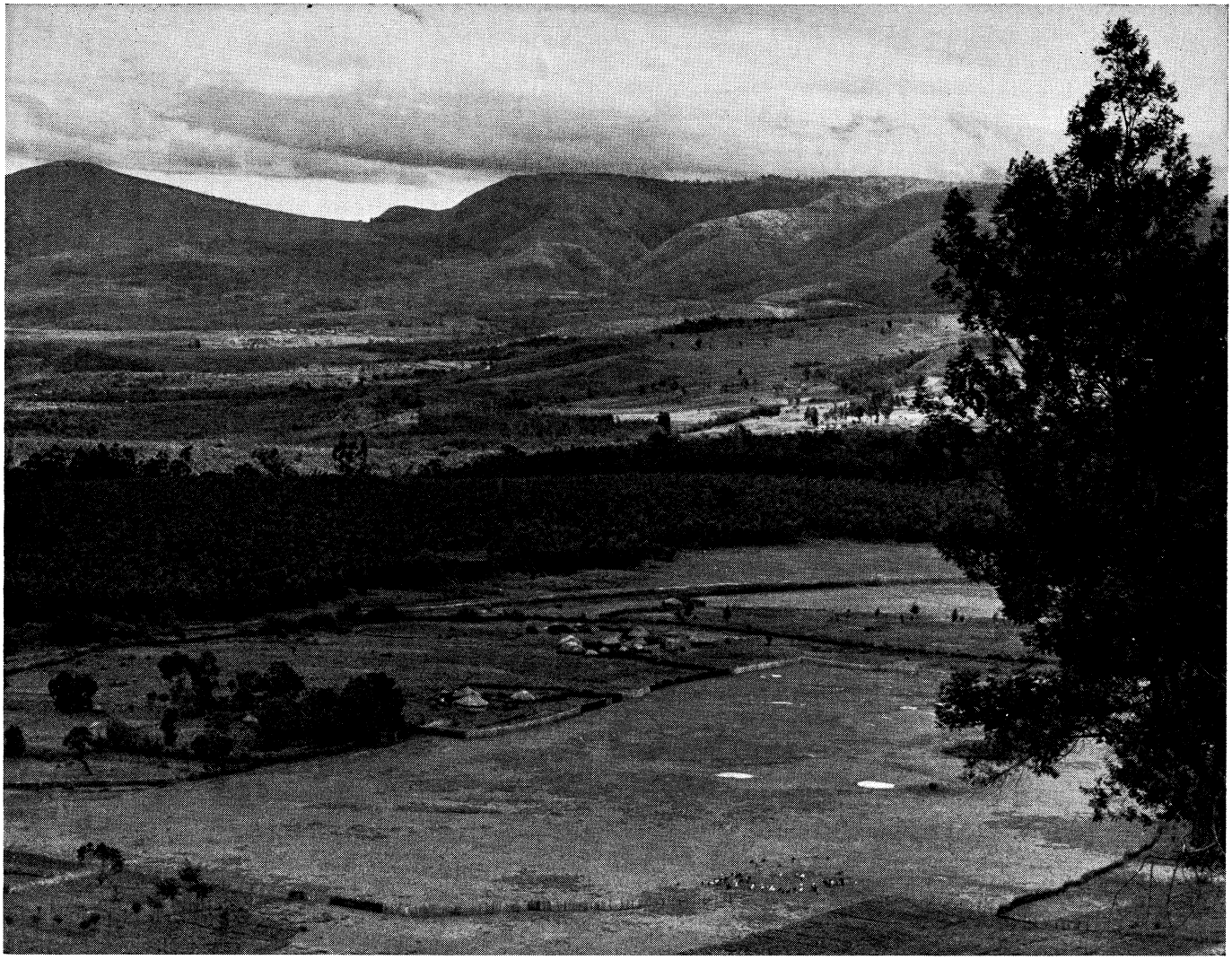


Baling dried sisal fibre at a processing plant near Hoey's Bridge. Sisal is one of Kenya's principal crops

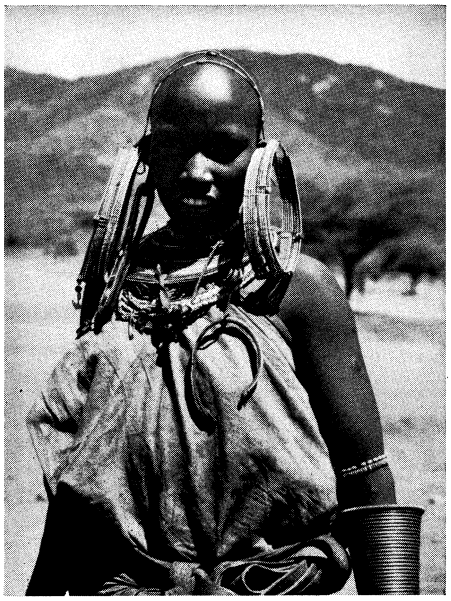
VIEWS OF KENYA AND ITS PEOPLE

BY COURTESY OF (CENTRE RIGHT) CONSULATE OF GREAT BRITAIN, CHICAGO, (BOTTOM RIGHT) CATERPILLAR TRACTOR CO.; PHOTOGRAPHS, (TOP LEFT AND RIGHT, BOTTOM LEFT) AUTHENTICATED NEWS, (CENTRE LEFT) WIDE WORLD

KENYA



Part of the Kenya branch of the Great Rift valley seen from the uplands. Suitable only for cattle farming, it is flanked on either side by fertile farmland



A Masai woman. The Masai are pastoral nomads of Kenya



Parliament building in Nairobi, the capital of Kenya and most important urban centre in East Africa

SCENES OF KENYA

PHOTOGRAPHS, (TOP, BOTTOM RIGHT) AUTHENTICATED NEWS, (BOTTOM LEFT) E. AUBERT DE LA ROE

its spacious harbour at Kilindini.

State-owned, the railways, harbours and allied services had financial autonomy from 1921, and after 1926 they came under a high commission for transport (consisting of the governors of Kenya and Uganda, acting jointly with the aid of a railway advisory council and harbour advisory board). By an order made by the East African high commission, the two systems formerly known as the Kenya and Uganda Railways and Harbours and the Tanganyika Railways and Ports services were amalgamated in 1948 into one system, the East African Railways and Harbours administration.

The trunk railway, starting from Mombasa, runs northwest through the southern part of Kenya and eastern Uganda to the Nile, near its source. Originally the line went to Kisumu on Lake Victoria, whence a steamer service gave connection with Uganda. A preliminary survey was carried out in 1892, and work was begun in 1896. The distance by rail from Mombasa to Kisumu is 587 mi, and to Kampala, Uganda, 879 mi. Essentially a mountain line, it has gradients of 1 in 50 and 1 in 60. From Mombasa it crosses to the mainland by a bridge half a mile long, and ascends the plateau till it reaches the edge of the rift valley, 346 mi. from its starting point, at the Kikuyu escarpment, where it is 7,600 ft. above the sea. It then descends across ravines bridged by viaducts to the valley floor, dropping to a level of 6,011 ft., and next ascending the opposite (Mau) escarpment to the summit, 10,165 ft. above sea level. In the remaining 100 mi. to Kisumu the level sinks to 3,717 ft., the altitude of Lake Victoria. The first locomotive reached Victoria Nyanza (Lake Victoria) on Dec. 26, 1901; and the permanent way was practically completed by March 1903. The railway, by doing away with the carriage of goods by men, gave the final deathblow to the slave trade in that part of East Africa. It put an end to the raids of the Masai a hich had long terrorized a wide area. It also facilitated the continued occupation and development of Uganda. Moreover, it was found that the line passed through a region which was suitable for colonization by whites.

For several years the existing line served all the needs of the settlers. In 1911–12 a branch line (91 mi.) was built to the Magadi soda lake; and a line (32 mi.) was built from Nairobi to the Thika river which by the 1950s had been extended to Nanyuki. In 1915–16, for military purposes, a line 92 mi. long was built from Voi via Taveta to Kahe in German East Africa, linking the Uganda and the Tanga railways

White settlement in the Trans-Nzoia and Uasin Gishu districts and the sudden development of cotton growing in Uganda led, in 1921, to the adoption of a bold policy of railway development. From Nakuru (452 mi. from Mombasa) a new line was built north to Eldoret on the Uasin Gishu plateau, and thence north and east to the Uganda frontier and on to the Nile at Mbulamuti where it joins the line connecting Jinja with Namasagali, built in 1910. The Nile was bridged at Jinja in 1930. The line, opened in Jan. 1928, cost about £2,000,000. It at once became the main line, the section Nakuru-Kisumu being henceforth but a branch. Seventy miles from Nakuru, and a little north of the equator, the new main line reaches an altitude of 9,130 ft. The line sinks at Eldoret, 50 mi. farther on, to 7,000 ft., and thence continues to fall to about 3,500 ft. at its terminus. A branch (41 mi.) from the main line at Eldoret to Kitale serves the Trans-Nzoia district; another branch line, 48 mi. long, connects Gilgil in the rift valley with Thomson's Falls in the foothills of the Aberdares range.

The volume of traffic in 1951 over the Kenya, Uganda and Tanganyika railways combined exceeded by 113% the volume in 1939. Over the same period, the volume of cargo handled at Mombasa increased by 55%.

Road development was slow, and communications over much of the colony remained primitive, though considerable lengths were gradually being improved to all-weather standards in the 1950s. The Great North road enters Kenya from Tanganyika at Namanga, passing through Nairobi, Nakuru and Kisumu. The building of roads and the general use, after World War I, of the motor car revolutionized the country for the settler and tourist. Civil aviation had expanded rapidly by the 1950s. There were customs airfields at Nairobi (Eastleigh), Nairobi West, Kisumu and Mombasa. The East African Airways corporation links the more important centres to regular scheduled air services operated by the British Overseas Airways corporation, South African airways and other international air services calling at Nairobi. Cables from Mombasa and Dar-es-Salaam are connected at Zanzibar with the world cable network, and there is a radio-telephone service with most countries. A broadcasting station is operated at Nairobi.

Finance. — In the early years of the British administration, expenditure necessary for opening up the country exceeded revenue, and the taxpayers of the United Kingdom furnished between 1896 and 1913 £2,843,000, in addition to heavy capital expenditure on railways and public works. In 1913–14 the country became self-supporting; expenditure was £1,115,000 and revenue £1,123,000. In 1900–01, just before the opening of the Uganda railway, revenue had been £64,000 and expenditure £302,000. The 1937 budget figures were: revenue £3,667,393; expenditure £3,565,976. Revenue in 1954–55 was £35,000,848; expenditure £38,930,038. The chief sources of revenue (railways and harbours apart) are customs and taxes, including a poll tax on all adult males of every race (at the age of 18 in the case of whites). A moderate income tax was introduced in 1937. In spite of the Mau Mau emergency, there was considerable new capital investment in the colony in the 1950s. The report of the royal commission on East Africa (published in June 1955) stressed the need for new capital to finance industries, water supplies, communications and mining. The commission was appointed in Jan. 1953 to investigate the means whereby African living conditions might be improved. It advocated private rather than tribal ownership of land and of ownership of houses in urban areas, raising the minimum wage to stabilize labour, and better education. (S. M. C.; X.)

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KENYA, a great volcanic mountain in Kenya, just south of the equator in 37° 20' E. It is one of the highest mountains of Africa. its highest peak reaching an altitude of 17,058 ft. The central core, which consists of several steep pyramids, is that of a much denuded old volcano. This central core (the highest point) is a nepheline syenite, the sides are of ashes and tuffs and the lavas consist of phonolites, kenytes and olivine basalts. Lavas dip in all directions from the central crystalline core. From the central peaks, ridges radiate outward. separated by broad valleys, ending upward in vast cirques. The most important ridges centre in the peak Lenana (16,355 ft.) at the eastern end of the central group, and through it runs the chief water parting of the mountain, in a north to south direction. Three main valleys, the Hinde, Gorges and Hobley valleys, run down to the east, and four—Mackinder, Hausberg, Teleki and Hohnel—to the west. From the central peaks 15 glaciers, all lying west of the main divide, descend to the north and south, the 2 largest being the Lewis and Gregory glaciers, each 1 mi. long, which, with the smaller Kolb glacier, lie immediately west of the main divide. Most of the glaciers terminate at an altitude of 14,800–14,900 ft. Glaciation was formerly more extensive, old moraines being observed down to 12,000 ft.

In the upper valleys a number of lakes occur, occupying hollows and rock basins in the agglomerates and ashes, fed by springs. and feeding many of the streams that drain the mountain slopes. The largest of these are Lake Hohnel (13,760 ft.); and Lake Michaelson (13,010 ft.). At a distance from the central core the radiating ridges become less abrupt and descend with a gentle gradient into the level plateau (7,000 ft.). These outer slopes are clothed with dense forest and jungle, composed chiefly of junipers and *Podocarpus,* and between 8,000 and 9,800 ft. of huge bamboos. The forest zone extends to about 10,500 ft., above which is the steeper alpine zone in which pasturages alternate with rocks and crags. This extends to a general height of about 15,000 ft., but in damp, sheltered valleys the pasturages extend some distance higher. The only trees or shrubs in this zone are the giant Senecio (groundsel) and *Lobelia,* and tree heaths.

Of the fauna of the lower slopes, tracks of elephant, leopard and buffalo have been seen at an altitude between 11,500 and 14,500 ft. That of the alpine zone includes two species of dassy (Procavia), a coney (Hyrax) and a rat (Otomys).

The bird fauna is of considerable interest. the finest swecies of the upper zone being an eagle owl, met with at 14,000 ft. At 11,000 ft. was found a brown chat, with white in the tail.

Kenya was first seen by the missionary Ludwig Krapf in 1849; approached by Joseph Thomson in 1883; partially ascended by Count S. Teleki (1889), J. W. Gregory (1893) and Georg Kolh (1896); and its summit reached by H. J. Mackinder in 1899.

KENYAH. The Kenyah are, with the Kayan and the Iban (Sea Dayaks), one of the three dominant tribes of Sarawak. and are also numerous in parts of Indonesian Borneo. Their original home seems to have been in the north central highlands. They are now mainly found on the middle reaches of the rivers, rarely along the coasts. They are usually closely associated with the Kayan, with whose culture they have much in common, though the lan-

guages differ. Kenyah economy is based on the cultivation of dry rice in jungle clearings. The forest is cut and burned and the rice is planted among the ashes. After 10 to 15 years the suitable ground nithin reach of a village is exhausted and the group moves to a new site. Fowls, pigs, goats and dogs are kept. The village often consists of only one communal house, always near a river. It is up to 400 yd. long, built on piles, with a row of family rooms at the back and a wide covered veranda which serves the purposes of general working space and village street. Kenyah are skilled craftsmen, making fine swords (*parang* ilang), originally from native ore but now from imported steel. The blades have a distinctive concavo-convex section and the hilts are of finely carved antler or wood. Kenyah do not weave but they make excellent baskets, and carve and paint elaborate house ornaments with curvilinear patterns often based on animal forms. Their war canoes hold up to 100 men.

Chieftainship is elective, though there is a strong bias in favour of a capable son of the old chief. An outstanding chief may have influence over a number of neighbouring villages. They are head-hunters. Their methods of warfare and their religious beliefs closely resemble those of the Kayan (*q.v.*). (B. A. L. C.)

KENYON, LLOYD KENYON, 1ST BARON (1732–1802), British lawyer, chief justice of the king's bench, was of conservative temper, and distrusted and refused to follow many of the liberal decisions of his immediate predecessor, Lord Mansfield. Kenyon was born on Oct. 5, 1732, the son of a Welsh landowner of modest means. He passed from Ruthin grammar school to a solicitor's office in Ruthin and was called to the bar in 1756. He made iittle progress for nearly ten years, but by 1778 he was in a position to refuse a judgeship and in 1782 became, through the patronage of Lord Thurlow, attorney general; between these two dates he led Lord Erskine in the defense of Lord George Gordon. Though elected as the member of parliament in 1780 and in 1784, he showed little aptitude or enthusiasm for his duties. He gladly accepted the mastership of the rolls. which did not, however, involve the loss of his seat, and succeeded Mansfield as chief justice in 1788, holding that office until his death on April 4, 1802. He continued to take some part in politics. Kenyon was reputed to be personally somewhat irascible and offensive, but he was a sound. though inflexible lawyer and a just, if pedantic judge. He was created baron in 1788.

See G. T. Kenyon, *The Life of Lloyd, First Lord Kenyon (1873).* (G. H. T.)

KEOKUK, a city of Lee county, in the southeastern corner of Iowa, U.S., on the Mississippi river at the mouth of the Des Moines. The first house on the site of the city was built in 1820 by S. C. Muir. but there was no further settlement until 1836. The town was laid out in 1837 and was chartered as a city in 1848.

At the foot of the Des Moines rapids in the Mississippi river, beyond which steamboats could not pass, the settlement, in its early days served as a transshipment point. A canal (opened 1877) was constructed around the rapids by the federal government. In 1910–13 the Mississippi River Power company dammed the river for a hydroelectric power plant, generating a total of 200,000 h.p. The dam proper is nearly one mile long; set in a channel cut several feet into the hard limestone bed of the river. it created Lake Keokuk, at the bottom of which lie the rocks that caused the rapids.

Keokuk has a large wholesale trade and numerous and varied manufacturing industries. There is a national cemetery there. The city was named after Keokuck, a chief of the Sauk Indians (1788–1848) who remained peaceful during the Black Hawk War. The word meant "the watchful" or "he who moves alertly." For comparative population figures see table in IOWA: Population.

KEONJHAR, a district of Orissa state, India. Formerly one of the princely states within the Eastern States agency. it was merged in Orissa on Jan. 1. 1948. Area 3.208 sq.mi.; pop. (1961) 745,893. Part of it consists of rugged hills. rising to more than 3,000 ft. above sea level. Rice is the chief crop. The district possesses considerable mineral wealth. Iron-ore production amounted in 1949 to 561,687 tons. Manganese. chromite and steatite are also found. The headquarters, Keonjhargarh (pop., 1951, 9,343) is the only town in the district. (S. GL.)

KEOS (CEOS; ZEA, mod. Gr. KEA), a Greek island in the Aegean sea, lies 22.5 km. (14 mi.) off the coast of Attica and 64 km. (40 mi.) from Piraeus, in the group of the Cyclades and the eparchy of Syros. Pop. (1951) 3,108. Its length is about 21 km. (13 mi.) and its breadth about 13 km. (8 mi.). Mt. Elias (Hagios Ilias) in the centre is 1,841 ft. high. Its products include lemons, citrons, olives, wine, honey and valonia. There were formerly four towns in the island: Iulis, about 3 mi. from the northwest shore, represented by the town of Kea; Coressia, the harbour of Iulis; Carthaea, in the southeast, at Stais Polais village; and Poieessa, in the southwest. Iulis was the birthplace of the lyric poets Simonides and Bacchylides, the philosophers Prodicus and Ariston and the physician Erasistratus. It was famous for its excellent code, whence the proverbial Kean laws, one of which forbade a citizen to protract his life beyond 60 years. Keos fought on the Greek side at Artemisium and Salamis; joined the Delian league (q v.), and also the Athenian alliance in 377 B C ; revolted in 363–362, but was reduced again. Athens then assumed monopoly of the ruddle, or red earth, the most valuable product of the island. Keos was divided in A.D. 1207 among four Italian adventurers; mas included in the duchy of Naxos in 1537; passed under Turkish rule in 1566 and thence into the Greek kingdom. Silver coins of Carthaea and Coressia on the island date from the 6th century B.C.

See Pridik, *De Cei Insulae rebus (1892)*; Pauly-Wissowa, *Real-Encyclopädie der classischen Altertumswissenschaft.* (J. Bo.)

KEPLER, JOHANNES (1571–1630), German astronomer, whose studies of the motions of the planets helped materially in laying the foundations of modern dynamical astronomy. He was born on Dec. 27, 1571, at Weil in Wurttemberg. His father was a petty officer in the duke of Württemberg's army and his mother. Catherine (née Guldenmann), came of a family of once noble standing. Johannes was a two months' premature infant and a very delicate child. With his younger brother Heinrich, he lived nith his grandparents while his father was engaged in the Dutch wars and his mother accompanied her husband to the Netherlands. When about four years of age he contracted smallpox and nearly went blind with the result that his eyesight was permanently impaired.

He first attended school in Weil, then in Leonberg on the return of his parents, and finally in the Convent schools of Adelberg (1584) and Maulbronn (1586). In Sept. 1588 he obtained his bachelor's degree and entered the University of Tübingen the following year. There, in Aug. 1591 he obtained his master's degree. He had hoped to enter the ministry but instead was persuaded to accept the post of professor of mathematics at Graz in 1594.

At Tübingen Kepler came under the influence of Michael Maestlin who became a lifelong friend. Maestlin was a protagonist of the views of Copernicus which he had to teach privately to his young pupil as the Ptolemaic system was still the picture of the universe which was held in official circles. Kepler absorbed the heliocentric concept of Copernicus and later developed it with a pertinacity and brilliance for which he will ever be remembered.

As professor at Graz, Kepler lectured on mathematics and also, at the request of the university, on Virgil and rhetoric. He was also expected to prepare annual almanacs giving astronomical and astrological predictions and so he applied himself with great diligence to the study of astrology. No disparagement should be attached to Kepler for this astrological work because at the close of the 16th century not only was the conception widely held that the stars and planets exerted a definite influence on day to day events, but there were no clear ideas of the forces which caused planetary motion; moreover, the concept of the differences between the behaviour of heavenly bodies and terrestrial phenomena was still unquestioned and thus even as independent and penetrating a mind as Kepler's could accept the basic doctrine of astrological influence. Soon after taking up his appointment. therefore, he published (1595) his *Calendarium* und Prognosticurn computed for the years 1591–99.

Kepler was, however, primarily interested in the problems of

the planetary system. Because of his firm faith in God and in the order of creation, he believed with almost fanatical fervour that there must be some regularity in the relationship between the orbits of the planets and he spent his major efforts in seeking this relationship. The first fruits of his labours were published in 1596 under the title *Prodromus Dissertationum Mathematicarum continens Mysterium Cosmographiczim.* Although a youthful work, Kepler showed here his freedom of mind and his ability to speculate in a scientific manner on problems of great significance and complexity. The hypothesis presented in the *Mysterium Cosmographicum* was ingenious: Kepler found that between the "spheres" of the six planets there could be fitted the five "regular" solids and believed that he had thus discovered a basic order underlying the distances of the planets from the sun. The publication of this work brought him fame and he began corresponding on very friendly terms with Tycho Brahe and Galileo, two of the most eminent astronomers of the day.

In April of the following year, Kepler married the wealthy Barbara von Mühleck, whom he had met in Graz, but by September all protestant theologians were expelled from the city, although his wife's influence enabled him to return after but one month away. However, the situation remained unfavourable and in 1599 he asked Maestlin to help him obtain a chair at Tiibingen. He met aith no success and, finally, in 1600, Kepler and his wife had to leave Graz. The Roman Catholic Hensart von Hohenberg, who was an old pupil of Maestlin's and with whom Kepler had been in correspondence, suggested that Tycho Brahe *(q* v.) might help. Tycho himself had been forced to leave the island of Hveen but when appointed court mathematician to Emperor Rudolf II in Prague invited Kepler to join him there and, two months after leaving Graz, Kepler and his wife made their home in Prague.

Tycho died a year after Kepler's arrival in Prague and he was thereupon appointed by the emperor to succeed his late patron as court mathematician (although at a reduced salary). All the observations which Tycho had made were at Kepler's disposal and, as later events proved, these were a veritable storehouse of information to which astronomy will ever be in debt. The emperor had, however, astrological leanings and in 1602 in *De fundamentis astrologiae certioribus,* his first publication from Prague, Kepler declared his aim of distilling and preserving the grain of truth which he believed astrology to possess. He also drew up horoscopes for the emperor and other dignitaries.

Although he had no liking for this kind of well-paid activity, Kepler believed that a means of subsistence was provided for all humans and classed astrology as the means of assisting astronomers in their work. In 1603 he dedicated to the emperor the *Judicium de trigono igneo,* a small treatise on an important conjunction. On Sept. 30, 1604, a nova appeared and remained visible for 17 months; this stimulated in 1606 another small publication *De Stella·nova in pede Serpentarii.* But much more important was the publication in 1604 of the *Astronomiae pars optica.* This book contained Kepler's fundamental ideas on the nature of vision and a definition of a ray of light which later became generally adopted in geometrical optics. There was also offered an explanation of the reflection of light and a notable approximation to the law of refraction.

From the time he came to Tycho, Kepler paid particular attention to the observations of Mars, the movements of which, because of its comparatively large eccentricity, had always been difficult to account for by means of the customary circular motion. It was in his efforts to reconcile the observations with the Copernican system that Kepler was led to take the bold step which had so profound an effect on future astronomy and made a complete break with traditions of more than 2,000 years. He proposed first that the planets revolved round the sun in elliptical paths with the sun at one focus. Next, with his belief in the order and regularity of the heavens, he sought some kind of regular motion which would describe the behaviour of the planets in paths of elliptical form. Such work entailed much labour but finally he discovered that the radius vector of each planet described equal areas of the ellipse in equal times. Thus he accounted precisely for the irregular velocity of a planet in its orbit and obviated the need for epicycles. This new and fundamentally important work was published in Prague in 1609 in Kepler's 36th year. Beside making public the two laws of planetary motion, the book contained a discussion of celestial forces and extended ideas first enunciated 13 years earlier in his *Mysterium cosmographicum.* He supposed that some kind of force emanated from the sun and that its effect lay in a plane close to the planes of the planetary orbits, its magnitude being proportional to the length of the radius vector. The orbital motion of the planets Kepler presumed to be due to the rotation of the sun on its axis and the whole concept was, in fact, a theory of vortexes. This explanation was the first attempt to formulate a physical mechanism to account for the motion of the planets; that it was not satisfactory is no discredit to Kepler for it was based on the 16th-century belief that a force must be constantly applied to a body in order to keep it in motion. In the same year Kepler published also the *Mercurius in Sole* on a transit of Mercury and in 1610, after observing with a Galilean telescope, he published the *Narratio de Observatis a se quatuor Jovis Satellibus erronibus.* The year 1610 also saw the *Tertius Interveniens* on astrology and a publication on Galileo's *Nuncio Sidereo.*

The use of the newly invented telescope stimulated Kepler to further aptical studies and in 1611 his *Dioptrice* appeared. In this the design of the inverting astronomical telescope which, with modifications, came later into wide use, was first suggested.

Political disturbances were occurring in Prague. Matthias, brother of the emperor Rudolf, assumed the throne in 1611 and the next year Rudolf died. Fortunately Kepler's loyalty to Rudolf did not prevent his being favoured by Matthias and in 1612 he was appointed mathematician to the states of upper Austria. In 1613, with the new emperor, he advocated the introduction of the Gregorian calendar but was frustrated by antipapal prejudice. During this year he married an orphan, Susanna Reutlinger, his wife Barbara having died two years earlier.

In 1613 an abundant vintage drew Kepler's attention to the methods used for determining the cubical contents of vessels. His thoughts on this appeared in 1615, in the *Nova Stereometria Doliorum,* which could be said to have prepared the way for the development of the infinitisimal calculus. Some theological writings appeared in 1614 and 1615, and in 1618 observations of three comets gave rise to *De Cometis* (1619) wherein Kepler suggested that comets were condensations in the ether and moved in straight lines due to impulses received from the sun.

Kepler extended his planetary laws to the satellites of Jupiter in the *Epitome astronomiae Copernicanae* published in parts between 1618 and 1620–21 and which is notable for its emphasis on physical explanations. The third planetary law connecting the periods and mean distances of the planets had seen the light of day in 1619 in his *De Harmonice Mundi* with which his great contribution to dynamical astronomy was completed. It was in this work that Kepler proposed the mathematical concept of "harmony" in the solar system, believing he had thus further extended his search for unification by marrying together intervals in the musical scale with the angular velocities of the planets.

He was the first to apply his three laws to the computation of ephemerides and, to assist his work, used logarithms. He wrote on the subject and published (1624) *Chilias Logarithmorum.*

In 1627 there appeared the *Tabulae Rudolphinae.* These tables held their place for over a century, being universally used in calculating planetary positions. This work contained also tables of refraction and of logarithms and an extended catalogue of 1,005 stars based on Tycho's observations of 777 star positions.

In 1628 Kepler and his family moved to Silesia where he still concerned himself with ephemerides and in 1629 drew attention to approaching transits in *Admonitio ad astronomos.* On Nov. 15, 1630, in Ratisbon (Regensburg), Kepler died but left behind him achievements which helped to change the face of astronomy and ensured his permanent and deserved fame. *See* also references under "Kepler, Johannes" in the Index volume.

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also Carola Baumgardt, *Johannes Kepler: Life and Letters* (1952); *L.* L. C. von Breitschwert, *Johann Keplers Leben und Wirken* (1831); Max Caspar, *Bibliographia Kepleriana* (1936); Sigmund Gdnther, *Kepler und Galilei* (1896); Paul Rossnagel, *Johannes Keplers Weltbild und Erdenwandel* (1930), Hans Schimank, *Epochen der Naturforschung* (1930); Max Caspar, *Kepler* (1948); Eng. trans. by C. Doris Hellman (1959). (CN A. R.)

KEPPEL, AUGUSTUS KEPPEL, VISCOUNT (1725–1786), British admiral, second son of the 2nd earl of Albermarle, was born on April 25, 1725. He entered the navy, and at the age of 15 went round the world with Anson in the "Centurion." After the peace of Aix-la-Chapelle (1748) he was sent on a mission to persuade the dey of Algiers to put down piracy, and succeeded in making a treaty with him. During the Seven Years' War he saw constant service. In 1757 he was a member of the court-martial which condemned Admiral Byng, and actively endeavoured to secure his pardon. In 1762 he went with Sir George Pocock in the expedition which took Havana, and secured £25,000 of prize money. He became rear-admiral in Oct. 1762, a member of the Admiralty Board (July 1765–Nov. 1766), and vice-admiral in Oct. 1770. The most debated period of his life belongs to the opening years of the War of American Independence. He was a strong supporter of the Whigs, led by Rockingham and Richmond, and at that time excluded from power by George III. As M.P. for Windsor (1780), he was a steady opponent of the "King's Friends." When therefore he fought against France (1778) in command of the Western Squadron, he believed that Lord Sandwich, then first lord of the admiralty, would be glad to see his defeat. Unfortunately Sir Hugh Palliser, a member of the Admiralty board, whom he therefore held partly responsible for the condition of the navy, went to sea with him in a subordinate command. He believed his failure in the battle with the French (July 27, 1778), due in reality partly to his own incapacity, and partly to Palliser's disregard of his orders, to be a deliberate betrayal. He praised Sir Hugh in public. but attacked him in private, and a campaign of calumny was begun in the press which resulted in the trial and acquittal first of Keppel and then of Palliser, for neglect of duty. Keppel was ordered to strike his flag in March 1779. When Lord North's ministry fell in 1782 he became first lord, and was created Viscount Keppel and Baron Elden, but his career in office was not distinguished. He died on Oct. 2, 1786. His portrait was six times painted by Sir Joshua Reynolds. The copy which belonged originally to Burke is now in the National Gallery.

See T. Keppel, *Life of Keppel* (1842).

KER, WILLIAM PATON (1855–1923), British man of letters, was born at Glasgow on Aug. 30, 1855. He studied at Glasgow university and Balliol college. Oxford. He was elected fellow of All Souls college in 1879, professor of English literature and history at Cardiff in 1883 and of English literature at University college, London, in 1889, a post which he held until 1922. In 1920 he was elected professor of poetry at Oxford Ker's principal work was done on mediaeval literature. His works include: *Epic and Romance* (1897); *The Dark Ages* (1904); *Essays on Mediaeval Literature* (1905); *Sturla the Historian* (1907); *The Art of Poetry* (1923); and posthumously collected essays and lectures (1925). Ker was a singularly inspiring teacher and a scholar of wide and humane sympathies. He died suddenly in the Alps, at Macugnaga on July 17, 1923, and was buried there.

KERAK (KARAK, anc. KIR MOAB, or KIR HARESETH or KIR HERES), a town in Jordan, 10 mi. E. of the southern shore of the Dead sea peninsula, El-Lisān, and about 3,000 ft. above sea level. Kir was destroyed by a Hebrew-Edomite coalition (II Kings iii, 2j), and railed at several times by Isaiah. It became in Christian times the see of an archbishopric suffragan to Petra. The crusaders fortified it (1136), calling it Krak. It yielded to Saladin after a long and desperate struggle in 1188. The fortifications were reconstructed by Bibars (13th century). After enjoying a semi-independence under the Turks it was taken by Ibrahim Pasha in 1832. The modern town of Karak, population 5,539 (1952), is a jumble of flat, mud-roofed houses, and is surrounded by a wall breached in several places. The castle, one of the most beautiful erected by the Franks, is in a good state of preservation. The entrance to the town was formerly through tunnels cut in the rocky substratum., (E. Ro.)

KERALA, a state of the Republic of India, lies mainly along the extreme southmestern coast of the Indian peninsula. It stretches for about 340 mi. between 13° 40' N. and 8° 20' N. lat., thus excluding the peninsular tip around Cape Comorin, which is in Madras state. Its maximum inland width is 75 mi. Comprising broadly the territory of the medieval kingdoms of the same name, Kerala was revived as a political entity under the States Reorganization act, 1956, when the states of peninsular India were realigned mainly on a linguistic basis. Thus Kerala comprehends the peoples speaking Malayalam (*q.v.*), and is bounded east by Tamil-speaking Madras and north by Kannada or Kanarese-speaking Mysore. It absorbed the former princely states of Travancore and Cochin (united since 1949 as Travancore-Cochin), with the exception of some Tamil-speaking subdivisions in the south. together with the former Malabar district and other land in the north hitherto in Madras.

Physical Features.—Being on the west coast and receiving the full force of the southwest monsoon the state has a heavy rainfall—for the most part more than 80 in. a year—and being in the extreme south there is little difference in temperature between one season and another. Cochin, for example, has a range from 78° F. in July to 84° F. in April. The contrast is even less at Trivandrum, the state capital in the south, which has considerable rainfall in October and November as well as in the normal Indian rainy season in May, June and July.

Along most of the coast are lines of sand hills and dunes thrown up by the waves of the Arabian sea and densely covered with coconut palms. Behind lies a succession of sheltered lagoons nhich are linked by artificial cuts so that it is possible to travel by boat almost the length of the state. Here and there the lagoons connect with the sea and at Cochin the entrance of a great lagoon called the Vembanad "lake" was dredged to afford a good modern harbour. Bordering the lagoons are extensive alluvial lands devoted to rice cultivation. 'These rice plains stretch inland to the foothills and spurs of the mountains which make up the eastern part of the state.

The hill lands are densely wooded with equatorial-type forests. The land rises eastward to the crests of the Western Ghats which form the state's boundary in the north and to those of the Cardamom hills which divide it from Madras in the south. Between the Vellangiris, the Ghats' southern bastion, and the Anaimalai hills, the northern extension of the Cardamoms, is the Palghat gap affording a line for the railway to Madras. (L. D. S.)

History.—Kerala always offered easy access from the western world by sea, and it remained almost isolated by land from the rest of India until the British period. This explains much of its history. Pepper, rice and other commodities brought Greek, Koman, Ethiopian and Arab traders by the 2nd century B.C. The Arabs stayed and founded colonies along the Malabar coast; their descendants are known as Malabar Moslems or Moplahs. The Portuguese, arriving under Vasco da Gama in 1498, emulated the Arabs, whom they drove out where they could. The Malabar coastal strip was rarely invaded from the eastern side of the Western Ghats, and this security enabled petty rajahs to rule sections of it generally without acknowledging an emperor.

The early history of Kerala is obscure. The land is mentioned in inscriptions of the Buddhist emperor Asoka (*q.v.*). Western classical texts, including Pliny and the *Periplus of the Erythraean Sea,* refer to its ports, but it is not until the end of the Perumal dynasty (C. A.D. 900–950) that any historical details can be dated. The *Kerala Mahatmyam* is a late and unreliable document. Inscriptions on copper plates and occasionally on stone can be dated only paleographically; few are dated in the Malabar era, which began in A.D. 824–825, the date apparently marking the foundation of the city of Kollam or Quilon (*q.v.*). Thereafter (and also earlier) references are made throughout south India to the Kerala ruler as "the Chera king."

By the 10th century, Jews and Christians were already established alongside the Moslems, Nayar (*q.v.*), Thiyya and other Hindu peoples characteristic of Malabar.

Medieval Kerala was often allied to the Pandyas, who intermittently sought to monopolize south Indian and Ceylonese trade. For short periods the Cholas (*q.v.*) managed to gain supremacy. In return Tiruvadi Ravivarma Kulasekhara, king of Quilon, conquered the greater part of the Pandya (*q.v.*) and Chola countries after their defeats in 1310–11 at the hands of Malik Kafur, general and favourite of Sultan Ala-ud-Din Khalji of Delhi.

Interference from the north via the west coast began in the reign of Mohammed ibn Tughlak at Delhi (1325–51); but on the whole Malabar was left in peace. and in the 14th–16th centuries the Hindu empire of Vijayanagar buffered the Malayali peoples from the Moslem Bahmani sultanate and the subsequent Moslem sultanate of Bijapur.

The Portuguese exploited rivalries between Cochin, by then the power in central Kerala, and Calicut in the north, which assisted them to take Goa in 1510. The Dutch followed about 1640 and benefited from Portuguese decline, until Travancore (south Kerala) defeated them in turn in 1741 and Hyder Ali of Mysore did the same in 1778. While the rajah of Cochin suffered under Hyder's son Tipu Sahib, Travancore was relatively safe from the Mysorean. becoming an ally of the British. Cochin became a subsidiary of the East India company in 1791, and prospered after the disappearance of the Dutch. Travancore entered the same relationship in 1795. Rebellions of 1804 and 1809 were put down with ease. and except for Moplah rebellions of 1849–55 and 1921 Kerala has been at peace since.

Enlightened princes ruled with legislative councils and able chief ministers until in 1949, following the accession of the two states to independent India, the union of Travancore-Cochin was formed as one of its component states. In 1956, with revised boundaries, the Malayalam-speaking areas were united in one state and the ancient name of Kerala restored. Anxieties were aroused by the return of a Communist ministry in the general elections in 1957. Following disturbances and a period during which state constitution was suspended by the central government, midterm elections in 1960 restored an anticommunist front led by the Congress party to power.

Extreme orthodoxy and the preservation of Sanskritic learning continue side by side with radicalism among the people of Kerala; ancient customs, including the disappearing matriliny and polyandry, endure side by side with cosmopolitanism. Innovations, such as the opening of temples to all Hindus (1936), gave a lead to other parts of India. Malayalis had a thirst for education and a versatility beyond the average before missionaries came to develop both. (J. D. M. D)

Population. — Upon its formation in 1956 Kerala embraced a population, computed from the 1951 census, of 13,549.118 on an area of 14,937 sq.mi. Thus, uith an average density of 907 persons per square mile, rising to more than 4,000 in some localities, it is thickly populated compared with the all-India mean of 315.

About 25% of the population are Christian. accounting for about one-third of the Christians of India. Kerala's ancient "Mar Thoma" Christian community claims continuity from the reputed Indian apostolate of St. Thomas (q v.). It is now divided between the uniate church of the Malabar or Malankara rite, in communion with Rome; the Monophysite Syrian Orthodox (Jacobite) Church of Malabar, which acknowledges the spiritual authority of the patriarch of Homs. Syria; and a number of small independent Nestorian or Monophysite communities. There are also many congregations of Roman Catholics (Latin rite). (See also ROMAN CATHOLIC CHCRCH.)

Other ancient communities are Jews. Nayars and Moslems (Moplahs) of Arab origin. In the hills are tribespeople such as the Kadirs (Kadars), probably of Negrito stock.

Administration. — There is a state governor, appointed by the president of India, but practical administration is exercised by a chief minister and cabinet of departmental ministers drawn from the majority party in the legislative assembly. This assembly is elected on a constituency basis under universal adult suffrage, normally every five years. The local government of the state was reorganized in 1958–59 to provide eight districts, Alleppey, Cannanore, Palghat, Quilon, Trivandrum (*qq.v.*), Kottayam, Kozhikode. and Trichur, in place of the previous five; in the process the historic name of Malabar disappeared from the political map.

There is a state high court of justice and public service commission in Trivandrum. (X.)

Education and Social **Welfare.**—Kerala leads India in literacy, with 50.37% of the male and 31.65% of the female population literate according to the 1951 census. By the 1960s primary education was provided for virtually all children, and in most towns and many villages, had been made free and compulsory. In addition to secondary and vocational schools, there is the University of Kerala, founded in 1937 as the University of Travancore. Its headquarters and central teaching faculty are at Trivandrum, and it has affiliated colleges there and in other towns.

Under the contributory employers' state insurance scheme medical aid and cash benefits for sickness, maternity and employment injury are provided for factory workers. Free medical treatment is available in many hospitals and dispensaries.

The state government's program for the social amelioration of tribal and backward communities includes the provision of schools, mobile medical units and welfare centres, as well as cottage industries and free grants for buying agricultural implements.

(S. B. L. N.)

The Economy. — Along the coasts and in the lagoons, fishing flourishes. Besides being a country with a large rice and coconut production, Kerala includes the famous old Malabar spice coast: pepper, cardamoms and other spices are still produced; also rubber, tea (from the hills), cashew and areca nuts, tapioca and oilseeds. The forests afford teak, ebony and a variety of other moods. Kerala has a wide range of minerals: beach sands yield monazite, ilmenite, zircon and other minerals of economic importance: there are deposits of white clay, and products from the old rocks include mica, graphite and limestone.

The preparation of coir from the husks of coconuts is a leading cottage industry or occupation and other home industries are organized on a co-operative basis. Most modern industrial concerns are state-owned or state-sponsored; there is a wide range of manufactures — from textiles, ceramics and chemicals to electrical goods, glass and paper — though for the most part on a small scale.

For centuries small ports shipped timber and spices, but until the improvement of Cochin the area's external trade on a modern scale relied mainly on the long rail haul across the peninsula to Madras. Landward access to the state, both road and rail, is largely through the Palghat gap from Madras and the more difficult Shencottah gap across the Cardamoms in the south. The wet country is difficult for road construction and maintenance. The main road route serves the southern coast from Trivandrum northward to Cochin; then from Ernakulam to Madras

Broad-gauge railway lines with termini at Mangalore (just within the Mysore boundary in the extreme north) and Cochin harbour (Ernakulam) join in the middle of the state to pass through the Palghat gap to Madras. The Mangalore line hugs the coast for all but 30 mi. of its 190-mi. length and serves administrative centres and small roadstead ports such as Kozhikode (Calicut), Mahé (*q.v.*), Tellicherry, Cannanore and Kasaragod. On the Cochin spurline are the industrial towns of Trichur (cotton manufactures, tiles) and Ernakulam (soap, rice-milling). A metre-gauge line follows the more difficult Shencottah route to Quilon and Trivandrum and the two systems are linked by a further metre-gauge route from Quilon northward to Ernakulam. Cochin and Trivandrum have domestic airports. (L. D. S.)

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KERASUND (GIRESUN) (anc. CHOERADES, PHARNACIA, CERASUS), the capital of a vilayet on the north coast of Turkey. and the port — an exposed roadstead — of Kara-Hissar Sharki, with which it is connected. Pop. of vilayet (1955) 334,701. The

town is situated on a rocky promontory, crowned by a Byzantine fortress, and has a growing trade.

It exports filberts (for which product it is the centre), walnuts, hides and timber. Cerasus nas the place from which the wild cherry was introduced into Italy by Lucullus and so to Europe (hence Fr. cerise, "cherry"). The population of the town (1955) was 15,260.

KERB MARKET: see CURB MARKET.

KERCH (KERTCH), a seaport of the Crimean *oblast*, Ukrainian Soviet Socialist Republic on the Strait of Kerch or Yenikale in 45° 21′ N. and 36" 28′ E. Pop. (1959) 99,000. It stands on the site of the ancient Panticapaeum, and, like most towns built by the ancient Greek colonists in that part of the world, occupies a beautiful situation. clustering round the foot and climbing up the sides of the hill (called after Mithridates) on which stood the ancient citadel or acropolis.

The chief exports include vheat, barley and other agricultural products; the local iron mines were opened in 1895. A considerable fishing industry was developed. The town also became noted for its mineral mud baths.

The church of St. John the Baptist, founded in 717, is a good example of the early Byzantine style. That of Alexander Nevsky was formerly the Kerch museum of antiquities, founded in 1825.

The Greek colony of Panticapaeum was founded about the middle of the 6th century B C., by the town of Miletus. From about 438 B.C. till the conquest of this region by Mithridates the Great, king of Pontus, about 100 B C., the town and territory formed the kingdom of the (Cimmerian) Bosporus, ruled over by an independent dynasty. Phanaces, the son of Mithridates, became the founder of a new line under the protection of the Romans, which continued to exist till the middle of the 4th century A.D., and extended its power over the maritime parts of Tauris. After that the town—which had already begun to be known as Bospora—passed successively into the hands of the Eastern empire, of the Khazars, and of various barbarian tribes. In 1318, the Tatars, who had come into possession in the previous century, ceded the town to the Genoese, who soon raised it into new importance as a commercial centre. They usually called the place Cerchio, a corruption of the Russian name Kertchev (whence Kerch), which appears in the 11th century inscription of Tmutarakan (a Russian principality at the north foot of the Caucasus). Under the Turks, whose rule dates from the end of the 15th century, Kerch was a military port; and as such it played a part in the Russo-Turkish wars. Captured by the Russians under Dolgorukov in 1771, it was ceded to them by the peace of Kuchuk-Kainarji, and it became a Russian naval centre.

Archaeologically Kerch is of particular interest, the kurgans or sepulchral mounds of the town and vicinity having yielded since 1825 a rich variety of beautiful works of art. In the Altun or Zolotai-oba (Golden Mound) was found a great stone vault similar in style to an Egyptian pyramid; and within, among many objects of minor note, were golden dishes adorned with griffins and beautiful arabesques. In the Kul-oba, or Mound of Cinders (opened in 1830–1831), was a similar tomb, in which were found what would appear to be the remains of one of the kings of Bosporus, of his queen, his horse and his groom. The ornaments and furniture were of the most costly type; the king's bow and buckler were of gold; his very whip intertwined with gold; the queen had golden diadems, necklace and breast jewels, and at her feet lay a golden vase. In the Pavlovski kurgan (opened in 1858) was the tomb of a Greek lady, containing among other articles of dress and decoration a pair of fine leather boots (a unique discovery) and a beautiful vase. In a neighbouring tomb was what is believed to be "the oldest Greek mural painting which has come down to us," dating probably from the 4th century B.C. The catacombs on the northern slope of Mithridates hill possess interest, not only for relics of old Greek art, but as material for the history and ethnography of the Cimmerian Bosporus. In 1890 the first Christian catacomb bearing a distinct date (491) was discovered.

KERENSKY, ALEXANDER FEODOROVICH (1881–), Russian politician, born at Simbirsk, studied at the University of St. Petersburg, where he took his degree in law, and afterward joined the St. Petersburg bar. In 1912 he was elected to the fourth duma and joined the Labour group. He was in reality an adherent of the Social Revolutionary party, but as it was impossible in those days to enter the *duma* under this flag he-chose the Group of Toil (Labour) in preference to the Social Democrats, whom he considered to be too pedantic and distant from the people. As a member ot the duma he made his mark as an eloquent speaker. (See RUSSIA.)

When the first provisional government was formed after the Feb. 1917 revolution, Kerensky took the portfolio of minister of justice. He became war minister on May 5 and set to work to reorganize the demoralized army. He had a temporary and partial success, reintroducing the death penalty, himself visiting the front and effecting a brief offensive in June. On July 25 he succeeded Prince Lvov as prime minister of the second provisional government, holding this office until the outbreak of the bolshevist revolution. But he was unable to rally a war-weary population and, caught between the two forces of militaristic reaction and bolshevist revolution, his government was marked by vacillation and indecision. He fled from Petrograd on the eve of the October revolution and attempted to march with armed forces on the capital. but was defeated. He went to Paris and later to the United States

See his books. *The Prelude to Bolshevism* (1919), *The catastrophe* (1927) and *Crucifixion of Liberty* (1934).

KERGUELEN'S LAND CABBAGE, *Pringlea antiscorbutica* (family Cruciferae), a plant resembling in habit and belonging to the same family as the common cabbage (*Brassica oleracea*). The cabbagelike heads of leaves abound in a pale-yellow highly pungent essential oil, which gives the plant a peculiar flavour but renders it extremely wholesome. It was discovered by Capt. James Cook during his first voyage, but the first account of it was published by (Sir) Joseph Hooker in *The Botany of the Antarctic Voyage* of the "Erebus" and "Terror" in 1839–43. During the stay of the latter expedition on the island, daily use was made of this vegetable either cooked by itself or boiled with the ship's beef, pork or pea soup. Hooker observes of it, "This is perhaps the most interesting plant procured during the whole of the voyage performed in the Antarctic Sea, growing as it does upon an island the remotest of any from a continent. and yielding, besides this esculent, only seventeen other flowering plants." Though belonging to a family of insect-pollinated plants it has become modified for wind pollination, having projecting stamens and long threadlike projections on the stigma. This peculiarity is apparently an adaptation to the absence from the island of winged insects.

KERKRADE, a town of the Netherlands, in the province of Limburg, upon the German frontier. Pop. (1957 est.) 47,307 mun It is the centre of a coal-mining district.

KERMADEC, a group of volcanic islands in the Pacific, part of the New Zealand Dependencies, 600 mi. N.E. of New Zealand. Area about 13 sq.mi. Largest of the Kermadecs is Sunday Island (11 sq.mi.), 20 mi. in circumference, which rises to a height of 1,723 ft.; in 1957, 8 persons staffed a meteorological station and airfield. Other islands are uninhabited. The group was named in 1791 from Huon Kermadec, D'Entrecasteaux's captain; it was annexed in 1887 by New Zealand. (*See* PACIFIC ISLANDS.)

KERMAN, a large province (ancient *Karmania*) and town of Iran. The province, which for administrative purposes includes Iranian Baluchistan (*q.v.*) and Makran, is bounded north by the Qainat district of Khurasan and Yezd, west by Fars, east by British Baluchistan, while south it extends to the Arabian sea. Situated to the southwest of the great Central Iranian desert, Dasht-i-Lut, the province is terminated in the east by steppes, while from the direction of Yezd and Fars, it is bordered by desert and uncultivated land. The chief feature which distinguishes Kerman from Fars and the country northwest and west is that the cultivated part of Fars is an uninterrupted territory, while Kerman consists of a number of fertile areas, widely separated by desert tracts, through which villages and settlements are scattered.

Divisions. — Geographically Kerman falls under five districts: that of Kerman to the north, Sirjan to the west, Jiruft in the

south and the two districts of Bam and Narmasir in the east. Chains of mountains stretch across much of the province from northwest to southeast. To the north is found the highest range which forms a part of the Kuh Rud and has peaks to the northwest of Bam, with an altitude of nearly 15,000 ft. This chain separates the district of Kerman from that of Sirjan; its continuation toward the southeast being the Jabal Bariz or Pariz. There are other parallel but less elevated chains to the southwest. Snow lies on these mountains for a considerable part of the year. Kerman has no important rivers: the cultivated areas receive their water from the mountains and from the most important stream, the Khalil Rud, which flows across the Jiruft district and empties itself into the Jaz Murian Hamun (or sweet-water lake) without reaching the sea.

Desert Areas. — The true desert of Kerman lies mainly in the north and northeast, where it merges into the great desert or "Lut" (a word meaning bare, void of vegetation) which itself stretches into Khurasan. The Kerman desert tracts differ from the *Kavir* of central Iran mainly in three respects: they are less saline, are drier and more sandy, and present in some places tracts of 80–100 miles almost absolutely destitute of vegetation. Yet they are crossed by well-known tracks, Kerman lying across the great roads leading from Fars to Seistan, Khurasan and India, and on the route for commerce and pilgrimage which leads from Bandar Abbas to the northeast of Iran and beyond. These sandy wastes are said to be continually encroaching on the fertile tracts even in the Narmasir district, which is being invaded by the sands of the desolate plains extending toward Bam. A feature of the country are the *Kefeh*, or salt swamps, which occur in isolated depressions, but nowhere in Kerman of so great extent as are the great *Kavir* farther north. The desert of Kerman lies about 1,000 ft. above the sea, apparently on much the same level as the Lut, from which it cannot be geographically dissociated.

Climate and Products. — The climate of Kerman varies murh with the latitude and the relief of the land but has the reputation of being unhealthful, because the cool air from the hills is usually attended by chills and agues; but many of the upland valleys enjoy a genial and healthful climate. The desert part of Kerman is probably more extensive than in ancient times for, according to the historian Mustawfi, there were still forests affording cover for the larger beasts of prey in the first ce'nturies of Islam. Now there are almost no trees, except date palms in great numbers around the villages and towns. Irrigation is very laboriously practised by the subterranean water channel or *kanat*. The principal products are wheat, barley and opium. The higher regions, or *sardsir*, produce in autumn millet, cotton and beet-root; in the *garmsir*, or warm region, rice and maize are cultivated in summer. Henna is produced around the towns of Bam and Khabis, and all sorts of fruits are found in abundance, the dates from the southern districts being noted. The chief animal products are wool and *kurk*, the soft under-hair of goats, the latter being used in the manufacture of Kerman shawls, which in delicacy of texture yield only to those of Kashmir, while often surpassing them in colour and design. Bandar Abbas is the natural outlet of Kerman, but since shipping has shown a preference for Bushire the trade of Kerman in this direction has greatly fallen off. The four main roads from the interior to the coast at Bandar Abbas are still only rough tracks, which are sometimes insecure.

Population. — The inhabitants of Kerman are described in general as of a dark brown colour and slight physique. As regards the settled population, it seems to be mainly of Iranian stock, while the nomads, who form a strong minority, are probably the descendants of the Arab. Turkish and Kurd invaders. Population of the province is estimated at 600,000 including a numerous community of Zoroastrians. Area 167,612 sq.mi. Kerman, the administrative headquarters, 30° 17′ N., 56° 59′ E., is situated at the meeting point of three valleys at an altitude of 5.680 ft. The surroundings of the town consist almost exclusively of steppe with very little cultivated land. The population was estimated at 50,000 in 1949. The majority are Shi'is, next come Shaikhis, Babis. Zoroastrians and a small community of Jews.

Town of Kerman.—The town is surrounded by a wall of baked clay 30 ft. high still in fair repair, with four gates, and there is a quarter outside the town, known as Mahalla-i-Gabr, peopled by Zoroastrians. The citadel is situated on the western side and the most ancient mosque, the Masjid-i-Malik built by the Seljuk Turan Shah (1084–1096), has been restored. The Jebel-i-Sang, a stone monument of the 12th century, is especially important. In the plain to the east and south are large numbers of remains of buildings of archaeological interest. Destroyed by an earthquake in 1794, Kerman was rebuilt by Fath Ali Shah, but only began to prosper toward the middle of the 19th century. It owes its industrial reputation to its shawls, but this industry has been surpassed by that of carpetmaking. Other important industries are the manufacture of felt and brasswork.

There is a British consulate at Kerman, an agency of the Imperial Bank of Persia was opened in 1904, and there is a telephone service.

The town is connected by a good road with Yezd and Isfahan (400 mi.). Another important road leads to Zahidan (Duzdab), by which route are exported nearly all the Kerman carpets. The average maximum temperature in June is recorded at 100.8° F. and the average minimum in January 26°; the annual rainfall as far as records are available is 4.7 in., the wettest month being December.

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KERMANSHAH, a province and town of Iran. The province is situated west of Hamadan, north of Burujird (Luristan), south of Kurdistan, and extends to the frontier of 'Iraq. It is one of the richest parts of Iran, producing wheat, maize, rice, clover, castor-oil, fruits and opium, while the hills have fertile pastures. The inhabitants are for the most part Kurds, but in the south of the province there are tribes of Lurs. The district is rich in monuments of the Achaemenids and Sassanians, such as the Taq-i-Bustan sculptures, 3 mi. E. of the town of Kermanshah.

The administrative headquarters of the province is Kermanshah (or Kermanshahan), situated in 34° 20′ N. and 47° E., in a very fertile plain at an elevation of about 4,860 feet, near the Qara Su, an upper reach of the Kerkha river. The population was estimated at 100,000, mostly Kurds, then Persians, Turks, Jews and a few Christians. Kermanshah owes its prosperity to its situation on a line of great transit trade, forming the principal entrance into Iran, through a-hich the commerce of Baghdad (distant 250 mi.) passes. It is also a busy local distributing centre for grain, fruits, gum and opium. There is very little local industry, the making of carpets having died out. A large oil refinery is owned and operated by the Anglo-Iranian Oil Co. Kermanshah is known in Iran for an excellent kind of sweetbread. In 1915 the town was occupied by the Turks.

See A V. Williams Jackson, *Persia Past and Present* (1906); F. Hale, *From Persian Uplands* (1920); H. *L.* Rabino, Kermanschah, *Rev. du Monde Mussulman*, 1920, XXXVIII, pp. 1–40.

KERMESSE (also KERMIS and KIRMESS), originally the mass said on the anniversary of the foundation of a church and in honour of the patron, the word being equivalent to "Kirkmass." Such celebrations were regularly held in the Low Countries and also in northern France, and were accompanied by feasting, dancing and sports of all kinds. The Brussels Kermesse is still marked by a procession in which the effigies of the Mannikin and mediaeval heroes are carried. They still survive, but are now scarcely

more than country fairs, and the old allegorical representations are uncommon. The word Kermesse (generally in the form "Kirmess") is often applied in the United States to any entertainment, especially one organized for charity.

KERNER, JUSTINUS ANDREAS CHRISTIAN (1786–1862), German poet and medical writer, was born on Sept. 18, 1786, at Ludwigsburg, Wurttemberg. He studied medicine at Tubingen, and settled as a practising physician in Wildbad. With Uhland and Schwab he produced the *Poetischer Almanach fur 1812,* which was followed by the *Deutscher Dichterwald* (1813), and in these some of Kerner's best poems were published. In 1815 he became district medical officer in Gaildorf, and in 1818 was transferred to Weinsberg, where he spent the rest of his life. In 1826 he met Friederike Hauffe (1801–29), the daughter of a forester in Prevorst, a somnambulist and clairvoyant, who forms the subject of Kerner's famous work *Die Seherin von Prevorst, Eröffnungen über das innere Leben des Menschen und über das Hineinragen einer Geisterwelt in die unsere* (1829). He also wrote popular medical books. In 1851 failing eyesight compelled his retirement. He died Feb. 21. 1862, at Weinsberg.

Kerner's *Ausgewählte poetische Werke* appeared in 2 vol. (1878); *Sämtliche poetische Werke,* ed. by J. Gaismaier, 4 vol. (1905); a selection of his poems will also be found in Reclam's *Universal-bibliothek* (1898). His correspondence was edited by his son in 1897. *See* also A. Watts, *Life and Works of Kerner* (1884); T. Kerner, *Das Kernerhaus und seine Gaste* (1894).

KERNITE (RASORITE), the name given to a mineral which is a hydrated sodium borate, $Na_2B_4O_7.4H_2O$. It occurs as veins, irregular masses and crystals embedded in clay shale beds. Kernite was the chief source of commercial borax (*q.v.*), which was produced by dissolving kernite in water, filtering off the insoluble clay and crystallizing borax by evaporation. Kernite recently has been displaced by the mineral borax as a cheaper source of commercial borax.

Kernite crystals are commonly large, 2 to 3 ft. thick, the largest observed measuring 8 by 3 ft. Kernite crystallizes in the monoclinic system; the commonest forms present are the basal pinacoid, the front pinacoid, the unit prism and the dome. The natural crystals from California are characterized by the notable absence of pyramid faces which have been observed on synthetic crystals. Kernite is colourless and transparent with a vitreous lustre except on fibrous cleavage surfaces where it is satiny. It has two perfect cleavages, parallel to {100} and to {001} and a fair cleavage parallel to {201}. When well developed these perfect cleavages give rise to a fibrous structure. The mineral is soft (H = 2.5) and has a specific gravity of 1.908. Kernite fuses easily before the blowpipe flame and forms white cauliflowerlike masses which on further heating change to clear glass (borax glass). Kernite is slowly soluble in cold water, readily soluble in hot water and in acids. One part of kernite dissolved in water upon evaporation will yield 1.39 parts of borax ($Na_2B_4O_7.10H_2O$). While well drillers were drilling for water, immense deposits of kernite were discovered in 1926 in the Kramer borate district in the Mohave desert in southeastern Kern county, Calif. In 1948 the second occurrence was reported from the borate deposit of Tincalaya of the Salar del Hombre Muerto, in the department of Antofagasta de la Sierra, in the province of Catamarca, Arg. Kernite occurs associated with borax, ulexite, colemanite, tincalconite, probertite (kramerite), calcite, realgar and stibnite.

See W. T. Schaller, "Borate Minerals from the Kramer District, Mohave Desert, California," U.S. Geol. Survey *Prof. Paper 158-I,* pp. 137–173 (1930); Frederico Ahlfed and Victorio Angelelli, *Las Especies Minerales de la República Argentina* (1948). (G. T. FT.)

KEROSENE, a term used to describe mineral oil prepared for illuminating purposes. It is chiefly distilled from petroleum, although it may be distilled from any crude mineral oil that boils between the approximate limits of 150° C. and 300° C. It has a flash point high enough (150° F.) to make its use safe for ordinary domestic and other employment. In Great Britain it is commonly called paraffin oil or American paraffin oil.

The process of turning crude oil into kerosene, which must burn with a steady, highly luminous flame, calls for great care throughout the refining process. The crude oil is first distilled in continuous stills, able to deal with upward of 1,000 tons of oil a day. It is thus separated into naphtha and a heavy residue of a high flash oil that can be used as fuel or as a source of lubricating oil and waxes and pitch. The naphtha is sometimes redistilled and there is obtained from it a light gasoline fraction and a heavier kerosene. In many plants, however, redistillation is avoided. The crude oil is pumped through a tubular still under pressure and is discharged into a tall fractionating column that is provided with a series of perforated decks, the perforations being covered by serrated cast iron hemispherical caps. This arrangement brings about intimate contact between the vapours ascending and the condensed liquid descending. The vapour of the gasoline issues from the top of the tower, and the kerosene is taken from a deck lower down. At various decks still lower down, gas oil and lubricating oil are drawn, and finally residue is taken from the bottom.

The crude kerosene distillate thus obtained usually requires further chemical treatment to remove colour and objectionable compounds of sulfur which produce an unpleasant smell and poor burning qualities. There is a variety of methods by which this is accomplished. A widely used one is to agitate the crude oil with strong sulfuric acid, which dissolves out sulfur derivatives and the coloured impurities. If the mixture is allowed to stand after thorough agitation, there falls to the bottom of the agitator a heavy tar above which floats the treated oil. The tar is run off and the oil is purified by being washed with water and with weak caustic soda. This method has many drawbacks, and attempts are constantly being made to improve upon it. Edeleanu. the Rumanian chemist, agitated the oil with liquid sulfur dioxide, thus separating from the oil by means of their greater solubility those bodies that cause inferior burning. Other processes aim at removing objectionable materials by filtration through fuller's earth, ignited bauxite or other adsorptive materials and at removing objectionable odours by agitation with a solution of litharge in caustic soda. (*See* also PETROLEUM.)

(A. E. D.; X.)

KERR, SIR JOHN GRAHAM (1869–1957), British zoologist known for his research on the embryology of the lower vertebrates and as the first expert on naval camouflage, was born at Arkley, Hertfordshire, on Sept. 18, 1869, and began by studying medicine at the University of Edinburgh. In 1889 he joined an Argentine expedition to the Pilcomayo river in Paraguay. His account of this expedition, *A Naturalist in the Gran Chaco,* was only published in 1950. On his return in 1891 he joined Christ's college, Cambridge, and except for a second expedition to Paraguay to study *Lepidosiren* during 1896–97, he remained at Cambridge until appointed regius professor of natural history at Glasgow in 1902, this title being changed to that of professor of zoology in 1903. He held this post until 1933, when he resigned the chair on being elected member of parliament for the Scottish universities. He was made a fellow of the Royal society in 1909 and knighted in 1939. Kerr's outlook was morphological and phylogenetic and he greatly advanced knowledge of the evolution of vertebrates. He is best known for his studies of the embryology of dipnoans, especially of *Lepidosiren,* but he published papers on *Spirula* and many other zoological subjects. He was the first to advocate a system of camouflage for ships based on "dazzle" principles, and in Sept. 1914 urged their adoption upon the British admiralty. His books include *A Textbook of Embryology* (1914–16); *Zoology for Medical Students* (1921); and *Evolution* (1926). He died at Barley, Hertfordshire, on April 21, 1957. (ED. HE.)

KERRY, a county of Ireland, in the province of Munster, bounded west by the Atlantic ocean, north by the estuary of the Shannon. which separates it from Clare, east by Limerick and Cork, and southeast by Cork. Land area 1,815 sq.mi., the county being the fifth of the Irish counties in extent. Pop. (1956) 122,072.

On the north and east are Carboniferous shales and sandstones, reaching unproductive coal measures east of Listowel and on the Glanruddery mountains. The Carboniferous limestone fringes these beds and is cut off by the sea at Knockaneen bay, Tralee and Castlemaine. In the southwest, Hercynian trend lines are well marked. Dingle bay, Kenmare river, Bantry bay and Dunmanus

bay are narrow steep-sided inlets occupying synclinal troughs of Carboniferous Limestone between ribs of Old Red Sandstone. There is extensive evidence of glaciation. Macgillicuddy's Reeks reach a height of 3,414 ft. in Carntual (Carrantuohill), in the Dingle promontory Brandon mountain attains a height of 3,127 ft. Formerly the mountains were well-wooded with fir. birch and yew, which were. however, extensively used as fuel for iron smelting. Constant pasturage of cattle prevents the growth of young trees. The principal rivers are the Blackwater, which forms for a few miles the boundary between Kerry and Cork, and then passes to the latter county: the Roughty, which falls into the head of the Kenmare river; the Inny and Ferta; the Flesk. which flows through the Lower lake of Killarney, after which it takes the name of Laune and flows to Dingle hay: the Caragh which, after forming several lakes. falls into Castlemaine harbour; the Maine, which flows to Castlemaine harbour, receiving the northern Flesk; and the Feale. Galey and Brick. the junction of which forms the Cashen. The principal lakes. other than the lakes of Killarney (*q.v.*), are Lough Currane (Waterville lake) near Ballinskellig's bay, and Lough Caragh near Castlemaine harbour. Off the Dingle peninsula are the Blaskets, rocky islets of which only Great Blasket is inhabited.

Ciar. with his tribe, the Ciarraidhe. is stated to have inhabited about the beginning of the Christian era the territory lying between Tralee and the Shannon. That portion lying south of the Maine was at a later period included in the kingdom of Desmond (*q.v.*). Kerry suffered frequently from invasions of the Danes in the 9th and 10th centuries. until they were finally overthrown at the battle of Clontarf in 1014. In 1172 Dermot MacCarthy, king of Cork and Desmond. submitted to Henry II on certain conditions. but was nevertheless gradually compelled to retire within the limits of Kerry. which is one of the areas generally considered to have been made shire ground by Ring John. In 1579–80 Spaniards landed at Smerwick harbour, near Dingle, and erected a fortress. which was destroyed by the English in 1580. In 1652 a rebellion in Kerry was completely subdued and a large number of estates were confiscated.

In the county are many dolmens, souterrains, Ogham stones and other antiquities. There are remains of a round tower at Xghadoe, near Killarney, and another, one of the most perfect specimens in Ireland. 92-ft. high, at Rattoo, near Ballybunion. On a hill to the north of Kenmare river is Staigue fort. There are several stone cells on the Great Skellig. The main groups of sepulchral stones are those on the Tomies mountains, a stone fort at Cahirciveen, a stone circle with cromlech in the parish of Tuosist, and inscribed stones near Dingle. Notable mcnastic ruins are those of Innisfallen, founded by St. Finian, a disciple of St. Columba. and the remains at Muckross abbey, founded by the Franciscans in 1340. Ruined churches of interest are at Xghadoe, Kilcrohane, Lough Currane, Derrynane and Muckross. Ardfert cathedral, founded probably in 1253, was partly destroyed during the Cromwellian wars, but was restored in 1831.

The climate is very moist, western Kerry having the highest rainfall in Ireland, and so mild even in minter that arbutus and other trees indigenous to warm climates grow in the open air. and several flowering plants are found which are unknown in England. The Killarney woods, where the dominant trees are oak and holly, are especially well known for the abundance of arbutus growing around the margins. In the northern parts the land is generally coarse and poor, except in the valleys, where a rich soil has been formed by rocky deposits. In the Old Red Sandstone valleys there are many fertile regions. and some districts now covered by bog admit of easy reclamation. Dairy farming—especially creameries—is largely followed and bacon curing is carried on. At Tralee there are mills and factories. The Kerry breed of cattle—small black or red animals, with short upturned horns—are in considerable demand. Goats share with sheep the higher mountain pasture. The Muckross estate (10,000 ac.) was given to Ireland as a national park in 1932.

The linen trade in Kerry is now nearly extinct, the chief manufacture being that of woollens. A considerable trade in agricultural produce is carried on at Tralee, Dingle and Kenmare. The deep-sea and coastal fisheries are prosperous, the centres of the two fishery districts being Valencia and Dingle. Kenmare and Killarney are centres for salmon fishing. There are chalybeate mineral springs near Killarney, near Valencia island and near the mouth of the Inny; sulphurous chalybeate springs near Dingle. Castlemaine and Tralee; and a saline spring at Magherybeg in Corkaguiney. Killarney, well-known for the beauty of its lakes and mountains, is an inland tourist centre. Among the coastal resorts are Derrynane. Glenbeigh, Parknasilla, Waterville (an Atlantic telegraph station) and Ballybunion.

The railway traverses the centre of the county, touching Killarney, Tralee and Listowel. Branches are from Headford to Kenmare: Farranfore to Killorglin, Cahirciveen and Valencia harbour, and Tralee to Fenit. The only inland branch is from Tralee to Castle island. The county of Kerry returns seven members to *dail eireann.* In Kerry there are areas which are Irish-speaking; students go to Dunquin. which faces Blasket sound. to study Irish.

KERSAINT, ARMAND GUY SIMON DE COETNEMPREN, COMTE DE (1742–1793), French sailor and politician, was born at Paris on July 29, 1742. Entering the navy in 1755, in 1782 he became a captain. At that time the officers of the French navy were divided into the reds or nobles, and the blues or *roturiers.* At the outbreak of the Revolution. Kersaint took the side of the latter, and in a pamphlet entitled *Le Bon Sens* attacked feudal privileges. On Jan. 1, 1793, Count Kersaint was appointed vice-admiral. He devoted himself to questions of national defense, prepared a report on the English political system and the navy, and caused a decree to be passed for the formation of a committee of ,general defense, which after many modifications became the Committee of Public Safety. He entered the ranks of the Girondins, but resigned his seat in the convention on Jan. 20. After the death of the king he denounced the September massacres, but when called upon to justify his attitude confined himself to attacking Jean Paul Marat, who was at the time all-powerful. He was arrested on Sept. 23. He was executed on Dec. 4, 1793.

KESHUB CHUNDER SEN (KESHAVA CHANDRA SENA) (1838–1884), Indian religious reformer; was born of a high-caste family at Calcutta in 1838. He was educated at one of the Calcutta colleges, and became a clerk in the Bank of Bengal, but resigned his post to devote himself exclusively to literature and philosophy. As early as 1857 he joined the Brahma Samaj. a religious association aiming at the reformation of Hinduism. In 1862 he helped to found the Albert college, and started the *Indian Mirror,* a weekly journal in which social and moral subjects mere discussed. In 1863 he wrote *The Brahma Samaj Vindicated.* The steady development of his reforming zeal led to a split in the society, which broke into two sections: Chunder Sen putting himself at the head of the reform movement. which took the name "Brahma Samaj of India," and tried to propagate its doctrines by missionary enterprise. Its tenets at this time mere the following: (1) the wide universe is the temple of God; (2) wisdom is the pure land of pilgrimage; (3) truth is the everlasting scripture; (4) faith is the root of all religions; (5) love is the true spiritual culture; (6) the destruction of selfishness is the true asceticism. In 1866 he delivered an address on "Jesus Christ. Europe and Asia," which led to the false impression that he was about to embrace Christianity. In 1870 he paid a visit to England where he was warmly welcomed. His own impression of Christianity in England was somewhat disappointing. It appeared to him too sectarian and narrow. too muscular and hard; even. Christian life, in England. he considered more materialistic and outward than spiritual and inward.

After his return to India, Chunder Sen developed a tendency toward mysticism and a great leaning to the spiritual teaching of the Indian philosophies, as well as a somewhat despotic attitude toward the Samaj. He gave his child daughter in marriage to the rajah of Kuch Behar; he revived the performance of mystical plays. and himself took part in one. These changes alienated many followers, who deserted his standard and founded the Sadharana (General) Brahma Samaj (1878). Chunder Sen did what he could to reinvigorate his own section by a new infusion of Christian ideas and phrases. During the intervals of his last illness he wrote *The New Samhita, or the Sacred Laws of the*

Aryans of the New Dispensation. He died in Jan. 1884. *See* BRAHMO SAMAJ.

See P. Mozoomdar, *Life and Teachings of Keshub Chunder Sen* (1888); M. C. Parekh, *Rajarshi Keshub Chunder Sen* (1926).

KESSELRING, ALBERT (1885–1960), German army officer, prominent field commander in World War II, was born at Marktstedt, Bavaria. Nov. 30, 1885, and commissioned in artillery in 1906. After serving mostly in staff duties throughout World War I and the 1920s, he was transferred to the illicit air force in Oct. 1933. He commanded air fleets in the Polish and western campaigns, 1939–40, ordered the bombing of Warsaw and Rotterdam and conducted the air attack on the Dunkirk evacuation and later on Britain. He was promoted to field marshal in July 1940. As commander in chief: south, Kesselringshared in directing Erwin Rommel's campaign in Africa, the withdrawal from Tunisia and the defensive battles in Italy. Retaining Hitler's confidence to the end, he relieved Gerd von Runstedt as commander in chief, west, in March 1945 and surrendered the southern half of German forces on May 7. He was sentenced to death by a British military court in Venice in May 1947 for ordering the shooting of Italian hostages, but the sentence was commuted to life imprisonment in Oct. 1947, and he was freed in Oct. 1952. Subsequently he was active in German veterans' organizations. He died at Bad Nauheim, Ger., on July 16, 1960. Kesselring wrote *Soldat bis zum letzten Tag* (1953), published in English as *Memoirs of Field Marshal Kesselring* (1953) and as *Kesselring: a Soldier's Record* (1954); also *Gedanken zum Zweiten Weltkrieg* ("Thoughts on World War II"; 1955). (P. N. T.)

KESTREL or WIND-HOVER, common name for a dozen species of small falcons (*q.v.*) noted for hovering in mid-air against the wind or on quivering wings while watching the ground below for beetles, grasshoppers and other large insects, and field mice, rarely sparrows and other small birds. They are usually 10 to 12 in. long. reddish brown above and whitish or rusty below. Their familiar cry is a rapid *kle kle kle kle kle,* usually uttered on the wing. The nest is a natural cavity or old woodpecker hollow with three to five rounded oval eggs, buffy and heavily mottled with brown and lavender. The common old world kestrel (*Falco* or *Cerckneis tinnunculus*) ranges over Europe, Asia, and Africa, to Japan. and on Madeira. the Canaries, and Cape Verde Islands. The lesser kestrel (*F.* or *C. naumanni*) ranges from the Mediterranean to Manchuria: the fox-coloured kestrel (F. or *C. alopex*), from the Gold Coast to Ethiopia; the large African kestrel (*F.* or *C. rupicoloides*), East and South Africa; the Madagascar kestrel (F. or C. *newtoni*), also on Aldabra, while nearby Mauritius and the Seychelles each possess a species (*F.* or *C. punctatus* and *araea*): the nankeen kestrel (*F.* or C. *cenchroides*), Australia, Tasmania and New Guinea: and the Moluccan kestrel (F. or C. *moluccensis*), Moluccas to Java. The familiar American kestrel or sparrow hawk (*F.* or *C. sparverius*) is the only new world species, with some 23 races ranging irom Alaska and Newfoundland through Canada. the United States, northwestern Mexico, the West Indies, Guatemala, and over South America to Tierra del Fuego and on Juan Fernandez Islands off Chile. The face is black and white, the cap bluish centred mith reddish, the upper parts and tail bright reddish-brown in the male (tail ending in broad black hand narrowly tipped white), rufous barred mith black in the female, under parts buffy, more heavily streaked in the female. Three species oi gray kestrels, placed in another subgenus *Dissodectes,* sometimes as with *Cerchneis* rated of generic rank, occur in Africa and Madagascar, the commonest being *F.* or *D. ardosiaceus* of tropical Africa. (G. F. Ss.)

KESWICK, a market town and urban district in the Workington parliamentary division of Cumberland. Eng., 33 mi. S.S.W. of Carlisle by road. Pop. (1961) 4,752. In the northern part of the Lake District (*q.v.*) national park, it stands in the beautiful valley of the Greta, with Skiddaw on the north and Derwentwater on the south. The Moot hall (1813), painted white and black, stands in the wide market place. Fitz park, in which is a museum and art gallery, was opened in 1887 and there is a school of industrial arts near Greta bridge. Greta hall, where Robert Southey and S. T. Coleridge lived, is at Crosthwaite (N.W.) and there Southey is buried in the yard of the 16th-century parish church built on the site of one built by St. Kentigern in 553.

The tourist trade, the manufacture of lead pencils, bobbin making and slate and granite quarrying are the main industries.

KET (or KETT), **ROBERT** (d. 1549), English rebel, is usually called a tanner, but he certainly held the manor of Wymondham in Norfolk. With his brother William he led the men of Wymondham in their quarrel with a certain Flowerdew and he headed the men of Norfolk when they rose in rebellion in 1549 because of the hardships inflicted by the extensive enclosures of common lands and other agrarian grievances, and perhaps encouraged by the anti-enclosure policy of the protector Somerset. A feast held at Wymondham in July 1549 developed into a riot and gave the signal for the outbreak. Leading his followers to Norwich, Ket formed a camp on Mousehold heath, where he is said to have commanded 16,000 men, introduced a regular system of discipline, administered justice and blockaded the city. He refused the royal offer of an amnesty on the ground that innocent and just men had no need of pardon, and on Aug. 1, 1549, attacked and took possession of Norwich.

John Dudley, earl of Warwick, marched against the rebels, and forced his way into the city, driving its defenders before him. Strengthened by the arrival of some foreign mercenaries, he attacked the main body of the rebels at Dussindale on Aug. 27. Ket's men were easily routed by the trained soldiery. and Robert and William Ket were seized and taken to London, where they were condemned to death for treason. Both were executed early in Dec. 1549, Robert at Norwich on Dec. 7, William at Wymondham.

See F. W. Russell, *Kett's Rebellion* (London, 1859); *S.* T. Bindoff, *Ket's Rebellion 1549* (London, 1949).

KETCH, JOHN (d. 1686), English executioner, who as "Jack Ketch" gave the nickname for nearly two centuries to his successors, is believed to have been appointed public hangman in the year 1663. The first recorded mention of him is in *The Plotters Ballad, being Jack Ketch's incomparable Receipt for the Cure of Traytorous Recusants and Wholesome Physick for a Popish Contagion,* a broadside published in December 1672. The execution of William, Lord Russell, on July 21, 1683 was carried out by him in a clumsy way, and a pamphlet is extant which contains his "Apologie," in which he alleges that the prisoner did not "dispose himself as was most suitable" and that he was interrupted while taking aim. He died in 1686.

KETCH, a two-masted fore-and-aft rigged type of sailing vessel now used chiefly for fishing.

KETCHIKAN, city near the southern tip of the southeast Alaska Panhandle, located on Revillagigedo Island, about 600 mi. N.W. from Seattle by way of the Inside passage (*q.v.*). Ketchikan is the principal port of entry for steamers. The public-school system includes a two-year community college.

When Alaska became a state in 1959, Ketchikan had a registered fleet of approximately 2,500 boats, about half of which were engaged in halibut and salmon fishing. Over 80 fish traps were operating in the vicinity. Five salmon canneries were located within the city limits, producing a pack with an annual retail value of between $10,000,000 and $15,000,000. A wood-pulp mill with a daily capacity of 450 tons was in operation. The annual value of its product in the late 1950s was approximately $26,000,000. A lumber mill specialized in high-grade Sitka spruce. For comparative population figures, *see* ALASKA: *Population.* (J. E. CL.)

KETENES, in chemistry, a class of organic compounds containing the carbonyl group, CO, combined with either methylene, CH_2, or its analogues, RCH and R_2C, where R may be either an alkyl or an aryl radical (for other carbonyl compounds *see* ALDEHYDES AND KETONES).

Ketene, $CH_2{:}CO$, the prototype of the series, is a colourless gas at ordinary temperature, having a penetrating odour. It has been condensed to a liquid and even solidified (melting point −134.6° C.; boiling point −56° C.). It was discovered in 1907 by N. T. M. Wilsmore among the gaseous products formed when a platinum wire is heated electrically under the surface of acetic anhydride, and was subsequently obtained by H. Staudinger (1908) by the action of zinc on bromoacetyl bromide. The latter chemist and 0. Kupfer also obtained ketene by passing carbon monoxide and diazomethane, $CH_2{:}N_2$, through a quartz tube at 400–500° C. It is prepared most conveniently by the thermal de-

composition of acetone, acetic acid, or diketene (*see* below).

Ketene is a remarkably active chemical substance. It reacts with hydrogen chloride, acetic acid, ammonia and aniline, yielding respectively acetyl chloride, acetic anhydride, acetamide and acetanilide. It acetylates hydroxylated compounds by direct addition, the primary alcohols being most readily attacked, the tertiary alcohols and phenols least readily. When kept for some time, ketene polymerizes to a liquid dimeride $(CH_2:CO)_2$, known as diketene. boiling at 126–127° C., which combines with water to form acetoacetic acid and with aniline to yield acetoacetanilide. Diketene is now available commercially. At 600° C., ketene decomposes into carbon monoxide and ethylene.

The more complex ketenes are divisible into two classes: (a) aldoketenes, (b) ketoketenes. The aldo group includes ketene itself and its monoalkyl and monoaryl derivatives RHC:CO They are colourless. do not undergo autoxidation and are polymerized by pyridine. The keto group consists of the dialkyl and diaryl ketenes, $R_2C:CO$. These derivatives are coloured, undergo autoxidation and form additive compounds with certain unsaturated nitrogen compounds. *e.g.,* Schiff's bases. pyridine. quinoline and acridine. In addition to the foregoing aldoketenes and ketoketenes. carbon suboxide O:C:C:C:O is a ketene of unique type.

(G. T. M.; X.)

KETONES: *see* ALDEHYDES AKD KETONES.

KETTELER, WILHELM EMMANUEL, FREIHERR VON (1811–1877), German Roman Catholic churchman and social reformer, considered by some the outstanding German bishop of the 19th century, was born at Münster on Dec. 25, 1811. He abandoned an incipient career in the Prussian government service for the church when, in 1837, the Cologne archbishop Droste zu Yischering, was arrested. Ordained a priest in 1844 and appointed bishop of Mainz in 1850, Ketteler attracted national attention by his sermons and his writings. As a churchman, Ketteler, while generally favourable to papal authority, regarded the proclamation of papal infallibility as inopportune; his basic views on the subject caused him to be the first member of the Vatican council's minority to rally to the decision of the majority. Always interested in political and social as well as religious problems, he was a member of the Frankfurt national assembly in 1848 and of the German *Reichstag* in 1871–72. He had favoured Austria in the war of 1866 but accepted Bismarck's empire in the hope that the Prussian tendencies toward centralism and toward state absolutism in religious matters could be checked.

In the field of social reform Ketteler's views were most comprehensively expressed in his book *The Labour Question and Christianity* (1864). While the treatise—it followed the criticism of the existing order as presented by the Socialist writer Ferdinand Lassalle—was not original, it was forceful and popular and greatly stimulated the interest of German Roman Catholics in social problems, as did his other writing and his sermons. In his advocacy of a position between *laissez faire* liberalism and Socialist collectivism, Ketteler stressed the need for a Christian foundation. He died in Burghausen. Bavaria, on July 13, 1877.

Ketteler's more important norks were edited by Johannes Mumbauer *Wilhelm Emmanuel von Kettelers Schriften,* 3 vol. (1911; 2nd ed, 1924).

The leading biography is Fritz Vigener, *Ketteler: Ein Deutsches Bischofsleben des 19. Jahrhunderts* (1924). (F. A. Hs)

KETTERING, a municipal borough in the Kettering parliamentary division of Northamptonshire. Eng 14 mi NNE of Northampton by road. Pop. (1961) 38,631. Although Kettering became a considerable trading town following the grant in 1227 of the Friday market and yearly fair there to the abbot of Peterborough lord of the manor from 972 until 1540. its later prosperity began nith the woolen manufacture. introduced in the 17th century. A substantial trade in silk and plush weaving and bell founding also grew up, but this along nith the woolen industry, gradually gave nay to the manufacture ot boots and shoes, especially for men and boys, though iron ore is quarried and smelted; cardbodrd and brushes are made and there is engineering The County School of Boot and Shoe Manufacture and the headquarters of the Boot and Shoe Research association are in the town The Baptist Missionary society nas founded in Kettering in 1792. Kettering an urban district in 1894, was incorporated in 1938.

KETTERING, a city of Montgomery county. **O.** U S.. on the southern periphery of Dayton (q v.) is located in the rolling moraine country of the middle Miami valley. It was incorporated as a village in 1952 and as a city of 38.000 in 1955 and has operated under a charter form of government since 1956. It is a planned city of nide streets and generous lots. nith a professional planning director and a five-member lay planning commission. There nas in 1960 only a railroad spur and one factory; 1.200 ac had been zoned for future industrialization. The city has a board of construction review and operates a 200-unit housing project. nith income going to the city; government is by the council-manager plan in effect since 1954 The Kettering Memorial Medical centre commemorates the inventor and industrialist Charles F. Kettering, for nhom the city was named. Pop. (1960) 54,462 (A. J. WT)

KETTLEDRUM: *see* TIMPANI.

KEUPER: *see* TRIASSIC SYSTEM.

KEVIN (CAEMGEN, COEMGENUS), **SAINT** (d. 618 or 622), founder of the famous Irish monastery of Glendalough, County Wicklow. According to his genealogy he belonged to the royal race of Leinster. His earliest *Life* (10th or 11th century?) contains the following biographical details. Kevin chose the religious life in his early youth; he lived for some time as a hermit and ascetic beside the upper lake of Glendalough; later he founded a monastery near the lower lake, where he died in his old age as abbot of a large community. The *Life* also records a visit by Brandub, king of Leinster, before the battle of Mag Ochtair (590) and is consistent in associating Kevin with Leinster saints and chiefs of the 6th and early 7th century. How much of all this is historical remains uncertain. The extant lives of st, Kevin consist largely of hagiographical legends in which he is often represented as a protector of animals. His feast day is June 3.

The story, immortalized by Thomas Moore, that Kevin rid himself of a woman who had come to seduce him by throwing her into the lake is probably the romantic development of an episode in the *Life,* where young Kevin cools a girl's passion for him by flogging her with a bunch of nettles.

See also GLENDALOUGH. VALE OF.

See C. Plummer, *Vitae sanctorum Hiberniae,* vol. 1, pp. lv-lvi, 234–257 (1910; edition ot the earliest *Life);* J. F. Kenney, *Sources for the Early History of Ireland,* pp. 403–404 (1929). (L. BR)

KEWEENAWAN: *see* PRE-CAMBRIAN TIME.

KEW GARDENS, the name popularly applied to the Royal Botanic gardens at Kew. Surrey, Eng.. 6 mi. W.S.W. of London and lying along the south bank of the Thames. The name is derived from the grounds of Kew house, a former royal estate. Starting with an original botanical collection begun by Lord Capel in the late 1600s. Princess Augusta established the botanical garden of 9 ac. about 1759 with the scientific help of the earl of Bute. Since that time other grounds have been assimilated till by the end of the 19th century the gardens covered 288 ac. Sir William Chambers designed the orangery, a superb example of Georgian architecture and also the pagoda, a Chinese-style building 163 ft. high, which serves as a landmark. George III continued to develop the gardens uith the help of Sir Joseph Banks who was. in effect director for 47 years. The gardens were handed over to the nation in 1841 when Sir William Hooker became the first official director They soon developed into an important botanical institution with a herbarium, which by the early 1960s contained more than 6.000.000 sheets exceptionally rich in "type" specimens, and a specialized library of 55,000 volumes. There are three museums largely devoted to economic plant products and a laboratory where, in addition to cytogenetical investigations. the structure of plants is studied, especially in relation to classification.

The living collections comprise more than 40.000 different kinds of plants. Among the greenhouses, which provide for the less hardy plants, the largest are the Temperate house, about an eighth of a mile in length, and the Palm house, built in 1848, both from designs by Decimus Burton and housing magnificent collections of tree ferns and cycads The collections of tropical orchids,

succulents and tropical ferns are exceptionally fine, and the Australian house, erected in 1952 and built of aluminum alloy, contains numerous plants native to Australia.

Kew originated the plantation industry of rubber and still plays an important role in plant introduction and as a quarantine station. Its publications include numerous basic floras of commonwealth areas, the Kew Bulletin and the Index Kewensis, for which supplements are periodically issued.

See also BOTANICAL GARDENS. (E. J. S.; G. T.)

KEY, ELLEN (KAROLINA SOFIA) (1849–1926), Swedish essayist and educationalist whose radical ideas exerted a wide influence. She was born on Dec. 11, 1849, at Sundsholm, the daughter of the landowner and politician Emil Key (1822–92). Family misfortune obliged her to take up teaching in Stockholm in the late 1870s and for the next 20 years she also lectured at the workers' institute there. *Barnets århundrade* (1900; Eng. trans., The *Century* of *the* Child, 1909) made her world-famous. Both this and Lifslinjer (1903–06; Eng. trans., Lines of Life) were translated into many languages. In 1903 she started lecture tours abroad. particularly in Germany. She also propagated her ideas through an enormous correspondence and many young authors were influenced by her. Her liberal and radical opinions in most fields of cultural life, and especially on love and marriage, led to controversy. She died at Strand, on Lake Vattern, April 25, 1926.

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KEY, FRANCIS SCOTT (1779–1843), U.S. lawyer and author of the national anthem, "The Star-Spangled Banner," was born in Frederick county (now Carroll county), Md., Aug. 1, 1779. He attended St. John's college, Annapolis, Md., 1789–96. Upon graduation, he studied law in Annapolis, and began to'practice in 1801 in Frederick. Md. In 1805 Key moved to Georgetown, D.C., where he became a partner of his uncle Philip Barton Key.

In Sept. 1814, after the burning of the city of Washington by the British during the. War of 1812, Key was sent to the British fleet in Chesapeake bay to secure the release of his friend, William Beanes, who had been captured after the defeat of the U.S. forces at Bladensburg, Md. Key was detained on his ship during the shelling of Ft. McHenry, one of the forts that successfully defended Baltimore. During the night of the bombardment, Sept. 13–14, Key's anxiety was at high pitch, and in the morning when he discerned the American flag still flying over the fortress, he wrote "The Star-Spangled Banner." Released that day, he rewrote the poem in a Baltimore hotel. It was immediately printed anonymously under the title "Defence of Fort M'Henry," and on Sept. 20 was published by the Baltimore Patriot. Set to the tune of the English drinking song, "To Anacreon in Heaven," it soon became popular throughout the nation. It was later adopted by the army and navy as the national anthem, but it was not until 1931 that congress officially adopted it.

Key died in Baltimore on Jan. 11, 1843, and was buried in Mt. Olivet cemetery in Frederick. (JA. B. R.)

KEY, an instrument of metal used for the opening and closing of a lock (see LOCK). The word key is by analogy applied to means for the opening or closing of anything, for the making clear of that which is hidden. The term is also used of a place of commanding strategic position. Thus Gibraltar is called the "key of the Mediterranean."

The word is also frequently applied to mechanical contrivances for unfastening or loosening a valve. nut, bolt, etc.; to the instruments used in tuning a pianoforte or harp or in winding clocks or watches. and to appliances which serve to fasten together distinct parts of a structure.

In music the term key has two meanings. the most important having reference to the mode (major or minor) in which a composition is written and the degree of the scale on which it is based (see MUSIC). The term is further applied in the case of certain wind instruments to the levers which open and close valves in order to produce various notes. In keyboard instruments. "key" is the name of the external parts (the keyboard) of the levers which operate the sound-producing mechanism (see PIANOFORTE).

A key is the insignia of the office of chamberlain in a royal household (see CHAMBERLAIN and LORD CHAMBERLAIN). The "power of the keys" (*clavium* potestas) in ecclesiastical usage represents the authority given by Christ to Peter by the words, "I will give unto thee the keys of the kingdom of heaven" (Matt. xvi, 19).

KEYES, ROGER JOHN BROWNLOW KEYES, 1ST BARON (1872–1945), British admiral. planned and directed the raid on the German base at Zeebrugge, Belg. (April 23, 1918). which, as well as helping to close the Straits of Dover to German submarines, captured the imagination by its courage in the face of fierce enemy fire. Born at Tundiani Fort, Punjab, India, on Oct. 4, 1872, he entered the navy in 1885 and was promoted commander for bold action during the China war of 1900. From 1912 to 1915 he was commodore in charge of submarines, being responsible for the scheme which led to the battle of Heligoland Bight (*q.v.*). In 1915 he became chief of staff to the commander of the Dardanelles expedition. Appointed director of plans at the admiralty in 1917. he began work on a plan for a raid on Zeebrugge and Ostend, and in 1918, as vice-admiral in charge of the Dover command, led the successful attack on Zeebrugge. He was created knight commander of the Order of the Bath and after the armistice was made a baronet, and received a grant of £10,000. He became deputy chief of staff at the admiralty, 1921, commander in chief in the Mediterranean, 1925, and at Portsmouth, 1929–31, with the rank of admiral of the fleet from 1930. He was elected to parliament in 1934, retaining his seat until elevated to the peerage in 1943. He retired from active service in 1935 but was recalled in 1940 and acted as liaison officer to King Leopold of the Belgians, subsequently exerting himself to defend him from criticism of his surrender of the army in 1940. He then became director of combined operations with special charge of commandos. After retirement in 1941 he remained a keen critic of the conduct of the war. He died on Dec. 26, 1945, at Buckingham.

KEYNES, JOHN MAYNARD KEYNES, 1ST BARON (1883–1946), British economist who revolutionized economic theories, critic and architect of national economic policies, political essayist, successful financier, bibliophile and patron of the arts, was born at Cambridge. Eng., on June j, 1883. He was educated at King's college, Cambridge, as a mathematician but his scholarly interests, then and throughout his life, were wide. He first studied economics under Alfred Marshall (*q.v.*), founder of the Cambridge school, in preparation for the civil service, in which he was posted in 1906 to the India office. He returned to Cambridge, however, as a lecturer in economics in 1908 and remained an active fellow of King's for the rest of his life, exercising great influence over successive generations of students. In 1915 he became a temporary wartime civil servant in the British treasury and in 1919, as one of its most senior officials, served as its chief representative during the peace negotiations at Versailles. He found himself in increasing disagreement, however, with the severity of the obligations to be imposed, which he believed to exceed Germany's capacity to make payment and to threaten disruption of the world economy. He finally resigned and wrote The Economic Consequences of the Peace (1919). The furore created by this book, with its pungent attacks on Lloyd George and Woodrow Wilson, first made Keynes a public figure. During the subsequent years he was continually active in economic controversy. seeking solutions of the major practical issues of the day: currencies and exchange rates, the gold standard and economic reconstruction were among the issues to which he devoted his prolific energies.

Until the 1930s he was to be regarded as an orthodox economist of unusual brilliance and penetration. In the subsequent ten years he attained fame as the protagonist of a school of economic unorthodoxy and a savage critic of earlier orthodoxies. Seeking to analyze the causes of the recession of the 1930s, he showed how demand in total was determined by expenditures and how an equilibrium short of full employment might emerge without automatically setting in operation forces of recovery. Full employment, according to his theory. could be achieved only if governments and central banks deliberately encouraged investment in new capi-

tal goods and maintained a cheap money policy and public investment in a recession. Keynes's most important work, *The General Theory of Employment, Interest and Money* (1936), advancing these ideas, for a time divided economists throughout the world into two opposing camps. Determined to provoke argument, Keynes had made uncompromising attacks on his predecessors and colleagues and, as he subsequently wrote, had deliberately heightened controversy. The academic impact of the book was permanent and a majority of economists the world over came to use much of Keynes's technique of thought, even if in detail they departed significantly from his first conclusions.

At the level of practice the book had profound effects, first upon the American scene and later upon war finance. In the U.S., Keynes had earlier outlined his ideas to Franklin D. Roosevelt and they were known to some of his advisers; they formed one intellectual ingredient in framing the Roosevelt policies for economic recovery. In Great Britain, though vigorously pressed by their author, his ideas made little impact on policy before the outbreak of World War II, though they greatly affected it subsequently. They uere, paradoxically, more influential in shaping war finance; Keynes applied the same techniques to the problems of controlling inflation in *How to* Pay *for the War* (1940) and a few months later he was invited by the chancellor of the exchequer to join the treasury as an adviser. From that time he played a central part in British war finance and in the discussions of postwar problems. He was chief British representative at Bretton Woods in 1944, where plans for the International Monetary fund and the International bank to stabilize exchanges and assist reconstruction were worked out, and he was the chief negotiator of the large U.S. loan to Britain in 1945. Raised to the peerage in 1942, he died on April 21, 1946, at his home at Firle, Sussex, of a heart disease of which he had been continuously a victim for the last nine years of his life.

His other major works include *Indian Currency and Finance* (1913), *A Treatise on Probability* (1921), *A Tract on Monetary Reform* (1923) and *A Treatise on Money,* 2 vol. (1930).

See R. F. Harrod, *The Life of John Maynard Keynes* (1951) and *E.* A. G. Robinson, "John Maynard Keynes," *Economic Journal,* vol. *LVII,* no. 225 (March 1947), for biographical information

(E. A. G. R)

KEYS AND KEYWAYS. A key, in mechanical engineering, is a machine element used to connect two other machine elements, one of which is a shaft, to prevent relative motion between them; for example, a gear, pulley, sheave, coupling, clutch or flywheel may be keyed to a shaft (fig. 1). The grooves in which the key fits are called keyways. Connections between such machine elements may also be made by splines, descrided below, and by means of force fits, shrink fits or, if appropriate, by welding. However, a keyed connection can be disassembled without damaging any parts.

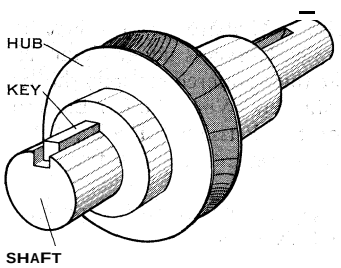


FIG. 1.—SHAFT KEYED TO A HUB

A key with a rectangular cross section is called a flat key and is placed so that its smaller dimension is in the radial direction; a square key has a square cross section. Keys with a circular cross section-are called pin keys; they may be straight-sided or tapered, and they may be assembled in either of the positions shown in fig. 2; *i.e.,* either along the shaft or through it. The arrangement shown in fig. 2(A) has the greater power capacity for a particular size of key.

For convenience in replacements, keys are made in standard sizes. defined in the U.S. by the American Standards association. In its assembled position. the key lies nith about half of its radial dimension in the hub and about half in the shaft (figs. 1 and 2[A]). A keyway cut into a shaft weakens the shaft significantly and introduces an undesired concentration of stress at the inside corners of the keyway, a phenomenon which the designing engineer must consider.

Flat and square keys are available tapered, the taper making it possible to draw the hub tight against the opposite side of the shaft and facilitating disassembly because the key is more easily driven out. The matching keyway taper is in the hub, not the shaft. There are a number of other types of keys, some of which are shown in fig. 3. The gib-head key is useful for disassembly purposes, but it is dangerous where workmen's clothing might be caught. Kennedy keys are square keys in a special arrangement to provide greater holding capacity. The Woodruff key, widely used in machine tools, is easy to remove by tapping it on an end until it rocks in its seat. The patented Rollpin is mounted in a radial hole as in fig. 2(B).

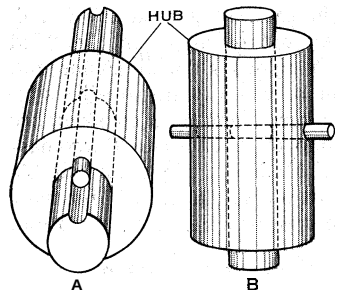


FIG. 2.— PIN KEYS ASSEMBLED (A) ALONG THE SHAFT AND (B) THROUGH IT

Ordinary keyed connections prove inadequate in many situations where heavy duty and repeated applications of the loads are involved. If a stronger junction is needed, a splined connection is used. In this case, the shaft has integral splines which fit into corresponding grooves in the hub. The splines may be rectangular in shape or they may have an involute profile. Splined connections are used both for permanent fits, the hub being pressed on the shaft, and for sliding fits where it is desired to move the hub axially, as to disengage a clutch or meshing gears. *See* also GEARS; *SHAFT,* DRIVING. (V. M. F.)

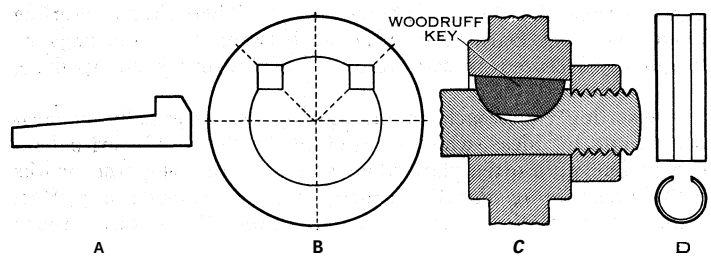


FIG. 3.— (A) GIB-HEAD KEY: (B) KENNEDY KEYS: (C) WOODRUFF KEY: (D) ROLLPIN

KEYSER, HENDRIK DE (1565–1621), Dutch architect and sculptor, the most important Dutch sculptor of his day, was born in Utrecht on May 15, 1565. In 1594 he was appointed municipal stonemason and sculptor of Amsterdam, and from 1612 onward was mentioned as a municipal architect. His architectural works formed a link between the ornamental style of the Netherlandish Renaissance and the classicism which marked Dutch architecture around 1630. Most of his work was done in Amsterdam; *e.g.,* the South church (1603–14), which was the first Protestant church erected in the Netherlands; the East India house (1606); a number of fine towers; and his greatest building, the West church (1620).

The tomb for William the Silent in the New church, Delft (1614–21), is his principal work in sculpture. A few of his terracotta busts suggest some of the immediacy and directness which Frans Hals brought to 17th-century Dutch portrait painting. His best-known pupil was the English sculptor Nicholas Stone (*q.v.*), who became his son-in-law. De Keyser died in Amsterdam on May 15, 1631. His sons Pieter (1595–1676), Willem (1603–after 1674) and Hendrick (1613–6j) became sculptors, and Thomas (1596/97–1667) was an outstanding portrait painter.

See *Architectura Moderna ofte Bouwinge van onsen tyt* (a book of engravings published in Amsterdam, 1631); Elisabeth Neurdenburg, *Hendrik de Keyser* (1931). (S. SE.)

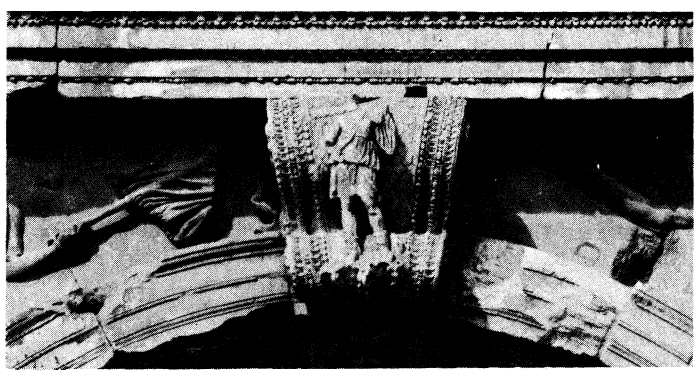
KEYSER, THOMAS DE (1596/1597–1667), Dutch painter, best known for his masterly portraiture. was born at Amsterdam, the son of the architect and sculptor Hendrik de Reyser. Aert Pietersz. Cornelis van der Voort, Werner van Valckert and Nicolas Elias are accredited by different authorities with having developed his talent. De Keyser chiefly excelled as a portrait painter, though he also executed some historical and mythological pictures, such

as the "Theseus" and "Ariadne" in the Amsterdam town hall. His portraiture is full of character and often, as in the "Old Woman," is distinguished by a rich golden glow of colour and Rembrandtesque chiaroscuro. Some of his portraits are life size, but the artist generally preferred to keep them on a considerably smaller scale, like the famous "Group of Amsterdam Burgomasters" assembled to receive Marie de' Medici in 1638. Among his other works are a characteristic portrait group of a "Merchant With His Clerk"; a magnificent "Portrait of a Savant"; and a fine portrait of "Claes Fabricius."

KEYSERLING, HERMANN ALEXANDER, GRAF (1880–1946), German philosophical writer whose ideas enjoyed considerable popularity after World War I largely because of his forceful personality and the troubled atmosphere of the times, was born at Konno in Livonia on July 20, 1880. He studied at several universities in Europe before beginning, in 1911, a world tour which provided the material for his best-known work, *Das Reisetagebuch eines Philosophen* (1919; Eng. trans. *The Travel Diary of a Philosopher,* 1925). Dispossessed of his family property by the Russian Revolution, he moved to Berlin, where he married one of Bismarck's granddaughters (1919). Thereafter Keyserling lived mainly at Darmstadt, although between 1927 and 1932 he frequently lectured abroad. He died at Innsbruck on April 26, 1946.

Keyserling's approach to philosophy was essentially nonacademic. and his ideas, nhich centred on the theme of spiritual regeneration, nere often platitudinous or obscure. His other works include *Das Gefüge der Welt* (1906); *Unsterblichkeit* (1907; Eng. trans., *Immortality,* 1938); *Schöpferische Erkenntnis* (1922; Eng. trans., *Creative Understanding,* 1929); *Wiedergeburt* (1927; Eng. trans., *The Recovery of Truth,* 1929); *America Set Free* (1929); and *Südamerikanische Meditationen* (1932; Eng. trans., *South American Meditations,* 1932).

KEYSTONE, in architecture, the central stone of an arch; although of no more structural importance than any of the other voussoirs. or wedge-shaped stones of which the arch is built, its position at the centre makes it a unit that can be advantageously accented. Thus, in Etruscan, Roman and Renaissance work it is frequently projected beyond the face of the rest of the arch and decorated with S-scrolls, masques or figures. In Gothic architecture the pointed arch is usually built with a joint at the centre, so



ALINARI

KEYSTONE FROM THE ARCH OF TITUS IN THE ROMAN FORUM

that no keystone exists. In vault ribs, however, keystones decorated with bosses often occur where two ribs intersect.

The keystone serves as the popular symbol of the state of Pennsylvania. *See* ARCH AND VAULT.

KEY WEST, a city of Florida, U.S., is the southernmost settlement within the continental limits of the United States. It is located 100 mi. from the mainland of the state at the end of a long string of keys on an island 33 mi. long and 1 mi. wide, 157 mi. S.W. of Miami and 90 mi. N. of Havana, Cuba. It is the seat of Monroe county and has served as a port of entry from 1822, when a naval depot nas established there.

A modern highway, which terminates there. connects the keys with long bridges over vast expanses of water. The weather is tropical, varying from an average of 70" F. in January to an average of 84" F. in August. The lowest temperature ever recorded was 41" and the highest was 97°. The tropical plant life includes bougainvillaea, which flourish throughout Florida. royal poinciana, sea grape, breadfruit. Spanish lime, coconut palms and many tropical flowers.

There is a unique blend of Cuban, West Indian, Bahamian and American atmosphere in the city. It was incorporated in 1828. Its history is told in old buildings and residences. pre-Civil War forts. churches and monuments set amid trees and shrubbery native to a coral isle. Tourists who visit the island contribute a major source of income; among the attractions are the aquarium, museum, garden centre, library and public beaches

Sports fishing and commercial fishing are other sources of income; over 20,000,000 lb. of food fish, crabs, lobsters, shrimp and sea turtles are marketed annually. Throughout its history the city has been the seat of naval activity and the largest single payroll comes from the several U.S. naval installations which employ large numbers of navy personnel and civilian workers. The name Key West derives from its position as the westernmost of the Florida keys and the Spanish *cayo,* "small island"; Spanish explorers named it *Cayo Hueso* ("key of bones") because of the human bones found there. The city has a council-manager form of government, in effect from 1945. For comparative population figures *see* table in FLORIDA: *Population.* (J. E. D.)

KHABAROVSK, a town and administrative centre of a *kray* of the same name in the Far East region of the Russian Soviet Federated Socialist Republic, U.S.S.R. The town is situated on a cliff 315 ft. high, on the right bank of the Amur, 29 mi. below its confluence with the Ussuri. The river is frozen from December to April and ice is often heaped up to a height of 20 ft. Its river front is 3 mi. long and the town extends along three low hills, separated by tuo little streams. Wooden stairs lead from one hill to another. Many buildings are wooden, and the streets are unpaved and muddy. There is a large cathedral, a monument to Count Muraviev-Amurski, a branch of the Russian Geographical society with a museum, and technical and other schools. The town has increased in importance since the construction of the railway and its population (1959) was 322,000, mainly composed of Russians, Koreans and Chinese.

It is an entrepôt for goods coming down the Ussuri and its tributary, the Sungacha, and is a collecting centre for the fur trade. Its industries include tanning, fur dressing, brewing and distilling, tobacco processing and the manufacture of small ironware. It has wind-driven flour mills. There is a civic water and electricity supply and a radio station. The town is named after the 17th-century Russian merchant and explorer Khabarovsk, who erected a fort on the present site in 1652. The Russians under Count N. Muraviev settled there in 1858. The town suffered severely during the anarchy following the 1917 Revolution. When the Far Eastern area was incorporated as a unit of the Russian S.F.S.R., Khabarovsk was made the administrative centre, and its trade recovered rapidly.

The area of Khabarovsk *kray* is 318,378 sq.mi. with a population of 1,143,000 according to the 1959 census.

KHAFRE (KHAFRA; Gr. CHEPHREN according to Herodotus. SOUPHIS according to Manetho) (3rd millennium B.C.), the fourth Pharaoh of the 4th dynasty of Egypt and builder of the second of the pyramids of Giza, reigned probably from *c.* 2540 to *c.* 2514 B.C., though Herodotus allots 56 years to his reign and Manetho 66. He was the son of Khufu (Cheops), who built the Great pyramid, and his consort Hetepheres. and succeeded the short-lived Dedefra, probably his elder brother; he married his full sister Khamerernebti, Meresankh III and perhaps two other queens. Though many of his relatives were hastily buried in cheap tombs. his own pyramid is almost as vast as his father's. The valley temple. linked to it by a causeway, was of great monolithic blocks of granite and contained remarkable diorite statues of the king (now in the Cairo museum) from a remote quarry in the Nubian desert nhere his father's name has been found inscribed. Near the causeway is the Great sphinx, which many consider to bear Khafre's features. *See* EGYPT: *History* and *Archaeology;* EGYP-

TIAN ARCHITECTURE; PYRAMID. (M. S. DR.)

KHAIRPUR, a town, a district and a division of West Pakistan, in the Sind region. The town, also called KHAIRPUR MIRS, is the capital, and headquarters of the divisional commissioner. It is on a canal, 11 mi. S. of the Indus and on the main line of the North-Western railway (Lahore-Karachi), 1 mi. S.W. of Rohri. Pop. (1951) 18,186. There are manufactures of cloth, carpets, goldsmiths' work and arms.

KHAIRPUR DISTRICT (area 6,050 sq.mi.; pop., 1961, 473,000) consists of (1) an alluvial plain bordering the Indus, rich and fertile, and (2) the southeastern part, a desert of sand dunes, impregnated with mineral salt. A small ridge of nummulitic limestone hills passes through the northern part of the state, being a continuation of a ridge known as the Ghar, running southward from Rohri. These hills are barren and forbidding. The climate is arid and hot. The state is watered by canals drawn off from the Indus at the Lloyd barrage. Wheat. millets. cotton. oilseeds and tobacco are the chief products. In the 1950s the state made considerable industrial progress, and textile, tobacco and other mills were established. A large amount of soda is extracted from the desert. Cottage industries include hand-loom cotton. silk and blanket weaving.

The chief, or mir, of Khairpur belongs to a Baluch family known as the Talpur. which rose on the fail of the Kalhora dynasty of Sind in 1783, when Mir Fateh Ali Khan obtained a *sanad* from Kandahar which made him the titular ruler of Sind. His nephew Mir Sohrab Khan separated from him and founded Khairpur state, which was recognized by the British in 1832. On the partition of India in 1947 the state acceded to Pakistan. in which it occupied a status similar to a governor's province. After 1955 it was in effect one of the districts of the newly formed division to which it gave its name.

KHAIRPUR DIVISION (20,449 sq.mi.; pop., 1961, 3,027,000) comprises the districts of Khairpur, Jacobabad, Sukkur, Larkana and Nawabshah.

KHAJURAHO (KHAJRAHO), a village in Chhatarpur district. Madhya Pradesh. India. 27 mi. S. of Mahoba on the Jhansi-Manikpur line. Pop. (1951) 2,347. Of its 85 famous temples. 20 survive (disused), dedicated by Chandella Rajput kings to Siva, Vishnu and Jain patriarchs. The most notable is the Kandarya Mahadeo temple (*c.* 1000), a 116-ft. agglomeration of porches and turrets culminating in the spire. The temple represents Meru, the world mountain, uniting heaven and earth; this union is emphasized by the luxuriant sculptural cladding of mithunas (couples in amorous embrace). Khajuraho was probably the capital of the ancient kingdom of Jijhoti (modern Bundelkhand).

KHAKI, originally a dust-coloured fabric. of the character of canvas. drill or holland. used by the British and native armies in India (from Urdu khak, dust). It seems to have been first worn by the guides, a mixed regiment of frontier troops, in 1848. and to have spread to other regiments during the following years.

Some at any rate of the British troops had uniforms of khaki during the Indian mutiny (1857–58), and thereafter drill or holland (generally called "khaki." whatever its colour) became the almost universal dress of British and native troops in Asia and Africa.

During the South African War of 1899–1902, drill of a sandy shade of brown was worn by all troops sent from Great Britain and the colonies. Khaki drill. however. proved unsuitable material for the cold weather in the uplands of South Africa. and after a time the troops were supplied with dust-coloured serge uniforms.

Since 1900 all drab and green-gray uniforms have been commonly designated khaki.

KHALIFA, THE, ABDULLAH EL TAAISHA (Sayyid Abdullah ibn Sayyid Mohammed) (1846–1899), successor of the mahdi Mohammed Ahmed. born in 1846 in the southwestern part of Darfur, was a member of the Taaisha section of the Baggara Arabs.

The mahdi on his deathbed (1885) solemnly named him his successor, and for 13 years Abdullah ruled over what had been the Egyptian Sudan. Khartoum was deserted by his orders. and Omdurman, at first intended as a temporary camp, was made his capital. At length the progress of Kitchener's expedition compelled him to give battle to the Anglo-Egyptian forces near Omdurman, where on Sept. 2, 1898, his army, fighting with desperate courage, was almost annihilated. The khalifa fled to Kordofan with the remnant of his host.

On Kov. 25, 1899, he gave battle to a force under F. R. Wingate, and was slain at Om Debreikat.

See KHARTOUM; SUDAN.

Personal sketches of the khalifa are given in Baron R. C Slatin's (Slatin Pasha) *Fire and Sword in the Sudan* (1879–95) and in Father Ohrnalder's *Ten Years in the Mahdi's Camp* (London, 1892). *See* also Sir F R Wingate, *Mahdiism and the Egyptian Sudan* (1891).

KHALIL (AL-KHALIL IBN AHMAD IBN 'AMR IBN TAMIM AL-FARAHIDI AL-AZDI) (d. 786 or 791), Arab philologist, leader of the Basran philological school and compiler of the first Arabic dictionary. He also discovered and codified the rules of Arabic prosody and, although his book on the subject is lost, his system still stands. He was born at 'Uman, but his date of birth is unknown. It is known, however, that when he died (at Basra. in 786 or 791) he was 75 years of age. He compiled the dictionary, nhich he called Kitab *al-'Ain* ("Book of the Eye"). with the help of his pupil, Laith, a Khorasani. In it he used an anagratnmatical arrangement, and also listed roots separately in accordance with the number of letters they contained: two, three, four or five. He also invented a special alphabetical order based on phonetic principles, beginning with the gutturals and ending with the labials. This suggests Sanskrit influence, but no direct contacts are known.

BIBLIOGRAPHY.—There are manuscripts of the *Kitab al-'Ain* in Tübingen and Baghdad. *See* G Flügel, *Die grammatischen Schulen der Araber* (1862); *C.* Brockelmann, *Geschichte der arabischen Litteratur,* vol 1, p. 100 (1898); suppl. vol. i, p. 159 (1937). (J. A. HD.)

KHAMSIN: *see* WIND: *Local Winds.*

KHAN, a title of respect in Mohammedan countries. It is a contracted form of kaghan (Persian and Arabic khaqan), a Mongolian word equivalent to "sovereign," used among the Mongol and Turki nomad hordes. At the time of Jenghiz. a distinction was still made betneen the title qaan, uhich he assumed as supreme ruler of the Mongols. and the inferior title *khan.* but the latter gradually ousted the former and his successors became known as the great khans (in European works sometimes as the chams. etc.) of Tartary or Cathay. The title of khan is still applied to semi-independent rulers such as the khan of Kalat in Baluchistan. The meaning of the term also extended downward, until in Iran and Afghanistan it became an affix to the name of any Mohammedan gentleman.

KHANDESH, formerly a district of the Bombay presidency, divided in 1906 into the districts of East and West Khandesh. As the Tapti river flows through both districts from east to west, dividing each into two unequal parts, the topography of the two political areas is here treated as one. Of the two natural divisions of each district the larger lies south of the Tapti, and is drained by the Girna. Bori and Panjhra rivers. Northward beyond the alluvial plain, which contains some of the richest tracts in Khandesh, the land rises toward the Satpura hills. In the centre and east the country is level, save for some low ranges of barren hills, and is mostly arid and unfertile. Toward the north and west. the plain rises into a difficult rugged country, thickly wooded and inhabited by tribes of Bhils. Drainage centres in the Tapti, which receives 13 principal tributaries in the districts. The districts on the whole are fairly well supplied with surface water. A large area is under forest, but the jungles have been denuded of most of their valuable timber. Wild beasts are numerous. The principal crops are cotton (especially in East Khandesh), millets, pulses, wheat and oilseeds.

EAST KHANDESH DISTRICT (4.875 sq.mi.) had a population in 1961 of 1,765,461. The district headquarters are at Jalgaon (pop. [1951] 68,412), at the junction of the Tapti valley line to Surat with the main Central railway (Bombay to the north). 230 mi. N.E. of Bombay city. There, and at Amalner (44,646), 35 mi. W., are undergraduate colleges of Poona university. The district is a prosperous cotton-growing area and there are four other towns with more than 20,000 inhabitants, having cotton mills, presses and gins; Bhusanal (54,346), 12 mi. E. of Jalgaon, is an important

junction of railways from Bombay, the north and central India.

WEST KHANDESH DISTRICT is much less developed than the eastern district. though Dhulia (pop. [1951] 76,880), the headquarters. 185 mi. N.E. of Bombay, is a cotton market town; otherwise, only Nandurbar (30.144) on the Tapti valley line to the northwest is important. Area, 5,072 sq.mi.; pop. (1961) 1,350,143.

KHANSA, AL- (TUMADIR BINT 'AMR) (died c. 645). Arabian poet of the tribe Sulaim, a branch of Qais, is famous for her elegies. Before the time of Islam she lost her brothers Sakhr and Moawiya in battle. Her elegies written on these brothers and on her father made her the most celebrated poet of her time. With her tribe she accepted Islam somewhat late, but persisted in wearing the heathen sign of mourning, against the precepts of Islam. When her four sons were slain in the battle of Kadisiya, Omar wrote her a letter congratulating her on their heroic end and assigned her a pension. Her daughter 'Amra also wrote poetry.

See also ARABIC LITERATURE: Pre-Islamic Poetry.

BIBLIOGRAPHY.—Hercollected poems have been edited by L. Cheikho (1895) and translated into French by Father De Coppier (1889). See also G. Gabrieli, I tempi, la vita, et il canzoniere della poetessa araba al-Hansa, 2nd ed. (1944).

KHAQANI (IBRAHIM IBN 'ALI NAJJAR [AFZAL AL-DIN]) (c. 1106–*c.* 1185), Persian poet, whose eminence rests mainly upon his numerous court poems, satires and epigrams, was born at Shirvan on the Caspian sea. His father was a carpenter and a Moslem, his mother a Nestorian Christian. Brought up in poverty, he aimed at a court career by composing panegyrics and for several years enjoyed the favour of Akhsitan the shirvanshah of Baku. Shortly after 1150 Khaqani sought permission of his royal patron to make the pilgrimage to Mecca, and this long journey inspired him to write his most famous poem, the *Tuhfat* al-'Zraqain ("Gift to the Two Iraqs"), a description of his travels interspersed with panegyrics and some autobiography. Returning to court in 1157, he quickly fell into disgrace when he boasted of the consideration shown him during his absence by other rulers, and he was committed to the prison fortress of Shabiran. His suiferings there moved him to write a habsiya (jail ballad) which is considered one of the finest specimens of its kind. He was eventually released. and after his wife's death, which he mourned in a tender elegy, he retired to Tabriz where he died. His style is learnedly obscure, and his writings generally require detailed commentary for their elucidation.

See N. de Khanikov, Mdmoire *sur* Khacani (1865); Yahya Qarib (ed.), *Masnavi i Tuhfat al-'Iraqain* (1953). (A. J. AV)

KHARAN, a former princely state of Pakistan in the Baluchistan region, between Iran (west), Kalat (east), Chagai (north) and Makran (south); one of the five districts of the Kalat division of West Pakistan province, formed in 1955. Area of Kharan. 18.533 sq.mi.; pop. (1961) 42,000. Hot dusty winds blow in summer and a large area is arid sandy waste. Sheep, goat and camel rearing is the main occupation. Some cultivation is found near the hills and along the Mashkel and Baddo rivers. Wheat is the staple, though there are rich date groves. Kharan Kalat (pop [1951] 2,589), the capital, near the Baddo, is 77 mi. S.W. of Kalat city. The chief or nawab is of the Nausherwan tribe, of Persian Kiani descent. Kharan was recognized by the British in 1940 as separate from Kalat and only nominally under its suzerainty; it acceded to Pakistan on March 17, 1948; and was a constituent of the Baluchistan States union, 1952–55.

KHARGA (AL WAHAT AL KHARIJAH), the largest of the Egyptian oases, frequently called the Great oasis, lies in the Libyan desert between 24° and 26° N. and 30° and 31° E. Area 1,426 sq.mi., measuring 100 mi. from north to south and from 12 to 50 mi. east to west. Permanent pop (1947) 11.121, a mixture of Berber and Bedouin stock. The chief town Al Kharijah (pop. about 7,000) is due west of Isna (*q.v.*) and 435 mi. by rail S.W. of Cairo; it is reached by narrow-gauge line (opened 1908) from Kharga junction on the Nile valley line near Farshut.

The oasis consists of a depression, down to 70 ft. above sea level. The climate is virtually rainless and, because of a steady lowering of the underground water table, there is no longer a single natural-flowing spring, but water is obtained from numerous borings of the porous Nubian sandstone which underlies the greater part of the Libyan desert. Rice, barley and wheat are the chief crops, with berseem for fodder. Other occupations are basket and mat weaving, from palm leaves and fibre. In ancient times the cultivated area was greater than today; but new boring and land reclamation is slowly proceeding. Al Kharijah town lies among palm groves. Its houses are of sun-dried brick, and the streets are narrow and winding, sometimes cut through solid rock and mostly roofed over, the roofs carrying upper stories. (A. B. M.)

The higher water table during the Paleolithic period made Kharga a centre for Paleolithic hunters, and remains dating from the Acheulean to the Levalloisian have been found. Mesolithic and Neolithic settlers were also present.

Kharga was called Kenem by the ancient Egyptians but does not appear to have come under their control until the 18th dynasty, when the Temehu tribesmen were subdued. In the 26th dynasty a temple to Amon, of sandstone, mas built, and during the 27th dynasty this was added to and enlarged. The water supply was improved and wells and pools were built. This led to a large increase in the sedentary population which reached its peak under the Ptolemaic and Roman rulers.

Other remains include a Roman fort on the eastern escarpment and remains of an early Christian necropolis on a hillside 3 mi. N. of Al Kharijah. These were provided with mummy chambers, a practice continued by the Christian Egyptians for some time.

Kharga is usually identified with "the Oasis" and was called the Island of the Blessed by Herodotus (bk. iii. 26). It was regarded as the home of spirits. The oasis was visited by the army of Cambyses on its way to the oasis of Amon Siwa, before perishing in the desert from sandstorms. Owing to its remote position it was also used as a place of exile. (M. V. S.-W.)

KHARKOV (Ukrainian, KHARKIV), chief town of the Kharkov oblast of the Ukrainian Soviet Socialist Republic, U.S.S.R., and its former capital, at the junction of three unnavigable rivers, the Lopan, the Kharkov and the Udy.

Founded about 1655 by the free (*i.e.*, outside the Polish commonwealth) Cossacks, as the Ukrainians were then called. it soon became a fort along the then southern frontier of Muscovy. From 1780 it was the chief town of the Russian Kharkov *gubernya* (province). As an important communication and trade centre it developed rapidly. In the second half of the 19th century industrial development in the Donbas coal field and the Krivoi Rog iron ore district led to rapid growth and the building of railways, six of which radiate from Kharkov. In 1805 a university, second in the Russian empire and first in the Ukraine, was founded there: and from 1885 Kharkov had a college of engineering.

On Dec. 24–25, 1917, the first All-Ukrainian congress of soviets was held in Kharkov and proclaimed the. city as the capital of the Ukrainian S.S.R. From April 20. 1918, up to Jan. 3. 1919, Kharkov was occupied by the Germans. Retaken by the Red army it was in the hands of the "White" Russian forces from July 3, 1919, up to November.

From 1928 industrialization progressed rapidly and plants producing tractors, turbogenerators and machine tools were built. In the summer of 1934 the capital of the Ukraine was transferred to Kiev. From Oct. 24. 1941, to Aug. 23. 1943, Kharkov was again occupied by the Germans and this time the city suffered heavy damage. All industrial enterprises were destroyed while 45% of the dwelling houses were blown up or burned out. The city was replanned and by 1956 completely rebuilt. A certain number of ancient monuments, however, such as the Pokrovsky and Uspensky churches, the Catherine palace (now the main part of the university building) and the Korolenko public library, escaped destruction.

After World War II the importance of Kharkov as an industrial centre increased and many new plants for heavy and light industry started production there. In 1956 the city had 259 kindergartens. 124 elementary and secondary schools, 39 vocational schools and 24 institutions of higher education. There were also 60 hospitals, 402 libraries, 53 clubs. many museums as well as six theatres, including an opera house and Russian and Ukrainian dramatic theatres. In 1956 the city covered an area of 104 sq.mi. Its population rose from 174,846 in 1897 to 833,432 in 1939. In 1959

the population was 930.000. (A. F. Mk.)

KHAROSTHI AND BRAHMI, two alphabets of India. Kharosthi was a local alphabet of Aramaic origin, introduced after the conquests of Darius.

The Brahmi alphabet developed characteristic forms in India where writing can be proved to have been in use from 600 B.C.

KHARPUT (HARPUT), chief town of Elazig il, Turkey, situated at an altitude of 4.350 ft., a few miles south of the Murad Su or eastern Euphrates. and almost as near the source of the Tigris, on the Samsun-Sivas-Diarbekr road. Pop.(1 960) 1,772. The town is built on a hill terrace about 1.000 ft. above a well-watered plain of exceptional fertility which lies to the south and supports a large population. The province has much mineral wealth and fertile soil.

KHARTOUM is a province and the capital of Sudan. The province has an area of 8,097 sq.mi. and contains three large towns, Khartoum, Omdurman (*q.v.*) and Khartoum North, each with a municipal council. Pop. (1956) 504,923. The city of Khartoum (Arab, "elephant's trunk") is so named from the shape of the narrow tongue of land on which it is situated at the junction of the Blue and White Niles, at an altitude of 1,252 ft. It is 492 mi, S.W. of Port Sudan, on the Red sea, by rail, and 1,356 mi. S. of Cairo by rail and steamer.

When the Egyptians invaded the Sudan in 1820 they established a military camp on this site and from it grew a town which in 1830 they chose as the capital. As the country gradually became opened up to travelers and traders. Khartoum developed from a large slave and ivory market into an economic and political centre. Gen. Charles George Gordon (*q.v.*) was sent to Khartoum in 1884 at the time of the mahdist rebellion to evacuate the Egyptian garrisons from the country. He was besieged by the dervishes whose armies lay across the river at Omdurman and it was on the steps of the palace in Khartoum that he was killed in 1885. During the rule of the khalifa Abdullah. who succeeded the mahdi from 1885 until 1898, Khartoum was abandoned, but on the reconquest of the country in 1898 by Anglo-Egyptian forces under General (later Lord) Kitchener, the seat of government was retransferred from Omdurman to Khartoum.

The modern city of Khartoum (pop. 1956, 93,103) as originally planned by Lord Kitchener resembled from the air a Union Jack, the buildings being erected in squares and the streets completing the pattern of the flag. The motive for this layout was probably mainly for defensive purposes. The buildings are of stone and brick and are surrounded by green gardens while the streets are lined with palm and other shady trees. Alongside the river runs a 2 mi. long drive flanked by large buildings. Parallel with the river drive runs Gordon avenue with the statue erected in the general's name standing in the centre.

There are many fine buildings in the city including the governor general's palace. the Gordon memorial college. which in 1951 was embodied, with the Kitchener school of medicine. as the University College of Khartoum. The city has a Roman Catholic cathedral: an Anglican cathedral, a Coptic church and a large mosque. as well as Maronite and Greek churches. Khartoum is the seat of government (1954); the senate, the legislative assembly. the cabinet offices, the official residence of the prime minister and the headquarters of the various government departments are housed in modern buildings.

The climate of the city is seasonal. From October to March northerly winds prevail and temperatures are low. From April to July the atmosphere is dry and very high temperatures are registered while strong winds and sandstorms occur frequently. In August and September rain is intermittent and the atmosphere is humid.

Public transport over macadam roads is provided within the city by an electric streetcar line and a bus service which links the three towns of the province. A road and rail bridge opened in 1910 over the Blue Nile joins the capital with the suburb of Khartoum North (pop. 1956, 39,082), where the government stores and river dockyards are found; and the road bridge over the White Nile built in 1928 joins the native and historical town of Omdurman with the capital. In 1954 the city was provided with a fully equipped international airport capable of landing jet planes and this caters not only for a network of internal air lines linking all the provinces and other parts of Africa with the capital, but also provides an important staging and service centre for the international air lines which traverse Africa. Internal and international telegraph services are also well developed.

The export trade of the country passes through the capital. From the west by rail comes cotton from the Gezira and gum. oil products and cattle from Kordofan and Darfur. Communications with the three southern provinces are by air and by river steamer and the railway running northward connects the regions of the south and west with Egypt and with Port Sudan on the Red sea coast. This modern port caters for the commerce of the country and provides access to and from the markets of the world.

The population of the city is mainly Sudanese and Arabic speaking; there are in addition large British, Greek, Syrian, Coptic and Italian commercial communities and each nationality maintains its own churches, schools and clubs. (R. C. ML.)

KHASI HILLS and **JAINTIA HILLS,** adjacent highland systems in Assam, India. forming a single massif or plateau between the Brahmaputra and Surma valleys. The massif consists of a succession of steep ridges, running east and west, with elevated tablelands between. On the southern side, toward Sylhet, the mountains rise precipitously from the Surma valley and form a plateau 4,000 to 6,000 ft. above sea level. There is situated the town of Shillong (*q.v.*), 4,900 ft. above the sea; behind lies the Shillong range, of which the highest peak rises to 6,441 ft. On the north side, toward Kamrup, are two similar plateaus of lower elevation. The general appearance of all these tablelands is that of undulating grassy downs. At 3,000 ft. the indigenous pine, *Pinus* khasya, predominates. It is the chief building timber of the area. The highest ridges also are clothed with magnificent clumps of timber trees, chiefly many kinds of oak and chestnut. The flora is exceptionally rich in the variety and number of plants, orchids being especially prolific. Oranges, betel nuts and pineapples are a source of wealth to the Khasis. The orange groves supply the greater part of East and West Bengal and Assam; the pineapple. which is not native to the country, is almost like a weed in the profusion of its growth. Potatoes are cultivated and exported on a large scale. Iron ore exists and the remains of smelting furnaces may be seen for miles below Cherrapunji. The industry died out because of the competition first of English and then of Bihar and Bengal iron; and the exhaustion of local supplies of fuel. Vast deposits of limestone are quarried on the southern face of the hills. Sulphurous Tertiary coal crops out at several places.

The Khasi hills were conquered by the British in 1833 but the tribes were left in semi-independence. They are grouped in 2j petty states, each under a chief called a ***siem*** (often elective rather than hereditary), with a durbar or council. The Jaintia hills formed a petty Hindu principality which was annexed by the British in 1835. The inhabitants are Panars, called "Syntengs" by the Khasis. Prior to India's becoming independent in 1947 Shillong. together with a few villages in the Khasis and the whole of the Jaintias. were part of British India and called Khasi and Jaintia Hills (British) district; area 2,353 sq.mi. The Khasi hill states (total area 3.768 sq.mi.) were under British paramountcy, with the governor of Assam as agent. In practice, however, their administration was largely assimilated to that of British Assam. Between Dec. 15, 1947, and March 19.1948, the Khasi states formed a federation and acceded severally and collectively to the new dominion of India. In 1950, however. the Khasis and the Jaintias were joined in a single district of Assam state, the Khasi *siems* retaining some petty jurisdiction. The KHASI AND JAINTIA HILLS DISTRICT thus formed has an area of 5,546 sq.mi. after boundary adjustments with neighbouring districts; pop. (1961) 462,870. The district headquarters were transferred in, 1864 from Cherrapunji (which has the heaviest rainfall in the world: annual average 424 in.) to Shillong, afterward the capital of Assam. (X.)

The **Khasi** People.—The people of the Khasi and Jaintia hills are of short stature, mesaticephalic, with straight or wavy

hair. light complexion and platyrrhine nose; they are of mixed origin but speak a Mon-Khmer language. The use of shouldered iron hoes and of long two-handled iron swords also suggests a Khmer culture. Most are now Christian (predominantly Calvinistic Methodist), but menhirs and table stones as cenotaphs of male and female ancestors respectively were freely erected and are often of great size. a menhir at Nartiang measuring 26 ft. above ground and a table stone at Laitlyngkot 28½ by 13¾ by 1⅔ ft. Menhirs. sometimes capped with a round stone, were occasionally carved They are probably phallic in original intention. Ideas of ancestor worship were strong. but there was a belief also in a Creator or Creatrix. Divination by egg breaking is practised. Property passes by the female line and is always inherited by the youngest daughter. and the social organization is by matrilineal exogamous clans some of which are eponymous while the names of some suggest a totemistic origin. Public affairs, however. are a purely male province. Where the hereditary principle obtains. the succession to state siem-ships or chieftaincies goes to the youngest daughter's eldest son. The dead are burned and the uncalcined bones placed in small stone cairns. Periodically the bones from these cairns are collected with ceremony and placed in a family burial cromlech. The *siem* of Cherra is pickled. and can only be burned by his successor after accession. Head-hunting used to be practised and the head placed on a table stone. Remnants of human sacrifice and snake worship long survived in the cult of the Thlen, a phantom serpent whose cult was hereditary in certain families and required the offering of a human life.

The *Syntengs.*—The Jaintia Syntengs are one of five subtribes of the Khasi people, the Khasis proper being another In former times the Synteng husband. unlike the Khasi, only visited his wife at her mother's house, himself living with his mother. His widow might keep his bones unless she remarried. when they were placed by the clan in a building which she could not enter. The Syntengs. to prevent sickness, played ritual games in a stream inhabited by a goddess, stretching poles across, jumping on them till they broke and struggling for them in a tug of war. The Synteng princes of Jaintiapur practised human sacrifice, accompanied by ceremonial cannibalism. (J. H. H.)

KHASKOVO (also Chaskoi, Haskoi, Khaskioi, Chaskovo, *Haskovo, Khaskoy*), a town of southern Bulgaria; 45 mi. E.S.E. of Philippopolis, Pop. (1956) 39.006. The town has a station 7 mi. N. on the Philippopolis-Adrianople section of the Belgrade-Istanbul railway. Carpets and woollen goods are manufactured, and in the surrounding country tobacco and silk are produced.

KHAZARS, probably a Turkish-speaking people, played a role of some importance in the second half of the 1st millennium A.D. Although it is impossible to establish with exactitude the by no means unvarying limits of their empire, they can be placed approximately in the second half of the 6th century, in the territory between the Sea of Azov, the Caspian sea, and the Volga and Don rivers. The Caucasus constituted the southern limit of their expansion.

The Khazar empire was for many centuries an important turntable on the crossroads between Byzantium and the world of Islam, between the forest peoples of the north and the nomadic empires of central Eurasia. It also exerted some influence on the destinies of the smaller peoples of the Caucasus region. In spite of the fact that the southern and western neighbours of the Khazars belonged to civilizations with a solid tradition of historical writing. knowledge of Khazar history is rather poor and, although some details emerge with sufficient clarity, oddly enough the main trends remain relatively obscure.

To begin with, the problem of the origin of the Khazars has yet to be elucidated. The name Khazar appears only in the 6th century A.D., but there can be little doubt that the same people had previously existed under a different name. Some scholars would like to see in the Huns called Akatzir their direct ancestors. This theory, if warranted, would add another century to the span of Khazar history with which we are acquainted, for the Akatzirs are known from the middle of the 5th century. Unfortunately, however, our knowledge of the Akatzirs themselves is very scanty. so that their identification with the Khazars, instead of shedding new light on the origin of this people, would simply push the problem back a century. The main argument for the identification of the two peoples is the similarity of their names, and geographical location is of little further help. The anonymous geographer of the *Ravenna* Cosmography, quoting Jordanes, suggests that the Xkatzirs mentioned by him are in fact the Khazars. Theophanes and Nicephorus have the Khazars coming from Bersilia, which almost certainly means Daghestan; but according to the historian Mas'udi. Khazar mas the Persian name for a people called by the Turks Sabir. This implies that the Khazars were in fact the direct descendants of the Sabirs. Of this people again our knowledge is very slight, for all we really know of them is that from the middle of the 5th century they were living in central Russia in the neighbourhood of the Bulgars. The only way of reconciling the statements of the Ravenna geographer and Mas'udi is to consider the Akatzirs and the Sabirs as one and the same people; but this cannot be harmonized with the testimony of Priscus, who quite clearly holds them to be distinct.

There can be little doubt that any attempt to trace back the history of the Khazars beyond the time when their name, *khazar*, appears for the first time must be speculative and cannot claim to be considered as solidly based. It seems more reasonable to admit failure in shedding light on Khazar prehistory, and to start an account of their history from the time when at least the identity of the people itself is sufficiently well established.

The first certain reference to the Khazars seems to be that found in the Syriac chronicle of Zachariah of Mytilene, which dates from the middle of the 6th century A.D. Although Persian sources of this date do not mention the Khazars by name, the Persians certainly had contact with them as early as the reign of Kusrau (Chosroes) I (A.D. 531–579). It is very likely that at this epoch they formed part of the western Turk empire. The Khazars really enter the orbit of western politics under the reign of the emperor Heraclius (610–642). In his campaign against the Persians Heraclius secured the help of Khazar auxiliary troops, whose contribution proved to be decisive. The Khazar kaghan obtained as reward the hand of one of the emperor's daughters.

Toward the middle of the 7th century the Arab conquest reached the Transcaucasian territory and in 661 Arab armies penetrated to the north of the Caucasus, compelling the Khazars to abandon Derbent. This major defeat, which marked the beginning of a lengthy warfare between the expanding Arab forces and the Khazar empire, coincides with a westward expansion of the latter. It is difficult to know whether this was a deliberate move on the part of the Khazars to transfer the centre of gravity of their empire to safer regions; it is, however, certain that the Khazar power was untouched by this first Arab offensive. Some years later, in about 681, the Khazars were strong enough to take the initiative into their hands. Around 685 they carried their attacks south of the Caucasus; first Georgia, Armenia and Albania, later, in 717, Azerbaijan were invaded. This campaign was followed in 721–22 by a Khazar attack against the Alans. These conquests brought the Khazars into the neighbourhood of the Arabs, and in 722, the two forces clashed on Armenian territory. The Khazars were victorious, but soon afterward the Arabs launched a counterattack, which finally led, in 730, to the fall of the great Khazar city of Balanjar in the region of the Caucasus between the Darial and the Samandar. In the very next year, however, 731, the Khazars attacked again and their victorious army penetrated as far as Mesopotamia. Although later Arab counterattacks compelled them to withdraw north of the Caucasus, the historical effects of their initial victories were of considerable importance. Thereafter the Caucasus remained the northern border of Arab expansion.

During all this time the Khazars remained in close touch with the emperors of Byzantium. During his exile Justinian II stayed for several years with the Khazars, and in 704 he married the sister of the kaghan. Their apparent friendship soon deteriorated however and the Khazars, by supporting the revolt of the inhabitants of Kherson, played a considerable part in the fall of Justinian (711). In 732 Leo III the Isaurian, married his son, the future Con-

stantine V. to a Khazar princess called Tzitzakion (Turkish *chichek,* "flower"): who was then baptized Irene. At this time Khazar influence was considerable in the Byzantine court, and their son Leo IV bore the surname of "the Khazar."

In general it can be said that it was in the second half of the 8th century that the Khazar empire reached the acme of its glory. Their zone of direct influence extended all over the immense plains of southern Russia. stretching from the northern shores of the Black sea and the Caspian to the Urals and the Volga beyond Kazan. The Alans and other peoples living to the north of the Caucasus between the mountain range and the river Kuban, the Hungarians who occupied probably the territory between the rivers Don and Dnieper, the Goths. and the Greek colonies of the Crimean peninsula all recognized the Khazars as their overlords. as did the Bulgars farther to the north. in the region of the middle Volga. The kaghan of the Khazars was also the suzerain of a number of Slavonic tribes centred chiefly around Kiev.

The second half of the 8th century saw the renewal of Khazar-Arab wars. In 786 or 787 the Goths of the Crimea were also attacked by the Khazars; and sometime during the same period there was a Khazar attack on Georgia.

During the 9th century the Khazars had to face a new and extremely powerful enemy: the Russians. In 96j the campaign led by Svyatoslav spelt the virtual end of Khszar might. In 1016 the emperor. Basil II. joined with the Russians in an attack against the Khazars, occupied the Crimean colonies of this people, and also the Taman peninsula. Around 1030 the Khazars ceased to play a political role on the northern shores of the Black sea. and their territories became subjected to Byzantium. Khazars are. however, still mentioned as late as the 12th century. It seems almost certain that the Karaites are the descendants of the Khazars. although the historical link between the two peoples is not entirely plain.

Khazar civilization shows a fairly complex texture, and their religious life raises more than one problem. Christianity. Islam. Judaism and some sort of "pagan" worship are all attested by sources. About Xoo the Khazar ruler—and probably the greater part of the ruling classes—were converted to Judaism. The' circumstances of the conversion remain obscure, the depth of the Jewish layer difficult to assess; the fact itself is, however, undisputed and unparalleled in the history of central Eurasia. Christianity was also fairly widespread among the Khazars.

It is interesting to note that in spite of the relatively high level of Khazar civilization. and the wealth of material preserved in Byzantine and Arabic sources, not a single line of the Khazar language has come down to us. No inscriptions have so far been found. Single words, mostly proper names. embedded in Greek texts suggest that the Khazars spoke a Turkish language. It is very likely that several Turkish dialects. and possibly some other languages belonging to wholly different (perhaps Finno-Ugrian?) stock were also in use within the Khazar empire.

Although probably basically Turkish. the Khazar state shows little resemblance to the other Turkish empires of central Eurasia. The organization of the state—with. at its head, a secluded supreme ruler of semireligious character. who wielded practically no power—is very different from the usual pattern. The military organization seems to lack the forcefulness of those of the greater Turco-Mongol nomad empires. The Khazars also seem to have been more inclined to a sedentary way of life, tilling the soil and planting gardens and vineyards. Trade was among the main sources of income, and it is not too bold to surmise that the fall of the Khazar state was chiefly due to the Russians seizing the chief trade routes of central Russia.

No coins have been found which belong unquestionably to the Khazars and archaeological records of this people are extremely scanty. We are, in fact, very far from having a clear picture of Khazar civilization.

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KHEDIVE, a Persian word meaning prince or sovereign, granted as a title by the sultan of Turkey in 1867 to his viceroy in Egypt, Ismail. The title was abandoned on the assumption of the style of "sultan" by Husein Kamel in 1914.

KHERI, a local government town area and district in the Lucknow division of Uttar Pradesh, India. The town (pop.. 1951, 9,287) is 73 mi. N. of Lucknow. on the North-Eastern railway.

KHERI DISTRICT (area 2,972 sq.mi.; pop., 1951. 1,058,343) consists of a series of fairly high plateaus, separated by rivers flowing from the northwest. each bordered by alluvial land. Sortheast of the Ul river. which bisects the district, flow two others. the Gogra and Chauka, changing their courses constantly so that the surface is seamed with deserted river beds. The Gogra forms the eastern border of the district with Bahraich district. The vegetation is very dense. and the stagnant waters are the cause of endemic fevers. Southwest of the Ul stretches a plain. considerably lower than the tract to the north. There is very little slope and marshes are formed, from which emerge the headwaters of many secondary streams. which in the rains frequently cause devastating floods. There are several large lakes. some formed by the ancient channels of the northern rivers being fine sheets of water, fringed in places with magnificent groves. The whole north of the district is covered with forest. of which much is government reserve. Sal trees occupy about two-thirds of the forest area. The municipalities of Gola Gokarannath (10,586) and Lakhimpur (25,055) are the largest towns in the district. The latter. 3 mi. N. of Kheri and virtually contiguous with it, contains Yuvraj Datta college affiliated to Agra university.

KHERSON, a port of the Ukrainian S.S.R., on a hill above the right bank of the Dnieper, about 19 mi. from its mouth in 46° 37′ N.. 32° 37′ E. Population (1926) 134,000. The river was dredged to a minimum depth of 21 ft., and a new harbour was constructed with accommodation for 18 steamers. There are 10 floating grain elevators. and a floating dock lifting 2,000 tons. Goods are mostly shipped from barges by floating elevators in the stream. Winter is severe and the port is closed for navigation from December till early March. The exports are mainly grain and timber, and the imports general merchandise for local needs. It has flourmills, and breweries and manufactures machinery. Its only railway link is via Nikolayev. The name was given to the town from the supposition that it was on the site of the former Chersonesus Heracleotica, a Greek city founded by the Dorians of Heraclea. Kherson was founded by Potemkin in 1778 as a naval station and seaport and by 1786 it had grown to be a place of 10,000 inhabitants.

Near Kherson lie the remains of John Howard, the English philanthropist, who died here in 1790.

KMEVENHULLER, LUDWIG ANDREAS (1683–1744), Austrian field-marshal, Count of Aschelberg-Frankenburg, first saw active service under Prince Eugkne in the War of the Spanish Succession, and by 1716 had risen to the command of Prince Eugène's own regiment of dragoons. He distinguished himself greatly at the battles of Peterwardein and Belgrade. and became in 1723 major-general of cavalry, in 1726 proprietary colonel of a regiment and in 1733 lieutenant field marshal. In the War of the Polish Succession (1734) he was present at several actions, and for a time commanded the army in Italy. In 1737 he was made field marshal. His chief exploit in the Turkish War, which soon followed his promotion, was at Radojevatz (Sept. 1737), where he cut his way through a greatly superior Turkish army. In the War of the Austrian Succession he was commander-in-chief of the Army of the Danube, which he led brilliantly against the French and Bavarians in 1742, overrunning Bavari and capturing Munich in the following campaigns; though place under Prince Charles of Lorraine he showed equal skill. He diei suddenly at Vienna. Jan. 26, 1744.

He was the author of various instructional works for officers an soldiers (Des *G.F.M. Grafen v. Khevenhüller Observationspunkte* fü

sein Dragoner-regiment (1734 and 1748) and a *règlement* for the infantry (1737), and of an important work on war in general, *Kurzer Begriff aller militärischen Operationen* (1756; French version, *Maximes de guerre,* 1771).

KHEVSURS, a people of the Caucasus, kinsfolk of the Georgians. They live in scattered groups in the remote mountainous region to the north and northwest of Mt. Borbalo. Their name is Georgian and means "people of the valleys." They numbered about 6,500 in 1897. In complexion and colour of hair and eyes they vary greatly, evidence of their mixed ancestry. Their language is a dialect of Georgian but no longer comprehensible to Georgians.

They are fond of fighting and obey the lam of vendetta. which is sacred among them as among most Caucasian peoples.

Many curious customs still prevail among the Khevsurs, as for instance the imprisonment of a woman during childbirth in a lonely hut, round which her husband parades, firing off his musket at intervals. After delivery, food is surreptitiously brought to the mother, who is kept in her prison for a month, after which the hut is burnt. The boys are usually named after some wild animal, *e.g.,* bear or wolf, while the girls' names are romantic, such as Daughter of the Sun, Sun of my Heart. Children are betrothed by parents.

Formerly no Khevsur might die in a house but was always carried out under the sun or stars. The Khevsurs call themselves Christians, but their religion is a mixture of Christianity. Islam and heathen rites. They keep the Sabbath of the Christian church, the Friday of the Moslems and the Saturday of the Jews. They worship sacred trees and offer sacrifices to the spirits of the earth and air.

See G. F. R. Radde, *Die Chevs'uren und ihr Land* (1878); E. Chantre, *Recherches anthropologiques dans le Caucase,* 4 vol. (1885–87).

KHIDR, AL- (contraction of AL-KHADIR, "the green one"), a legendary figure in Islam who developed, in folk religion, into a favourite saint, especially with sailors and Sufis (mystics). The origin of the cycle of myths and stories that have gathered around this figure and endowed him with immortal life is a vague narrative in the Koran (18: 59–81), which takes Moses and his servant on a long and arduous journey to the "meeting of the tno seas," in the course of which they lose a fish which had accompanied them and then meet a "man of God" who performs outrageous deeds but gives them satisfactory explanation. Modern scholars detect in the Koranic original a strand from the Babylonian epic of Gilgamesh (*q.v.*), nho goes in search of an ancestor endowed nith eternal life; another, from the romance of Alexander, whose cook discovers for him the fountain of life; and a third. from the Jewish legend of Elijah, one of the few who never tasted death. Arab commentators elaborated and embellished the Koranic story and named the "man of God" Khidr, claiming that as he dived into the spring of life he turned green. The Khidr story soon enjoyed wide popular spread—despite orthodox Islamic opposition—among Arabs, Turks. Persians and other Moslem communities. What gave the cult easy vogue mas the consideration of the saint as a still-living being, nith ability to assume local characteristics. In Syria he became partially identified with St. George, nhom a local tradition makes of Syrian nativity; in Bengal, with a nater deity specializing in the protection of mariners and river travelers; and in Sufi circles, with their founders, who were often endowed with holiness and sainthood. (P. K. H.)

KHILCHIPUR (area, 625 sq.mi.; pop., 1951, 119,106), formerly a princely state within the Central India agency, was merged into Madhya Bharat on June 15, 1948. In 1956 Khilchipur became part of Madhya Pradesh in Rajgarh district. Khilchipur town had a population in 1951 of 6,227.

KHINGAN MOUNTAINS (TA-HSING-AN-LING SHAN-MO), a mountain system of northeast China, extending about joo mi. from the great bend of the Amur river south to the upper reaches of the Liao river. The width of this mountain system, known also as the Greater Khingan range. varies from 80 mi. in the south to 200 mi. in the north. The highest elevation is an unnamed summit at 44° 30′ N., 118° 40′ E., reaching 6,673 ft. The Greater Khingan is a tilted fault block, trending north-northeast by south-southwest and forming the easternmost bastion of the Mongolian plateaus, which lie at an altitude of 3,000 ft. at the base of the gradual western slope of the mountain system. To the east the ranges fall more rapidly to the plains of central Manchuria, whose undulations are partly caused by projecting spurs from the Greater Khingan. The mountain system forms an important orographic divide in Asia, for it intercepts the moisture-laden southeasterly winds and is thus a factor in the contrast between fertile Manchuria, on one hand. and arid Mongolia, on the other.

The Greater Khingan is crossed by tno railroad lines, and settlement has proceeded mainly along their rights of way. The main line, in the north, is the historic Chinese Eastern railroad, which crosses the mountains between Tsitsihar and Hailar. Lumber railroads penetrate into the rich timber stands of the Greater Khingan, especially in the newly developed Tuliho area. The southern railroad is a branch of the Manchurian rail net and goes through the regional centre of Ulan Hoto to the hot springs resort of Xrshan.

The Greater Khingan has not been thoroughly explored, and vast sections. particularly in the northernmost portion. are virtually unknown. The mountains have a sparse population, consisting mainly of Mongols. Under the Chinese Communist regime the Greater Khingan has, therefore, become a part of China's Inner hfongolian Autonomous Region. Other population groups include the Chinese, who are employed in the lumber industry along the Chinese Eastern railroad; the Evenki and Orochon, tno Tungus hunting peoples; and the Daurs, who are related to the hfongols and the Tungus.

The Little or Lesser Khingan range (Hsiao-hsing-an-ling) is connected with the Greater Khingan by the Ilkhuri range (I-li-hu-li Shan) and extends for about 37 j mi. along the Chinese right bank of the Amur river. Except for an active lumber industry at Ichun, the Lesser Khingan is little developed. The name Little Khingan (Malyy Khingan) is also applied to mountains in the Bureya-Amur natershed of the Soviet Union, especially in the Jen ish Autonomous province (Eirobidzhan). (T. SD)

KHIVA, a tonn of Asiatic Russia in the Khorezm oblast of the Uzbek Soviet Socialist Republic, U.S.S R., in latitude 41° 30′ N., longitude 60° 18′ E , lying 2 j mi. W. of the Amu Darya, on which it and the oasis around it depend for irrigation. Pop. (1935) 21,595.

The town mas formerly the centre of a flourishing kingdom of great antiquity, which has declined owing to various physiographical and political causes. In very ancient times the Amu Darya flowed to the Caspian and thus possibly linked the oasis kingdom with the west, by the Sary Kamish depression. Later the river changed its course and now flows into the Sea of Aral. The increasing desiccation of Turkistan and the constant shift of the river toward the east! with consequent difficulties of irrigation to the oasis, are other physiographical factors in its decline. The final political blow, following on a long series of troubles, was the heavy war indemnity imposed upon the khanate after the capture of the town in 1873. The whole region was involved in the civil strife following the 1917 revolution, and the khanate ceased to exist, becoming absorbed in Uzbekistan republic, but the effects of civil war on the delicate balance of irrigated regions were disastrous and the oasis was much crippled, especially as no railway net reached it, and funds mere lacking for energetic measures to cope with the hydrographic problem of the Amu Darya. For its economic condition see UZBEKISTAN. (S.)

History.—Khiva was once a great kingdom, under which the names of Chorasmia, Kharezm (Khwārizm) and Urgenj (Jurjāniya, Gurganj) held the keys of the mightiest river in central Asia. The Oxus (Amu Darya) has changed its outlet and no longer forms a waterway to the Caspian and thence to Europe.

Chorasmia is mentioned by Herodotus, it being then one of the Persian provinces over which Darius placed satraps, but nothing material of it is known till it was seized by the Arabs in A.D. 680. When the power of the caliphs declined, the governor of the province probably became independent; but the first king known to history is Mamun ibn Mohammed in 995. Khwārizm fell under the power of Mahmud of Ghazni in 1017 and, subsequently, under that of the Seljuk Turks. In 1097 the governor Kutb-ud-din as-

sumed the title of king, and one of his descendants, 'Ala-ud-din Mohammed, conquered Persia and was the greatest prince in Central Asia when Jenghiz Khan appeared in 1219. Khiva was conquered again by Timur in 1379 and by the Uzbeks in 1512.

Russia established relations with Khiva in the 17th century. The Cossacks of the Yaik (ancient name of the river Ural) during their raids across the Caspian learnt of the existence of this rich territory and made more than one plundering expedition to the chief town, Urgenj. In 1717 Peter the Great, having heard of the presence of auriferous sand in the bed of the Oxus, desiring also to "open mercantile relations with India through Turan," and to release from slavery several Russian subjects, sent a military force to Khiva. When within 100 mi. of the capital, they encountered the troops of the khan. The battle lasted three days and ended in victory for the Russian army. The Khivans, however, induced the victors to break up their army into small detachments and treacherously annihilated them in detail. It aas not until the third decade of the 19th century that the attention of the Muscovite government was again directed to the khanate. In 1839 a force under General Perovsky moved from Orenburg (now Chkalov) across the Ust-Urt plateau to the Khivan frontiers to occupy the khanate, liberate the captives and open the way for trade. This expedition likewise terminated in disaster. In 1847 the Russians founded a fort at the mouth of the Jaxartes or Syrdarya. This advance deprived the Khivans not only of territory but of a large number of tax-paying Kirghiz and also gave the Russians a base for further operations. For the next few years, however, the attention of the Russians was taken up with Khokand, their operations on that side culminating in the capture of Tashkent in 1865. Free in this quarter, they directed their thoughts once more to Khiva. In 1869 Krasnovodsk, on the east shore of the Caspian. was founded, and in 1871–72 the country leading to Khiva from different parts of Russian Turkistan was thoroughly explored and surveyed.

In 1873 an expedition to Khiva was carefully organized on a large scale. The army of 10,000 men placed at the disposal of General Kaufmann started from three different bases of operation — Krasnovodsk, Chkalov and Tashkent. Khiva was occupied almost without opposition. All the territory (35,700 sq.mi.; pop. 110,000) on the right bank of the Oxus was annexed to Russia, while a heavy war indemnity mas imposed upon the khanate. In the summer of 1919 the soviet government firmly established itself in this area, and the native dynasty was expelled. By autumn the khan of Khiva was deposed, and a people's soviet republic was substituted for the khanate. The remaining sections of Russian Turkistan uith Khiva and Bukhara and the Trans-Caspian province now constitute the two soviet socialist republics of Uzbekistan and Turkmenistan. In Oct. 1924 these two republics were admitted to membership of the U.S.S.R. The part of Khiva on the right bank of the Oxus is part of Turkmen.

(C. EL.; A. N. J. W.)

KHMER, an ethnic term for Cambodian, still in use among the inhabitants of the country and apparently of native origin. The more familiar term Cambodian, which, in various forms, has been used in European languages since the 16th century A.D., derives from a form *kambuja-desa,* "land of the lineage of Kambu," the eponymous legendary founder of the Cambodian royal line. The great sage Kambu fathered this line, according to Khmer tradition, upon the celestial nymph Mera, a name which may have been fabricated to provide an etymology for the word Khmer. This tradition may derive from a Pallava source in India. In southeast Asia the terms *kambuja* and *kambuja-desa* were first employed by Sanskrit-using kings or by their scribes. There is reason to think that the term srok kok *thlok,* "land of the thlok tree." may have preceded srok *khmer,* "land of the Khmer," as a designation for the country known in the west as Cambodia. Cham evidence. confirming the usage *kambuja-desa,* also points to a form *kvir* as well as *khmer.* Arab travelers of the 9th and 10th centuries A.D. used *k.m.r* with various medial vowels to designate this country, while Chinese sources may sometimes have referred to it under the term *k'un-lun,* which is also of much wider usage. If this is so. a further variant *k.r.m* must be postulated, unless this form is to be explained as a metathesis, or transposition. See also CAMBODIA; INDIAN ARCHITECTURE.

(A. H. CE.)

KHOI. A district and city in the Iranian ostan of west Azerbaijan, lying in the northwest corner of Iran between Lake Urmia and the Aras river. The district, which contains many flourishing villages, consists of an elevated valley 16 to 18 mi. long and 8 mi. broad, well drained and highly cultivated under a skilful system of irrigation which produces rich crops of wheat, barley, rice, cotton and many kinds of fruit. Timber, however, is scarce, as the surrounding hills are treeless.

The city of the same name lies 38° 37' N. by 45° 15′ E., at an elevation of 3,000 ft., 91 mi. N.W. of Tabriz, on the great trade route from Trebizond at its junction with the road from Urmia to the Aras. The Kotur Chai tributary of the latter river flows two miles to the east of the city and is crossed by a brick-built bridge of seven arches, 75 yd. long, with a roadway of 18 ft. Owing to its topographical position with reference to the frontiers of Iran, Turkey and Russia, Khoi seems always to have been regarded as possessing considerable strategical importance and in the early part of the 19th century was surrounded with strong fortifications under the direction of French engineers, General Gardane and staff. James Morier saw the building work in progress when he passed through in 1810. The design took the form of a quadrilateral, with faces 1,200 yd. in length and fortifications consisting of two lines of bastions and fosses, which made Khoi the most strongly fortified town in Iran. The city was attacked by the Russians in 1827 but was successfully defended. Following the treaty of Turkmanchai (Feb. 1828) it was held by a garrison of 3.000 Russian troops as a guarantee for the payment of the war indemnity.

During the Crimean War and again during the Russo-Turkish War of 1877–78 a considerable body of Persian troops was located there at the request of Russia. In the early part of 1911 the place was occupied by Turkish troops, who withdrew when a Russian consul general put in an appearance with an escort of 4,000 men.

If its extensive suburbs are included, the population of Khoi (1956) must approach 50.000, but of these only 34,509 live within the walls. The city within the walls is one of the best laid out in Iran, with cool streams, and lines of willows running along its broad and regular streets.

There are several mosques, an extensive brick-built bazaar, a fine caravanserai and some beautiful gardens. The city became the centre of much transit trade and local traffic with districts across the Turkish border.

KHOISAN, a synthetic name originally devised to designate the racial grouping to which. the Bushmen and Hottentots (see BUSHMAN; HOTTENTOT) of southwestern Africa belong, but also used with reference to their language and culture. "Khoi-san" is a compound of the initial syllable of the name *Khoi-khoin* ("men of men") by which the Hottentots call themselves, and the first syllable of Sun-qua ("San people"), the name. by which the Hottentots call the Bushmen, who have no collective name for themselves. Properly, Khoisan refers to these two groups. who are culturally, linguistically and physically related, while differing markedly from their Bantu neighbours in all three respects.

They have yellowish wrinkled skins, enlarged labia *minora* ("Hottentot apron") and steatopygia in females, and are short but not pygmy in stature. Bushmen average 62 in. and Hottentots 64 in. in height. The somewhat greater height, prognathism and narrower heads of the Hottentots, sometimes attributed to interbreeding with other African groups at an early date, are their chief points of difference in physical types.

Khoisan languages, whose unity has long been recognized, are characterized by sex gender, semantic tone, pre-positional genitives and monosyllabic roots. Their most striking features are the implosive consonants or clicks (*q.v.*), of which Bushmen and Hottentot each have four: lateral, dental, alveolar and palatoalveolar. Similar click consonants are also present among the Bantu-speaking Nguni and Sotho of southeastern Africa, but as the result of contact rather than common origin. J. Greenberg's Click language family includes Khoisan and two related languages in Tanganyika :

Hatsa (Hadzapi) and Sandawe. (*See* AFRICAN LANGUAGES: THE CLICK FAMILY; BUSHMAN LANGUAGES.) The Sandawe (*q.v.*), who practise farming, are similar to the Khoisan peoples in physical type as well as language, but differ in culture.

Culturally the Hottentots are distinguished by a sense of ethnic unity, a more complex social and political organization and by their herds of cattle from the Bushmen, who were nomadic hunters with the dog as their only domesticated animal. Neither group practised agriculture, on which the economies of most African societies are founded, or weaving. Iron working has disappeared among the Hottentots, who practised it at the time of first European contact, and was unknown among the Bushmen. Pottery making, which has also been abandoned, was confined to the Hottentots and a few southern Bushmen groups. Despite some differences, the Khoisan people were discussed by I. Schapera as a single cultural unit, and the Khoisan area is included in the culture areas of Africa outlined by M. Herskovits. The Negro Dama who have been assimilated to the Nama Hottentots have adopted Khoisan language and culture, but they differ in racial type.

The origin of the Khoisan peoples is uncertain. An estimated 15.000 Hottentots lived in South-West Africa in 1926, but few have survived in the Republic of South Africa except as mixed breeds in the Cape Coloured population. The Bushmen have also declined in numbers; the evidence suggests that they were once spread over most of eastern, central and southern Africa. In 1956 their number in South-West Africa, Bechuanaland and Angola was estimated at 50,000.

See also AFRICA: Ethnography (Anthropology): *Southern* Africa.

See I. Schapera, ***The*** Khoisan Peoples of South Africa (1930).

(WI. B.)

KHOJENT (renamed LENINABAD), a town of Asiatic Russia, in the Leninabad oblast, Tadzhik Soviet Socialist Republic, U.S.S.R., on the left bank of the Syr-darya or Jaxartes, 40° 18' N., 69° 42' E. Pop. (1959) 77,465, mainly Tajiks. The narrow Khojent pass is the entrance to the Ferghana valley, and the railway and the main road from Bukhara both utilize it. Before the Russian occupation there was much strife between the khanates of Khokand and Bukhara as to the possession of this strategic point. In 1866 the town was stormed by the Russians, and it played an important part in their war with Khokand in 1875. Irrigation from the Jaxartes is rendered difficult there by the height of the river bank. Cotton plantations, fruit gardens and vineyards surround the town, and silk worms are reared. The inhabitants weave and embroider cotton and silk goods.

KHOLM: see CHELM.

KHOND (KOND, KANDH, KONDH), a tribe in the hills and jungles of Orissa state, India, mainly in the districts of Phulbani, Koraput and Kalahandi. Their numbers, in 1960, were estimated at 700,000, making them the largest tribe in Orissa. Their language, Kui, and its southern dialect Kuwi, are Dravidian (see DRAVIDIAN LANGUAGES). Most Khonds are now rice cultivators, but there are still groups, for instance the Kuttia Khonds of Phulbani, who practise slash-and-burn agriculture in the forest, raising a crop in the ash.

The country was pacified between 1836 and 1850, when annual punitive expeditions, known as the Meriah wars, were made from the Orissa coast to suppress the Khond rite of human sacrifice. From about 1850 the country was administered as an agency and attempts were made to limit exploitation by traders and adventurers from the plains. In the Republic of India, Khonds, as a scheduled tribe, qualify for privileges in education and employment.

The Khonds have been in contact for many centuries with Oriya-speaking neighbours to the west, north and east, and Telugu-speakers to the south. By degrees they have taken on the language and customs of their more advanced neighbours. In such places as the Baudh plains there are Khonds who speak only Oriya: farther into the hills the Khonds are bilingual: in the remoter jungles Kui alone is spoken. There is an analogous gradation in the practice of Hindu customs concerning caste and untouchability, and in the knowledge of the Hindu pantheon. The advance of Oriya culture has been accelerated by the many traders who settled in the hills after 1850, and the process of acculturation was progressing rapidly in the 1960s as a result of the welfare and development activities of the government of Orissa.

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(F. G. B).

KHONKAEN, a province of northeastern Thailand, situated in the western part of the Khorat plateau. Area, 13,404 sq.km. (5,175 sq.mi.); pop. (1960) 836,621. A major producer of rice paddy, the province has 22 commercial rice mills. Other important crops include corn (maize), beans, cotton, kenaf (ambary hemp) fiber and tobacco.

Khonkaen (Muang Khonkaen), the capital of the province, is about 240 mi. N.E. of Bangkok and 110 mi. directly south of Vientiane, capital of neighbouring Laos, at approximately 16° 30' N. and 103° S. Pop. (1957 est.) 22,080. It is on the Nakhon Ratchasima-Nongkhai rail line as are the province's other major towns, Muang Phon and Banphai, the starting point of the major road into the central plateau.

(G. W. SK.)

KHOSRAU (Arabic KISRA; Gr. CHOSROES). "the famous"; an often used Persian name, notably of two Sasanian kings of Iran:

KHOSRAU I ANUSHIRVAN ("of the Immortal Spirit"). son of Kavadh I, reigned A.D. 531–579. Restorer with his father of the power of the Sasanian monarchy, his justice and magnificence became proverbial in the east. Having acceded he executed his rebellious brothers Kaus and Zham and quickly exterminated the heretical Mazdakites. Confusion due to Mazdakite doctrines he remedied by social legislation. The celebrated tax reforms of Anushirvan (represented by al-Tabari as a substitution of fixed assessment for crop sharing as the basis of land revenue) were with few dissentients acclaimed profitable to subjects and exchequer alike. The "indefinite peace" concluded with Justinian in A.D. 532 was abrogated in 540 when Khosrau—alarmed at Byzantine triumphs in Italy—invaded Syria and captured Antioch, taking captives and booty. Later his forces campaigned against the Byzantines in Lazica (ancient Colchis) and Mesopotamia. Meanwhile the Turks made their first appearance in history, attacking the Hephthalites in Khurasan. By timely alliance with the Turkish king Silzibul (Sinjibu) Khosrau crushed the Hephthalite survivors (557). freeing his eastern frontier from long-standing danger and annexing Bactria. The Yemenite Arabs he supported against the Ethiopians, whose expulsion by his governor Wahriz gave him overlordship of the Yemen. In new fighting against Byzantium the Persians in 573 captured Dar'a, a stronghold facing Nisibin, and raided Syria and Cappadocia. Wartime captives were settled near Ctesiphon, where Anushirvan's palace became famous as the Taq-i *Kisra.* Peace negotiations were still pending when, in the early spring of 579, Khosrau died. In the Bibliothèque Nationale in Paris a jeweled dish with crystal representation of a king enthroned is believed to portray Anushirvan.

KHOSRAU II PARVEZ ("the Victorious"), son of Ormizd IV and grandson of Khosrau I, reigned from 590 to 628, being raised to the throne during the rebellion of Bahram Chobin (*q.v.*) against Ormizd, whose murder followed his deposition. Khosrau, powerless against Bahram, fled to Syria and gained support from the emperor Maurice. With Byzantine escort he recrossed the frontier early in 591 and drove out Bahram. The chronicler Evagrius describes thank offerings of Khosrau to the church of St. Sergius of Resafa, sent at the instance of his Christian consort Shirin, a figure celebrated in legend. There mas peace between Byzantium and Iran until Maurice was murdered by Phocas in 602. Khosrau then invaded Anatolia and Syria to avenge his death. In 608 his armies, threatening Constantinople, reached Chalcedon on the Bosporus. In 614, under the general Shahrvaraz, having taken Damascus they stormed Jerusalem and seized the Holy Cross. Alexandria too was captured (616), papyrus fragments attesting a ten-year Persian administration of Egypt. Only in 622 could the new emperor Heraclius (*q.v.*) assume the offensive in a brilliant series of expeditions carrying him into the heart of Media. In 626, however, Shahrvaraz again reached Chalcedon, but he failed

to cross the straits and take Constantinople. Finally, in 627, Heraclius defeated the Persians at Kineveh, and in 628 captured the royal residence of Dastagerd. Thence Khosrau fled to Ctesiphon. He was deposed in favour of his son Kavadh II, and four days later was murdered in prison (628). During his reign Khosrau had amassed fabulous treasures but his ferocity and avarice alienated his supporters. Two life-sized sculptures of him exist at Taq-i Bustan near Kermanshah, one showing him enthroned, the other in battle armour mounted on his charger Shabdiz. (A. D. H. B.)

KHOTAN (HO-T'IEN), town in the Sinkiang Uigur Autonomous Region. China, on the southern margin of the Tarim basin, 270 mi. S.E. of Kashgar (Su-fu). Khotan is the centre of an oasis, which also comprises the nearby towns of Yurung Kash. Bazar to the east and Kara Kash (Mo-yii) to the northwest. The oasis is watered by the Yurung Kash and Kara Kash rivers, which descend from the Kunlun mountains and unite to form the Khotan river. This river disappears in the sands of the Takla Makan desert, except during the high-water season of July–September, when it may reach the Tarim river.

Khotan was a relatively weak state in the time of the early Han dynasty, but, in the latter part of the 1st century A.D., when China was energetically establishing control over the Tarim basin. its geographical position as the largest oasis and best supply base on the more southerly of the two chief routes to the west, and as a connecting link between central Asia and India, gave it great importance. Conquered by the famous general Pan Chao in A.D. 70, it was held by China during the later Han dynasty and again under the T'angs in the 7th century, when it was one of the four garrison centres from which the Tarim basin mas then administered. In the following century it was conquered by the Arabs from Western Turkistan, and in the 10th it was annexed by Kashgar. Genghis Khan captured it in the 13th century, and later it was included in the Mongol Central Asian khanate (Jagatai). During this period Marco Polo passed through it (1274) and noted its agricultural wealth. especially cotton, its commercial importance and the unwarlike character of its inhabitants. Later it became one of the chief centres of Mohammedan activity in Chinese central Asia and played a prominent part in the Moslem revolt against Chinese authority (1864–75) and that of Yakub Beg of Kashgar a year or two later.

The surrender of Kashgar and Khotan to the famous "agricultural army" in 1878 marked the final stage in the reassertion of Chinese authority, and Khotan was included in the province of Sinkiang. of which it became one of the chief centres.

The oasis is of outstanding agricultural importance. The staple cereals are wheat, rice, oats, millet and, above all, Indian corn. The early harvest of the spring-sown crops and the abundant water supply in summer permit of its being grown everywhere as a second crop. The cotton crop is also of great value, and good fodder crops of lucerne are grown. So, too, are great quantities of olives and fruits, including apricots, peaches and apples. The cultivation of the mulberry is carried on everywhere as the basis of the silk industry, of which Khotan is an important centre. Carpets and felts are manufactured. Its metalwork is famous, and there is extensive mining, including that of gold, which is still washed from the alluvium in the rivers.

For centuries Khotan was famous for jade or nephrite, a semi-precious stone greatly esteemed by the Chinese for making small fancy boxes, bottles and cups and mouthpieces for pipes, also bracelets, etc.

The population of the town (1958 est.) was 50,000.

(T. SD.)

KHRUSHCHEV, NIKITA SERGEEVICH (1894–), Soviet statesman, first secretary of the Communist Party of the Soviet Union and prime minister (chairman of the council of ministers) of the U.S.S.R., was born on April 17, 1894, in the village of Kalinovka, in the Kursk province, on the borderland between Russia and the Ukraine. His father, apparently a Russian. worked as a miner. Khrushchev had a limited education as a child and went to work early in life, first as a shepherd and later as a fitter in the factories and mines of the Donets basin. When revolution swept across Russia in 1917 he enlisted with the Red Guards in the town of Yuzovka (later known as Stalino, now Donetsk), joining the Communist party in 1918. For three years he was actively engaged in the civil war, though his duties were political rather than military. At the end of the war in 1921 he returned to his work in industry in Yuzovka. At the end of 1922 he seized an opportunity of completing his education in the "workers' faculty" (*rabfak*) of the Donets Industrial institute in Yuzovka. He not only took a three-year course, mainly in technical subjects, but also acted as secretary of the school's Communist cell. On completing his course he entered into full-time party political work in Yuzovka. By mid-1927 he occupied a leading position on the Yuzovka party committee and was a delegate to the tenth congress of the Ukrainian Communist party. In 1928 he became a secretary of the party committee in Kiev, but a year later he was selected for further training at the Industrial academy in Moscow, where he took a course in engineering and again served as secretary of the party cell. In Jan. 1931 he left the academy and was appointed first secretary of the party organization in a borough of Moscow and a member of the Moscow committee of the party.

During 1932–34 Khrushchev worked first as second and then as first secretary of the Moscow town party organization; in 1935 he became first secretary of the Moscow province party organization, of which he remained in charge until 1938. In 1934 he entered the central committee of the Soviet Communist party and in 1937 he was first elected to the supreme soviet.

In Jan. 1938 Stalin chose Khrushchev to take chatge of the Ukraine, the largest non-Russian republic of the U.S S.R. Khrushchev was made first secretary of the Ukrainian Communist party and was elevated to candidate membership of the ruling Politburo of the All-Union party. In March 1939 he became one of the eight full members of the Politburo and thus, under Stalin, one of the supreme rulers of the Soviet state.

Being in the Ukraine on the eve of World War II, Khrushchev supervised the annexation of Polish territory under the agreement with Germany and then, after the German invasion, the evacuation of Ukrainian industry to the east. He served on the military councils of the western and southwestern fronts, directed partisan warfare behind the German lines in the Ukraine and played an active part in the defense of Stalingrad. In 1943 he was given the military rank of lieutenant general. He did not serve on the State Defense committee in Moscow.

After the expulsion of the German armies from Kiev in Nov. 1943, Khrushchev resumed control of the party and governmental organs in the Ukraine. Apart from a brief period from March to Dec. 1947 (when he was prime minister in the Ukraine), he remained first secretary in the Ukraine until Dec. 1949. He restored the region's economy and suppressed all opposition to Soviet rule.

In Dec. 1949 Khrushchev was summoned back to Moscow to become first secretary once again of the province party committee and a member of the secretariat of the All-Union Communist party. At the 19th congress of the party in Oct. 1952 he made the report on organization and was appointed to the presidium (formerly Politburo) and secretariat of the central committee.

When Stalin died in March 1953 Khrushchev remained a member of the "collective leadership" in whom power was vested, but he did not appear at first to be one of the principal contenders for the succession to Stalin. While G. M. Malenkov was made prime minister, Khrushchev was put in charge of the apparatus of the Communist party, of which he was made first secretary in Sept. 1953. In the next few years he initiated many sweeping reforms in domestic and foreign policy, around which conflicts developed between him and the other leaders. By mid-1955 he had emerged as a serious contender for supreme power, and in July he accompanied N. A. Bulganin, who had succeeded Malenkov as prime minister, to the Geneva "summit" meeting. At a closed session of the 20th congress of the Soviet Communist party on Feb. 25, 1956, he made a sweeping denunciation of the excesses committed by Stalin in his later years. In 1956 and 1957 he made several journeys abroad. including a visit to Asia and to Great Britain.

At a central committee meeting in June 1957. the conflicts among the Soviet leaders came to a head and an attempt was made

to remove Khrushchev from his position in the party. But he managed to rally support and secured instead the expulsion from the committee of his opponents, V. M. Molotov, Malenkov and L. M Kaganovich. He subsequently brought about the eclipse of Marshal G. K. Zhukov (Oct. 1957). the minister of defense, and several lesser figures. In March 1958 he took over the post of prime minister in addition to his other positions and appeared to be unchallenged as ruler of the U.S.S.R.

Khrushchev began to take an increasingly active part in the conduct of foreign affairs. He visited Peking twice and the capitals of all the Communist countries of eastern Europe at least once. In Sept. 1959 he paid an official visit to the United States and addressed the general assembly of the United Nations on disarmament. In May 1960 Khrushchev took part in the unsuccessful Paris "summit" meeting. Seeing that there was no chance of obtaining the western powers' agreement for a conclusion of a peace treaty recognizing the existence of two German states—as well as of a free city in western Berlin—he used the shooting down of a U.S. aircraft near Sverdlovsk to break up the meeting. Though from Nov. 1958 he had been insisting on the necessity of a German settlement such as he wanted, he yet avoided provoking a major crisis over Berlin. On June 3–4, 1961. he met Pres. John F. Kennedy of the U.S. in Vienna, but no agreement was reached on the German peace treaty. Building of the Berlin wall on Aug. 31. 1961, was his reply to Kennedy's stand in Vienna.

Khrushchev married twice, first in 1918 and for the second time in 1929. By his first wife, who died, he had a son (killed in World War II) and a daughter. By his second wife, Nina Petrovna, he had a son and two daughters. He received numerous Soviet awards including Orders of Lenin, the title of Hero of Socialist Labour and the Lenin peace prize. (D FD.)

KHUFU (KHUFWEY; Gr. CHEOPS; reigned *c.* 2590–67 B.C.), second pharaoh of the 4th dynasty of Egypt and builder of the Great pyramid at Giza (Jizah). Herodotus (book ii, 124–128) represents his reign and that of his son Chephren (Khafre), the builder of the second pyramid, as 106 years of oppression and misery. His story of Cheops' prostitution of his daughter in order to raise money for his building projects is clearly scandalmongering legend. belied by his later reputation in Egypt as a wise ruler and a benefactor. Of Khufu as a historical personage information is scarce. He was the son of Sneferu and his queen Hetepheres. He was probably married four times: to Heterpheres II. his full sister, who was buried in one of the three small pyramids beside his own; to a second queen, perhaps Merityetes; to Henutsen, whose pyramid is the third of the group; and to Nefert-kau, the eldest of Sneferu's daughters. Two of his sons, Rededef and Khafre, succeeded him in turn.

Khufu's name has been found on fragments in the temple of Bubastis and in several others, and it occurs twice in the copper mines of Sinai, but his knoun monuments are nearly all at Giza. The Great pyramid itself, the largest single building ever erected, covers 13 ac. and probably contains upward of 2,500.000 blocks of stone, averaging 2½ tons weight apiece, some of the blocks being six times as large. The length of Khufu's reign (63 years), as given by Manetho, must be too long; the 23 years of the Turin "Canon of Kings" is a minimum, for it has been calculated that to build this one monument, 100,000 men would have had to work unceasingly for 20 years. See also EGYPT: *Ancient Civilization and Culture: Transport and Trade.*

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KHULNA, a municipality and district in the Rajshahi division of East Pakistan. The town (pop., 1951, 41,409) is on the Bhairab river 77 mi. E.N.E. of Calcutta, India, with which it is linked by road and by a roundabout railway route via Jessore. It is connected with the rest of the East Bengal railway through the Jessore-Darsana section completed in 1950, which avoids the former necessity of going through India. Four of the undergraduate colleges of Rajshahi university (1953) are in or near the town.

KHULNA DISTRICT (area 4,810 sq.mi.; pop., 1951, 2,079,611) was formed out of Jessore (1882) and is the central district of the three having in their southern part the Sundarbans (*q.v.*), the swampy forest-clad debouchment of the Ganges. The district's northeast part, against the Mathumati branch of the Ganges delta, is also swampy; but the centre, though low lying, is cultivated. Rice and jute are the main crops. The northwest part of the district is more elevated. The chief industries are boatbuilding and fishing and the manufacture of date molasses.

KHURASAN originally signified a vast tract of country to the east of Iran, comprising lands situated to the south of the Amu Darya and to the north of the Hindu Kush. To Arab geographers, Khurasan had for its boundaries on the east Seistan and India, west the desert of Ghuzz and Jurjan, north Transoxiana and south and southwest the desert of Iran. In Iran the meaning of the name gradually came to indicate the northeasterly *ostan* (province) of Iran, coterminous on the north with the Trans-Caspian region of the U.S.S.R. (the Atrak river serving as the'frontier as far as Chat), east with Afghanistan, west with the Iranian provinces of Asterabad, Shah Rud, Semnan and Damghan, and Yezd and south with Kerman. It is a tract of considerable extent measuring about 500 mi. from north to south and 300 mi. from east to west, an area of 119,260 sq.mi. It extends southward almost to 30° N. and includes the district or subprovince of Qainat.

Physical Features.— The surface of the province is essentially mountainous, especially on the north and east. The ranges generally run in parallel ridges enclosing broad valleys with a normal direction from northwest to southeast and elevations in the southern border of 11,000–13,000 ft. The whole of the north is occupied by an extensive highland system composed of the Elburz range and its prolongations from the neighbourhood of Shah Rud. The Great Kavir desert obtrudes into Khurasan and occupies its central and western part, and the Dasht i Lut obtrudes similarly in the south. The true character of these great salt depressions which form the distinctive feature of east Iran has scarcely been determined, some regarding them as the beds of dried up seas. The surface of Khurasan is thus very diversified, consisting mainly of highlands, saline swampy deserts and upland valleys. some of which are fertile and well watered. Broadly, the country offers the appearance of a group of oases watered by intermittent rivers and by wells. Of the fertile valleys—occurring mainly in the north—the chief are: the great longitudinal valley stretching northwestward from near the Afghan frontier and Herat, wherein are situated the important towns of Meshed, Kuchan. Shirnan and Bujnurd; the districts of Nishapur and Sabzavar farther south; and the districts around Birjand and Qain still farther south. These tracts produce, in particular, rice and other grains, cotton, tobacco, opium and fruits in profusion.

The rivers of Khurasan are comparatively small. The most important are: the Atrak rising northeast of Kuchan and flowing into the Caspian sea; the Kashaf Rud or Ab i Meshed which joins the Hari Rud from Afghanistan, the two eventually losing themselves north of the Trans-Caspian railway; and the Kaleh i Mura (of which the Kara Su is a tributary) which rising in the hills near Bujnurd flows south and eventually loses itself in the great desert. All the other rivers are mere torrents which, though they often have a perennial supply near their sources, are so much drawn on for irrigation that it is only in spate that they have sufficient water to reach their terminals in the desert.

Natural Resources and Agriculture.— The mineral products consist of turquoises from the mines at Maadan near Nishapur; salt is found over great areas in the form of a thick efflorescence; and iron, lead, alum, gold and copper are said to exist. Coal is found about 20 mi. S. of Meshed, but whether in workable quantities has yet to be determined. The agricultural products are fruits in great variety and most kinds of grain, some silk, saffron, large quantities of asafetida, and cotton; also manna, tobacco, pistachio nuts and gums. The soil of the various districts is varied in character and productivity: the northwest, north and northeast have a very rich soil and being abundantly irrigated are all extremely productive, especially of wheat. Meshed is in a rich well-watered plain as also is Kuchan where rice is said

to yield four hundred fold.

Peoples.—Khurasan is peopled by a great variety of races, only that part of the province lying near the Aleshed-Tehran roads being occupied mostly by Persians. To the northwest. on the frontier of Xsterabad, are Turkmans. largely of the Guklan and Yamut tribes. To the north and northeast are the Kurds of Bujnurd and Kuchan. South of Meshed are sections of the 'Amaq tribe of Timuris. while westward of these, around Turbet i Haidari (*q.v.*), are Turks and Baluchis. There are here and there Barbaris (of Mongol origin), Arabs, a few Jews and, scattered all over the country, gypsies. Total population in 1956 was 2,006,582.

Communications and Trade.—The administrative capital of the province is Meshed (*q.v.*). A good motor road traverses the north of the province from Tehran, via Shah Rud to Meshed; and a similar road runs south from Meshed to the railhead of the Indian railway system at Zahidan (Duzdab). The Trans-Caspian railway skirts the province on the north, the important station of Ashkhabad being only a few miles distant from the Iranian frontier. The articles of export, in order of value, are carpets, hides and skins, opium, timber, cotton stuffs, silk and turquoises.

(P. Z. C.)

KHURRAMABAD, an Iranian town, now the capital of the *ostan* of Luristan in 33° 32' N., 48° 15' E., at an elevation of 4,250 ft. Pop. (1956) 38,806. It is situated 138 mi. W.N.W. of Isfahan on the Khurramabad river (also called Abi-i-Istaneh) on the shortest route from the Persian gulf to the main distributing centres of Iran. passing from Mohammerah via Ahwaz and Dizful to Tehran. Between the town and river stands the ruined Diz-i-Siyah (black castle), with annexes called Falak ul Aflak (heaven of heavens), built in the 10th century by a famous Kurdish chieftain, Hasanawaih.

KHUZISTAN (formerly Arabistan), an *ostan* (province) of Iran bounded west by the frontier of Iraq and the Shatt-al-Arab, north by the *ostans* of Burujird (Luristan) and Gulpaigan, east by those of Isfahan and Fars and south by the Persian gulf. Khuzistan, meaning the "land of the Khuz," was a part of the biblical Elam and corresponds largely to the ancient Susiana. It is watered and drained mainly by the Karun (*q.v.*) and the Karkheh rivers, whose waters are dissipated in the Hawiza marshes. Other independent, smaller streams are the Jerrahi, and Hindian or Tab rivers. All these rivers bring down much silt from the Zagros range and its offshoots in the north, and this goes to create extensive mud Bats in the south toward the coast of the Persian gulf. Thus, broadly, the province falls into two natural physical divisions: the northern mountainous part where the country slopes gently down from the Bakhtiari highlands, bare and shingly; and the southern part, which consists, to a great extent, of open alluvial plains or morasses which in places are fertile and grassy and in other parts barren or thickly sprinkled with desert scrub.

Population.— The population of Khuzistan (1956) was 2,065,108; in this figure no account is taken of about 120,000 nomadic people or of the Bakhtiaris and Lurs who enter the northeastern districts in winter, the most important numerically being probably the Sagwand Lurs who encamp in the district of Dizful, sometimes numbering 15,000. The bulk of the population of Khuzistan is either pure Arab or, more frequently, a mixture of Arab. and Persian, and the tribes are settled, or nomadic, or in a transitional stage between the two modes of life. Speaking generally, the tribal system of Khuzistan is rather loose and does not rest upon a rigid basis of race. Whole tribes are sometimes merged and disappear, or are distributed as sections among other tribes. Among the more powerful or numerous of the tribal communities are the Kaab, probably numbering 50,000, located in southern Khuzistan around Mohammerah! Jerrahi district and Ahwaz; the Dizfuli around Dizful; the Muhaisin in the Mohammerah and Ahwaz districts; the Shushtari in Shushtar district; the Tamim, Qanawati and Khamis, nomadic. The Kaab claim to be Awamir or Bani Xmir whose original home is stated to have been in Nejd; their political influence, formerly very powerful, has declined, while that of the Muhaisin has risen. Mention should also be made of the tribes who dwell in the Hawizeh district and who in summer and autumn encamp in the marshes and in winter roam the deserts with their flocks and herds and who are regarded as turbulent elements.

Soil and Productions.— The soil of Khuzistan is naturally very fertile, but since the Shahdurwan weir across the Karun at Ahwaz was swept away and the numerous canals which diverted the water of the river for irrigation purposes became useless, a great part of that district, once accounted among the richest in Iran, has become uncultivated. A project of irrigation and cultivation of an area of about 197,600 ac. was started by the Agricultural bank in Tehran. Pumps were installed to make use of the water of the Karun and Karkheh rivers. Land was divided among peasants, but the scarcity of population in Khuzistan made it necessary to bring peasants from other parts of the country. Most of the crops depend for water on rainfall or wells. The climate is hot, the relative humidity high and the low-lying swampy districts unhealthy. The prevailing winds are northwest and southeast: the former hot and dry from the arid regiom west of Mesopotamia, the latter bearing much moisture from the Persian gulf. Khuzistan is productive in patches. Wheat and barley are the more general crops in their distribution, but rice, cotton, sesame, beans and sugar cane are grown in a number of districts, while linseed, maize and pulse are produced in other localities. Special crops are indigo in the Dizful district, opium and pepper in Shushtar and tobacco around Ram Hormuz and Aqili.

Communications and **Trade.**—Ahwaz is the most important road and railway centre in the province, being in direct communication with Shiraz by way of Ram Hormuz on the east, with Wasit and Baghdad on the west, with Shushtar, Qum and Tehran on the north (a large part of this road being fit for motor traffic), with Isfahan on the northeast and with Mohammerah and Basra on the south. Other chief centres of trade and distribution are Dizful, Shushtar and Ram Hormuz, the latter being the market for produce of the adjacent Bakhtiari and Lur country. The most important mineral product is petroleum, from the oil fields east of Shushtar. which is exported from Abadan (*q.v.*). Important ports are Khoram Shar, the former Mohammerah (*q.v.*) at the estuary of the Shatt-al-Arab, and Bandar Shahpur, the end of the Trans-Iranian railway. (P. Z. C.; X.)

KHWARIZMI, AL- (MOHAMMED IBN MUSA AL-KHWARIZMI) (fl. 9th century A.D.), mathematician and astronomer, whose work in the first golden period of Islamic science had far-reaching influence, flourished in Baghdad under the caliphates of al-Mamun (813–833) and al-Mutasim (833–842). He was probably born in a suburb of Baghdad but of a family that came from the province of Khwarizm, south of the Aral sea. His work on elementary mathematics, *Kitab al jabr wa'l muqabala,* has' in part survived in the term "algebra," as has his name in the term "algorism."

The *Algebra* is a compilation of rules for arithmetical solutions of linear and quadratic equations, for elementary geometry and for inheritance problems; *i.e.,* distribution of money according to proportions. The work was based on a long tradition originating in Babylonian mathematics of the early 2nd millennium B.C. and traceable through Hellenistic, Hebrew and Hindu treatises. Its elementary and practical character undoubtedly contributed to its survival. Another work on Hindu numerals (*i.e.,* the decimal system) is preserved only in a fragmentary Latin translation.

Al-Khwarizmi also compiled a set of astronomical tables, based largely on the *Sindhind,* an Arabic version of the *Brahmasiddhanta* (7th century A.D.), but also showing Greek influence. *See* also MATHEMATICS, HISTORY OF; ALGEBRA: *History.*

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KHYBER PASS, the most important of the passes which lead from Afghanistan into Pakistan. It is threaded by road and. in

part, rail. It is a narrow defile winding between cliffs of shale and limestone 600 to 1,000 ft. high. stretching up to more lofty mountains behind. No other pass in the world has had such strategic importance or so many historic associations. It was, however, not so much used before modem times as has been generally supposed. Alexander the Great advanced through the mountainous country to the north of the Kabul river. but his generals, Hephaestion and Perdiccas, probably used the Khyber pass. It was used at least once by Mahmud of Ghazni and more than once by Babur. It was also the route used by Nadir Shah and Ahmad Shah Durani. The tribes inhabiting the pass and the surrounding country have always been difficult to control and constant punitive expeditions had to be undertaken by the Moguls and the British.

The mountain barrier which separates the Peshawar plains from the Afghan highlands differs in many respects from the mountain barrier which intervenes between the Indus plains and the plateau farther south. To the south this barrier consists of a series of flexures folded parallel to the river, through which the plateau drainage breaks down in transverse lines forming gorges and clefts as it cuts through successive ridges. West of Peshawar the strike of the mountain systems is roughly from west to east, and this formation is maintained with more or less regularity as far south as the Tochi river and North Waziristan. Almost immediately west of Peshawar, and stretching along the same parallel of latitude from the meridian of Kabul to within 10 mi. of Peshawar, is the great central range of the Safed Koh, which forms the southern wall or water-divide of the Kabul river basin.

The Khyber, as its name implies. runs through the Khyber hills from the Shadi Bagiar opening, about 3 mi. beyond the fort and cantonment of Jamrud, for about 33 mi. in a northwesterly direction. It finally debouches, just beyond the old Afghan fort of Haft Chah, onto the barren plain of Loi Dakka. There is a very steep ascent at the mouth of the pass, but afterward it rises gradually to Fort Ali Masjid (3,174 ft.), where the Khyber stream is first encountered, and where it also leaves the pass to flow through the Kuki Khel country. From Ali Masjid the pass winds through the village of Sultan Khel to Landi Kotal (3.518 ft.), where its highest point is reached, and whence a route leads into the Shilmani country. The main pass, however, descends from Landi Kotal through Shinwari territory to Landi Khana, where the limits of Afghanistan are reached. In and around the Khyber dwell the Khyber Afridis. From Jamrud to Ali Masjid the Khyber winds through the territories of the Kuki Khel, Sipah, Kamrai and Kambar Khel; from Ali Masjid to the Kandar ravine, near Garhi Lala Beg, it passes through the habitat of the Malikdin Khel and Zakka Khel. During the first Afghan War the Khyber was the scene of many skirmishes with the Afridis. It was at the fortress of Ali Masjid that Sir Neville Chamberlain's friendly mission to the amir Shere Ali was stopped in 1878, thus causing the second Afghan War. The treaty uhich closed the war in May 1879 left the Khyber tribes under British control. In 1897 the Afridis seized the pass, on the withdrawal of the British officers,and held it for some months. This was the chief cause of the Tirah expedition of 1897. After the defeat of the Afridis the Khyber Rifles were reorganized under British officers supported by a movable column at Peshawar, and the British became responsible for the safety of the pass. At the end of the third Afghan War of 1919 the Khyber Rifles were disbanded and their place taken by Khassadars, tribal levies paid by the British but providing their own arms and ammunition. In 1947 Pakistan became responsible for the control of the Afridi clans. Area 1,024 sq.mi.; pop (1951) 216,622. (C. C. D.)

KIAMIL PASHA (1832–1915), Turkish statesman, was the son of an artillery officer, Salih Agha. Having completed his military training in Egypt as a cavalry lieutenant, he was appointed by the Khedive, Abbas Pasha, tutor in English to his son Ibrahim Pasha. In 1861 Kibrizli Mehemmed Pasha took him into the service of the Ottoman government. He was twice governor of Jerusalem and three times governor of Beirut. In 1878 he was appointed governor of Kossova and soon afterward of Aleppo, with the rank of pasha. He resigned as the result of the British protest against his conduct during the Armenian revolt at Zeitoun, and returning to Constantinople became undersecretary for the interior. In 1881 he became minister of Evkaf, and after the resignation of the Kutchuk Said Pasha cabinet in that year, grand vizier. In spite of his forced resignation from the governorship of Aleppo he steadily pursued a pro-British policy. He resigned the grand vizirate in 1887 owing to Russian intervention, but was reappointed in 1896. He was dismissed by Sultan Abdul Hamid, however, oning to his proposal that a cabinet responsible to the nation should be formed, and was sent to Smyrna as governor, where he remained for 12 years. After the promulgation of the constitution (1908) Kiamil Pasha joined the Kutchuk Said Pasha cabinet and soon after became grand vizier for the third time. He was, however, strongly opposed by the Union and Progress party. During the Balkan War (1912) he became grand vizier for the fourth time. but was forced to resign in 1913 as the result of a military *coup d'état* and the unpopularity of the peace terms accepted by him He retired to Egypt. and although he returned later to Constantinople he was forced by the government to leave immediately. He went to Cyprus and died there in 1915. Kiamil Pasha knew English, French and Arabic and published a book on Turkish history.

KIANGSI (CHIANG-HSI SHENG), a province of central eastern China south of the Yangtze river occupying the P'o-yang (*q.v.*) lake basin. Area 63,629 sq.mi., pop. (1953) 16,772,865, (1957 est.) 18,610,000. Its chief river is the Kan Chiang running from the south into the lake which empties into the Yangtze through a wide neck constricted at Hu-k'ou (*q.v.*). From the west the Hsiu Shui, and from the east the P'o and Hsin Chiang (rivers) enter the lake which acts as a reservoir for the Yangtze flood waters. As a result, it is heavily silted and shallow and expands and contracts greatly with the met and dry seasons. Kiangsi and the lower Yangtze valley occupy a trough through which the Kan Chiang and the lower Yangtze run in a line with relatively small deviations from the city of Chi-an in the south to Nanking in the north. This corridor, connecting in the south via the Mei-ling Kuan (pass) with the similarly aligned Pei Chiang valley south of the Nan-ling (southern range) and leading in the north directly to the Grand canal, formed the famous Ambassadors' route from Canton to Peking during the 18th and 19th centuries.

The climate of the province is temperate. The average January temperature is 38° F. at Chiu-chiang on the Yangtze but rises to 41.5° F. at Chi-an in the south This permits two crops of rice on the same land in the south, but only one in the lake plain. Annual rainfall averages from 40 to 47 in., and is heaviest in the southeastern hills. The rainiest place in the province, however. is on the Lü Shan northwest of the lake. with 79 in. Its coolness in summer and easy access from the Yangtze have made this massif a famous summer resort area, notably at Kuling.

Rice, wheat, beans and sweet potatoes are the chief food crops, and the provincial capital and largest city Nan-ch'ang (q v.) as well as the river port of Chiu-chiang (*q.v.*) in the lake plain are famous rice and tea markets. Cotton, ramie, tobacco, tea, soybeans and peanuts are important industrial crops. Nanfeng near the eastern central border is a leading tangerine and orange growing centre. Bamboo and other woods are floated down the Kan Chiang and exported via the Yangtze. Important quantities of camphor, tung oil, pitch and raw varnish are derived from the mountainous forests. Vast numbers of fish for export as well as for local consumption are cultivated in fish ponds, especially in the southeast.

Minerals are abundant in the Ta-yii Ling and the Chiu-lien mountains, in the extreme southwest and south. Some of the world's leading wolfram mines (Sihwashan, Lung-nan) are found here and furnish most of China's tungsten supplies. Coal mines are numerous, one of the largest in south central China being at An-yiian near P'ing-hsiang (site of a projected steel centre) where the railroad crosses into Hunan. East of P'o-yang, China's most famous porcelain centre supplying two-thirds of the nation's fine chinaware is based upon the excellent kaolin (*q.v.*) or china clay deposits at Kingtehchen (King-te-chen; *q.v.*). Much of the industry is of the handicraft type, but modern factories include a paper plant and a sugar mill at Kanchow, where cotton cloth, matches, cigarettes, electric bulbs and chemicals are also produced.

Nan-ch'ang's newer industries include ramie weaving, electric motors, dyes, pitch, and sanitary products, and a jute mill.

Much of the products of the province is transported in native junks along its extensive system of rivers. River steamers can navigate only a few miles above Nan-ch'ang on the Kan Chiang, but small junks can reach Kanchow in the southern hill basin. River communications are supplemented by a highway system, mostly dirt roads. In 1937 the completion of the railway crossing the province from Chekiang to Hunan linked Nan-ch'ang with an earlier line running south from Chiu-chiang on the Yangtze. These lines were torn up during World War II but have been restored. To bolster strategic communication with the coast opposite Formosa, the Chinese Communists built a branch line southeastward into Fukien from Ying-t'an about 100 mi. E. of Nan-ch'ang.

History. — Politically, the provincial territory was part of Chiang-nan province during the early T'ang dynasty. Later this was divided into an eastern and western province when the present provincial territory became Chiang-nan Hsi Tao (Chiang-nan west province). The Mongol or Yuan dynasty simplified this to Chiang-hsi. conventionally Kiangsi. Except for the flat plain around the lake, the province is very hilly and especially rough in the south. Communist leaders found this favourable to their defense during Chiang Kai-shek's extermination campaign against them from 1928 to 1934. Kiangsi achieved historic importance as the revolutionary base of the early Communist movement. It was at Nan-ch'ang on Aug. 1. 1927, that Chu Teh formed the 1st China Workers and Peasants Red army. At Jui-chin near the Fukien border in Nov. 1931 the so-called Chinese Soviet Republic was proclaimed with Mao Tse-tung as chairman. In Oct. 1934 Chiang Kai-shek forced the collapse of the Red army, and Mao Tse-tung and Chu Teh fled on their long march to northwest China. After the successful comeback of the Chinese Communists in 1949, Kiangsi came under the control of the central and south China regional administration. The subsequent abolition of the administrative regions brought the provincial administration back to the direct control of the Communist government at Peking. (H. J. Ws.)

KIANGSU (CHIANG-SU SHENG), one of the smallest but one of the most densely populated provinces of China situated on the east coast bordering the Yellow sea between Shantung province in the north, Chekiang in the south and Anhwei in the west. Area 41,820 sq.mi., pop. (1953) 41,252,192, (1957 est.) 45,230,000. Except in the southwest corner of the province and in the extreme north where low hills occur, the entire area is part of the marshy delta lands of the Yangtze, Huai Ho (*qq.v.*) and the Yellow rivers and a continuation of the north China plain. Virtually the entire coast is devoid of settlement because of extensive offshore mud and sand flats that hinder navigation. The Yangtze forms the chief artery connecting the two most important cities, Shanghai (*q.v.*) near the estuary, and Nanking (*q.v.*) on the provincial border in the west, 150 mi. away.

Several old courses of the Yellow river cross northern Kiangsu, but after 1946 the route of the river was successfully diverted north of Shantung. The Huai Ho gathers the drainage of Anhwei between the Yellow river and the Yangtze, and pours its waters into Hung-tze Hu (lake) west of which the boundary of the Kiangsu runs. In the past, during floods the Yellow river flowed through the Huai Ho and then followed the adjoining Grand canal into the Yangtze. The Grand canal, first built in the 7th century A.D., runs the length of the province. T'ai Hu in the south is the largest lake in the province. Kiangsu is crisscrossed by canals and rivers. Major canals include the Su-pei (North Kiangsu Irrigation Trunk canal) completed by the Communist regime to facilitate the discharge of Huai Ho water from Hungtze Hu. Other projects planned are a 120 mi. canal from Hungtze Hu to Lien-yun Chiang (Sinhailien) harbour, and a new sluice gate and shipping lock on the Yen Ho, both to help divert excess flood waters from the Huai Ho to the sea. In the south a 35 mi. flood control and navigation canal was built to connect T'ai Hu with the Huang-p'u Chiang (Whangpoo river) flowing past Shanghai. In the north, the east-west running Lung-hai railroad crosses Kiangsu where it runs between Sinhailien and Süchow. From Shanghai, a railroad runs northwest to Nanking and another runs southwest across the provincial boundary to Hangchow. Highway communications are less important than canal and river routes in most of Kiangsu, although navigation on waterways other than the Yangtze and the short Huang-p'u Chiang is limited to small shallow-draft boats and steam launches.

Climatically, Kiangsu from Hung-tze Hu northward shares the climate of the north China plain with its lower precipitation (25–30 in.) and colder winters. The line of the Huai Ho usually is considered the climatic divide between north and south China. The lower Yangtze region ranges in precipitation from 42 in. at Nanking to 45 in. at Shanghai, with average January temperatures between 34° and 35° F. respectively. Hot humid summers characterize the entire province. Agriculturally, winter wheat and summer kaoliang (sorghum) predominate in the north, with other summer crops being chiefly millet, cotton, corn, soybeans and sweet potatoes. The lower Yangtze plain is a transition zone between wheat and rice dominance. In winter, wheat and barley are dominant; in summer, rice, cotton, soybeans and mulberry are the chief crops. Cotton is especially important near the Yangtze estuary, and mulberry between Shanghai and Lake T'ai. The grain crop in the mid 1950s included 10% of China's rice and wheat. About 20% of China's cotton is grown in Kiangsu. Silkworms, fed on the mulberry leaves, produce large quantities of silk for the reeling mills and looms of Shanghai, Wusih, and Soochow (*q.v.*). The cotton produced provides raw material for Shanghai's cotton textile industry. Along the drier northern sector of coastal Kiangsu. salt evaporation is an important industry. Fishing is significant in the rivers, lakes and canals as well as off the coast in the southern sectors as a means of livelihood. North of the Yangtze, pigs and cattle are raised; the amphibious landscape is the setting for breeding huge numbers of ducks.

Although poor in mineral resources because of its alluvial foundations, Kiangsu through its strategic position has controlled more than half the commerce of China and industrial development. Some of China's largest cities are here: Shanghai which is politically independent of Kiangsu. Nanking, the provincial capital, Soochow, Wusih and Changchow. All five are south of the Yangtze and along the railroad between Shanghai and Nanking. Yangchow and Chen-chiang (*qq.v.*) command the north and south entries of the Grand canal from the Yangtze.

Historically, the provincial territory has had an important status. In ancient times it formed parts of the Wu and then the Chou kingdoms, with Soochow being capital of the former in the 5th century B.C. During the later dynasties it formed parts of larger provinces. It was not given separate provincial status until 1667. Nanking became the seat of national government as early as the Six Dynasties period and became the capital of the Ming empire in A.D. 1368. At other times it has been the provincial capital of Kiangsu. Nanking was the national capital temporarily in 1911, and again during 1928–37 and 1945–49. In 1949 the Communists moved the capital to Peking and the provincial seat from Chenchiang to Nanking. North of the Yangtze, Mandarin or the national language (kuo-yü) is spoken. South of the Yangtze, Southern Mandarin dialect prevails in the Nanking area. From east of the Mao hills to the coast. people speak the Sung-chiang or Wu dialect which is considerably different. (H. J. Ws.)

KIAOCHOW BAY: see TSINGTAO.

KIDD, WILLIAM (CAPTAIN KIDD) **(c.** 1645–1701), privateer and convicted pirate, was of obscure origin. In 1691 an award from the council of New York of £150 was given him for his services during the disturbances in the colony after the revolution of 1688. In 169j he nent to London nith a sloop of his own to trade. He was recommended to the colonial governor Lord Bellomont as fit to command a vessel to cruise against pirates in the eastern seas. Accordingly the "Adventure" galley was privately fitted out. and Captain Kidd received the king's commission to arrest all pirates, and a commission of reprisals against the French. Kidd sailed from Plymouth in May 1696 for New York, and in 1697 reached Madagascar where, instead of hunting the pirates down, he associated nith them, capturing native trading vessels. During 1698–99 complaints of his proceedings reached the British government. Kidd deserted the "Adventure" in Madagas-

car and eventually reached New England in a small sloop. He wrote to Bellomont, professing his ability to justify himself and sending the governor booty. He was arrested in July 1699, was sent to England for trial and found guilty of murder and piracy. He was hanged on May 23, 1701. *See* also PIRATE AND PIRACY.

KIDDERMINSTER, a market town and municipal borough in the Kidderminster parliamentary division of Worcestershire, Eng., 14 mi. N. of Worcester, on the river Stour and the Staffordshire and Worcestershire canal. Pop. (1951) 37.406. In 736, lands upon the Stour called Stour-in-Usmere and identified with the site of Kidderminster were given to *comes* Cyneberght by King Aethelbald to found a monastery. Cyneberght's son gave these lands to the bishop of Worcester, and in 816 Bishop Deneberht gave them to Coenwulf, king of the Mercians, in return for privileges. Kidderminster remained a royal manor until Henry II granted it to Manasser Biset. The first charter of incorporation (1636) remained valid until 1835. Kidderminster sent two members to the parliament of 1295. The public library (1855) has a large collection on local history. The church of All Saints is Early English and Decorated, with Perpendicular additions. The cloth trade is first mentioned in 1334 but the manufacture of woolen goods was replaced by that of carpets in 1735.

KIDDUSH AND HABDALAH, in Judaism are, respectively, the beginning and concluding ceremonies of sabbaths and festivals. (Kiddush, "sanctification"; Habdalah, "separation"). Kiddush includes the blessing or sanctification of the day, of the wine and of the bread, and is recited at the first of the three statutory meals (the last two items, which were the earlier, are pronounced also at other meals). Those scholars who believe that the Last Supper took place on Passover consider Jesus' blessing of the cup to have been the Passover Kiddush.

The term Habdalah is applied (1) to the section of the evening service proclaiming the distinction between light and darkness and marking the boundary between sacred and secular days; (2) to the subsequent synagogal and domestic ceremony which contains the four blessings of Habdalah, wine. light and spices. At the conclusion of festivals and fasts alterations and omissions are introduced. The prohibition against kindling fire on sabbath (Exod. xxxv, 3) is modified on festivals (Exod. xii, 16), hence the festival Habdalah lacks the blessing over the light. The origin of this blessing may, however, be symbolical, as may be that of the spices (or myrtles, which are substituted in the east). The spices may recall the bowl of incense used after banquets in Roman days.

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KIDERLEN-WACHTER, ALFRED VON (1852–1912), German diplomatist, was born at Stuttgart on July 10, 1852, the son of a banker Robert Kiderlen, who had married Baroness Marie von Wachter. He fought as a volunteer in the Franco-German War (1870–71) and then studied at different universities. In 1879 he entered the German Foreign Office. After holding various diplomatic posts, among them that of Prussian minister to Hamburg, he was sent to Bucharest in 1900 and was recalled in 1908 to act as deputy for the Foreign Secretary Von Schoen, and in June 1910 succeeded him in the office. He was soon in the thick of the negotiations with France (1911) over the Agadir incident, which, owing to the state of Kiderlen-Wachter's health, were partly conducted between him and the French ambassador, Jules Cambon, at the Bavarian spa of Kissingen. The mystery which Kiderlen-Wachter with the complicity of his chief, Bethmann-Hollweg, chose to maintain with regard to Germany's ultimate intentions in Morocco, was largely responsible for the crisis which arose between the western powers and Germany. An agreement on the basis of a cession of territory in the French Congo in exchange for a German declaration of complete *désintéressement* in Morocco was nevertheless ultimately effected Kiderlen-Wachter died at Stuttgart, Dec. 30, 1912.

KIDNAPPING, a criminal offense consisting of the forcible seizure of a person and his detention or transportation to a place of concealment. The principal motives for kidnapping are to subject the victim to some form of involuntary servitude, to make it easier to commit some further criminal act upon him or to obtain ransom for his safe release. The word itself is a compound of two slang expressions, "kid," meaning a child, and "nap" or "nab," meaning to snatch or seize. The word as originally coined (c. 1680) described the then-prevalent practice of stealing children and sending them to servitude on British plantations in America. It later came to mean the taking and sending off of any person to servitude in another country and, as so expanded, was described by Blackstone as a common-law misdemeanour.

Kidnapping for the purpose of subjecting the victim to servitude has taken many forms. In European countries one of the most prevalent was the practice of crimping, that is. the impressment (*q.v*) of sailors or soldiers by kidnapping, drugging, decoying or other illegal means. Crimping or shanghaiing, as it is sometimes known, of merchant seamen flourished in port towns throughout the world where the owners of water-front boarding-houses, brothels and taverns did a brisk business by victimizing their own clientele. To prevent such malpractices in Great Britain the Merchant Shipping act, 1894, empowered the board of trade to grant licences for the supplying of seamen upon closely defined terms and contained provisions for the protection of seamen from imposition. State laws regulating the licensing of boardinghouses and limiting the amount of money paid by masters of vessels to the suppliers of ships' crews greatly curbed crimping in the U.S.

The white-slave traffic, whereby young girls are abducted and sold into a life of prostitution, is another aspect of kidnapping for subjection to servitude. (For a fuller discussion of this problem and the laws relating to it, see WHITE-SLAVE TRAFFIC)

With the growth of organized crime in the U.S. during the prohibition era (1920–33). the maintenance of criminal discipline required that punishment be meted out to those who infringed the underworld code. This usually took the form of the victim-offender's being "taken for a ride," that is, seized and whisked anay by automobile (the modern kidnapper's chief resource) to some secluded spot, there to be dispatched at leisure. This pattern persisted throughout the era, although the motive changed from inflicting underworld "justice" to extorting large sums of money on the promise, often broken. of the victim's safe return. Kidnapping then offered all the rewards of bank robbery with few of the risks. In the late 1920s and early 1930s it became commonplace for wealthy persons or their children to be taken off or "snatched," in the argot of the underworld, and held for heavy ransom. In 1931 alone, for example, 279 kidnappings were reported to have taken place in the U.S.

Most of the kidnappings that attracted public attention at that time involved the transportation of victims across state lines. It was widely believed that state and local law enforcement was inadequate to cope with this form of crime and there was consequent agitation for making kidnapping a federal offense, so that the enforcement resources of the federal government might be brought into play. The kidnapping and murder of Charles A. Lindbergh's infant son in March 1932 so aroused public sentiment that the desired legislation was speedily passed. The Lindbergh law made it a federal offense to transport a kidnapped victim across a state line and imposed heavy penalties, including death at the jury's option, if the victim was not released unharmed. Federal agents were empowered to enter a case after seven days, even though no proof existed that a state line had been crossed. State legislatures, similarly aroused, passed laws greatly increasing existing penalties for kidnapping.

Following the passage of these laws kidnapping for ransom in the U.S. declined sharply. Advocates of capital punishment discerned a causal relationship in this sequence of events and maintained that the Lindbergh law and its state counterparts demonstrated the deterrent efficacy of the death penalty. Others questioned this conclusion, maintaining that the decline was more properly attributable to criminals' fear of almost certain capture by the Federal Bureau of Investigation.

Modern U.S. criminal statutes generally divide kidnapping into

two offenses: simple kidnapping, typically penalized by terms of up to 25 years imprisonment, and kidnapping for ransom, typically penalized by life imprisonment or death.

Although counterparts exist in the laws of other countries (in Germany. *Menschenraub;* in France, arrestation *illégale* et *séquestration* de *personnes*), kidnapping as a widespread social problem appears to have been confined primarily to the Cnited States.

(H. L. PR.)

KIDNEY: see URINARY SYSTEM; EXCRETION (KIDNEY).

KIDNEY, DISEASES OF. The kidneys may be affected directly by a wide variety of congenital, inflammatory, vascular, and neoplastic disorders nhich interfere with their function by tissue destruction. urinary tract obstruction and local circulatory derangement. In addition, serious disturbances in renal function may arise during the course of disease elsewhere in the body. (For the anatomy of the kidney, see URINARY SYSTEM.)

Congenital Anomalies. — The anatomic abnormalities of the kidneys cover a range which includes congenital absence of the kidneys at one extreme and minor irregularities in the arrangement of the calyces at the other. Hypoplasia or failure of a kidney to go through normal growth occurs rarely and may prove difficult to recognize in adult life, owing to its resemblance to atrophy caused by disease. Abnormalities of shape or position occur more commonly, giving rise on the one hand to the horseshoe, cake, L-shaped or sigmoid kidney, depending upon the manner and extent of median fusion: and on the other to the floating kidney (nephroptosis) which may be found anywhere in the abdomen or pelvis. Cysts appear quite frequently. ranging from solitary cysts to virtual replacement of all the kidney tissue by small cysts. Polycystic disease is believed to arise from failure of fusion between secretory and collecting ducts during embryonic development or from congenital dysplasia of the tubular epithelium. The condition may cause death shortly after birth, or it may go unrecognized until late adulthood when the passage of bloody urine (haematuria), bouts of flank pain or the discovery of large abdominal masses may disclose its presence. The development of high blood pressure and renal insufficiency may follow, but progression is usually slow.

Glomerulonephritis (see also BRIGHT'S DISEASE). — Acute diffuse glomerulonephritis is believed to develop chiefly as a complication of infections by the haemolytic streptococcus. most commonly affecting the throat, as in scarlet fever. The renal disorder usually begins abruptly one to three weeks after the onset of the infection, with dropsy (manifested in puffiness of the face and swelling about the ankles), elevation of the blood pressure, and uraemia. The urine is usually grossly bloody; contains albumin and other blood proteins (proteinuria, albuminuria) and casts (cylindrical extrusions from the tubules composed of epithelial, white or red blood cells, coagulated protein and detritus); and is often reduced in quantity. The kidneys are swollen and often peppered with small haemorrhages. Microscopic examination reveals damage of the glomerular capillaries that apparently interferes with filtration, accounting for the tendency to retain water, salts and nitrogenous products. In a small number of cases, heart failure, convulsions or uraemia may prove fatal, but in the majority recovery occurs within a few weeks. In the main. acute nephritis is a disease of childhood, and when it occurs in adults the outlook is less favourable. In about 10% of children and 50% of adults healing fails to occur, and chronic diffuse glomerulonephritis develops. The inflammatory process in the kidney persists; here and there glomeruli cease to function because they are blocked by proliferation of endothelial tissue, infiltrated by hyaline material and replaced by scars; tubules also undergo degenerative change and are replaced; and in time the kidneys are reduced to small granular grossly deformed structures. This course may be swiftly run in a matter of months, but more frequently the acute episode subsides, and the urine clears completely save perhaps for slight persistent proteinuria. The course thereafter is variable. The patient may live a normal life span with no further difficulty, or, as is unfortunately more often the case, after a few years of latency, evidence of renal functional abnormality becomes increasingly apparent. At first there is increasing proteinuria and dropsy may be marked (nephrotic phase); later the blood pressure rises and uraemia appears. The ability of the kidneys to concentrate the urine is impaired; the urine output increases (polyuria); and the volume excreted during the night exceeds that put out during the day (nocturia). Even in the terminal phase careful medical management may assure a productive active life for as long as ten years or more, and the total course often covers a period of several decades. Since overt acute nephritis does not precede the appearance of chronic nephritis in most instances, it is possible that the acute episode is usually mild and unrecognized. However, many believe that there are two forms, differing in origin but terminating similarly in uraemia.

Uraemia develops uhen the failure of the kidney to perform efficiently its excretory function leads to retention of nitrogenous substances, principally urea, in the blood and ultimately to derangement in the electrolyte composition of body fluids. Accumulation of the excess fixed acids formed during metabolism and loss of base may combine to produce acidosis. Other electrolyte disturbances include increased phosphate and decreased calcium concentration in the blood that may produce muscular spasm and even convulsions or that may induce changes in the bones. Occasionally potassium is retained and may reach concentrations in the blood high enough to poison the heart. Considerable variation is observed in the extent and rate at which these disorders develop. Weight loss, severe anaemia and debility are common. Treatment consists chiefly of supportive measures designed to correct acidosis. aid in the elimination of phosphates, maintain nutrition and alleviate anaemia. Restriction of protein and salt intake may be necessary but, as a rule, a well-balanced high caloric diet is preferable. When far-advanced. uraemia is characterized by nausea and vomiting, stupour gradually deepening into coma, and neurologic disorders that may be attributable to unknown toxic substances. Potassium intoxication has been successfully treated by oral administration of "ion-exchange resins" that fix and remove potassium by way of the gastrointestinal tract. The use of the "artificial kidney" permits more rapid correction of the blood chemistry. In this device the patient's blood is pumped through a series of thin-walled tubes immersed in a fluid of appropriate composition (with which it comes into equilibrium by diffusion) and is then returned to the body by intravenous injection.

Nephrosis.—Friedrich Müller introduced the term nephrosis in 1905 to describe those renal disorders characterized by degenerative rather than inflammatory changes. The modern term is used loosely to denote a variety of conditions that have little in common except tubular cellular damage. In general they may be divided into two major categories, one characterized clinically by excessive loss of protein in the urine, the other by necrotic lesions of the tubules.

Proteinuric *Nephrosis.*—In all these disorders heavy albuminuria occurs, presumably as the result of defects in the glomerular capillary walls which permit the escape of the large protein molecules from the blood. In consequence the concentration of albumin in the blood may decrease markedly. Dropsy develops because the osmotic attraction exerted by the plasma proteins is decreased and fluid escapes from the blood into the tissues. The accumulation of fluid in the tissues and body cavities may produce a striking change in appearance and may prove extremely uncomfortable. For some obscure reason the fatty constituents of the blood usually increase, giving the serum a milky appearance. Genuine, or lipoid nephrosis is characterized by these changes (called collectively, the nephrotic syndrome) in the absence of a demonstrable renal lesion. The tubule cells are commonly distended with lipoidal and hyaline material. As a rule this affliction occurs in children. Most sufferers recover completely, but in a few death occurs as the result of infections or following the development of typical chronic glomerulonephritis.

Amyloid *Nephrosis* develops occasionally in the course of chronic infectious disease, particularly tuberculosis, osteomyelitis and syphilis, and in certain neoplastic diseases. Deposits of mucopolysaccharide-protein complex appear in the blood vessel walls and glomeruli. The kidneys are enlarged and rubbery; the spleen and liver may also be affected. The clinical picture is dominated

by the underlying disease but in a number of cases the nephrotic syndrome is the first manifestation. In others, moderate proteinuria may be the only sign.

Intercapillary glomerulosclerosis or Kimmelstiel-Wilson's disease develops as a late complication of diabetes mellitus and is characterized by the more or less simultaneous appearance of the nephrotic syndrome, elevated blood pressure and uraemia. It appears to be attributable to nodular deposits of a hyaline material between the capillary loops of the glomeruli which arise in connection with small localized defects in the capillary wall. This disorder is becoming more prevalent as insulin therapy has prolonged the lives of a large number of diabetic patients.

The nephrotic syndrome also develops occasionally in the secondary stage of syphilis and in collagen diseases such as lupus erythematosus.

Necrotizing Nephrosis.—Poisoning by heavy metals, notably mercury, uranium, bismuth and gold, gives rise to a nephrosis characterized clinically by diminished urinary output, proteinuria, and uraemia and pathologically by degenerative lesions of the tubule cells. These disorders arise after ingestion of metallic salts, such as bichloride of mercury, by accident. for therapeutic reasons or with suicidal intent; the pure metals themselves are relatively nontoxic. Within a day or so after a poisonous dose is taken, the urine contains albumin, red cells and numerous casts, is reduced in quantity (oliguria) or urine flow ceases altogether (anuria). Ordinarily other manifestations such as nausea, vomiting, diarrhoea and shock dominate the clinical picture at first. Later. if kidnev function does not improve, uraemia becomes prominent and may cause death within a week or two. The changes in the tubular cells are usually limited to the proximal segment and vary in severity relative to the amount of metallic ion taken up. They may progress to cell death. and necrosis may occur. With recovery, healing is complete and no permanent damage results. The management and prognosis of mercury poisoning was dramatically modified by the introduction of BAL (British anti-lewisite), a sulphydryl-containing compound that takes up and inactivates the mercuric ion. This drug must be given in large doses within four to eight hours after mercury has been taken ii it is to be effective. Other poisonous materials. such as carbon tetrachloride, sulfonamide, diphtheria toxin produce similar abnormalities of renal function attributable to damage affecting all parts of the tubule. Administration of mismatched blood, intravascular haemolysis (as in blackwater fever) and release of pigment from muscle cells following crushing injuries may produce the same type of change. In these cases the urine may be laden with haemoglobin or myoglobin, and pigmented casts are prominent. Since the distal tubule segment may be conspicuously involved in these conditions the term "lower nephron nephrosis" has been applied. It is believed that renal anoxia may play a role in the production of these disorders because vasoconstriction in the kidney during shock or congestive heart failure appears to predispose to a similar renal injury.

Nephrosclerosis.—High blood pressure commonly develops in the absence of renal disease or other obvious causes and may ultimately prove fatal as a result of heart failure, cerebrovascular accident or other vascular complications. In a small percentage of cases, hypertensive vascular disease produces renal damage, arteriolar nephrosclerosis, which may be indistinguishable from chronic glomerulonephritis. Depending upon the velocity with which nephrosclerosis develops, two general types of change are encountered. The term benign nephrosclerosis is applied when the disease progresses slowly, whereas it is called malignant nephrosclerosis when the course is rapid or fulminating. The most striking and typical alteration is a change in the small blood vessels, the arterioles, consisting of thickened walls and reduced calibre. Presumably as a result of the reduction in blood flow secondary to this change, glomeruli and tubules degenerate, and are gradually replaced by scar tissue, the kidney slowly shrinking and becoming granular as in glomerulonephritis. Clinically this slow process is manifested only by albuminuria and a gradual but not marked impairment of kidney function. In malignant nephrosclerosis these changes are complicated pathologically by the appearance of necrotic endoarteritis of the small vessels in the kidnry and acute destruction of glomeruli and tubules, clinically by the rapid development of uraemia, heart failure and serious vascular lesions in the eyes (papilledema).

Infections of the Kidneys.—The kidneys are frequently the site of bacterial invasions from the blood stream, from the urinary tract or by direct spread from neighbouring organs. Congenital deformation or obstruction to the outflow of urine make the kidney prone to infections.

Acute pyelonephritis is characterized by inflammation of the urinary tract with extension into the lowermost portions of the renal tubules. It usually begins suddenly with chill and fever, pain and tenderness in the loin over the affected kidney or bilaterally if both are involved, and the appearance of pus, albumin and bacteria (usually E. coli) in the urine. This disorder affects the female more frequently than the male sex and is a prominent complication of pregnancy, in which partial ureteral obstruction by the gravid uterus probably plays an influential role. Chemotherapy and supportive measures proved very effective in combatting this disorder, though surgery may be necessary to correct predisposing obstructive lesions.

Chronic pyelonephritis rarely develops in patients who suffer repeated bouts of the acute disorder and in whom the resulting renal damage becomes excessive. Under these circumstances the course resembles that of chronic glomerulonephritis. Occasionally the acute inflammatory process may give rise to renal abscesses which may break out into the tissues surrounding the kidney to produce a perinephritic abscess.

Tuberculosis of the kidney may arise as the result of the invasion of tubercle bacilli from the blood or from the urinary tract. In the first, miliary tubercles may appear throughout both kidneys, affecting the cortex predominantly, and in the second, ulcerative, caseous lesions beginning in the pelvic mucosa slowly destroy one or both organs.

Nephrolithiasis.—Urinary tract infection, stasis, vitamin A deficiency, excesses of vitamin D, hyperactivity of the parathyroid glands and nutritional disturbances including diets high in calcium oxalate, or citrate content predispose to the formation of stones (calculi) in the urinary tract. Calculi are formed of urinary constituents which remain in solution under normal conditions, such as calcium phosphate. calcium oxalate, or ammonium magnesium phosphate. Uric acid and urate stones are common, and occur frequently in gout, or diseases such as leukaemia, characterized by high urate excretion. Despite extensive investigation the mechanism of stone formation was still unknown at mid-20th century. Once formed, the stone often passes down the ureter and in doing so produces pain (renal colic) and obstruction. The pain is characteristically intense, beginning in the flank and radiating anteriorly and down into the groin. The urine is usually bloody. The common complications are infection and hydronephrosis; *i.e.*, dilatation of the pelvis by urine pent-up behind an obstructing stone. Hydronephrosis may also develop as a result of other obstructive processes and may produce excessive renal damage. Surgical intervention is often necessary to hasten the removal of calculi and to prevent or correct hydronephrosis.

Infarct.—Obstruction of a renal artery or one of its larger branches results in infarction or death of tissue in that portion from which blood is excluded. As a rule a wedge-shaped mass of tissue becomes pale, gradually degenerates and is replaced by scar tissue. The arterial obstruction may occur as the result of compression or of plugging by blood clot which has arisen in the heart or at some site in the large arteries. When smaller clots are released from the cardiac lesions of subacute bacterial endocarditis, numerous small capillary occlusions may occur in both kidneys, principally affecting the glomeruli. This is often referred to as focal embolic glomerulonephritis. Acute and chronic diffuse glomerulonephritis may also complicate this condition.

Turnours.—Various benign and malignant growths may involve the kidneys producing haematuria, pain and a palpable mass in the abdomen. Among the malignant growths, Wilms's tumour in children and hypernephroma in adults are the most common.

See UROLOGY and also Index references under "Kidney, Dis-

eases of" in the Index volume.

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KIDNEY AND URETERS, SURGERY OF. Conservation of life and of functional renal tissue is the ultimate objective of all surgical procedures on the kidney and ureter. The functional reserve of the normal kidneys is sufficient to maintain life following removal of one entire kidney and as much as one-third of the remaining organ.

The classical surgical approach to the kidney. its pelvis. and upper ureter is through an oblique incision in the flank, approximately parallel to the lowest rib. Location of the kidney beneath the diaphragm may require a transthoracic approach in which a segment of rib is removed. the lung temporarily collapsed and the diaphragm opened. Anomalies of number or position frequently require an approach through the abdominal cavity to permit separation of fused kidneys or repair of displaced (ectopic) kidneys that may lie in any position within the abdomen, the pel\-is or. rarely, the thoracic cavity.

The blood supply of the kidney is derived from a single large artery of sufficient length to permit temporary occlusion with control of blood flow. The segmental distribution of the branches of this artery within the kidney is such that an incision may be made in line with either the long or short axis of the organ. The kidney may be bisected along its convex border to permit removal of otherwise inaccessible stones or of segments from the centre or either pole.

Major advances in renal surgery have included the successful transplantation of kidneys between homozygous twins and repair of aneurysms or removal of plaques (endarterectomy) from the renal arteries without sacrifice of the kidney. Development of the artificial kidney has reduced the risk of operations in certain patients n-ith advanced kidney disease.

The ureter, renal pelvis and calyces are most commonly involved in diseases that result in obstruction of the flow of urine. Stones (calculi') and congenital anomalies of the ureters are the most common causes of ureteral obstruction. Operations designed to enlarge the lumen of the ureter by plastic surgical techniques are among the most numerous and important contributions of the genitourinary surgeons.

Calculi are among the most ancient of recorded human diseases, dating from about 7,000 years ago. Areas of unusually high incidence include England, the Netherlands. France. the Balkan peninsula. the Volga valley. Arabia and Mesopotamia, lower Egypt. the Punjab and northern provinces of India. southern China. northern Thailand and the southeastern United States. The precise mechanism of stone formation is unknown, but many metabolic diseases and deficits are known to be predisposing factors. Cystine stones develop in persons who have a hereditary defect in the reabsorption of cystine by the kidney tubules. Therapy is directed at treatment of the underlying metabolic disease and surgical removal of the stones. which are usually too hard to be dissolved or crushed in *situ*. (*See* CALCULUS.)

The terminal orifice of the ureter is readily visualized within the bladder. Ingenious instruments are available for removal of stones. ureteroceles (hernias of the ureters) and diseased portions of the lower ureter through the transurethral approach. Relatively small muscle-separating incisions in various parts of the abdominal wall permit access to any segment of the ureter without entry into the abdominal cavity.

Transplantation of the ureters to the abdominal wall or large bowel is necessary when the urinary bladder must be removed. The former procedure may be facilitated by the interposition of a segment of small bowel (ileum) between the skin and ureters. Replacement of a diseased segment of the lower ureter may be accomplished by forming a tube from the bladder. The entire ureter may be replaced by a segment of small bowel.

See also UROLOGY; URINARY SYSTEM; EXCRETION (KIDNEY); KIDNEY, DISEASES OF; UREMIA; BLADDER AND PROSTATE DISEASES; GENITOURINARY TRACT. DISEASES OF.

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KIDSTON, ROBERT (1852–1924), British paleobotanist noted for his researches on fossil plants of the Devonian period, was born on June 29, 1852, at Bishopton house. Renfrewshire. He was educated at Stirling high school and Edinburgh university. His private means enabled him to devote himself entirely to his scientific interests. He died at Gilfach Goch, Wales, on July 13, 1924.

During the first period of Kidston's work (1880–1904), he concentrated on systematic, floristic and stratigraphic problems. From 1904 on he was concerned more with structure. He was the first to describe seed-fern specimens with seeds attached (1904). His most noteworthy work was on Devonian plants of the Rhynie chert (1917–21), done with W. H. Lang. Three new genera were described. and a new class of vascular plants (Psilophytales) was based upon them. Psilophytes had been known for about 60 years, but their great significance was unrecognized until the work of Kidston and Lang. Kidston's most ambitious enterprise, The *Fossil Plants of the Carboniferous Rocks of Great Britain* (six parts published, 1923–25), was only partially completed when he died.

An account of Kidston, his work and his more than 170 publications is found in a British Geological Survey memoir, *The Kidston Collection of Fossil Plants* (1938). (J. W. TT.)

KIDWELLY, market town and municipal borough, Carmarthenshire, Wales, at the head of an inlet in the northeastern corner of Carmarthen bay. Pop. (1951) 3,007. Area 4.5 sq.mi. It lies on the South Wales coastal lowland, at this point low and swampy. Its name (Cyd-weli) denotes its position at the junction of two streams, the Gwendraeth Fawr and Gwendraeth Fach. The Normans realized the importance of this site for defense as it commanded the way along the coast as well as two minor valley ways northward whence Welsh raids were frequent. Consequently Kidwelly has a magnificent castle. Built in 1084 by William de Londres, a follower of Robert Fitz Hamon who conquered Glamorgan, the castle was destroyed about 1230 by Llewellyn the Great, and rebuilt about 40 years later. It is now in the care of the ministry of works. Kidwelly received its first charter from Henry I, and it was confirmed by Edward III, Henry VI, Henry VIII, Charles II and again in 1877 and 1885. The town has a fine 13th- to 14th-century church, once a chapel of a Benedictine priory. The harbour has silted up and the ever-increasing power of Llanelly focused the new developments on the coal field. Three important industries are limestone quarrying, the manufacture of silica bricks for furnaces and the making of spectacle lenses.

KIEL, the capital of the *Land* Schleswig-Holstein, Germany, lies along both shores of the southern end of the Kieler Förde, which cuts into the land for almost 9 mi. Population (1950) 254,449; (1956 est.) 258,100. Area 25 sq.mi. About two-thirds of the town was devastated by air raids in World War II. The new town. with building blocks separated by wide green spaces, centres round the town hall (1911) and the Kleine Kiel, two small lakes once a branch of the fiord. Close to the town hall are the municipal theatre (1907) and the Ostseehalle (1950), designed for exhibitions, congresses and mass entertainment. In the market place stands Kiel's oldest church, St. Nicholas', built about 1240, when the town was founded, and rebuilt after 1949. Close by are the remaining wings of the palace, which dates from the 13th century. The university medical school was founded by Christian Albrecht, duke of Schleswig, in 1665, the new university buildings include a school for agricultural science and the Institute of World Economics. There are also an art gallery and the botanical gardens near the old university grounds facing the sea.

Kiel has a magnificent harbour with a comparatively uniform depth of water. averaging 40 ft. Its length is 7 mi. and its breadth varies from 656 yd. at the southern end to about 2 mi. at the mouth. A promenade along the western shore adjoins the yachting harbour. Farther north are the locks of the Kiel canal (*q.v.*), opened in 1895. The canal is crossed by a high-level bridge. Kiel is connected by road and rail with Hamburg. 70 mi. S., and with the chief towns of Germany and Denmark. Small steam-

boats ply between the eastern and western parts of the town and serve the fishing villages and bathing resorts along both shores. Shipbuilding and engineering are the main industries. There are also a fish market, iron foundries. printing works, breweries, brickworks, a fish curing industry and other factories. Trade is carried on in coal, timber, oils. machinery, cereals and fish. Kiel became an important naval base during the 19th and early 20th centuries. The main event of the town's year is Kiel week, celebrated in June as an international yacht-racing contest and, since 1947, also as a cultural festival.

The name of Kiel appears as early as the 10th century in the form Kyle (probably from the Anglo-Saxon *Kille,* a "safe place for ships"). In 1242 it received the Lubeck rights; in the 14th century it acquired various trading privileges, having in 1284 entered the Hanseatic league. By the treaty of Kiel in 1814 Norway was ceded to Sweden. In 1773 Kiel became part of Denmark, and in 1866 it passed with the rest of Schleswig-Holstein to Prussia.

(W. JN.)

KIEL CANAL. The Kiel canal connects the North sea and the Baltic. The sluices at the entrances at Holtenau (the harbour of Kiel) and Brunsbuttekoog (mouth of the Elbe) are 1.082.6 ft. long. 144 ft. wide and 45.9 ft. high. The canal is 53.3 nautical miles long and 44.9 ft. deep. Vessels are admitted on it which do not exceed the following dimensions: depth 29.7 ft., width 131.2 ft., length 1,033.5 ft., height of masts over the waterline 131.2 ft. Steam and motor propelled vessels pass up the canal under their own power. The highest speed permitted is 8.1 knots, the lowest 5.4. Other vessels are tugged. either by private tugs or the tugs of the canal administration, as desired. Pilots are compulsory.

Prior to World War II the Kiel canal was owned by the German reich, which administered it through the Reichskanalamt in Kiel. Art. 380–386 of the treaty of Versailles (June 28, 1919) laid down certain regulations respecting the Kiel canal. Canal and pilotage dues were limited to a rate sufficient to cover the cost of administration, maintenance and improvements. All mercantile and war vessels of nations at peace with Germany had permanent free use of the canal, without special permission, and on an equal footing (but as foreign ships of war passed through German territorial waters in approaching or leaving the canal they were expected to obtain permission through diplomatic channels). Subjects. goods and vessels of all nations enjoyed equal treatment as regarded payments and attention. Traffic on the canal was subject only to general police. shipping and sanitary and customs regulations. Goods in transit arriving under seal or accompanied by customs officers were not subject to any further customs formalities. In the event of violations of any of these conditions, or of disputes as to the interpretation of them. any interested power could appeal to the jurisdiction instituted for the purpose by the League of Nations. A local German authority at Kiel was qualified to deal with disputes in the first instance. Following World War II the canal mas in the German Federal Republic.

The Kiel canal, being the safest, most convenient, shortest and cheapest route connecting the North sea and the Baltic, is increasingly used by merchant vessels. In 1913, 55,382 ships passed of 10,350,000 tons net displacement; in 1927, 53,711 ships of 19,912,069 tons; and in 1936, 62,402 ships of 31,600,000 tons.

(M. C. M.; X.)

KIELCE, a *województwo* (province) in southeast Poland, surrounded by the *województwa* of Lodz, Warsaw, Lublin, Katowice, Cracow and Rzeszów. Area 7.520 sq.mi. Pop. (1931) 2,936,976, of which 90% were Poles. the rest mostly Jews; (1960) 1.818.000. Its surface is an elevated plateau 800 to 1.000 ft. in altitude. intersected by ravines and rising to 2,005 ft., as in the Lysogory hills. famous in legend and in war. The *województwo* is bounded on the north, south and east by the Vistula and its tributary, the Pilica, and is drained by the Nida; the Radomka and other rivers running through deep valleys. Silurian and Devonian quartzites. dolomite, limestones and sandstones prevail in the north and contain rich iron ores, lead and copper ores. Carboniferous deposits with rich coal seams occur chiefly in the south, particularly in the Dombrova coal field. The Triassic deposits contain lead and rich zinc ores of considerable thickness. The Cretaceous deposits yield gypsum, chalk and sulfur. M'hite and black marble are also extracted. The soil is of great variety, and fertile in parts, but owing to the proximity of the Carpathians, the climate is severe. Rye, oats, wheat, barley and buckwheat are grown. Over 50% of the area is cultivated. Grain is exported. Gardening is á thriving industry in the south; beet is grown for sugar in the southeast. Industries are considerably developed; zinc ores are extracted, as well as iron and sulfur, and the coal field in the southwest is the most thickly populated part of the province Tiles. metallic goods. leather, timber goods and flour are the chief products of the manufactures. The *województwo* was the central part of the early Polish state and contains some of the most thickly populated parts of Poland The chief towns are Kielce, Radom, Czestochowa. Bendzin, Sosnowiec. Dombrowa. Zawiercie. Olkusz, Sandomierz, Pinczow, Ilza and Opatow. Kielce was occupied by Germany in 1939. It was returned to Poland in 1945.

KIELCE, a town of Poland, capital of the *wojewddztwo* of Kielce, 152 mi, by rail south of Warsaw. situated in a picturesque hilly country. It has a castle, built in 1638, and formerly held the Zaluski library. which was taken to St. Petersburg (Leningrad) after the partitions, but was restored to Poland by the treaty of Riga in 1921. The principal factories are hemp spinning. cotton printing and cement works. The town was founded in 1173 by a bishop of Cracow. Pop. (1960) 89.000. Kielce was occupied by Germany in World War II.

KIEPERT, HEINRICH (1818–1899), German geographer, was born at Berlin on July 31, 1818. He studied geography at the Cniversity of Berlin and became professor there in 1854. He was a leading authority on Asia Minor, which he visited four times (1841–88). He died at Berlin on April 21, 1899.

His works include: *Atlas von Hellas und den hellenischen Kolonien* (1840–46); *Historisch-geographischer Atlas der alten Welt* (1848); *Atlas antiquus* (1st ed., 1854); *Neuer Hand-atlas über alle Teile der Erde* (1855, *et seq.*); *Lehrbuch der alten Geographie* (1877–78); *Leitfaden der alten Geographie* (1879, Engl. trans. 1881); *Formae orbis antiqui; Corpus inscriptionum latinarum;* also a map of Asia Minor, *Karte des osnzanischen Reiches in Asien* (1844 and 1869).

KIEPERT, RICHARD (1846–1915), German cartographer, was born at Weimar on Sept. 13, 1846, the son of Heinrich Kiepert (1818–1899), also a noted cartographer. He received the doctorate of philosophy at Jena in 1874; from that year until 1878 he was engaged in the compilation of Richthofen's atlas of China, and from 1875 to 1887 he edited a geographical periodical *Globus.* He prepared maps from the data collected by many well-known German travelers, such as Rohlfs, Barth and Mollendorf. After his father's death in 1899 he continued or brought up to date many of his maps. including the *Fornzae orbis antiqui* (1894, etc.). Perhaps his most important single work was the *Spezialkarte von Kleinasien* (Asia Minor) (1:400,000) (1902–8). He died in Berlin on Aug. 4, 1915.

KIERKEGAARD, SOREN AABYE (1813–1855), Danish philosopher and theologian. whose curious genius entitles him to be regarded both as the founder of modern existentialism and as a revolutionary figure in the history of Protestant Christianity, was born in Copenhagen on May 5, 1813. His father, Michael Pedersen Kierkegaard, was a West Jutland farmer who later moved to Copenhagen and acquired a considerable fortune as a wool merchant. Very early in his life, however, Michael had cursed God; and Soren's mind was dominated by a mysterious and perhaps pathological sense of involvement in his father's guilt. After his father's death (1838), Kierkegaard entered a critical period of his life in connection uith a young woman named Regine Olsen: having become engaged to her in 1840, he broke the engagement in 1841. His relations with her have been variously interpreted, but no finally satisfactory account of them has been given. His later life was marked by a series of controversies; *e.g.,* with Meir Aaron Goldschmidt, editor of the periodical *Korsar,* and with two Protestant bishops, J. P. Mynster and H. L. Martensen. He died in Copenhagen on Nov. 11, 1855.

For all the complexity and distortion of his character. Kierkegaard wrote and published voluminously. The title of his largest and best-known work. *Either/Or* (1843; Eng. trans., 1944), in-

dicates the central feature of his thought, viz., his insistence on the choice which each individual has to make between Christ and the world. According to Kierkegaard there are no logically compelling reasons why a man should opt for one rather than for the other. Someone may choose a life of pleasure or of cultivated humanism, but he will inevitably be haunted by a conscious or an unconscious despair (*The Sickness unto Death,* 1849; Eng. trans., 1941). He may seek to achieve something more valuable by following the path of duty, but this takes him into a world where general principles and collective aims are apt to obliterate consciousness of individual responsibility. Serious concern with this discloses itself in the feeling of dread (*The Concept of Dread,* 1844; Eng. trans., 1944), which "eats away all the things of the finite world and lays bare all illusions." A man in this condition has intimations of the infinite but no rational guarantee of what God requires of him. He must himself decide whether or not to take the "leap" of faith. If he asks for proofs he shows that he does not believe. Hence Kierkegaard considered that all attempts at providing Christianity with a rational justification were fundamentally irreligious. This brought him into conflict not only with orthodox rational theology but also with the philosophy of Hegel, for Hegelianism claimed to be Christianity rationalized. Kierkegaard's *Concluding Unscientific Postscript* (1846; Eng. trans., 1941) was an attack on Hegel's claim to have demonstrated that human history is an intelligible plan in which God's will is manifest. According to Kierkegaard it is ridiculous for any human being to pretend to such knowledge, for he would have to be God to know what only God could know. Kierkegaard considered that a preoccupation with science and with objective thinking ("objectivity") betrayed a desire to remain a mere spectator and to shirk the necessity of choosing for oneself. It was in opposition to this attitude that he proclaimed that "truth is subjectivity." *See* further EXISTENTIALISM.

To receive the impact of such major works as *Concluding Unscientific Postscript* and *Training in Christianity* (1850; Eng. trans.! 1941) one must have oneself felt the attraction of the Hegelian metaphysical transcription of the notion of reconciliation, or have found nothing amiss in conventional pictures of Christ, whether traditional or modernist. Kierkegaard does not offer anything which could be called a metaphysical system or an ethical doctrine; nor can one extract from his religious writings even the outlines of a dogmatic (notwithstanding the influence that they were to have on the development of Karl Barth's thought). He is always concerned to unsettle, to put a question mark against accepted prejudices and habits of thought; and he emphasizes the significance of the particular and individual (his outlook on this subject has a certain kinship with some of Ludwig Wittgenstein's later moods). Kierkegaard's writings have their obvious inspiration in the traditions of the Romantics, but his very emphasis on interiority (characteristic of the Romantic and idealist temper) drew him eventually into an altogether different world, so that a Thomist can detect in him a blurred, but infinitely subtle, acceptance of the "primacy of being." His hostility to the Hegelian dialectic is rooted in his understanding of its implications and in his sense of the incompatibility of its fundamental assumption with a true religious seriousness. Yet his criticism draws its strength from perception as well as passion, from sympathy as well as rejection.

The consideration of his own experience gave Kierkegaard a point of departure for a profound religious evaluation of the whole of human life. It was an aspect of his genius that his colossal self-preoccupation (his sense of the significance of the subjective, etc.) was continually disciplined by a sort of matter-of-fact simplicity.

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Pseudonyms used by Kierkegaard were: Victor Eremita; Johannes de Silentio; Constantin Constantius; Johannes Climacus; Nicolaus Notabene; Vigilius Haufniensis; Hilarius Bogbinder; H. H.; and Anti-Climacus. Important works, other than those cited in the text above, include: *On the Concept of Irony* (1841); *Edifying Discourses* (1843–44; Eng. trans., 1943–46); *Fear and Trenzbling* (1843; Eng. trans., 1939); *Repetition* (1843; Eng. trans., 1941); *Philosophical Fragments* (1844; Eng. trans., New York, 1936); *Stages on Life's Way* (1845; Eng. trans., 1940); *Edifying Discourses in a Different Vein* (1847; Eng. trans., 3 vol., 1937–55); *Christian Discourses* (1848; Eng. trans., 1940); *Two Minor Ethico-Religious Treatises* (1849; Eng. trans., 1940); *On My Work as an Author* (1851; Eng. trans., *The Point of View,* 1939, inciuding a version of *The Point of View of My Work as an Author,* 1859). *See* also *The Journals of Søren Kierkegaard,* selection trans. by A. Dru (London, New York, 1938).

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KIEV (KIYEV), an *oblast* (province) of the Ukrainian Soviet Socialist Republic, U.S.S.R., lies in the north-central Ukraine along the Dnieper river (*q.v.*). Its area is 11.158 sq.mi. Most of the *oblast* is west of the river in the "right-bank Ukraine." The northern part of the right-bank area and that part of the *oblast* east of the Dnieper are low-lands, drained by the tributaries of the Dnieper, the Desna to the east and the Pripet, Teterev and Irpen to the west. Here the relief is very level and there are widespread sand dunes. Much of the area is swampy and extensive drainage operations have been undertaken. The southwest of the *oblast* is part of the Dnieper uplands, rolling hills covered by loess, which is suffering very severe soil erosion by the formation of gullies. The natural vegetation, where it still exists, consists of mainly deciduous forest in the north, giving way southward to increasingly extensive steppe areas. Soils range from podsols and gray forest soils in the north to black earths in the south. The climate is mild by Russian standards. Kiev has a January average temperature of 21° F. and a July average of 67° F. The annual rainfall is 21 in.

The population, largely Ukrainian, was 2,821.000 by the census of 1959. Of these, 1,547,000, or 55%, were urban dwellers. The chief towns are Kiev (1,102,000), centre of the *oblast* and capital of the Ukrainian S.S.R., and Belaya Tserkov (71,000).

Agriculturally, the southwest is most important, particularly for sugar beet; this is part of the major sugar beet region of the U.S.S.R. Winter wheat, barley, corn (for fodder) and rye are also grown. The centre of the *oblast,* on either side of the Dnieper, is mainly concerned with dairying and market gardening for Kiev. In the low, damp north, flax, potatoes and dairying predominate. There too, there is some forestry. Industry is largely concentrated in Kiev, which manufactures a wide range of engineering and consumer products, especially textiles. Belaya Tserkov and the smaller centres of Vasilkov. Fastov and Boguslav have small-scale light engineering, food processing and shoe and leather industries. There are a number of sugar refineries, scattered throughout the south. Kiev *oblast,* which was formed in 1932, is well served by a network of railways and hard-surfaced roads, focusing on Kiev, while the Dnieper is navigable, as are the Desna and Pripet. (R. A. F.)

KIEV (Ukrainian, KIIV; Russ., KIYEV), a town and the capital of the Ukrainian Soviet Socialist Republic, U.S.S.R., and Kiev *oblast,* is situated on the Dnieper river, a few miles below its confluence with the Desna. The town is on the high, western bank, which rises up to 300 ft. above the river. On the low, opposite bank are several new suburbs, notably Darnitsa and Poznyaki. The population of Kiev, 248,000 in 1897 and 540,000 in 1914, by the 1939 census was 1,102,000, making it the third largest city of the U.S.S.R.

Kiev is one of the oldest and most historic towns of the U.S.S.R. and has been called "the mother of Russian towns." First mentioned in 9th-century documents, tradition ascribes its founding to Kiy and his brothers in the 8th century. The high bank, with marshy surrounding areas, provided a strong defensive site and the city rapidly rose to pre-eminence. By the late 9th century its princes had established their suzerainty over the other Russian principalities and founded the first Russian state. Kiev's wealth and importance derived chiefly from trade from Byzantium along the Dnieper and over portages to the rivers flowing to the Baltic, the so-called "Water Road from the Varangians to the Greeks."

At this time, according to the chronicles, there were 400 churches in Kiev. Throughout the period of Kievan Rus, the city was engaged in ceaseless struggle against the nomadic warriors of the steppes. Khazars, Pechenegs and Polovtsy. In the late 12th century its power declined in the face of constant nomad attacks and internecine warfare by the Russian princes, and in 1240 the city was overthrown and completely laid waste by the Tatars of the Golden Horde. under Batu, nephew of Genghis Khan. „Thereafter Kiev passed to the control of, first. Lithuania and. later. Poland. In 1648. the town was involved in the uprising of Ukrainian Cossacks under Chmielnicki (Bogdan Khmelnitski). With the suppression of the rising the Cossacks appealed to Moscow and. after a Russo-Polish war, in 1667 Kiev became the chief town of an autonomous Cossack state, oning suzerainty to Russia. In 1793 it was incorporated into Russia and became a provincial capital. In the 19th century Kiev began to grow in importance especially with the coming of the railways, to Moscow in 1863 and Odessa in 1870. In 1917 the Ukrainian S.S.R. was formed and in 1934 its capital was transferred to Kiev from Kharkov.

Folloning the destruction of World War II Kiev was rebuilt and most of the buildings are new, including the main shopping street. Kreshchatik. The new city has been attractively laid out with tree-lined streets and it is famous for its public gardens. The steep bank overlooking the Dnieper was made into a wooded park. On the outskirts are a huge forest-park and a permanent exhibition of the agriculture and industry of the Ukraine. Among the larger modern buildings are those of the supreme soviet of the Ukraine and the Ukrainian council of ministers. Survivals of Kiev's earlier history include the 11th-century St. Sophia cathedral, the 18th-century church of St. Andrew (both now museums) and the St. Vladimir cathedral, dating from the 19th century and renowned for its murals. Also of the 11th century are the ruins of the Golden gate of Kiev and the Pecherskaya Lavra. The Lavra. with its labyrinth of catacombs, is now partly a museum and partly in use as a monastery although its Uspenski cathedral was destroyed during World War II.

Beside its administrative function as a capital, Kiev has important industries. Engineering takes first place, including the production of machinery for a wide range of factories, river craft, tramcars, motorcycles, excavators. cables, electrical equipment and radios. The chemical industry makes paints and lacquers, pharmaceutical products and photographic materials. Consumer goods are important, particularly textiles and footwear. In Darnitsa is one of the largest artificial textile mills of the Ukraine, employing more than 7.000 workers. Food production, printing, furniture making and other timber processing are also significant.

Kiev is a major communications centre, with railways to Moscow. Kharkov and the Donets basin (Donbas), Vinnitsa and Odessa and Brest. The Dnieper is crossed there by two railway bridges and a road bridge. The airport has services to the other republic capitals and to several east European countries. For nine months of the year, the Dnieper is navigable and there are regular passenger and cargo services.

The chief cultural centre of the Ukraine, Kiev is the seat of the T. G. Shevchenko State university (1834) and an academy of sciences (1919). There are many other higher educational establishments and a number of theatres, notably the Shevchenko Theatre of Opera and Ballet. *See* also Index references under "Kiev" in the Index volume. (R. A. F.)

KIKUYU (*pl.* Akikuyu, correctly Gikuyu and Agikuyu), a tribe of Bantu-speaking negroids inhabiting Kenya between 36° and 38° E., 0° and 2° S. According to the tribal analysis of 1948 they numbered 1,026,341 and were the largest tribe in Kenya, forming 19.5% of the colony's total African population. The tribe is divided into nine clans and the Kikuyu land unit is divided into three districts: Fort Hall. Kiambu and Nyeri. It is thought that the Akikuyu first settled in the Fort Hall district before the 16th century; there has been considerable intermarriage with the Wanderobo, an aboriginal tribe formerly occupying the area, and with the Masai. The Altikuyu are of medium height and slender build, with skins of varying shades of brown. Temperamentally they are cunning and suspicious. The Imperial British East Africa company set up the first post in Kikuyu territory at Dagoreti in 1890. Soon after, Christian missions established schools. The social organization was patriarchal and territorial units had a council of elders responsible for law and religious observances. Religion was threefold: animistic, with belief in a supreme god (Ngai); worship of ancestral spirits; and worship of the spirits of trees, rocks and epidemic diseases. Initiation rites took place at adolescence. Medicine men (workers in white magic and herbal remedies) had an important function in the tribe.

Predominantly an agricultural people, the Kikuyu nevertheless attach great importance to owning stock. and cattle. goats and sheep were regarded as currency. Crops are planted twice yearly during the rains and are mainly tended by the women. The circular huts are made from poles and thatched. The older men and women were still wearing skins and numerous ornaments of beads and metal at mid-20th century, but European clothes had been adopted by the younger generation. In 1922 the first political organization, the Kikuyu Central association: was formed; it was concerned chiefly with grievances over land and was banned for subversive activities during World War II. Unrest culminated in the Mau Mau movement in 1952.

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KILDARE, EARLS OF: *see* FITZGERALD.

KILDARE, a county of Ireland in the province of Leinster, bounded west by County Leix (formerly Queen's County) and County Offaly (formerly King's county), north by Meath. east by Dublin and Wicklow, and south by Carlow. The land area is 654 sq.mi. Pop. (1956) 65,915. The greater part of the county is formed of gray Carboniferous Limestone, well seen in the flat land about Clane. Along the southeast the broken ground of Silurian shales forms the higher country, rising toward the Leinster chain, the granite core of which appears in the south around Castledermot. A parallel ridge of Silurian rocks rises from the plain north of Kildare town, with some Old Red Sandstone on its flanks, to the Hill of Allen (676 ft.) and Chair of Kildare. The low ground is diversified by eskers and masses of glacial gravel, notably at the dry sandy plateau of the Curragh; but in part it retains sufficient moisture to form extensive bogs. The principal rivers are the Boyne, which with its tributary .the Blackwater rises in the north of the county, but soon passes into Meath; the Barrow, which forms the boundary of Kildare with Co. Leix, and receives the Griese and the Lerr shortly before leaving Kildare; the Lesser Barrow, which flows southward from the Bog of Allen to near Rathangan; and the Liffey, which enters the county near Ballymore Eustace, and flowing northwest and then northeast quits it at Leixlip, having received the Morrel between Celbridge and Clane, and the Ryewater at Leixlip. Trout are taken in the upper and lower waters, and there are salmon reaches near Leixlip.

According to the Book of *Leinster,* the original name of Kildare was *Druim Criaidh* (Drumcree), which it retained until the time of St. Brigid (Bridget), after which it was changed to *Cill* Dura, "the church of the oak," from an old oak under whose shadow the saint had constructed her cell. Kildare was a liberty of Dublin until 1296, when it was constituted a separate county.

There are several large standing stones, the principal being those at Punchestown, Harristown, Jigginstown and Mullaghmast. Among remarkable earthworks are the raths at Mullaghmast, Knockaulin near Kilcullen and Xrdscull near Athy, and the numerous sepulchral mounds in the Curragh. Of the round towers the finest is that of Kildare; there are remains of others at Taghadoe, Old Kilcullen, Oughterard and Castledermot. There are remains of a Franciscan abbey at Castledermot. At Graney are ruins of an Augustinian nunnery and portions of a building said to have belonged to the Knights Templars. The town of Kildare has ruins of four monastic buildings, including the nunnery founded by St. Brigid. The site of a monastery at Old Kilcullen, said to date from the time of St. Patrick, is marked by two stone crosses, one of which is curiously sculptured. On the Liffey are the re-

mains of Great Connel abbey near Celbridge, of St. Wolstan's near Celbridge, and of New abbey. At Moone, uhere there was a Franciscan monastery, are the remains of an ancient cross with carved panels. Among castles may be mentioned those of Athy and Castledermot, built about the time of the Anglo-Norman invasion; Maynooth castle, built by the Fitzgeralds; Kilkea, restored within the 19th century; and Timolin, erected in the reign of King John.

Largely because of the vast extent of bog, the climate of the northern districts is moist and fogs are frequent, but the eastern portion is drier and the climate of the Liffey valley is mild and healthful. The soil is principally a rich deep loam inclining occasionally to clay. easily cultivated and very fertile if properly drained About 40,000 ac. in the northern part of the county are included in the Bog of Allen, which is, however, intersected in many places by elevated tracts of firm ground. To the east of the town of Kildare is the Curragh (*q.v.*), an undulating down of more than 4.800 ac. in extent. The most fertile and highly cultivated districts of Kildare are the valleys of the Liffey and a tract in the south watered by the Griese. The demesne lands along the valley of the Liffey are finely wooded. The pastures which are not ploaed are generally rich. Wheat is grown sparsely, but oats. barley, beets, turnips and potatoes are all considerably cultivated. Cattle and sheep are grazed extensively. Of the former, crosses with the shorthorn or the Durham are the commonest breed. Leicesters are the principal breed of sheep. Poultry farming is a growing industry. Turf production by Bord na Mona (a statutory corporation whose main function is to produce turf for the nation) is done on a huge scale in the county and provides seasonal employment for several thousands, who are accommodated in hostels adjacent to the bogs. Other chief industries in Co. Kildare are ropemaking, cutlery, asbestos cement, wallboard, and frozen meat factories, as well as a small cotton mill and several corn mills.

The lines of the Midland Great Western railway follow the northern boundary of the county, with a branch to Edenderry, and those of the Great Southern cross the county by way of Newbridge and Kildare. with southward branches to Naas (and Tullow, Co. Carlow) and to Athy and the south. The northern border is traversed by the Royal canal, which connects Dublin with the Shannon at Cloondara. Farther south the Grand canal, which connects Dublin with the Shannon at Shannon harbour, occupies the valley of the Liffey until at Sallins it enters the Bog of Allen and passes into Co. Offaly near the source of the Boyne. Several branch canals afford communication with the southern districts.

Kildare constituency returns three members to *dail eireann.*

(J. A. O'H ; X.)

KILDARE, a market town and the county town of Co. Kildare, Ire., 35 m i W.S.W. of Dublin by road. Pop. (1956) 2,617. There is a Protestant cathedral church, the diocese of which was united aith Dublin in 1846. St. Brigid (Bridget) founded a religious community at Kildare in the 5th century. The cathedral of St. Brigid suffered at the hands of the Danes and the Irish and during the Elizabethan and Cromwellian wars. Extensive restoration was begun in 1875. Close to the church are an ancient cross and a round tower (105½ ft.) with a doorway showing Romanesque ornament. There are remains of a 13th-century castle and monastery. Kildare was incorporated by James II. There are peat-moss works and a wallpaper factory.

At Tully, 2 mi. S., is the Irish National Stud.

KILHAM, ALEXANDER (1762–1798), English Methodist, aas born at Epworth, Lincolnshire, on July 10, 1762. He was admitted by John Wesley in 1785 into the regular itinerant ministry. He became the leader and spokesman of the democratic party in the Connection which claimed for the laity the free election of class leaders and stewards, and equal representation uith ministers at conference. They also contended that the ministry should possess no official authority or pastoral prerogative, but should merely carry into effect the decisions of majorities in the different meetings. Kilham further advocated the complete separation of the Methodists from the Anglican Church. In the violent controversy that ensued he wrote many pamphlets; for this he was arraigned before the Conference of 1796 and expelled, and he then founded the Methodist New Connection (1797, merged since 1907 in the United Methodist Church).

KILIAN (CHILIAN, KILLIAN), **ST.,** British missionary bishop and the apostle of eastern Franconia, where he began his labours toward the end of the 7th century. According to Hrabanus Maurus Kilian was a native of Ireland, whence with Coloman and Totman he went to eastern Franconia. After having preached the gospel in Wurzburg, the whole party were put to death by the orders of an unjust judge named Gozbert. The relics of the three martyrs are venerated in the cathedral of that town. His festival is on July 8.

See *Acta Sanctorum,* Julii, vol. ii, 599–619; F. Emmerich, *Der heilige Kilian* (Wurzburg, 1896); J. O'Hanlon, *Lives of the Irish Saints,* vol. vii, 122–143 (Dublin, 1875–1904); A. Hauck, *Kirchengeschichte Deutschlands,* 3rd ed., vol. i, 382 *seq.*

KILIMANJARO, a mountain in East Africa on the borders of Kenya and Tanganyika, its centre lying in lat. 3° 5′ S. and long. 37° 23′ E.; the highest summit of Africa, rising as a volcanic cone from a plateau of about 3,000 ft. to 19,340 ft. With Mt. Kenya (*q.v.*), 200 mi. to the north, and Mt. Meru, 25 mi. due west, it stands on a line of volcanic cones. Kilimanjaro lies on an east-to-west fault, which is crossed by others. The volcanic rocks composing it are of kenyte (trachydolerite) covered by nephelinephonolite.

The major axis of Kilimanjaro runs almost east and west; it has two principal summits, Kibo (west) the higher, and Mawenzi (east) (17,564 ft.) which is the older core of a former summit, the crater walls having been removed by denudation. Contrasting with the jagged rocks of Mawenzi, which has no icecap, the truncated cone of Kibo appears from the plains below as a smooth, snow-covered dome. Hidden below the rim. however, is a vast *caldera* inside which is a secondary and very recent cone with its own small crater. The *caldera* is rimmed with large and disjointed glaciers, the remains of a once unbroken icecap. remnants of which survive as isolated blocks within the crater. Because of the effects of strong solar radiation and the bare lava at their foot, the ice walls are subjected to vertical weathering which gives them a fluted appearance; this type of pillar structure and *nieve penitente* formation is characteristic of Kibo. During the last pluvial period in Upper Pleistocene times, the glaciers descended to 11,000 ft.; at present ice extends to 15,000 ft. on the southwestern slopes, but scarcely below the summit on the dry northern side. Although Mawenzi is 524 ft. higher than Mt. Kenya, unlike the latter it has no permanent ice and sno ; this is because the base of Kilimanjaro rises abruptly from arid, low-lying plains. whereas the base of Mt. Kenya is at a far higher elevation. Glaciers on Kilimanjaro are melting fast; aerial photographs taken in 1943 and 1950. for example, show an astounding deterioration. It is estimated that they will disappear entirely within a century or two from lack of nourishment. This retreat of the glaciers is due not only to lack of snowfall but also to increased volcanic activity. The *caldera* is partly surrounded by extensive sulphur beds and active fumaroles. No reference had been made to thermal activity until 1927, possibly because the fumaroles were then masked by greater amounts of ice and snow. It was not until 1942 that unmistakable signs of activity were observed.

The crater walls of Kibo are highest on the south, where the rim sinks about 600 ft. to the interior. On the west the rim is breached by one of the glaciers. Connecting the peaks of Kibo and Mawenzi is a saddle (14,000 ft.), below which the mountain slopes in a typical volcanic curve to the plains below. The heavily eroded rocks of Mawenzi form stupendous walls and precipices; on the eastern side, there is an abrupt fall of about 6,500 ft. to a vast ravine. The southern and eastern slopes of the mountain generally are furrowed by ravines, occupied by streams which feed the Pangani river and Lake Jipe (south) and the Tsavo (east). Like other high mountains of East Africa, Kilimanjaro presents well-defined zones of vegetation. The lower slopes are arid and scantily covered with scrub, but between 4.000 and 6,000 ft. on the south side the slopes are well watered and heavily cultivated by the industrious and prosperous Chagga people. The forest zone on the

south extends between about 6,500 ft. and 9,500 ft., but in the north it is narrower and in the northwest, the driest quarter of the mountain. it almost disappears. Above the forest is open moorland, marked by giant lobelias and tree-groundsel extending to 15,700 ft. on the sheltered southwestern flank of Mawenzi, though elsewhere vegetation grows only in dwarfed patches beyond 13,000 ft.

Johannes Rebmann of the Church Missionary society discovered Kilimanjaro in 1848. Visits to the mountain were paid by Baron Karl von der Decken (1861 and 1862), Charles New (1867), Joseph Thomson (1883), Sir H. H. Johnston (1884) and others. The mountain was studied by Hans Meyer, who made four expeditions to it, accomplishing the first ascent to the summit with L. Purtscheller in 1889, and by F. Jaeger (1907). Important additions to knowledge of Kilimanjaro were made by R. Reusch (1927), J. J. Richard (volcanological observations, 1942–43) and Lieut. Com. P. C. Spink (measurements of the retreat of glaciers during World War II).

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(S. M. C.)

KILIN or CH'-I-LIN, one of the four symbolical creatures which in Chinese mythology is believed to keep watch and ward over the celestial empire. It is a unicorn. portrayed in Chinese art as having the body and legs of a deer and an ox's tail. Its advent on earth heralds an age of enlightened government and civic prosperity. It is regarded as the noblest of the animal creation and as the incarnation of fire, water, wood, metal and earth. It lives for a thousand years, and is believed to step so softly as to leave no footprints and to crush no living thing.

KILKENNY, a county of Ireland in the province of Leinster and territory of Ossory is situated on the southeastern fringe of the central plain. It is bounded north by Leix, east by Carlow and Wexford, south by Waterford and west by Waterford and Tipperary. Pop. (1956) 64,089. Land area 795.9 sq.mi. The principal rivers are the Barrow, the Suir and the Nore, all with alluvial soils along their banks.

The Barrow forms the boundary with Wexford and part of Carlow, the Suir forms the boundary with Waterford. Roughly two-thirds of the county is of limestone origin. There are coal measures beneath the moorlands in the northeast. Good loam covers the limestone.

At Kiltorcan, near Ballyhale, are quarries which yielded many plant fossils from the fine greenish-yellow flaggy sandstone of Devonian age. Associated with the flora is the earliest known fresh-water mollusc *Archanodon* **jukesii.** Dunmore cave, 7 mi. N. in the limestone, has large stalagmite chambers; human bones have been found there.

Tradition has it that King Eaneus minted silver coin and manufactured silver armour 679 years before the Christian era at Magh Airgid Ros (the Plain of the Silver Wood) which extends through Freshford and Rathbeagh. In the middle of the 16th century lead was mined in large quantities; a lead mine about a mile from Stoneyford contained a percentage of silver. Iron ore, coal and other minerals were mined in Castlecomer between 1620 and 1740; in the worked-out Jarrow Channel coal seam, an assemblage of amphibian fossils was discovered. Anthracitic coal is worked in the area.

Kilkenny means the church or cell of St. Canice who founded his cell and church on the site of the present St. Canice's cathedral. The first record of the name dates to 1085 when the kings of Ossory ruled the territory. But after a battle in 1169 the king of Leinster wrested all their property from them. In 1170 Richard de Clare (Strongbow), earl of Pembroke (*q.v.*), came to Ireland and married Eva, the only child of the king of Leinster. Isabel, their daughter, who married William Marshal (created earl of Pembroke) in England in 1189, came with him to Kilkenny in 1191 to enter into possession of the vast estates of Ossory, Kilkenny was erected into one of the counties of Leinster in 1210 but for centuries before that date it was a place of great importance having in it the see of Ossory founded by St. Kieran in the 5th century.

There are many prehistoric remains in the county, such as the Iron Age fort at Freestone Hill, built on the site of a Bronze Age burial mound, Ogham stones, incised Celtic crosses, cromlechs and souterrains. At Harristown in the south is one of the largest dolmens in Ireland; it is called *Leac an Scail,* which means "flagstone of the warrior." Of the numerous old castles, some were built by the Irish and some by the Anglo-Normans. There are five round towers, one adjoining St. Canice's cathedral in the city of Kilkenny and the others at Tullaherin, Kilree, Fertagh and Aghaviller. Freshford has a perfect example of Hiberno-Romanesque doorway and at Knocktopher are the remains of a Carmelite priory founded in 1356. Thomastown, founded early in the 13th century by Thomas FitzAnthony, has many historical remains and at Jerpoint are some of the finest Cistercian ruins in Ireland; the abbey was founded in 1158 by Donough MacGillapatrick, king of Ossory. Graiguenamanagh has the remains of a Cistercian abbey founded in 1204 by William Marshal, earl of Pembroke. There are the remains of an Augustinian monastery at Inistioge and of Augustinian priories at Callan and Kells. The ruins of the ancient Collegiate church at Gowran have been incorporated into a Protestant church and at Ballyragget, a historic town on the Nore, are remains of an Ormonde castle. Barley, wheat, oats, potatoes. turnips, mangels and sugar beet are grown. Wheat and sugar beet acreages increased considerably after World War II and the southwestern end of the county is noted for apple growing. The principal breeds of cattle used for dairying and beef production are Shorthorns and Herefords and a small number of Aberdeen Angus. The breeding of thoroughbred horses is carried on to a limited extent. Sheep, pigs and poultry are raised.

Linen manufacture, introduced in the 17th century, has long been extinct but the woollen trade is carried on to a moderate extent. The black marble for which Kilkenny was, until recent years, famous, is no longer worked, because of a falling demand. The brewing of ale from local barley, corn milling, bacon curing, tanning and the manufacture of boots and shoes are the chief industries.

For parliamentary purposes Co. Kilkenny is united with the adjoining Co. Carlow to form one constituency, returning five members to *dail eireann.* For local government and all administrative purposes, Co. Kilkenny is a separate entity.

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(M. E. S.)

KILKENNY, a city and municipal borough and the capital of Co. Kilkenny, Ire., on both banks of the Nore, 73 mi. S.W. of Dublin by road. Pop. (1956) 10,607. The ancient capital of the kingdom of Ossory, as *Cill Chainnigh* ("the church of St. Canice"), Kilkenny in Norman times had two townships: Irishtown, which had its charter from the bishops of Ossory and was governed by a portreeve, and Englishtown, which was established by William Marshal, earl of Pembroke (*q.v.*), and had its charters from the earls marshal; in 1609 it was raised to the status of a city. Irishtown and Englishtown were united under the Municipal act of 1843.

The castle stands on an eminence 100 ft. over the Nore; its site had been chosen by the kings of Ossory for a palace. Strongbow occupied the castle soon after his marriage to Eva, daughter of the king of Leinster. It was burned in 1175 but was rebuilt about 1192 by Strongbow's son-in-law, William Marshal. In 1391 the 3rd earl of Ormonde bought the castle which has remained with the Butler family, though it is uninhabited. Its collection of historical documents is in the National library at Dublin. There were many parliaments held in Kilkenny, from 1293 to 1408. The Confederation of Kilkenny represented the native Irish and the Anglo-Norman Catholics and functioned as an independent Irish parliament for six years; the first meeting was in May 1642. Oliver Cromwell attacked Kilkenny in 16jo and the town surrendered on honourable terms.

St. Canice's cathedral (Church of Ireland) was begun *c.* 1192 and is believed to occupy the site of a 6th-century church founded by St. Canice. It is of considerable size (226-ft. long) and has within its walls both a chapter house and a chapel of the Blessed Virgin. In the nave and choir are sepulchral monuments of famous churchmen and noblemen. The round tower close to the south transept is over 100-ft. high. St. Canice's library has many 16th- 17th-century books. The bishop's residence was founded about 1360. The Roman Catholic cathedral of St. Mary (1843–57) is a cruciform building with a 200-ft.-high tower. A Dominican "Black abbey," founded by William Marshal in 1225, is still used but a Franciscan abbey, founded by Marshal in 1234 on the banks of the Nore, is in ruins. The churches of St. Mary and St. John (both Church of Ireland) date to the 13th century. The Tholsel (1761) is used for corporation meetings, and among its valuable books is the *Liber Primus* (c. 1230); Shee's almhouses date from 1594; Grace's Old castle was built in 1210 and is now used as a court house.

Opposite the castle is the Protestant college of St. John, founded in the 16th century, where Jonathan Swift, William Congreve, George Farquhar, and George Berkeley received part of their education. St. Kieran's Roman Catholic seminary, founded in 1782, is in a large 19th-century building.

Kilkenny is a market centre and railhead for rich agricultural country. The local black marble is no longer quarried.

(M. E. S.)

KILKENNY, STATUTE OF, the name given to a body of laws promulgated in 1366 with the object of strengthening the English authority in Ireland. In 1361, Edward III sent his second son. Lionel, duke of Clarence, who was already married to an Irish heiress, to represent him in Ireland. From the English point of view the country was in an unsatisiactory condition. Lawless and predatory, the English settlers were hardly distinguishable from the native Irish, and the authority of the English king over both had almost vanished. Lionel and his advisers summoned a parliament to meet at Kilkenny early in 1366 and there the statute of Kilkenny was passed into law. It began by relating how the existing lawlessness was due to the malign influence of the Irish and, like Magna Carta. its first positive provision declared that the church should be free. As a prime remedy for the prevailing evils all marriages between the two races were forbidden. Englishmen must not speak the Irish tongue. nor receive Irish minstrels into their dwellings, nor even ride in the Irish fashion; while to give or sell horses or armour to the Irish was made a treasonable offense. Moreover English and not the Brehon law was to be employed, and no Irishman could legally be received into a religious house: nor presented to a benefice. The statute also contained clauses for compelling the English settlers to keep the laws. For each county four wardens of the peace were to be appointed. while the sheriffs were to hold their tourns twice a year and were not to oppress the people by their exactions. An attempt was made to prevent the emigration of labourers, and finally the spiritual arm mas invoked to secure obedience by threats of excommunication. The statute, although continually re-enacted represents an ideal rather than a practical legislative measure, and under the conditions then prevalent in Ireland little could be done toward carrying out its provisions.

The full text is published in the *Statutes and Ordinances of Ireland John to Henry V*, by H. *F*. Berry (1907). *See* also *E*. Curtis, *Mediaeval Ireland,* pp. *283–286* (1923).

KILLALA, a small town on the north coast of Co. Mayo, Ire., 78 mi. N. of Galway by road. Pop. (1951) 337. It was for centuries a bishop's see, the foundation being attributed to St. Patrick. The Protestant cathedral church of St. Patrick is a plain 17th-century structure with a souterrain in the graveyard. A round tower, 84 ft. in height, stands on a hill. Near the Moy river. south of Killala. are the abbeys of Moyne and Roserk. both Decorated in style and both possessing fine cloisters. At Rathfran, 2 mi. N., is a Dominican abbey (1274), and in the neighbourhood are stone circles, cromlechs, raths and an inscribed Ogham stone: 12-ft. high. Killala gives its name to a Roman Catholic diocese with its seat at Ballina. Once prosperous. Killala has largely lost its trade to Ballina and its population has decreased. In 1798 French troops landed in Killala bay and after some successes were forced to retreat.

KILLALOE, a town of Co. Clare, Ire., at the lower extremity of Lough Derg, at the foot of the Slieve Bernagh mountains 14 mi. N.E. of Limerick by road. The town is connected with Ballina (Co. Tipperary) by a bridge of 13 arches. Pop. (1951) 901. The cathedral of St. Flannan (Church of Ireland) occupies the site of a 6th-century church founded by St. Molua. The present building is mainly of the 12th century and has a Romanesque doorway. An ancient oratory in the churchyard is said to date from the period of St. Molua. Near Killaloe stood Brian Boru's palace of Kincora, the capital of the kings of Munster. Slate is quarried and there are textile industries. Killaloe is a centre for rough shooting and for fishing on Lough Derg and gives its name to Catholic and Protestant dioceses. The level of Lough Derg has been raised by embankments and a weir built below Killaloe for the Shannon hydroelectric station.

KILLARNEY, a market town of Co. Kerry. Ire.. 191 mi. S.W. of Dublin by road. Pop. (1951) 6,298. The Roman Catholic cathedral for the diocese of Kerry. built by A. W. Pugin, is in the town. The only manufactures carried on at Killarney are woollen goods, boots and fancy goods from local arbutus wood; the town owed its origin to iron-smelting works.

The lakes of Killarney, about $1\frac{1}{2}$ mi. from the town and surrounded by mountains. are famed for their beauty. The Lower lake, or Lough Leane (5,001 ac.), is studded with islands. mostly rich in vegetation; on the largest of these. Ross island, are the ruins' of Ross castle, a fortress of the O'Donoghues, and on another, the "sweet Innisfallen" of Thomas Moore, are the ruins of a 6th-century abbey founded by St. Finian. Between the Lower lake and the Middle or Muckross lake (680 ac.) stands Muckross abbey, built by Franciscans about 1440. The Long Range; a winding, wooded channel, leads to the Upper lake (430 ac.). Deer and goats wander through the lakeside woods. Notable ruins and remains, besides Muckross and Innisfallen, include the 12th-century church (formerly a cathedral) and a round tower at Aghadoe; and the Ogham cave of Dunloe. a souterrain containing inscribed stones. The waters of the neighbourhood provide trout and salmon. Much of the Killarney moods. known chiefly for the wild arbutus growing there, is in the Muckross national park (10,000 ac.).

KILLDEER, the commonest American plover, so called in imitation of its whistling cry. About the size of a snipe, it is sooty-brown above, but with cinnamon on the tail coverts, and a white wing bar; beneath it is white except for two black pectoral bands. It is the largest of the ringed plovers and is assigned to the genus *Charadrius*. Wintering in the south or on the seashore, in spring it spreads over the interior, breeding on plowed lands or grass fields. The nest is in a slight hollow, and is often surrounded with small pebbles and fragments of shells. There the hen lays her four pear-shaped, stone-coloured eggs, always arranged with their pointed ends touching each other. The killdeer (C. *vociferus*) ranges over most of Canada across the United States to lower California, central Mexico, the Gulf coast. Florida, the Bahamas. and with a separate race (C. *v. ternominatus*) in the Greater Antilles and another (C. *v. peruvianus*) on the coast of Peru. Northern birds winter from southern British Columbia and the northern U.S. to the West Indies and northern South America.

(G. F. Ss.)

KILLER WHALE, another name for the grampus (*q.v.*). The false killer (*Pseudorca* crassidens) is readily distinguished by being completely black. instead of having white underparts. It is of very irregular occurrence. In 1861, a hundred grounded at Kiel; a few were seen in European waters in the following year, and its next appearance in this region mas in 1927, when about 12 j were stranded in Scotland.

KILLIECRANKIE, a pass in Perthshire. Scot., $3\frac{3}{4}$ mi. N.N.W. of Pitlochry. Beginning close to Killiecrankie station it extends southward to the bridge of Garry through a narrow, wooded glen. in which flows the Garry. A road runs up the pass. and between this and the river is the railway. The battle of 1689 between the Jacobites. under Viscount Dundee (Graham of Claverhouse), and the royal force, led by Gen. Hugh Mackay, though named from

the ravine, was not fought in the pass. Mackay's troops had marched through it to take up a position in the valley, but before they had time to do so, the Highlanders fell upon them, driving many back into the pass where they were killed or drowned. Viscount Dundee was killed: however, and his death deprived the Jacobites of any hope of final success. (G. S. P.)

KILLIGREW, SIR HENRY (d. 1603), English diplomatist, was the fourth son of John Killigrew of Arwenack. He became M.P. for Launceston in 1553. He lived on the continent during Mary's reign but returned to England when Elizabeth I came to the throne and served the queen as a diplomatist. He was employed on a mission to Germany, and in conducting negotiations with Mary, queen of Scots in Scotland. In 1572 he was M.P. for Truro. He was knighted in 1591, and after other diplomatic missions he died early in 1603. Many of Sir Henry's letters on public matters are in the record office, London, and in the British Museum. He married Catherine (d. 1583). daughter of Sir Anthony Cooke.

SIR ROBERT KILLIGREW (*c.* 1579–1633), son of Sir William Killigrew, M.P. (d. 1622). was a member of all the parliaments between 1603 and 1633. A man of some scientific knowledge, he had been in the habit of supplying powders to Robert Carr, earl of Somerset, and it was alleged, though without certainty, that the powder administered to Sir Thomas Overbury came from him. He died early in 1633, leaving five sons, three of whom attained some reputation.

KILLIGREW, THOMAS (1612–1683), English dramatist and wit, son of Sir Robert Killigrew, was born in Lothbury, London, on Feb. 7, 1612. Sir John Mennis says that as a boy he satisfied his love of the stage by volunteering at the Red Bull to take the part of a devil, thus seeing the play for nothing. In 1633 he became page to Charles I. In 1641 he published two tragi-comedies, *The Prisoners* and *Claracilla,* both of which had probably been produced before 1636. In 1647 he followed Prince Charles into exile. At the Restoration he became groom of the bedchamber to Charles II, and later chamberlain to the queen. He received in 1660, with Sir William Davenant, a patent to erect a new playhouse, the performances in which were to be independent of the censorship of the master of the revels. This caused a dispute with Sir Henry Herbert, then holder of the office, but Killigrew settled the matter by generous concessions. He acted independently of Davenant, his company being known as the King's Servants. They played at the Red Bull, until in 1663 he built for them the original Theatre Royal in Drury Lane. In 1664 his plays were published. One of them, *The Parson's Wedding* (acted *c.* 1640, reprinted in the various editions of Dodsley's Old *Plays* and in the *Ancient British Drama*) is an unsavoury play. which displays nevertheless considerable wit, and some of its jokes were appropriated by W. Congreve. It was revived in 1664 and 1672 or 1673, all the parts being in both cases taken by women. Killigrew succeeded Sir Henry Herbert as master of the revels in 1673. He died at Whitehall on March 19, 1683. His son Thomas (1657–1719) was the author of a successiul little piece, *Chit-Chat* (1719).

Killigrew enjoyed a greater reputation as a wit than as a dramatist. Sir John Denham said of him:

> Had Cowley ne'er spoke, Killigrew ne'er writ,
> Combined in one, they'd made a matchless wit.

Many stories are related of his bold speeches to Charles I. Pepys (Feb. 13, 1668) records that he was said to hold the title of king's fool or jester and that he might revile or jeer anybody, even the greatest, without offense.

See R. Flecknoe, ***The Life*** *of Tomaso* ***the Wanderer,*** reprinted from the original of 1667 by G. Thorn-Drury (London, 1925).

KILLIN, a village of Perthshire. Scot., at the southwestern end of Loch Tay, 45 mi. W. of Perth by road. Pop. (1951) 1,199. The village is near the confluence of the Dochart and Lochay rivers where they enter Loch Tay, and is a tourist and winter sports centre. Near Killin a stone marks the site of Fingal's grave. An island in the Dochart. which is crossed at Killin by a bridge of five arches, is the ancient burial place of the clan MacNab. Finlarig castle. a ruin that contains the ancient beheading pit with its chains and is described by Sir Walter Scott in *The Fair Maid* of *Perth,* was a stronghold of the Campbells of Glenorchy, earls of Breadalbane. The Lochay rises in the hills beyond the forest of Mamlorn and has a course of 15 mi. The Dochart flows from Loch Dochart northeast for 13 mi. to Loch Tay.

KILLIS or KILIS, a town of Gaziantep il, Turkey, 60 mi. N. of Aleppo near the boundary of Syria. By the Franco-Turkish Convention of May 30, 1926, it was assigned to Turkey.

The country around is extremely fertile; olives especially are cultivated. The population in the 1960 census was 33.289 (Circassians, Turks, Arabs). Killis is in the area served by the Baghdad railway and lies also on the highway from Aleppo to Aintab and Birejik.

See E. Honigmann, "Killiz" in Encyc. *Islam* (bibl.).

KILLYBEGS, a fishing port in County Donegal, Ire.. 17 mi. W. of Donegal by road and standing on a fine natural harbour. Pop. (1956) 990. In 1952 the wooden pier was replaced by a reinforced concrete structure and the harbour was deepened. Killybegs is Ireland's major fishing port and has facilities for handling, processing and marketing fish. It has also a flourishing boatbuilding industry and carpet factory for Donegal carpets. In the inside wall of St. Mary's Catholic church is a remarkably sculptured slab, said to be the tombstone of Niall Mor MacSwyne.

KILLYLEAGH, a small seaport town of County Down, Northern Ire.. on the western shore of Strangford lough, 21 mi. S.E. of Belfast by road. Pop. (1961) 1,876. Linen manufacture is the principal industry and agricultural produce is exported. The castle, largely of the 19th century, incorporates a 13th-century tower and other portions duplicated in 1666 after damage caused by Gen. George Monk (1648). The town was incorporated by James I. Sir Hans Sloane was born at Killyleagh in 1660.

KILMAINE, CHARLES EDWARD (1751–1799), French general, was born at Dublin on Oct. 19, 1751. In 1762 he went with his father to France, where he changed his name from Jennings to Kilmaine. after a village in Mayo. He entered the French army in 1774, and afterward served as a volunteer in the navy (1778), fighting in Senegal. He took part in the War of American Independence (1780–1783), rejoining the army on his return to France. In 1791 he was recalled to active service and rose rapidly to the rank of lieutenant general (1793). He distinguished himself in the wars on the northern and eastern frontiers but aroused suspicion by his foreign birth and his relations with England. He was suspended from Aug. 4, 1793 until 1795. He took part in the Italian campaigns of 1796 and 1797, and was made commandant of Lombardy. He afterward received the command of the cavalry in Bonaparte's "army of England" and was commander-in-chiei during the absence of Desaix (1798). He died on Dec. 15, 1799.

KILMALLOCK, a market town in the "Golden vale" of County Limerick, Ire., 134 mi. S.W. of Dublin by road. Pop. (1956) 1.238. The name means "the church of Mochaellog." a' saint who founded an abbey there in the 7th century. It received a charter in the reign of Edward III when it was walled and fortified with four gates, one of which remains. Its fortifications were mostly demolished by order of Oliver Cromwell. The church of SS. Peter and Paul belonged to a former abbey, and its northwest tower is a converted round tower. The 13th-century Dominican abbey has Early English remains. The history of Kilmallock is closely linked with that of the Fitzgerald family, earls of Desmond. Eight miles from the town is Lough Gur, near which are stone circles and other prehistoric remains.

KILMARNOCK, a large burgh of Ayrshire, Scot., on Kilmarnock water, a tributary of the Irvine, 21 mi. S.S.W. of Glasgow by road. Pop. (1961) 47,509. Area 5.7 sq.mi. Though the town has many industries. it still possesses the core of "the streets an' neuks of Killie" celebrated by Robert Burns. The chief buildings are the Court house, the Palace theatre (with the Albert tower, 110-ft. high). the academy where Sir Alexander Fleming, discoverer of penicillin, was educated, the Dick institute (containing a public library, a museum and art gallery) and the Laigh kirk, with its high plain tower (1410), a building. like the Angel hotel, associated with Burns. In Kay park (30¼ ac.). purchased from the duke of Portland. stands the Burns memorial, consisting of two stories and a tower, and containing a museum in which have been

placed many manuscripts and relics of the poet and the McKie library of Burns's books. A marble statue of the poet, by W. G. Stevenson, stands on a terrace on the southern face. The first edition of Burns's poems was published in Kilmarnock in 1786. A Reformers' monument was unveiled in Kay park in 1885. Dean castle, to the north of the town, which was burned down in 1735, was restored in 1915.

Kilmarnock rose into importance in the 17th century by its production of striped woollen "Kilmarnock cowls" (Scotch bonnets), and afterward acquired a name for its carpets, which it still maintains. A large modern factory, completed in 1952 at Burnside, makes carpets which are sent all over the world. In the town, hosiery. bonnets and Madras muslin are made and there are auxiliary industries such as dyeing and wool scouring. Kilmarnock is also known for its engineering, especially locomotives, bearings and hydraulic equipment; its whisky blending (established there in 1820 by Johnny Walker, a grocer); the manufacture of boots and shoes; and its dairy produce.

Alexander Smith, the poet (1830–67), whose father was a lace-pattern designer, and Sir James Shaw (1764–1843), lord mayor of London in 1806, to whom a statue was erected in the town in 1848, were natives of Kilmarnock. The town dates from the 15th century, and in 1591 was made a burgh of barony under the Boyds, the ruling house of the district. The last Boyd who bore the title of Lord Kilmarnock was beheaded on Tower hill, London, in 1746, for his share in the Jacobite rising. The town was formed into a parliamentary burgh in 1832 and was extended by nearly 2,000 ac. in 1933.

KILMER, (ALFRED) JOYCE (1886–1918), U.S. poet whose "Trees" became one of the most widely known poems of the 20th century, was born at New Brunswick, N.J., on Dec. 6, 1886, and educated at Rutgers (New Brunswick, N.J.) and Columbia universities (A.B., 1908). His first volume of verse. *Summer of Love* (1911), was extremely derivative, with heavy echoes of Yeats and the Irish poets. After his conversion to Catholicism he modeled his poetry upon that of Coventry Patmore and the 17th-century metaphysical poets, although his work retained many of the characteristics of his previous journalistic verse.

His most famous poem, "Trees," appeared in *Poetry* magazine in 1913; its combination of sentiment and simple philosophy made it an immediate — and continuing — popular success. Kilmer subsequently repeated the formula with poems such as "Stars," "Roofs," "The Snow Man" and "Roses," none as popular. His works include: *Trees and Other Poems* (1914); *The Circus and Other Essays* (1916); *Main Street and Other Poems* (1917); and *Literature in the Making* (1917), a series of interviews with writers. He edited, in 1917, an anthology of modern Catholic poetry called *Dreams and Images.*

Kilmer mas killed in action during World War I near the village of Seringes, France, on July 30, 1918, and was posthumously awarded the Croix de Guerre.

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KILN, a place for burning, baking or drying. Kilns may be divided into two classes — those in which the materials come into actual contact with the flames, and those in which the furnace is beneath or surrounding the oven. Limekilns are of the first class, and brickkilns, pottery kilns, etc., of the second, which also includes places for merely drying materials, such as hop kilns, usually called oasts, or oasthouses.

KILSYTH, a small burgh of Stirlingshire, Scot., on the Kelvin and south of the Kilsyth hills, 13 mi. N.N.E. of Glasgow by road. Pop. (1951) 9,922. The chief industries are coal mining, the manufacture of coffin furniture, knitwear and revolving blackboards and cotton thread spinning. There are remains of the wall of Antoninus south of the town, and to the north the ruins of the old castle. The Colzium-Lennox estate (c. 50 ac.). a park, lies east of the town. Kilsyth dates from the middle of the 17th century and became a burgh of barony in 1826. It was the scene of the marquess of Montrose's defeat of the Covenanters on Aug. 15, 1645.

KILT, properly the short loose skirt or petticoat, reaching to the knees and usually made of tartan, forming part of the dress of a Scottish Highlander *(see* DRESS). The word means that which is "girded or tucked up," and is probably of Scandinavian origin (*cf.* Danish *kilte,* to tuck up). The early kilt was not a separate garment but was merely the lower part of the plaid, in which the Highlander wrapped himself.

KILWA, a seaport and district of Tanganyika, East Africa, about 200 mi. south of Zanzibar; in lat. 8° 45' S., long. 39° 25' E. Pop. of Kilwa district (1957) 88,628; of the town 2,760 (African only). There are three Kilwas: Kilwa Kivinje ("Kilwa of the casuarinas") on the mainland; Kilwa Kisiwani ("Kilwa on the island"), an ancient town on an island off the coast about 18 mi. S. of Kilwa Kivinje; and Kilwa Masoko, a new station carved out of the bush, on the mainland opposite Kilwa Kisiwani, on a bluff overlooking one of the finest natural harbours in East Africa. Kilwa Kivinje has no harbour but has a smooth shelving shore on which dhows can conveniently be beached. It is stated by Sir Richard Burton that about 1830 the people of Kilwa Kisiwani migrated to the mainland and founded Kilwa Kivinje because of the unwelcome attention of British warships engaged in suppressing the slave trade. On Kilwa Kisiwani the ruins of an ancient city include massive walls and bastions, remains of a palace and of two mosques and several forts. Pieces of Chinese celadon ware, in astonishing profusion, are to be found on the beach, and coins from the Kilwa mint are readily obtainable from the local people. On the island of Songo Mnara nearby are the ruins of another city unknown to history. Fragments of palaces and mosques in carved limestone exist, and on the beach, hidden by mangroves, are remains of a lighthouse. Chinese coins, dated A.D. 713 and 1201, and pieces of porcelain have been found on the seashore. The sultanate of Kilwa is reputed to have been founded about A.D. 975 by Ali bin Hasan, a Persian prince from Shiraz. The state extended its influence to the islands nearby and thence along the coast from Zanzibar to Sofala, and the city came to be regarded as the capital of the Zenj empire *(see* ZANZIBAR: *History).* An Arab chronicle lists more than 40 sovereigns who reigned at Kilwa in a period of 500 years. (J. P. MT.; X.)

KILWARDBY, ROBERT (d. 1279), archbishop of Canterbury and cardinal. studied at the University of Paris, where he soon became famous as a teacher of grammar and logic. He joined the order of St. Dominic, and was chosen provincial prior of his order in England in 1261, and in Oct. 1272 Pope Gregory X terminated a dispute over the vacant archbishopric of Canterbury by appointing Kilwardby. In 1278 Pope Nicholas III made him cardinal-bishop of Porto and Santa Rufina; he resigned his archbishopric and left England, carrying with him the registers and other valuable property belonging to the see of Canterbury. He died in Italy on Sept. 11, 1279. Kilwardby was the first member of a mendicant order to attain a high position in the English Church. Among his numerous writings, which became very popular among students, are *De ortu scientiarum, De ternpore, De Universale,* and some commentaries on Aristotle.

See N. Trevet, *Annales sex regum Angliae,* ed. by *T.* Hog (London, 1845); W. F. Hook, *Lives of the Archbishops of Canterbury,* vol iii (1860–76); J. Quetif and J. Échard, *Scriptores ordinis Predicatorum* (Paris, 1719–21).

KILWINNING, a small burgh and market town of Ayrshire, Scot., on the right bank of the Garnock, 24 mi. S.W. of Glasgow by road. Pop. (1951) 6,552. The ruined abbey, originally one of the richest in Scotland, was founded about 1140 by Hugh de Morville, lord of Cunninghame, for Tyronensian monks of the Benedictine order, and was dedicated to St. Winnin, who lived there in the 8th century and after whom the town was named. The abbey. a beautiful specimen of Early English architecture, was largely destroyed in 1561, and its lands were granted to the earl of Eglinton and others. Kilwinning is the traditional birthplace of Scottish freemasonry, the lodge, believed to have been founded by the foreign architects and masons who came to build the abbey, being regarded as the mother lodge in Scotland. Fairs and an annual cattle show are held in the town, the industries of which are farming. textiles and general works. Eglinton castle (1798), 1½

mi. S.E.. was the scene in 1839 of the Eglinton tournament, an attempted revival of ancient chivalry; it is now a ruin. and a factory is housed in the stables.

KIMBERLEY, JOHN WODEHOUSE, 1ST EARL OF (1826–1902), British statesman, the colonial secretary after whom the town of Kimberley, U. of S. Af., was named, was born in London on Jan. 7, 1826. He was the grandson of the and baron W'odehouse, whom he succeeded in 1846. Educated at Eton and at Christ Church, Oxford, he adopted his family's Whig attitude to politics and took office under Lord Aberdeen and Lord Palmerston as undersecretary of state for foreign affairs (1852–56 and 1859–61). From 1856 to 1858 he was envoy extraordinary to Russia and in 1863 was sent on a special mission to Copenhagen, Den.. in the forlorn hope of finding a peaceful solution of the Schleswig-Holstein question. He was made lord lieutenant of Ireland in 1864, retaining the post until the fall of the Liberal government in 1866, when he was created earl of Kimberley. He entered Gladstone's first cabinet in 1868 as lord privy seal but in 1870 was transferred to the colonial office, where he remained until 1874, an efficient if not a memorable colonial secretary. His second term at the colonial office (1880–82) was less fortunate; essentially a man of peace, he had the misfortune to be involved often in violent actions, and showed lack of resolution in his South African policy. He was secretary of state for India. 1882–86. and again during 1892–94, when he was also lord president of the council, and was one of the few Liberal peers who wholeheartedly supported Gladstone. Kimberley was leader of the Liberal party in the house of lords from 1891 to 1894, when he became foreign secretary, and again from 1897 until his death. In this position he acted with undeviating dignity. and in opposition (1895 onward) he showed himself to be a courteous antagonist and a critic of weight and experience. He was for many years a member of the senate of London university, and became its chancellor in 1899. He died in London on April 8, 1902, and was succeeded by his only surviving son.

KIMBERLEY, city, famed for its diamond mining industry, important railway and commercial centre; principal town of the northern Cape of Good Hope province, S.Af., altitude 4,012 ft., lying 17 mi. from the Vaal river and 647 mi. from Cape Town. Pop. (1960) 73,655.

Kimberley was founded in 1870 by diggers who discovered diamonds on the farms. There were at first three distinct mining camps, one at Dutoitspan. another at De Beers (called De Beers Rush or Old De Beers) and the third at the Colesberg Ropje (called De Beers New Rush or New Rush). The Colesberg Ropje mine was in July 1873 renamed Kimberley in honour of the then secretary of state for the colonies, the 1st earl of Kimberley, by whose direction the mines were—in 1871—taken under the protection of Great Britain. Kimberley was also chosen as the name of the town into which the mining camps developed. In 1880 the town was incorporated in Cape Colony. Among those early attracted to Kimberley were Cecil Rhodes and "Barney" Barnato, who in time came to represent two groups of financiers controlling the mines. The amalgamation of their interests in 1888—when the De Beers group purchased the Kimberley mine for £5,338,650—put the whole diamond production of the Kimberley fields in the hands of one company, the De Beers Consolidated Mines. Ltd.. so named after the former owners of the farm on which are situated the chief mines. Kimberley in consequence became largely dependent on the good will of the De Beers corporation.

In 188 j the railway connecting Kimberley with Cape Town was opened bringing new importance to the town. Besieged during the South African War (1899–1902), the city held out from Oct. 1899 until Feb. 15. 1900 (126 days), in the face of near starvation and shelling until relieved by Gen. Sir John French. The borough of Kimberley and the adjoining diamond mining township of Beaconsfield were amalgamated in 1912 and granted city status.

The famous Big Hole, the former Kimberley mine. is situated in close proximity to the centre of the city and an "Early Kimberley" museum has been established at the observation post. The Big Hole is the largest man-made crater in the world and is one of the major tourist attractions of South Africa. Cultural amenities include two public libraries, one covering among the finest Africana collections in Southern Africa, an art gallery, museum. Bantu gallery and theatre. The Duggan Cronin Bantu gallery is fast becoming world-renowned for its unique Bantu photographs and records of native tribal customs now extinct the majority of the photographs and curios being irreplaceable. The McGregor museum contains many interesting Bushman relics and prehistoric fossilised remains.

While much of the irregular layout still remains, fascinating from the historic viewpoint but a problem under modern conditions, the new townships embody all the principles of modern town planning and much is being done to widen streets and provide new through roads in the business area. A former slum area known as the Malay camp was demolished and a civic centre was created on the valuable land thus acquired.

While the diamond mining industry still plays an important part in the life of the city, the development of secondary industries and the exploration of the vast mineral and agricultural resources of its hinterland have placed Kimberley on a prosperous economic basis and its development during postwar years has been unprecedented in its history. The mining of base minerals has developed phenomenally and in 1950 their value for the area alone exceeded £5,000,000.

Large irrigation settlements were established at Riet river and Vaal Hartz.

KIMCHI (KIMHI), the family name of three Jewish grammarians and biblical scholars who worked at Narbonne in the 12th and 13th centuries.

JOSEPH KIMCHI (c. 1105–1170), a native of southern Spain, settled in Provence, where he was one of the first to set forth in Hebrew the results of Hebraic philology as expounded by the Spanish Jews in Arabic. His acquaintance with Latin grammar led him to divide the Hebrew vowels into five long vowels and five short, previous grammarians having simply spoken of seven vowels without distinction of quantity. His grammatical textbook, *Sefer Ha-Zikkaron,* "Book of Remembrance" (edited by W. Bacher, 1888), was marked by methodical comprehensiveness and introduced into the theory of the verbs a new classification of the stems which has been retained by later scholars. In the more ample *Sefer Ha-Galuy,* "Book of Demonstration" (edited by Matthews. 1887), he attacked the philological work of the Frenchman R. Jacob Tam, who espoused the antiquated system of Menahem b. Saruq, and this he supplemented by an independent critique of Menahem. This work is a mine of varied exegetical and philological details.

He also wrote commentaries on various scriptural books, those on Proverbs and Job being published. He composed an apologetic work *Sefer Ha-Berith* ("Book of the Bond"), and translated into Hebrew the ethico-philosophical work of Bahya ibn Paquda ("Duties of the Heart").

MOSES KIMCHI (d. c. 1190), son of Joseph, was the author of a Hebrew grammar, *Mahalak Shebile Ha-daat.* He was the first to make the verb *paqadh* a model for conjugation, and the first also to introduce the now usual sequence in the enumeration of stem forms. In the first half of the 16th century it became the favourite manual for the study of Hebrew among non-Judaic scholars (1st edition, Pesara, 1508). Of his Biblical commentaries, those on Proverbs, Ezra and Nehemiah are in the great rabbinical bibles falsely as the work of Abraham ibn Ezra.

DAVID KIMCHI (c. 1160–1235), also known as REDAK, was also a son of Joseph; he eclipsed the fame both of his father and his brother. His magnum opus is the *Sefer Miklol,* "Book of Completeness," uhich covers the grammar (first printed in Constantinople, 1532–4) and the lexicon, *Sefer Hashorashim,* "Book of Roots" (first printed in Italy before 1480). In the grammar he combined the paradigmatic method of his brother Moses with the procedure of the older scholars who devoted attention to details. In his dictionary, again, he recast the lexicological materials independently and enriched lexicography itself, especially by his numerous etymological explanations.

Under the title *Et Sofer,* "Pen of the Writer," David composed a sort of grammatical compendium as a guide to the correct punc-

tuation of the Biblical manuscripts; it consists mainly of extracts from the *Miklol.* His Biblical commentaries include those on Chronicles, on the Psalms, on the prophets and on Genesis. His annotations on the Psalms are especially interesting for the polemical excursuses directed against the Christian interpretation; his commentary on Genesis (edited by A. Giinsburg, 1842) explains Biblical narratives as visions.

The popularity of his Biblical exegesis is demonstrated by the fact that the first printed texts of the Hebrew Bible were accompanied by his commentary.

KIMERIDGIAN: *see* JURASSIC SYSTEM.

KIMMEL, HUSBAND EDWARD (1882–), U.S. naval officer, was born Feb. 26, 1882, in Henderson, Ky., and graduated from the United States Naval academy in 1904. He became a rear admiral in Nov. 1937 and commanded cruiser divisions until his appointment as commander in chief of the U.S. fleet, with the rank of admiral, on Feb. 1, 1941. He was in command at Pearl Harbor, Hawaii, at the time of the surprise attack by Japanese carrier-based planes on Dec. 7, 1941, and was relieved of his command on Dec. 17. He was retired two months later.

Admiral ***Kimmel's*** *Story* was published in 1955. (J. B. HN.)

KIN, a coliective word for persons related by blood, as descended from a common ancestor. In law, the term "next of kin" is applied to the person or persons who, as being in the nearest degree of blood relationship to a person dying intestate, share according to degree in his personal estate. ***See*** INTESTACY; INHERITANCE; KINSHIP; LAW OF SUCCESSION.

KINCARDINESHIRE, the southernmost county of the three which form the northeastern corner of Scotland. It comprises 19 parishes and has an area of 378.8 sq.mi. Population (excluding that part of Aberdeen city which is part of Kincardineshire) (1951) 27.882. Kincardineshire's outline is an irregular triangle. with the northeastern angle near Greg Ness, south of the Dee river, the southern angle at the mouth of the North Esk, and the western angle between Mount Battock and the Hill of Cammie. where the boundaries of Forfarshire. Aberdeenshire and Kincardineshire meet. It has a coastline of about 35 mi. Apart from a small portion to the west. Kincardineshire was formerly bounded on all sides by water—the North sea on the east, the North Esk to the southn-est. and the Aven, Feugh and Dee to the northwest and north. There are two anomalies in the county boundary—at Banchory and at Aberdeen, the former having taken place in 1646 and the latter in 1935. In the case of the former the Aberdeenshire estate of Leys was, by special act of parliament, transferred to Kincardineshire, its Burnett laird having inherited the barony of Muchalls in that county. while the latter—a small area—was by act of parliament transferred to the rapidly expanding royal burgh of Aberdeen. Kincardineshire is frequently referred to as the Mearns. The etymology of Mearns is obscure as 'is the origin of the word Kincardine. It is believed to be derived from two Gaelic words *ceann* and *garradh,* meaning the "headfield" (the last cultivated part before the mountains are reached), and the word Kincardine occurs in different parts of Scotland where such conditions exist.

Physical Features.— The county of Kincardine is divided into two nearly equal parts—a wild and rugged highland region to the northwest and a rich lowland region to the southeast. Much of the county's charm is due to this division and of course to its maritime type of scenery for which it is justly renowned. The Grampians (*q.v.*) stretch through the whole breadth of the county from east to west. They comprise an area of approximately 120 sq mi. of rugged moorland. the principal heights being Mount Battock (a. jj5 ft.), Clachnaben (1,944 ft.), Kerloch (1,747 ft.), Hound Hillock (1,698 ft.), Whitelaws (1.664 ft.), Cairn-o'Mounth (1.488 ft.), the Hill o' Fare (1,54j ft.), and Cairnmonearn (1,245 ft.).

The climate is bracing and the rainfall. when compared nith the west coast of Scotland, is relatively small. With the exception of the Dee and the North Esk. which belong only in part to Kincardineshire. the rivers are small. The Dee is 96 mi. from its source to the sea and the North Esk is 40 mi. There is now only one natural loch in the county—the Loch of Loirston (27 ac.)

Kincardineshire is of special interest to geologists for it contains the "Highland fault" which forms the geographical boundary between the Highlands and the Midland valley of Scotland. The scenery is varied; it has wide expanses of lush, gently undulating farmland. great hills. shady woods and stretches of desolate moorlands. The Howe o' the Mearns district, an area of about 50 sq.mi., possesses unusual charm for there the soil has a red appearance—popularly known as the "Mearns Keel"—which is due to the underlying clay. Kincardineshire's towns and villages are considered to be characteristically Scottish in flavour and are largely of local stone.

History.— The history of the county of Kincardine is of particular interest. It is accepted that the Roman legions of Severus passed (c. A.D. 208–11) through the county although the events connected with this invasion are still obscure. The line of the Roman march through Kincardineshire may be determined by the remains of their encampments—at Fordoun, at Raedykes near Stonehaven. and at Normandykes across the Dee at Peterculter. The Romans are also credited with building the ford over the Dee at Tilbouries. Originally. Kincardineshire formed part of southern Pictavia and from an early period the Scottish kings had a stronghold at the ancient burgh of Kincardine from which the county derives its name. The remains of the royal castle of Kincardine can still be seen. In 1296. during the Wars of Independence. Edward I of England passed through the county halting at Glenbervie, Kincardine and Durris. Kincardineshire was also the scene of the battle of Corrichie fought in 1j6z on the southeastern slopes of the Hill o' Fare between the forces of hlary, queen of Scots. and the earl of Huntly. After the coronation of Charles II in 1651, the "Honours" of Scotland—the crown, the sceptre and the sword —were deposited for safekeeping in Dunnottar castle, south of Stonehaven. Dunnottar castle figured again in history in the year 168j when, during the scare of the 9th earl of Argyll's invasion, 16; Covenanters were imprisoned there and suffered much privation. During the Jacobite risings of 171j and 1745 Kincardineshire came into prominence again. In 171j. the Old Pretender visited Fetteresso castle near Stonehaven and was proclaimed King James VIII by the earl marischal of Scotland. while in 1745 the duke of Cumberland and his army marched through the county burning the episcopal chapels as he went—Stonehaven. Drumlithie and Muchalls.

Kincardineshire is rich in buildings of architectural interest and these include St. Ternan's church at Arbuthnott (1276), and the ruinous churches of Cowie (1276), Fetteresso (1246) and Maryculter (1240). Of the castellated buildings. mention should be made of Balbegno, Benholm, Crathes, Dunnottar. Durris, Muchalls and Tilquhillie. The later houses include Arbuthnott, the Burn, Glenbervie, Kincausie. Netherley and Phesdo.

At Blairs. in the parish of Maryculter, stands the Roman Catholic college of St. Mary. The college possesses many interesting relics and works of art including the famous portrait of Mary, queen of Scots.

Agriculture, Industries and Communications.— Much of the county of Kincardine is occupied by grouse moors and about 13% is n-ooded, but the land by the Dee. the Howe o' the Mearns and along the coast is scientifically farmed and yields well. Of the total area. 115,000 ac are devoted to the growing of crops. rotation grass and permanent grass. In "soil power" the county occupies a high place as revealed by the estimated yields of such crops as oats and potatoes. Almost a third of the arable and grass area is devoted to oats and more than a fourteenth to potatoes. Over 2,400 persons are employed on the farms. Apart from agriculture, the principal industry is fishing of which Stonehaven is the centre, the salmon fisheries of the sea and rivers yield substantial returns. hlanufactures are relatively small; woollens are made in Stonehaven, and flax is spun at Inverbervie and Johnshaven. There are also a large distillery and a tannery at Stonehaven.

The Deeside railway runs through that portion of the county on the north bank of the Dee; another line runs to Aberdeen via Laurencekirk and Stonehaven.

Population and Administration.— At the 1951 census the

population was 2j.882 and Gaelic was spoken by 78 persons (41 males and 37 females) all of whom spoke English. There are four small burghs: Banchory (pop., 19j1, 1,960), Inverbervie (88j), Laurencekirk (1,485) and Stonehaven (4,436). There are five county districts. The only royal burgh is Inverbervie. The counties of Angus and Kincardine together send four members to parliament, two of these representing the city of Dundee. Kincardineshire is united in one sheriffdom with the shires of Aberdeen and Banff. and one of the Aberdeen sheriffs-substitute sits at Stonehaven, the county town since 1600.

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KINDERGARTEN, the name given by Friedrich Froebel (*q.v.*) to an institution founded by him in Blankenburg, Germany, in 1837, to meet the educational needs of children between the ages of four and six years, through the agency of play. Froebel was at this time a teacher of varied experience whose training had included study at the University of Jena and Pestalozzi's school at Yverdun. From these he had gained a knowledge of the principle of evolution, and from it had drawn the conclusion that education is, in essence. the guidance of children's development from stage to stage, and that the chief agency in that development is their spontaneous play activity. He therefore concluded that the early years are of strategic importance, and that the work of these should receive careful attention. He had tried to improve the work of his boys at Keilhau but felt that they lacked the foundation which they might have had if the earlier years had been utilized.

Froebel had long wished to organize a program of activities for a group of children of preschool age, when the opportunity to do so came to him through his appointment to the directorship of an orphanage in Burgdorf, Switzerland, in 1835. Here he experimented with a group of young children, working out with them games, songs, marches, handwork and other play forms. He also devised a progressive series of play materials from which the children might gain certain definite ideas, and by means of which they might give expression to others. For the first he selected a set of six soft balls, one of each of the six colours; for the second, a wooden sphere, cube and cylinder; for the third, a two-inch cube divided into eight smaller cubes; and for the fourth, a two-inch cube divided into eight oblong blocks, two inches long, one inch wide and half an inch thick. The fifth and sixth were three-inch cubes with more complex sub-divisions for building purposes. All of these were contained in boxes appropriate to their sizes and shapes. The remaining playthings in the series consisted of wooden tablets of different sizes and shapes; sticks of different lengths; and rings of different diameters. To distinguish these from other play material Froebel named those in this series "gifts" and the flexible material that accompanied them, "occupations."

The success of this experiment assured Froebel that he was working along right lines and he therefore left Burgdorf in 1837, and settled in Blankenburg. Here a little later he announced the opening of "a school for the psychological training of little children by means of play and occupations." To this the name "Kindergarten," meaning "a garden of children," was given in 1840.

The new institution attracted numerous visitors, and through these and Froebel's demonstrations and lectures, soon became well known. It continued in operation until 1844, when it was merged with the school at Keilhau, and Froebel's training classes moved to Liebenstein, and later to Marienthal. Here his work was continued until his death in 1852. The number of Kindergartens that had been established at this time was quite small—probably less than 20. His work was carried on, however,—at first through his ablest co-workers—Madame Froebel, his widow, the Baroness von Marenholtz-Biilow, his most brilliant pupil, and Fraulein Henrietta Breyman, his grand-niece. Madame Froebel built up a strong training centre in Hamburg. The baroness lectured in practically all the countries of Europe, and established a training school in Berlin.

Fraulein Breyman supervised kindergartens in Belgium and Switzerland, and (as Frau Schroder) later established the Pestalozzi-Froebel Haus in Berlin. In Italy the kindergarten was introduced by Madame Salis-Schwabe. The movement gained favour everywhere, and during the 25 years after Froebel's death, kindergartens had been established in the leading cities of Germany, Great Britain, Holland, Belgium, Switzerland, Austria, Hungary, Canada, Japan and the United States. (N. C. V.)

THE UNITED STATES

The kindergarten for children below the traditional school entrance age of six years is a generally accepted first unit of elementary schools in the United States.

By the 1950s, education laws of all but one of the states and of the Canal Zone and the Virgin Islands had authorized local public school officials to include kindergartens in the elementary schools.

Enrolment in U.S. public school kindergartens increased from 613,213 in 1940 to 733,974 in 1945 and to 1,122,000 in 1951. These figures represented approximately a third of the children reported enrolled in any one of the primary school grades, so it was apparent that the kindergarten was not yet fully included in the public school program throughout the state and local school districts. Kindergartens were, however, increasing in number. This increase was brought about most effectively when parents and other interested groups petitioned the school authorities for these added services, and when they worked for bond issues to finance this extension in education.

The terms "nursery school" and "kindergarten" cannot be defined solely on the basis of the ages of the attendant children. The range of ages in the nursery school is usually from three to five years, and for the kindergarten from four to six years. Though the terms are overlapping, the programs follow accepted principles governing child growth and child development.

Adequate standards for the operation of kindergartens are developed both by professional groups of educators and by local school authorities. These standards include essentials for the educational program: the equipment, the conditions of health and safety as well as the qualifications of teachers and the ratio of children per teacher.

Standards for the professional preparation of teachers are set up by school laws of the several states, and in many instances standards for teaching are required by municipal regulations. Teachers of young children are expected to meet the same academic requirements as teachers of older children, and in addition they must satisfy requirements in their field of specialization. This professional preparation is available from teachers colleges and universities of every state. The institutions are administered by both public and private agencies and meet the required state standards of operation.

Kindergartens are subject to state laws and municipal regulations. State education laws affecting privately conducted schools for children under the age of six years prescribe a wide variety of procedures. In the early 1950s, for example, in three states the private schools had to register with the state department of education and the teacher's professional preparation had to be certified before he or she was authorized to conduct a school. In t o other states privately administered schools were invited to register and such co-operative arrangements for registration were made in a few other states by departments of education and child health. Both public and private school staff members might receive counsel and assistance from specialists in early childhood education who were staff members of the state departments of education, or of state and local colleges and universities.

State supervisors and directors of elementary education work co-operatively with local school administrators for the improvement of schools for young children. Toward this end the supervisors, in co-operation with the United States office of education, formed a National Council of State Consultants.

State departments of education and individual school systems also prepared guides for teachers and introductory school leaflets for parents explaining standards of operation and the education program for young children.

Teachers of young children in the United States also formed two national professional organizations, the Association for Childhood Education, International, first organized in 1892 as the International Kindergarten Union; and the National Association for Nursery Education, initiated in 1926. (M. D. D.)

GREAT BRITAIN AND OTHER COUNTRIES

Emphasis was laid by the followers of Froebel in England on the choice and variety of material and on detailed study of the individual both by educational toys and by careful observation of the effect of giving children freedom to develop. The influences of the doctrines of Froebel, however, gradually extended far beyond the kindergarten proper. They profoundly affected the education of young children in all countries modifying existing practices in infant schools and combining with newer influences to create other schools of a fresh and thoroughly modern type. The term came to be loosely used in Great Britain and elsewhere either of method, when speaking of the infant school, or as descriptive of the preliminary classes attached to the preparatory department of the ordinary secondary school. *(See* INFANT SCHOOLS; SCHOOL AND CURRICULUM.)

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KINDI, AL- (*i.e.,* YAKUB IBN ISHAK AL-KINDI; 9th century A.D.), the first outstanding Islamic philosopher, called "the philosopher of the Arabs," was of noble Arabic descent and flourished in Iraq under the caliphs al-Ma'mun (813–833) and al-Mu'tasim (833–842). He was evidently appreciated as a philosopher at court. He seems to have died some time after 870. His influence and authority were great for about a century after his death but were then definitely overshadowed and superseded by later philosophers. The Latin scholastic philosophers knew a few of his treatises in translation *(see* texts ed. by A. Nagy, Munster, 1897).

The titles of more than 270 works by al-Kindi are known; and a considerable number of these works (mostly short treatises) are extant and have been identified as his. Al-Kindi concerned himself not only with various philosophical questions such as had been treated by the Aristotelian Neoplatonists of Alexandria but also with miscellaneous subjects; for instance, astrology, medicine, Indian arithmetic, logogriphs, the manufacture of swords and the art of cookery. He also discussed specific Islamic issues.

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KINEMATICS, the branch of mechanics which discusses the phenomena of motion without reference to force or mass; Gr. Κίνημα, motion.

See MECHANICS; MATHEMATICAL MODELS.

KINETICS, the branch of mechanics which comprises the phenomena of motion as affected by force; it is the modern equivalent of dynamics in the restricted sense (see MECHANICS).

KINETIC THEORY OF **MATTER.**—The kinetic theory of matter rests upon two distinct but closely related hypotheses, the hypothesis of the molecular structure of matter and the hypothesis that heat is a manifestation of the random to-and-fro motion of the molecules.

In the beginning the hypothesis of the molecular structure of matter merely asserted that all matter is composed of very small particles, which later came to be known as molecules. Soon after 1800 it was recognized that each chemical element consists of small particles that are all exactly alike; these were called atoms. It was concluded further that most molecules consist of two or more atoms in close combination. In the case of such compound molecules, motions of the atoms within the molecules must also be taken into account in considering the heat energy of matter.

The heat motion of the molecules is especially simple in matter that is in the gaseous state. At normal temperature and pressure the density of a substance in the gaseous state is of the order of one-thousandth of the density of the same substance in the solid or liquid state. It follows that the average distance apart of the molecules in the gaseous state is roughly ten times as great as in the solid or liquid state, and hence that in the gaseous state the molecules must be at distances apart which are large compared with their linear dimensions. If the molecules in the air at normal temperature and pressure were arranged in cubical order, the edge of each cube would be about 3.3×10^{-7} cm.; the average diameter of a molecule in air is 3.7×10^{-8} cm. Further important evidence as to the nature of the gaseous state of matter is provided by the experiments of J. P. Joule and W. T. Kelvin. *(See* VAPORIZATION: Modified *Joule-Thomson* ***Equation.)*** These experiments showed that when a gas is allowed to stream out into a vacuum, its change of temperature is in general very slight. In terms of the molecular theory this indicates that the total energy of the gas is very approximately equal to the sum of the separate energies of its different molecules; the potential energy arising from intermolecular forces between pairs of molecules may be treated as negligible when the matter is in the gaseous state.

These two simplifying facts bring the properties of the gaseous state of matter within the range of mathematical treatment. The kinetic theory of gases attempts to account, in terms of the molecular structure of matter, for all the nonchemical and nonelectrical properties of gases. A brief statement of the methods and results of the kinetic theory of gases will be given first, to be followed by a brief consideration of the kinetic theory of matter in the solid or liquid state.

The Kinetic Theory of Gases.—One of the earliest triumphs of the kinetic theory was its explanation of the laws which had been found to connect the density, pressure and temperature of a gas. The kinetic theory regards a mass of gas as a collection of independently moving molecules; if these are shut up in a closed vessel, molecules must continually collide with the walls of the vessel, exerting pressure at the moment of collision, and the kinetic theory interprets the pressure of the gas as the aggregate of the pressures exerted by the various molecules when they collide with the boundary. A quantitative relation between the pressure and the molecular velocities is easily obtained.

Calculation of the Pressure in a Gas.—The molecules of a gas will be moving in different ways, but they can be divided up into a system of showers, such that all the molecules in any one shower have approximately the same velocity and are moving in the same direction. Let u, v, w denote the components of the velocity of any molecule in three directions at right angles in space, and let us fix our attention on any one shower, whose molecules have components u_1, v_1, w_1. Let us consider the impact of the molecules of this shower upon an area S of the boundary of the containing vessel, and for simplicity let S be perpendicular to the direction of u. Then each molecule of the shower that strikes the area gives up momentum mu to it before its motion in the u direction is arrested, and as it rebounds with equal velocity it also acquires momentum mu in the opposite direction,

so that the total transfer of momentum is $2mu$. The number of molecules belonging to the shower which strike the area S in a small interval of time dt is equal to the number that lay within a distance u_1dt of S at the beginning of this interval and so occupied a small disk of volume Su_1dt of the gas. If there are ν_1 molecules in unit volume belonging to the shower, the number inside the disk was $Su_1\nu_1dt$.

Thus these molecules transfer momentum $2mu_1^2\nu_1Sdt$ to the area S of the boundary; and the total momentum so transferred by the molecules of all showers can be written

$$2m\ Sdt(\nu_1u_1^2+\nu_2u_2^2+\ldots.)$$

where the sum includes a term for each shower whose molecules are moving with a component u directed toward S. The sum can also be written $\frac{1}{2}\nu\ U^2$ where ν is the total number of molecules in unit volume and U^2 denotes the average value of u^2 for the different molecules; the factor $\frac{1}{2}$ is introduced because half of all the showers will be moving with a component u directed away from S and hence cannot contribute to the pressure on S. Or, let C^2 stand for the average value of $u^2+v^2+w^2$, or the square of the actual velocity, for all the molecules. Since as many molecules will be moving in one direction as in another, the average values of u^2, v^2 and w^2 will be the same. Hence $U^2=\frac{1}{3}\ C^2$; and the momentum transferred to the area S during the interval dt is $\frac{1}{3}\ m\nu SC^2dt$.

Since the momentum transferred must be equal to $pSdt$, where p is the pressure or force per unit area on the boundary, the value of p is

$$p=\tfrac{1}{3}m\nu C^2, \qquad (1)$$

or, since $m\nu$ is the total mass in unit volume and hence equals the density ρ, expressed in grams per cubic centimetre,

$$p=\tfrac{1}{3}\rho\ C^2. \qquad (2)$$

Since p and p can be measured for any gas, the value of C can be calculated. C is called the root-mean-square velocity of the molecules; the pressure would be the same as it actually is if all the molecules were moving with the velocity C. The distribution of the molecular velocities will be considered presently. Some values of C at 15° C. are as follows:

	Hydrogen	Air	Mercury vapour
C in cms. per sec.:	188,800	49,820	18,930
C in ft. per sec.:	6,190	1,634	621

The Gas **Laws.—It** was found by Boyle that as a gas is compressed without change of its temperature its pressure increases directly as its density. This conclusion follows from formula (2) if the assumption is made that C^2 depends only on the temperature. The latter assumption can be shown to be a consequence of the laws of dynamics.

Furthermore, it was shown by J. A. C. Charles and by J. L. Gay-Lussac that, when a gas is heated at constant volume, its pressure increases at a rate which is the same for all gases. The pressure increases, in fact, in proportion to the thermodynamic absolute temperature T, as can be shown by a thermodynamical argument. Thus the laws for a gas as established by observation can be expressed in the single formula

$$p=\rho\ RT \qquad (3)$$

where R is a constant depending upon the kind of gas, or, as the equation is more commonly written,

$$pv=RT \qquad (4)$$

where v equals $1/\rho$ and represents the specific volume or the volume of a gram. Let T be expressed in degrees centigrade.

Comparison of formulas (2) and (3) shows that

$$C^2=3\ RT \qquad (5)$$

Thus the average velocity of the molecules varies in proportion to the square root of the absolute temperature.

The Specific Heat.—The total kinetic energy of translation of all the molecules in unit volume is $\nu(\frac{1}{2}mC^2)$ or $\frac{1}{2}\rho C^2$ or $\frac{3}{2}\ \rho RT$. Since p represents the mass in unit volume, the energy in unit mass is $\frac{3}{2}\ RT$. This energy increases by the amount $\frac{3}{2}R$ when the temperature is increased by one degree. Hence the specific heat of a gas at constant volume should be $\frac{3}{2}\ R$, provided the molecules contain no variable energy other than that associated with the motion of translation.

The specific heat at constant volume is found by experiment to equal $\frac{3}{2}R$ or $\frac{3}{2}pv/T$ for helium and the other inert gases, whose molecules consist each of a single atom. For gases with polyatomic molecules, the specific heat exceeds $\frac{3}{2}R$ except at extremely low temperatures. The difference is ascribed to the existence of energy of rotation of the molecules, or of vibration of the atoms is gases having polyatomic molecules.

The Equipartition of Energy.—According to a famous principle known as the equipartition of energy, when a dynamical system is in statistical equilibrium at a given temperature T, the same amount of average kinetic energy is associated with each degree of freedom, *i.e.* each independent mode of motion of the system. A molecule in translation has three degrees of freedom corresponding to the three mutually perpendicular directions in which it can move independently. It follows that in gases composed of different kinds of molecules, the average translational energies of the molecules, or the values of $\frac{1}{2}mC^2$, should be the same for all the different kinds of molecules. When the molecules are actually mixed together, this conclusion can be verified by an analysis of the effects of their collisions with each other. Even if the different kinds of molecules are in different vessels, the same conclusion can be reached by a more abstruse argument based upon the Newtonian or "classical" laws of dynamics.

Since C^2 has been found to be proportional to the absolute temperature T, it is possible to write for the average translational energy of a molecule

$$\tfrac{1}{2}mC^2=\tfrac{3}{2}\ kT$$

where k is a constant of proportionality. The average kinetic energy for each degree of freedom, according to the principle of equipartition, is then a third of $\frac{1}{2}mC^2$ or $\frac{1}{2}kT$. Since C^2 also equals $3RT$, it is seen that $k=mR$. The numerical magnitude of k, which is known as the Boltzmann constant or the "gas constant for one molecule," is 1.38×10^{-16} in centimetre-gram-second units.

Soon after 1925, however, it came to be realized that the classical laws of dynamics represent only an approximation, which is close to the truth in dealing with masses that are sufficiently large, or moving sufficiently rapidly, or subjected to sufficiently weak forces. The classical laws, one of which has just been used in calculating the pressure in a gas, are sufficiently accurate for a description of the translational motion of the molecules in a gas; but they fail badly in dealing with the rotational and vibrational motions of the molecules. An adequate theory of the specific heat of gases composed of polyatomic molecules must be based upon the newer quantum or wave mechanics.

Counting the **Molecules.**—Since, as has just been seen, the quantity $\frac{1}{2}mC^2$ has the same value for all gases at a given temperature, it follows from formula (1) that the number of molecules in unit volume or ν is the same for all gases at the same temperature and pressure. This remarkable fact is known as Avogadro's law *(see* AVOGADRO'S CONSTANT.)

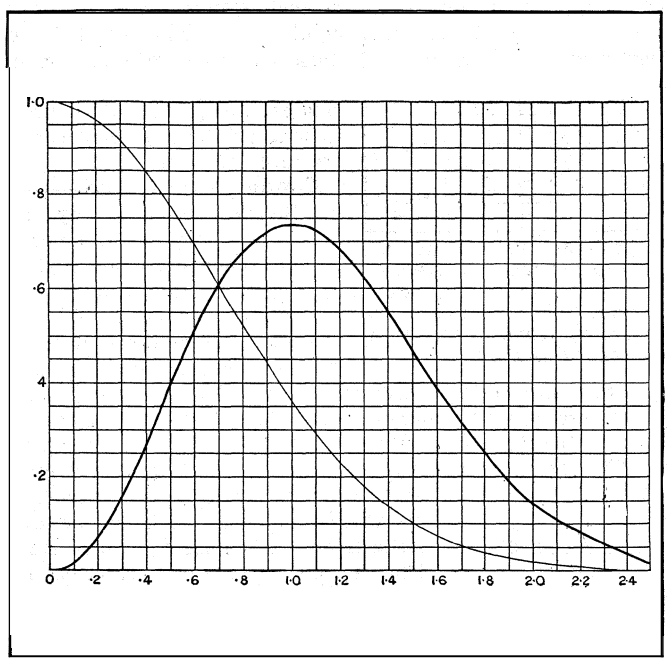
The kinetic theory of gases does not furnish any reliable method of ascertaining the numerical value of ν. The best method is to start from the well-attested fact that in electrolysis each atom of hydrogen carries an electric charge numerically equal to the charge on an electron which has been measured. The total amount of electric charge delivered by a gram of hydrogen in being deposited electrolytically is also known. *(See* ELECTRICITY, CONDUCTION OF: *Conduction* in *Liquids.)* The charge on a gram divided by the charge on an atom then gives the number of atoms in a gram of hydrogen; and this number, divided by 2, is the number of molecules in a gram of hydrogen gas. This number again, multiplied in turn by the density or the mass in unit volume, gives the number of molecules in unit volume or ν. It is thus found that in a gas under a pressure of one atmosphere and at a temperature of o°C.,

$$\nu = 2.69 \times 10^{19}.$$

In a similar way it is found that the number of molecules in a gram-molecule of any substance is $N_0 = 6.02 \times 10^{23}$. This is an enormous number.

The Law of Distribution of Molecular Velocities. — The molecules of a gas are not all moving with the same velocity. When the gas is at rest and free from disturbance, the effect of collisions between its molecules was shown by J. C. Maxwell and L. Boltzmann to be such that the molecular velocities soon come to be distributed in a definite manner. The gas is then in a steady or normal state. When this state has been attained, the statistical equilibrium is actually maintained in a very simple manner. Let us divide all possible velocities into distinct ranges a, b, c. . . . . When two molecules moving with velocities a,b collide, the collision changes the motion of both and they assume new velocities *p,q*. Thus the collision takes one molecule away from each of the classes *a,b* and adds one to each of the classes *p,q*. When the gas is in its steady state, there occur just as many collisions of the inverse type, in which a molecule is taken from each of the classes p,q and added to one of the classes *a,b*. The statistical effect of the collisions is thus nil.

The distribution of the molecular velocities in the steady state may be described as follows.



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FIG. 1.— KINETICTHEORY OF GASES. GRAPHS ILLUSTRATING THE LAW OF DISTRIBUTION OF VELOCITIES

Horizontal=values component of velocity. Vertical=number of rnolecuies in Maxwell's steady state. Thin curve=number of molecules in steady state for each value of velocity component. Thick curve=number of molecules in steady state for each value of the total velocity

Confining our attention to one component of velocity u, it is found that the values of u for the different molecules conform to what is called the lam of trial and error—they are distributed at random around the value $u = 0$ according to the same law that determines the distribution of shots around the middle point of a line-target. To express the result mathematically, if *u, v,* w denote the three components of velocity in three directions at right angles in space, then the number of molecules whose velocity is such that

u lies between u and $u+du$
v ,, ,, v and $v+dv$
w ,, ,, w and $w+dw$

is found to be

$$N\left(\frac{hm}{\pi}\right)^{\frac{3}{2}} e^{-hm(u^2+v^2+w^2)}\, du\, dv\, dw. \qquad (6)$$

Here N is the total number of molecules and m is the mass of each, while h is a constant, which will be found to depend on the temperature. This law is commonly known as Maxwell's law of distribution of velocities.

If we fix our attention on any one component of velocity, say *u,* disregarding the values of *v* and *w* entirely, it is found that the number of molecules for which this component lies between u and $u+du$ is

$$N\left(\frac{hm}{\pi}\right)^{\frac{1}{2}} e^{-hmu^2} du. \qquad (7)$$

This partition of values of *u* is shown graphically in the thin curve in fig. 1. The numbers along the horizontal axis represent values of u, and the corresponding height of the thin curve is proportional to the total number of molecules which have this particular value of *u* in Maxwell's steady state. The whole area of this curve is equal to $100\sqrt{\pi}$, or 177.25, of the small squares. Let us, for instance, suppose that each of these small squares represents a million molecules, then we find that in a gas of 177,250,000 molecules, rather less than 20,000,000 have values of *u* between 0 and 0.1, about 19,000,000 have values of *u* between 0.1 and 0.2 and so on, while less than a million have values between 1.7 and 1.8, and less than 40,000 have values between 2.4 and 2.5. These values of *u* are measured on an arbitrary scale which has not yet been determined. But whatever the scale on which *u* is measured, we see that high values of *u* are very rare, the majority of molecules keep to moderate values and the favourite value of all is zero.

In many problems the total velocity of a molecule is of greater importance than its individual components. If c^2 is written for $u^2+v^2+w^2$, so that *c* is the total velocity of a molecule, it can readily be deduced from formula (6) that the total number of molecules for which *c* lies between *c* and $c+dc$ is

$$4\pi N\left(\frac{hm}{\pi}\right)^{\frac{3}{2}} e^{-hmc^2} c^2 dc. \qquad (8)$$

This distribution of velocities is represented graphically by the thick curve in fig. 1. We see that both very high and very low values of c are now rare, the favourite value for c being unity.

From formula (8) it can be shown by integration that the average of the square of the velocity of the molecules, which was previously denoted by C^2, is also equal to $3/(2hm)$. Since $\frac{1}{2}mC^2$ also equals $\frac{3}{2}kT$ in terms of the Boltzmann constant k and the absolute temperature T, it follows that

$$h = \frac{1}{2kT}.$$

Dalton's Law. — Imagine that a gas consists of a mixture of gases of different kinds, so that unit volume contains a mass ρ_1 of one kind, ρ_2 of another and so on. The pressure on the boundary is now the sum of the pressures exerted by molecules of all kinds. The pressure exerted by the first kind is $\rho_1 RT$, that by the second kind is $\rho_2 RT$ and so on; hence the total pressure *p* is given by

$$p = \rho_1 RT + \rho_2 RT + \cdots = \rho RT$$

where p equals $\rho_1+\rho_2+\ldots$ . . . . and represents the total mass in unit volume. This formula shows that the pressure of a mixture of gases equals the sum of the pressures which would be exerted separately by the several constituents if each alone were present.

Brownian Movement. — From the value $k = 1.38 \times 10^{-16}$ it is readily calculated that a molecule, or aggregation of molecules, of mass 10^{-12} grams, ought to have a mean velocity of about 2 mm. a second at 0° C. Such a velocity ought accordingly to be set up in a particle of 10^{-12} grams mass immersed in air or liquid at 0° C., by the continual jostling of the surrounding molecules or particles. A particle of this mass is easily visible microscopically, and a velocity of 2 mm. per second would of course be visible if continued for a sufficient length of time. Each bombardment will, however, change the motion of the particle, so that changes are too frequent for the separate motions to be individually visible. But it can be shown that from the aggregation of these separate short motions the particle ought to have a resultant

motion, described with an average velocity which, although much smaller than 2 mm. a second, ought still to be microscopically visible. R. von S. Smoluchowski and Albert Einstein have shown that this theoretically predicted motion is simply that seen in the "Brownian movement" first observed by the botanist Robert Brown in 1827. From observations of the motion, values of v and N_0 can be deduced that are in fair agreement with those found by the method previously described. Thus the Brownian motion provides visual demonstration of the reality of the heat motion postulated by the kinetic theory. (See BROWNIAN MOVEMENT.)

Correction of the Gas Equation. — The laws which have just been stated are obeyed very approximately, but not with perfect accuracy, by all gases of which the density is not too great or the temperature too low. Van der Waals in 1873 ascribed the imperfections of the foregoing formula for the pressure to two causes:—

(a) the calculation has not allowed for the finite size of the molecules, and their consequent interference with one another's motion, and

(b) the calculation has not allowed for the attractive force between the molecules, which, although small, is known to have a real existence. The presence of this force results in the molecules, when they reach the boundary, being acted on by forces in addition to those originating in their impact with the boundary.

To allow for the first of these two factors, on the assumption that a molecule is a hard elastic sphere, Van der Waals found that v in formula (4) should be replaced by v − b where b is four times the aggregate volume occupied by all the molecules in a gram; while to allow for the second factor, on the assumption that the attraction is weak, he replaced p by $p+a/v^2$ where a is a new constant. He thus obtained for the pressure-volume relation the famous equation,

$$\left(p+\frac{a}{v^2}\right)(v-b)=\mathrm{RT},$$

which is known as Van der Waals's equation.

This equation has the great advantage that it predicts a general behaviour of gases under high pressure similar to that which is actually observed. (See LIQUEFACTION OF GASES.) Values can be assigned to a and b which make the equation fit the observations roughly, but it cannot be made to fit exactly for any gas.

Several reasons are recognized for the limited success of Van der Waals's equation. The principal one is that the molecules are not elastic solids and cannot even be said really to possess a definite size. When not too close together, two molecules attract each other; as they approach, this attraction increases to a maximum, then decreases to zero and is replaced by a rapidly mounting repulsion. Because of this strong repulsion when close together, the molecules behave in many respects as if they were hard objects having a certain size and shape. The equivalence is not exact, however, and no simple formula can be written to represent exactly the relation between p,v and T. In dealing with certain other phenomena in gases it is convenient to make the same arbitrary assumption that the molecules are small elastic spheres. The properties of such an elastic-sphere gas can then be deduced, and they are found to agree in large measure, although never exactly, with the properties of actual gases.

The Free Path in a Gas.—Let us regard each molecule of a gas provisionally as a small round shot. Each shot travels on in a straight line until it strikes some sort of target, after which its speed is changed and its direction of motion altered. Some molecules strike the target formed by the boundary of the vessel containing the gas; others strike another molecule. If the diameter of each molecule is a, two molecules cannot pass so close that the distance between their centres is less than a without a collision taking place, so that each molecule can be regarded as forming a target of area $\pi\sigma^2$. If there are v molecules per unit volume, the number in a small layer of thickness t and cross section S is vtS, and these form a target of total area $\pi\sigma^2 vt$S. This quantity is proportional to t, and for a certain value of t it becomes equal to S. When t has this value, the target formed by the combined molecules precisely fills up the whole area S, so that no molecule can get through without a collision. The value of t which makes $\pi\sigma^2 vt$S equal to S is

$$t=\frac{1}{\pi v\sigma^2},$$

so that in travelling through a layer of this thickness in the gas each molecule will collide with some other molecule and have its speed and direction of motion changed.

The foregoing simple calculation requires adjustment, however, in several respects. The molecules are distributed irregularly in space, and allowance must also be made for the variation in their velocities. An exact calculation, first given by Maxwell, shows that the average distance l which a molecule travels before colliding with another molecule is given by

$$l=\frac{1}{\sqrt{2}\,\pi v\sigma^2}. \qquad (9)$$

In ordinary air the length of the average free path is 0.000006 cm. or $\frac{1}{400,000}$ of an inch. Since the molecule of air travels at a rate of 50,000 cm. a second, it must describe 8,000,000,000 free paths every second, and so collides with 8,000,000,000 other molecules in each second of its existence.

The individual free paths between collisions mill be distributed statistically on both sides of l. The favourite length of free path is actually zero; in this case, a molecule stands almost still until another one strikes it. The frequency of free paths of a given length decreases as the length increases, and paths several times as long as the average length l are rare. (See fig. 2.)

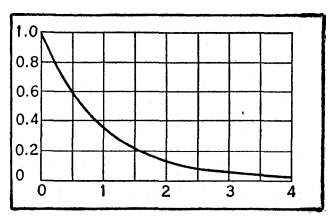
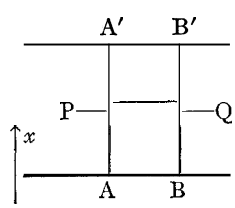


FIG. 2.—THE CURVE REPRESENTS THE RELATIVE NUMBERS OF MOLECULAR FREE PATHS OF VARIOUS LENGTHS. THE LENGTH IS EXPRESSED IN TERMS OF THE AVERAGE LENGTH AS A UNIT

Conduction of Heat. — During the description of any free path the energy of a molecule remains unchanged, although it may gain or lose energy at a collision with another molecule. Consider the motions of molecules in a gas in which the temperature is not uniform. Let one layer AB of the gas be at a temperature T, while another parallel layer A'B' at a distance 1 (equal to the mean free path of the molecules) is at a temperature T'. Owing to the difference of temperature, the average energies of the molecules in the two layers will be different; let them be E, E' respectively. A molecule which starts from a collision at A and describes the free path AA' before collision at A' is likely to have the energy E appropriate to the layer AB, while one which describes the free path B'B in the reverse direction is likely to have the energy E' appropriate to the layer A'B'. If the temperature T is higher than T', E will be greater than E', so that more energy is carried from the hot layer AB to the cold layer A'B' than travels in the reverse direction, and there is a resultant flow of heat-energy from the hot parts of the gas to the cold. In this way the kinetic theory explains the conduction of heat in a gas.



To study the amount of this flow of heat, let us fix our attention on the molecules which cross a unit area PQ, halfway between the two layers AB, A'B'. Half of these will cross PQ in one direction and half in the other. If there are molecules per unit volume each travelling with an average velocity c, then $\frac{1}{2}vc$ molecules will cross in each direction per unit time. The stream which crosses in the direction AA' will transport energy $\frac{1}{2}vc$E across the unit area in that direction, while the other stream will transport energy $\frac{1}{2}vc$E' in the reverse direction. The net transport of energy across the plane in unit time is accordingly

$$\tfrac{1}{2}vc\,(\mathrm{E}-\mathrm{E}').$$

The foregoing simple discussion needs correction, since the

free paths which cross the plane PQ are not, in general, perpendicular to PQ. *A* simple mathematical investigation shows that the necessary correction consists in multiplication by a factor $\frac{2}{3}$, so that the net transport of energy is

$$\tfrac{1}{3}\nu c\,(E-E').$$

Now by definition of v and E, νE is the total energy per unit volume at *A*, and this is equal to $p\,C_v\,T$, where p is the density and C_v is the specific heat of the gas at constant volume. Thus the net transport of energy in unit time may also be taken to be

$$\tfrac{1}{3}\rho C_v c\,(T-T').$$

If x is a co-ordinate measured perpendicular to PQ in the direction *AA'*, we may put

$$T-T'=-l\frac{d'T}{dx}.$$

The flow of heat-energy per unit area per unit time is then

$$-\vartheta\frac{d'T}{dx}. \qquad (10)$$

where

$$\vartheta=\tfrac{1}{3}\rho C_v c l. \qquad (11)$$

In the theory of heat the flow of heat is given by expression (10) where G is the coefficient of conduction of heat. Thus the kinetic theory explains the conduction of heat and predicts a definite value for the coefficient of conduction. This value needs minor adjustments of various kinds, and these result in ϑ assuming a value substantially larger than that given by equation (11).

Viscosity. — The phenomenon of gaseous viscosity can be discussed in a similar way. We now suppose the layers *AB* and *AB'* of the gas to be moving parallel to PQ with different velocities v,v' so that a molecule in the layer *AB* is likely to have momentum *mv* parallel to *AB*. We now investigate the transfer of momentum *mv* across the plane PQ. The net transfer per unit time is

$$\tfrac{1}{3}\nu c(mv-mv').$$

Since the density ρ of the gas is equal to mv, this may be put in the form

$$\tfrac{1}{3}\rho c(v-v')$$

or

$$-\tfrac{1}{3}\rho c l\frac{dv}{dx}.$$

This is equal to

$$-\mu\frac{dv}{dx}$$

where

$$\mu=\tfrac{1}{3}\rho c l. \qquad (12)$$

The coefficient in this equation again requires correction. The best value of the coefficient, for molecules in the form of spheres, is 0.499 instead of $\frac{1}{3}$.

Equations (11) and (12) give the following interesting relation between the coefficient of heat conduction ϑ, the viscosity μ and the specific heat at constant volume: $\vartheta=\mu C_v$. The fully corrected value, for spherical molecules, is close to

$$\vartheta=\tfrac{5}{2}\mu C_v.$$

This equation is verified experimentally to a close approximation for monatomic gases such as helium or neon. For other gases the coefficient lies between 5/2 and 1, as further analysis indicates that it should do.

Diffusion. — The phenomenon of diffusion can be treated in a very similar manner. We consider a mixture of two gases G_1 and G_2, supposing that the proportion of G_1 in the mixture is θ at AB and is θ' at AB'. The chance of a molecule which describes a free path *AA'* being a molecule of G_1 is θ, so that the mass of the gas G_1 which is carried by each molecule describing such a free path is, *on the average* equal to θm. As in formula (8), the net transport of G_1 across the plane PQ per unit time is

$$\tfrac{1}{3}\nu c(\theta m-\theta' m')$$

or

$$-\tfrac{1}{3}\nu c l\frac{d}{dx}(\theta m).$$

This can be put in the form

$$-D\frac{d}{dx}(\nu m\theta)$$

where D, which is the coefficient of diffusion, is given by

$$D=\tfrac{1}{3}cl.$$

The coefficient $\frac{1}{3}$ in this formula is again changed considerably when a more exact calculation is made.

The Size of Molecules. — We have seen that the kinetic theory explains the three phenomena of the conduction of heat, viscosity and diffusion as all three are dependent on transport by molecules describing free paths. The three coefficients for these phenomena are all found to be proportional to the average length of the free paths, and this in turn depends in a definite way upon the diameters of the molecules. Thus a comparison of the theoretical values of these coefficients with observational values provides three distinct means of evaluating the molecular mean free path and, from this, the molecular diameter.

The values of the average free path that are obtained in this way from the conduction of heat agree with those obtained from the viscosity as well as could be expected in view of the fact that the heat energy of the molecules includes energy of rotation and vibration, and the effect of molecular collisions in transferring this part of the energy from one molecule to another is not precisely known. The molecular diameters calculated from observations on diffusion are a little smaller. This is not surprising, in view of the fact that the theoretical formulas are based on the assumption that the molecules are elastic spheres, whereas there is no doubt that in reality they do not possess sharply defined surfaces but merely repel each other with a certain finite force when brought close together. A close examination of the collision process shows that the behaviour of molecules of this sort in the phenomenon of diffusion ought to resemble that of spheres of a somewhat smaller diameter than in the phenomenon of diffusion.

In the following table are shown values of the average free path l of the molecules of several gases at 15° C., as obtained by substituting the observed value of μ for μ in formula (12), with the factor $\frac{1}{3}$ replaced by 0.499, as already explained. Values of the molecular diameter a calculated from formula (9) using this value of l are also shown. For comparison, there are shown also values of the molecular diameter calculated from the constant b in Van der Waals's equation, in which a and b were chosen to secure the best fit with observations on the gases at ordinary pressures and temperatures. The approximate agreement between the values of a for many gases as obtained from viscosity and from b furnishes another confirmation of the correctness of the theory.

Gas	Average free path l, centimetres	Molecular diameter σ from viscosity, centimetres	Molecular diameter σ from Van der Waals's b, centimetres
Hydrogen . .	11.8×10^{-6}	2.74×10^{-8}	2.56×10^{-8}
Helium . . .	18.6×10^{-6}	2.18×10^{-8}	2.02×10^{-8}
Nitrogen . .	6.28×10^{-6}	3.75×10^{-8}	3.56×10^{-8}
Oxygen . . .	6.79×10^{-6}	3.61×10^{-8}	3.59×10^{-8}
Carbon dioxide .	4.19×10^{-6}	4.59×10^{-8}	5.60×10^{-8}

In general, the kinetic theory is found to give a satisfactory account of all physical phenomena in gases which are not compressed to too great a density.

Gases at Very Low Density. — As the pressure and density of a gas are reduced, it might be anticipated that the viscosity of the gas and the conduction of heat through it would be reduced, since less density means that less matter is present to cause these phenomena. The kinetic theory indicates, on the other hand, as was pointed out by Maxwell in 1866, that the viscosity and the

conduction of heat ought both to be independent of the density. This conclusion appears at once from formulas (11) and (12), in which the average free path increases in proportion as the density is reduced, as is obvious from formula (9). This surprising conclusion from the theory was soon confirmed by experiment.

Ultimately, however, the viscosity and the conduction of heat must decrease, becoming zero when all of the gas has been removed. The theory indicates that these phenomena should begin to decrease in magnitude when the density has been reduced until the average free path of the molecules becomes greater than the width of the space across which a viscous effect or the flow of heat is being observed. As the density is further decreased, both phenomena should ultimately become proportional to the density of the gas. These conclusions from the theory also have been confirmed by experiment.

CONDENSED PHASES

Kinetic Theory of the Solid and Liquid **States.**—As has been stated, two molecules are assumed to repel each other only when extremely close together, when the distance between their centres is about the same as the so-called molecular diameter **a;** at somewhat greater distances they attract each other. Under the influence of this attraction, as the temperature is reduced and the molecular velocities are thereby diminished, it eventually becomes possible for groups of molecules to cling together. In this way is explained the occurrence of the liquid and solid phases of matter.

Either a liquid or a solid may be in contact with its own vapour at the same temperature, which has the form of a gas. The equilibrium between the vapour and the condensed phase is interpreted in kinetic theory as being statistical in nature. Molecules coming from the vapour are continually impinging upon the liquid or solid phase, and many of them become attached to it, while other molecules which happen to acquire exceptionally high velocities are continually leaving the condensed phase and re-entering the vapour. Thus a continual process of evaporation and condensation is going on. If the temperature is raised, the process of evaporation increases in rapidity and predominates over the process of condensation; the net result is evaporation of the liquid or sublimation of the solid.

As a molecule leaves the liquid or solid phase, it is slowed down in its motion by the attraction of the remaining molecules. In this way, during evaporation or sublimation, heat energy becomes converted into potential energy representing work done against the attractive forces. This process is believed to constitute the chief reason for the large amount of heat that must be supplied in order to convert a substance into the vapour state. Another reason probably lies in a difference between the energy of the molecular motions in the vapour phase as compared with those in the liquid or solid phase at the same temperature. It is only the faster moving molecules that escape in the process of evaporation. and the decrease in their velocities due to the attraction just suffices on the average to lower their kinetic energies to the value proper to the temperature of the vapour. For this reason steam, for example, has the same temperature as the water from which it comes.

The Solid State.— In a solid the molecules are assumed to be so firmly held by their mutual attractions and repulsions that they seldom move far from their equilibrium positions. Thus are explained many facts of everyday experience. For instance, the surface of a finely-carved metal (such as a plate used for steel engraving) will retain its exact shape for centuries, and again, when a metal body is coated with gold-leaf, the atoms of the gold remain on its surface indefinitely; if they moved through any but the smallest distances they would soon become mixed with the atoms of the baser metal and diffused through its interior.

The molecules composing a solid may be compared with a collection of heavy particles connected by light spiral springs, one spring being supposed to connect each pair of adjacent particles. If left to themselves, the particles would settle into certain positions of equilibrium. By the application of external forces, the entire collection of particles could be either compressed or dilated or twisted, just as solid bodies can be.

Let two such masses of molecules be suspended by strings from the same point, and then let one mass be drawn aside, pendulum-wise, and allowed to impinge on the other. After impact the two masses will rebound, and the process may be repeated any number of times, but ultimately the two masses will be found again hanging in contact side by side. At the first impact each layer of surface molecules which takes the shock of the impact will be thrust back upon the layer behind it; this latter layer will in this way be set into motion and so influence the layer still further behind; and so on indefinitely. The impact will accordingly result in all the molecules in the mass being set into motion, and by the time that the masses have ceased impinging on one another the molecules of which they are composed will be performing oscillations about their positions of equilibrium. The kinetic energy with which the moving mass originally impinged on that at rest is now represented by the energy, kinetic and potential of the small motions of the individual molecules of which the bodies are composed. Thus, in harmony with common experience, when two bodies impinge, the kinetic energy which appears to be lost from the mass-motion of the bodies is in reality transformed into heat-energy.

Again, suppose that two bodies, both devoid of heat, are placed in contact with one another, and that the surface of the one is then rubbed over that of the other. The molecules of the two surface-layers will exert forces upon one another, so that, when the rubbing takes place, each layer will set the molecules of the other into motion, and the energy put into the act of rubbing will be used in establishing this heat-motion In this ne see the explanation of the phenomenon of the generation of heat by friction. At first the heat-motion will be confined to molecules near the rubbing surfaces of the two bodies, but, as already explained, these will in time set the Interior molecules into motion, so that ultimately the heat-motion will become spread throughout the whole mass. Here we have an instance of the conduction of heat; it does not, however, explain the whole phenomenon of conduction of heat, for other processes also help in the process, especially in substances which are conductors of electricity.

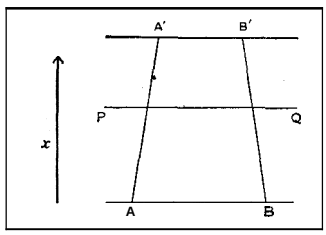


FIG 3.— KINETIC THEORY OF GASES
Diagram showing conduction of molecular heat. A B, A^1B^1 represent layers of a gas at different temperatures. PQ is a layer intermediate between AB and A^1B^1, while AA^1 and B^1B represent the free paths of molecules passing both ways between the two layers

When the molecules of a solid are oscillating about their equilibrium positions there is no reason why their mean distance apart should be the same as when they are at rest. This leads to an interpretation of the fact that a change of dimensions usually attends a change in the temperature of a substance. Suppose, for instance, that two molecules, when at rest in equilibrium are at a distance a apart. It is very possible that the repulsive force they exert nhen at a distance a–e may be greater than the attractive force they exert when at a distance a–e. If so, their mean distance apart. averaged through a sufficiently long interval of their motion, will be greater than a. A body made up of molecules of this kind will expand on heating.

As the temperature of a body increases, the average energy of its molecules will increase, so that the range of their excursions from their positions of equilibrium will also increase. At a certain temperature a stage will be reached in which it becomes a frequent occurrence for molecules to uander so far from their position of equilibrium that they do not return but fall into a new position of equilibrium and oscillate about this. In this way is explained the slow process of diffusion that occurs in solids at elevated temperatures. If the molecules change positions sufficiently easily. the shape of the body can be altered; the substance has become plastic. Finally, when the energy of motion of the molecules is so great that there is constant rearrangement of position among them, the substance attains to, a completely liquid

state. Crystalline solids, however, appear to pass immediately into the liquid state, without becoming plastic. by a process of progressive melting at the surface of the crystals.

Theory of the Solid State.—If the molecules composing a solid are analogous to a set of heavy particles. connected by springs, so that the net force on a molecule is proportional to its displacement from its equilibrium position relative to neighboring molecules, then the irregular heat motion of the molecules will cause them to possess potential energy, analogous to the work done in stretching or compressing the springs; and it can be shown from Newton's laws of motion that the average value of this potential energy will be the same as the average value of the kinetic energy of translation of the molecules. According to the principle of the equipartition of energy, the average kinetic energy of translation is the same for all molecules. It follows that monatomic molecules, that is, molecules each consisting of a single atom, should have twice as much heat energy in a solid as in a gas, where potential energy is absent.

In this way was explained the rule that the heat required to raise in temperature by one degree a given number of molecules of a solid consisting of a single chemical element is approximately the same for nearly all elements, and is twice as great as the heat required for the same number of molecules composing a gas such as helium. There are notable exceptions to this rule, however, for example, carbon in the form of diamond; and it was later found that the heat required diminishes for all substances when the temperature is lowered sufficiently, becoming almost zero at 20° or 10° absolute. A mathematical explanation of this failure of equipartition has been obtained from the newer quantum mechanics, but the new theory does not furnish a concrete picture of the molecular motions.

In the solids for which the rule just mentioned holds, each molecule consists of a single atom. Many simple chemical compounds also have the property that in the solid state the atoms enter into the crystalline structure as independent units. The molecule of common salt, for instance! contains two atoms, one of sodium and one of chlorine; but in a crystal of salt the atoms are arranged in a regular crystal lattice in such a way that each atom of sodium is equally distant from six atoms of chlorine and is not united more closely with one than with another. Such a crystal might be said to constitute one big molecule.

In the crystals of other substances, however, the atoms are distinctly grouped into ions or molecules. The heat motion of such crystals can be resolved into a motion of these groups as wholes together with a vibration of the atoms within the groups. (See SOLID STATE PHYSICS; BROWNIAN MOVEMENT; QUANTUM MECHANICS; THERMODYNAMICS; HEAT; VISCOSITY.)

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KING, CLARENCE (1842–1901), U.S. geologist, was born at Newport, R.I., on Jan. 6, 1842. He was known as an organizer and for ten years chief of the U.S. geological exploration of the 40th parallel, which laid the foundation of a systematic survey of the country. In 1862 he graduated from the Sheffield Scientific school of Yale. In the following years he was a student of glaciology under J. L. R. Agassiz; undertook a trip across the continent on horseback; and accepted a position as volunteer geologist on the California geological survey. The high mountain mass of the southern Sierras was discovered by him at this time, and he explored the desert regions of southern California and Arizona.

King persuaded the government to make a thorough geological survey of California in order to develop its mineral resources, and nccomplished the famous exploration of the 40th parallel against almost insuperable difficulties. The final summary of this work, a masterpiece of writing, was published in 1878, under the title Systematic Geology. He was instrumental in organizing the surveys of the country into one U.S. geological survey in 1879, of which he was made the first director, but retired in order to devote himself to some of the deeper problems of geology. He also gave much of his time to his profession as a mining engineer and skilled adviser in mining suits: and added to his literary reputation by his occasional articles and his book *Mountaineering in the Sierra Nevada.* His exposure of a great diamond fraud in 1872, which might otherwise have equalled the "Mississippi Bubble" as a financial disaster, gave him much prominence in the public eye. He died at Phoenix, Arizona, Dec. 24, 1901.

See S. F. Emmons, "Clarence King," Silliman's *Journal,* series 4, vol. xiii., p. 224–237.

KING, EDWARD (1612–1637), the subject of Milton's *Lycidas,* was born in Ireland, the son of Sir John King. a member of a Yorkshire family which had migrated to Ireland. Edward King was admitted a pensioner of Christ's College. Cambridge. on June 9, 1626, and four years later was elected a fellow. Milton, though two years his senior and himself anxious to secure a fellowship, remained a close friend of his rival. whose amiable character seems to have endeared him to the whole college. King served from 1633 to 1634 as praelector and tutor of his college. and was to have entered the church. His career, however. was cut short by the tragedy which inspired Milton's verse. In 1637 he set out for Ireland to visit his family, but on Aug. 10. the ship in which he was sailing struck on a rock near the Welsh coast! and King was drowned. Of his own writings many Latin poems contributed to different collections of Cambridge verse survive.

KING, EDWARD (1829–1910), English bishop, was the second son of Walter King, archdeacon of Rochester. Graduating from Oriel College, Oxford, he was ordained in 1854. and four years later became chaplain and lecturer at Cuddesdon Theological College. He was principal at Cuddesdon from 1863 to 1873, when he became regius professor of pastoral theology at Oxford and canon of Christ Church. He was a friend of Pusey and a leading member of the English Church Union. In Oxford, and especially among the younger men, he exercised an exceptional influence, due to his remarkable charm in personal intercourse, and his sincerity and goodness. In 1885 he was made bishop of Lincoln, where he won the respect of all by his saintliness. The most eventful episode of his episcopate was his prosecution (1888–90) for ritualistic practices before the archbishop of Canterbury, Dr. Benson, and, on appeal, before the judicial committee of the Privy Council (see LINCOLN JUDGMENT). He died at Lincoln on March 8, 1910.

See B. W. Randolph and J. W. Townroe, *The Mind and Work of Bishop King (1918).*

KING, ERNEST JOSEPH (1878–1956), United States naval officer, was born in Lorain, Ohio, Nov. 23, 1878, and entered the Naval academy in 1897. During the Spanish-American War, as a midshipman, he served on the U.S.S. "San Francisco" on patrol duty off the Atlantic coast, and on blockade duty off Cuba. He graduated from the academy in 1901, ranking fourth in a class of 67. For the subsequent five years he served on the Asiatic, European and Atlantic stations, and, after a three-year tour of duty on land, became aide on the staff of the commander of one of the divisions of the Atlantic fleet, and, later! of the Atlantic fleet proper. Just prior to World War I, King was commander of a destroyer division, and during the war, as a captain. was chief of staff to Admiral Mayo, commanding the Atlantic fleet. For this service he received the Navy cross in 1919. In 1923 he commanded the submarine base at New London. and was awarded the distinguished service medal for directing the salvage operations of the S-51 which sank off Block Island in 1925. Two years later he qualified as a naval flier, and commanded the aeroplane tender "Wright." A second distinguished service medal was awarded him in 1927 for directing the salvaging operations of the S-4, which sank off Provincetown, Mass. King's time from then on was spent largely in naval aviation. He became a rear admiral in 1933, and chief of the bureau of aeronautics the same year. By 1938 he was commanding the aircraft battle forces with the rank of vice admiral, and on Feb. 1, 1941, became commander-in-chief of the Atlantic fleet.

Immediately after Pearl Harbor, King was appointed commander-in-chief of the U.S. fleet. On March 13, 1942, by executive order he assumed the additional duty of chief of naval operations. He attained the newly created rank of fleet admiral on

Dec. 17, 1944, and was an adviser to the secretary of the navy from Nov. 1945 until his death at Portsmouth. N H., June 25, 1956. He is buried at Annapolis, Md.

An autobiography, *Fleet Admiral King, A Naval Record,* written with the help of Comdr. Walter hluir Whitehill, uas published in 1952. (W. B. Ck , X.)

KING, HENRY (1592–1669), English bishop and poet whose solemn and moving "Exequy" on his young wife is one of the great English elegies, was baptized at Worminghall, Buckinghamshire, on Jan. 16, 1592. Educated at Christ Church. Oxford. he took orders and eventually became bishop of Chichester in 1642, at the same time receiving the wealthy living of Petworth, Sussex.

He was dispossessed of both during the Great Rebellion and imprisoned for a short time, but was restored to his see in 1660. He died at Chichester on Sept. 30. 1669.

King was a friend and executor of John Donne, to whose poems he contributed an elegy in 1633, and he also wrote an elegy to Ben Jonson. His *Poems, Elegies, Paradoxes, and Sonnets* (1657) are distinguished by their gracefulness and quiet metaphysical wit He also published several of his sermons and a metrical version of the Psalms (1651).

See *The Poems,* ed by J. Sparrow (1925) and L. Mason, "The Life and Works of Henry King," *Transactions of the Connecticut Academy,* vol xviii (1913).

KING (OF OCKHAM), PETER KING, 1ST BARON (1669–1734), English church historian and lord chancellor, remembered as the author of the act (4 Geo. II. c. 26) substituting English for Latin in the law courts. was born at Exeter. A Presbyterian he published anonymously in 1691 *An Enquiry into the Constitution . . . of the Primitive Church,* which attracted the attention of John Locke. King entered the Middle Temple in 1694 and mas called to the bar in 1698.

From 1701 King was Whig member of parliament for Beer in Devonshire. His *History of the Apostles' Creed* appeared in 1702; it was well received on the continent and greatly stimulated research. He was highly esteemed as recorder of London (1708–14) and from 1714 to 1725, as chief justice of the common pleas, he was a learned and impartial common-law judge. In 1725 he became speaker of the house of lords, and his first task was to preside over the trial of the earl of Macclesfield. Immediately following this he was raised to the peerage and made lord chancellor.

While in office King established some important principles, *e.g.,* that a will of immovable property is governed by the *lex loci rei sitae* ("law of the place where the property is"); but in general, he lacked competence in equity. King resigned in 1733 and died at Ockham, Surrey, on July 22, 1734.

KING, RUFUS (1755–1827), U.S. political leader, was born on March 24, 1755, at Scarborough, Me., then a part of Massachusetts. He graduated from Harvard in 1777 and was admitted to the bar in 1780. He served in the Massachusetts general court in 1783–84 and in the confederation congress in 1784–87. During these critical years he adopted the "states' rights" attitude. It was largely through his efforts that the general court in 1784 rejected the amendment to the Articles of Confederation authorizing congress to levy a 5% impost. On Feb. 21, 1787, he introduced the resolution in congress sanctioning the call for the Philadelphia Constitutional convention, in which he supported the large-state party. In 1788 he was one of the most influential members of the Massachusetts convention which ratified the federal constitution. He removed to New York in 1788, was elected to the New York assembly in the spring of 1789, and was chosen one of the first representatives of New York in the U.S. Senate. In this body he served in 1789–96, becoming one of the recognized leaders of the Federalist party. He was minister to Great Britain in 1796–1803 and again in 1825–26; was the Federalist candidate for vice-president in 1804 and 1808, and for president in 1816. He was returned to the senate in 1813 and re-elected in 1819. In the Missouri compromise debates he supported the antislavery program, but for constitutional reasons voted against the second clause of the Tallmadge amendments providing that slaves born in the state after its admission into the union should be free at the age of 25 years. He died at Jamaica, L.I., on April 29, 1827.

The Life and Correspondence of Rufus King, begun about 1850 by his son, Charles King, was completed by his grandson, Charles R. King, and published in six volumes (1894–1900).

Rufus King's son, JOHN ALSOP KING (1788–1867), was educated at Harrow School, England, and in Paris, served in the War of 1812 as a cavalry lieutenant, and was a member of the New York assembly in 1819–21 and of the New York senate in 1823. When his father was sent as minister to Great Britain in 1825 he accompanied him as secretary of the U.S. legation and remained as chargé d'affaires until Aug. 1826. He was a member of the New York assembly again in 1832 and in 1840, was a Whig representative in congress in 1849–51, and in 1857–59 was governor of New York state. In 1861 he was a delegate to the peace conference in Washington.

Another son, CHARLES KING (1789–1867), was also educated abroad, served in 1814 in the New York assembly and was president of Columbia college in 1849–64.

A third son, JAMES GORE KING (1791–1853), was an assistant adjutant-general in the War of 1812, was a banker in Liverpool and in New York, and was president of the New York and Erie railroad until 1837. In London in 1835 he secured the loan to U S. bankers of £1,000,000 from the governors of the Bank of England. In 1849–51 he was a representative in congress from New Jersey.

Charles King's son, RUFUS KING (1814–76), graduated from the U.S. military academy in 1833, and was adjutant-general of New York state in 1839–43, a brigadier-general of volunteers in the union army in 1861 and U.S. minister to the Papal states in 1863–67.

His son, CHARLES KING (1844–1933), served in the artillery until 1870 and in the cavalry until 1879; he was appointed brigadier-general U.S. volunteers in the Spanish War in 1898 and served in the Philippines. He wrote *Famous and Decisive Battles* (1884) *Campaigning with Crook* (1890) and stories of military life.

BIBLIOGRAPHY.—*See* E. H. Brush, *Rufus King and His Times* (1926); S. F. Bemis (editor), *The American Secretaries of State* (1927).

KING, THOMAS (1730–1805), English actor and dramatist, was born in London on Aug. 20, 1730, and died on Dec. 11, 1805. Garrick saw him act in a booth at Windsor, and engaged him for Drury Lane He made his first appearance there in 1748 as the Herald in *King Lear.* He played the part of Allworth in Massinger's *New Way to Pay Old Debts* (1748), and during the summer he played Romeo and other leading parts in Bristol. For eight years he was the leading comedy actor at the Smock Alley theatre in Dublin, but in 1759 he returned to Drury Lane and took leading parts until 1802. One of his earliest successes was as Lord Ogleby in *The Clandestine Marriage* (1766), which was compared with Garrick's *Hamlet* and Kemble's *Coriolanus,* but he reached the height of his reputation with his creation of the part of Sir Peter Teazle in *The School for Scandal* (1777).

KING, WILLIAM (1650–1729), British divine, archbishop of Dublin, the son of James King, an Aberdeen man who migrated to Antrim, was born in May 1650. He was educated at Trinity College, Dublin, and became dean of St. Patrick's in 1689, bishop of Derry in 1691, and archbishop of Dublin in 1702. In 1718 he founded the King lectureship in divinity at Trinity College, Dublin. He died in May 1729. King was a convinced supporter of the revolution and author of *The State of the Protestants in Ireland under King James's Government* (1691). His chief work is *De Origine Mali* (1702; Eng. trans., 1731).

See *A Great Archbishop of Dublin, William King, D.D.,* ed. Sir C. S King, Bart. (1908).

KING, WILLIAM (1663–1712), English poet and miscellaneous writer, son of Ezekiel King, was educated at Westminster school, and at Christ Church, Oxford. He became known as a humorous writer on the Tory and High Church side. He took part in the controversy aroused by the conversion of the once stubborn nonjuror William Sherlock, one of his contributions being an entertaining ballad, "The Battle Royal," in which the disputants are Sherlock and South. A pamphlet in defense of Den-

mark was rewarded by a secretaryship to the princess Anne. He wrote various pamphlets in support of Charles Boyle in his controversy with Richard Bentley over the genuineness of the *Epistles of Phalaris*. He satirized Bentley in ten *Dialogues of the Dead relating to . . . the Epistles of Phalaris* **(1699).** In 1700 he published *The Transactioneer, with some of his Philosophical Fancies, in two Dialogues,* ridiculing Hans Sloane, who was then the secretary of the Royal society. This was followed up later with some burlesque *Useful Transactions in Philosophy* (1709). King wrote four pamphlets in support of H. Sacheverell. He held various government offices in Ireland between 1701 and 1708, and in 1711 Swift obtained for King the office of gazetteer, worth from £200 to £250. King was now very poor, but he had no taste for work, and he resigned his office on July **1, 1712.** He died on Dec. 25 in the same year.

King's *Remains . . .* were edited by J. Brown in 1732; and in 1776 John Nichols produced an excellent edition of his *Original Works . . . with Historical Notes and Memoirs of the Author.* Dr. Johnson included him in his *Lives of the Poets,* and his works appear in subsequent collections.

KING, WILLIAM LYON MACKENZIE (1874–1950), Canadian stztesman, was born at Berlin—now Kitchener—Ont., Dec. 17, **1874.** the son of John King and Isabel Grace Xackenzie. He was educated at Toronto university, and became fellow of political economy in the University of Chicago and of political science in Harvard university. King entered the public service of Canada in 1900 as deputy minister of labour. and acted as editor of the *Labour Gazette* for several years. In 1906 he represented Canada in negotiations with the British government on immigration from Britain, and was Canadian representative to the government of India on immigration from the orient.

He was elected as a Liberal member of parliament for North Waterloo in 1908, and in 1909 mas minister of labour in the Sir Wilfrid Laurier administration.

From 1914 to 1917, under the auspices of the Rockefeller foundation, King investigated the subject of industrial relations, and afterward wrote *Industry and Humanity* (1918), as well as other studies on economic subjects. During World War I he assisted leading industrial corporations in the U.S. to maintain a continuous maximum output of essential war supplies. At the National Liberal convention at Ottana in 1919 he was selected as the successor to Laurier, and became leader of the opposition in the same year. In **1921** he became prime minister of Canada. He held office until **1926,** and after one general election in June of that year found himself with a majority of only six in the dominion house of commons. He resigned office, which was assumed by the Conservative leader, Arthur Meighen, and a second general election was held in September.

The deadlock was then broken by the return of King to office with a substantial majority. His government fell in **1930,** but in 1935 King was again prime minister, supported by an overwhelming majority.

As Premier. — King's first administration followed the coalition government which had been created during World War I, and, although formerly there had been two parties in the house. a third party, known as the Progressives, was also returned in the general elections of **1921.** It was this party which supported the Liberal government. On the dissolution of the house in 1925 an attempt was made to return to the two-party system of government. but the Progressives were still given support. The prime minister himself was defeated, but because of the support and co-operation of the Progressives he was able to maintain the government until June **1926,** when charges of corruption in the customs service and the refusal of Governor General Lord Byng to dissolve parliament persuaded King and his ministry to resign. In the succeeding election **(1926)** the Liberals triumphed and Mackenzie King formed a new government, pledged to the constitution and to a reasonably low tariff. A reaction toward strong Canadian nationalism carried the Conservatives and Premier R. B. Bennett into power in 1930. Mackenzie King was able to survive the Beauharnois scandal which besmirched some of his party associates in 1931, and, as the "Bennett deal" made little headway against the depression that clouded his term, King rode triumphantly back to power in **1935.**

The strength of the Co-operative Commonwealth federation and of the Social Credit agitation together with the decisive defeat of the Conservatives seemed to indicate a moderate shift to the left. and King, entering office on Oct. 23. promised to set up a national commission to grapple with unemployment and to plan an extensive public works program.

Following Canada's entry into World War II, King's government came under political attack over his support of conscription for overseas duty, but in 1944 his proposals won a strong vote of confidence from the house (143 to 70). During this time he nrote *Canada and the Fight for Freedom* (Toronto, 1944). King cooperated with the United States in measures for common defense of the two countries and participated in several Churchill-Roosevelt conferences. In June 1945 his Liberal party won the general election, but King himself was defeated in his constituency in Prince Albert. Sask. He was re-elected in August, however, in a parliamentary by-election in Ontario. In **1948** King became ill and resigned from the party leadership (Aug. 7) and from the prime ministership (Nov. 15), retaining his parliamentary seat of Glengarry as a private member. He died at Kingsmere, Que., July **22.** 1950.

KING, WILLIAM RUFUS DEVANE (1786–1853), U.S. statesman, was born in Sampson county, N.C., on April 7, **1786.** He graduated at the University of North Carolina in **1803.** and was admitted to the bar in **1806.** He served in the State legislature, 1806–09 and in 1810 was elected to the U.S. house of representatives where he served six years as an ardent supporter of Madison's administration. In **1816** he was appointed secretary of the legation to the Kingdom of Naples and afterward to Russia, serving in both countries under William Pinkney, minister. Upon his return to the United States in **1818** he settled in Alabama, was a delegate to the convention which organized the new state government, and in **1819** was elected one of the first U.S. senators from that state. He served in the senate without intermission until **1844** when he was appointed minister to France. He was instrumental in persuading the French government not to join England in protest against the annexation of Texas by the United States. He returned to Alabama in 1848 and was again elected to the senate to fill an unexpired term, and re-elected for a full term in **1849.** In 1850 he became president of the senate. In **1852** he was nominated for vice-president on the Democratic ticket which carried the name of Franklin Pierce at its head and was successful in the election. King died near Cahawba, Ala., on April **18,** 1853, soon after taking the oath of his office.

KING, a title, in its actual use generally implying sovereignty of the most exalted rank (O. Eng. *cyning,* abbreviated into *cyng, cing; cf.* O.H.G. *chun- kuning, chun- kunig;* M.H.G. *künic, kunec, künc;* Mod. Ger. *Konig;* O. Norse *konungr, kongr;* Swed. *konung, kung).* Any inclusive definition of the word "king" is, however, impossible. It always implies sovereignty, but in no special degree or sense; *e.g.,* the sovereigns of the British empire and of Siam are both kings, and so too, at' least in popular parlance, are the chiefs of many barbarous peoples, *e.g.,* the Zulus. The use of the title is, in fact, involved in considerable confusion, largely the result of historic causes. It is used to translate the Homeric ἄναξ equally with the Athenian *βασιλεύς* or the Roman *rex.* Yet the Homeric "kings" were but tribal chiefs; while the Athenian and Roman kings were kings in more than the modern sense, as supreme priests as well as supreme rulers and lawgivers *(see* ARCHON; and ROME: ANCIENT **HISTORY).** In the English Bible, too, the title of king is given indiscriminately to the great king of Persia and to potentates who were little more than Oriental sheikhs. A more practical difficulty, moreover, presented itself in international intercourse, before diplomatic conventions became, in the 19th century, more or less stereotyped. Originally the title of king was superior to that of emperor, and it was to avoid the assumption of the superior title of *rex* that the chief magistrates of Rome adopted the names of *Caesar, imperator* and *princeps* to signalize their authority. But with the develop-

ment of the Roman imperial idea the title emperor came to mean more than had been involved in that of *rex;* very early in the history of the empire there were subject kings; while with the Hellenizing of the East Roman empire its rulers assumed the style of βασιλεύς no longer to be translated "king" but "emperor."

From this Roman conception the mediaeval empire of the west inherited its traditions. With the barbarian invasions the Teutonic idea of kingship had come into touch with the Roman idea of empire and with the theocratic conceptions absorbed from the old Roman and oriental views of kingship. With these the Teutonic kingship had in its origin but little in common.

The romance and Teutonic words for king have distinct origins. The Latin *rex* corresponds to the Sanskrit *rājā,* and meant originally "steerman." The Teutonic king corresponds to the Sanskrit *janaka,* and "simply meant father, the father of a family, the father of a people." The Teutonic kingship was national; the king was the supreme representative of the people, "hedged with divinity" insofar as he was the reputed descendant of the national gods, but with no absolute theocratic authority associated with the titles of *rex* or βασιλεύς. This, however, was modified by contact with Rome and Christianity. The early Teutonic conquerors had never lost their reverence for the Roman emperor, and were at times proud to acknowledge their inferiority by accepting titles, such as "patrician," which implied this. But by the coronation of Charles, king of the Franks, as emperor of the west, the German kingship was absorbed into the Roman imperial idea, a process exercising a profound effect on the evolution of the Teutonic kingship. In the political theory of mediaeval Europe, pope and emperor were sun and moon, kings but lesser satellites; though the theory only partly and occasionally corresponded with the facts. But the elevation of Charlemagne had had a profound effect in modifying the status of kingship in nations that never came under his nor his successors' rule. The shadowy claim of the emperors to universal dominion was in theory everywhere acknowledged; but independent kings hastened to assert their own dignity by surrounding themselves with the ceremonial forms of the empire. The title of king was regarded as inferior to that of emperor; and so it continued, as a matter of sentiment at least, down to the end of the Holy Roman empire in 1806 and the cheapening of the imperial title by its multiplication in the 19th century. To the last, the emperor retained the prerogative of creating kings. Since 1814 the title of king has been assumed or bestowed by a consensus of the powers; *e.g.,* the elector of Hanover was made king by the congress of Vienna *(1814).*

The title of king is now taken to imply a sovereign and independent international position, as implied in the recognition of the title in the rulers of Greece, Rumania, Serbia and Bulgaria when these countries were declared absolutely independent of Turkey. The fiction of this independent sovereignty was preserved even in the case of the kings of Bavaria, Saxony and Württemberg, who were technically members of a free confederation of sovereign states, but were not independent.

Divine Right of Kings.—The theory of the "divine right" of kings is of comparatively modern growth. The principle that the kingship is "descendible in one sacred family," is not only still that of the British constitution, as that of all monarchical states, but is practically that of kingship from the beginning. This, however, is not to assert, with the modern upholders of the doctrine of "divine right," not only that "legitimate" monarchs derive their authority from, and are responsible to, God alone; but that this authority is by divine ordinance hereditary in a certain order of succession. The power of popular election remained, even though popular choice was by custom or by religious sentiment confined within the limits of a single family. The custom of primogeniture grew up owing to the obvious convenience of a simple rule that should avoid ruinous contests; the so-called "Salic law" went further and, by excluding females, removed another possible source of weakness. Neither did the Teutonic kingship imply absolute power. The idea of kingship as a theocratic function that played so great a part in the political controversies of the 17th century, is due ultimately to oriental influences brought to bear through Christianity. The crowning and anointing of the emperors, borrowed from Byzantium and traceable to the influence of the Old Testament, was imitated by lesser potentates; and this "sacring" by ecclesiastical authority gave to the king a character of special sanctity. The Christian king thus became, in a sense, like the Roman *rex,* both king and priest. Shakespeare makes Richard II say, "Not all the water in the rough rude sea can wash the balm off from an anointed king"; and this conception of the kingship tended to gather strength with the weakening of the prestige of the papacy and of the clergy generally. Before the Reformation the anointed king was, within his realm, the accredited vicar of God for secular purposes; after the Reformation he became this in Protestant states for religious purposes also. In England the sacerdotal vestments, generally discarded by the clergy—dalmatic, alb and stole—continued to be among the insignia of the sovereign. Moreover, this sacrosanct character he acquired, not by virtue of his "sacring," but by hereditary right; the coronation, anointing and vesting were but the outward and visible symbol of a divine grace adherent in the sovereign by virtue of his title. Even Roman Catholic monarchs would never have admitted that their coronation by the archbishop constituted any part of their title to reign; it was no more than the consecration of their title.

In England the doctrine was developed to its extremest logical conclusions during the political controversies of the 17th century. Of its exponents the most distinguished was Hobbes, the most exaggerated Sir Robert Filmer. It was the main issue to be decided by the Civil War, the royalists holding that "all Christian kings, princes and governors" derive their authority direct from God, the parliamentarians that this authority is the outcome of a contract, actual or implied, between sovereign and people. In one case the king's power would be unlimited, according to Louis XIV's famous saying, *"L'état, c'est moi!,"* or limitable only by his own free act; in the other his actions would be governed by the advice and consent of the people, to whom he would be ultimately responsible. The victory of this latter principle was proclaimed to all the world by the execution of Charles I. The doctrine of divine right, indeed, for a while drew nourishment from the blood of the royal "martyr"; it was the guiding principle of the Anglican church of the Restoration; but it suffered a rude blow when James II made it impossible for the clergy to obey both their conscience and their king; and the revolution of 1688 made an end of it as a great political force. These events served as precedents for the crusade of republican France against kings, and later for the substitution of the democratic kingship of Louis Philippe, "king of the French by the grace of God and the will of the people," for the "legitimate" kingship of Charles X, "king of France by the grace of God."

The theory of the crown in Britain, as held by descent modified and modifiable by parliamentary action, and yet also "by the grace of God," is in strict accordance with the earliest traditions of the English kingship; but the rival theory of inalienable divine right is not dead. It survives among the Carlists in Spain and the Royalists in France (see LEGITIMISTS); and even in England there is a remnant of enthusiasts who still maintain the claims of a remote descendant of Charles I to the throne (see JACOBITES). (W. A. P.; X.)

KINGBIRD *(Tyrannus tyrannus),* a common inhabitant of North America, extending from southern Canada to Oregon, northern New Mexico, central Texas and Florida, wintering in Central America, Peru and Bolivia. The bird owes its name to the fury with which the cock will attack any bird that approaches his nest. The plumage is slaty-gray above and white beneath, with erectile feathers on the crown, which part to reveal an orange base, passing into scarlet and then to white farther back. The kingbird lives on insects. The nest is large, neatly lined with fine grass and containing five or six pale salmon-coloured eggs, spotted with purple, brown and orange, especially near the larger end. The gray kingbird *(T. dominicensis dominicensis)* breeds in the West Indies, Georgia and, rarely, southeastern South Carolina. The Arkansas kingbird *(T. verticalis),* gray above with a conspicuous yellow belly and white edge on either side of the blackish tail, ranges over the western United States. Cassin's kingbird *(T. vociferans),* with white chin, gray breast and yellow belly, breeds in the higher country from Montana, Colorado, central California and western Texas southward. The Tyrannidae are a numerous and diverse group, confined to America. They are the tyrant flycatchers,

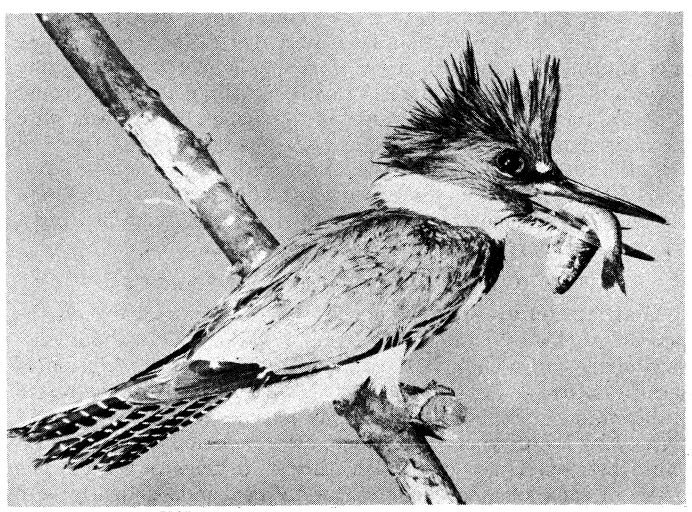
numbering about 365 species, including the familiar phoebe (*q.v.*), pewee (*q.v.*) and many more brilliantly coloured, including the gorgeous little vermilion flycatcher (*Pyrocephalus rubinus*) from southeastern California, southern Utah and south-central Texas southward to northern South America. See FLYCATCHER.

(G. F. Ss.)

KING CRAB, or horseshoe crab, a common name applied to any species of the class Xiphosura, (*q.v.*).

KINGFISHER. The common kingfisher, Alcedo ispida, is a beautiful European bird, extending also to northern Africa and southwest Asia to Sindh. Nowhere very abundant, the brilliant blue-green back and chestnut breast render it conspicuous. The sexes are alike in colour. It plunges into the water for its food, which consists of small fish, crustacea and aquatic insects. The birds nest, early in the year, in a tunnel which they excavate in a bank. The nest consists of the fishbones which the parents throw up, and in it six to eight white, translucent eggs are laid. When the young hatch, the mixture of these bones with the feces (which the parents, unlike most birds, do not remove) and decaying fish forms a dripping, fetid mass. The flesh of the kingfisher is said to be distasteful to birds of prey. The American belted kingfisher (*Megaceryle* alcyon) is larger and less brilliantly coloured.

The family Alcedinidae to which the kingfisher belongs is related to the hornbills (*Bucerotidae*) and consists of two subfamilies, Alcedininae and Deceloninae. Very uniform in structure, the kingfishers are characterized by the feebleness of the feet, in which the third and fourth digits are united (*syndactylism*); in two genera, Alcyone and *Ceyx,* the second digit is aborted. *Tanysiptera* is remarkable for the elongation of the middle pair of tail feathers. which are spatulate. The family is cosmopolitan, though only one genus, *Megaceryle* alcyon, is found in America, ranging from southern Labrador to the Gulf of Mexico. The Australian region is the headquarters of the group, and here are found the "laughing jackass," *Dacelo gigas,* and its relatives. Many kingfishers live on insects.



G. RONALD AUSTING FROM NATIONAL AUDUBON SOCIETY

BELTED KINGFISHER (MEGACERYLE ALCYON) OF NORTH AMERICA

The only fossil kingfisher known is Halcyornis *toliapicus,* from the Eocene of Sheppey.

KINGHORN, a royal and small burgh of Fifeshire, Scot., on the Firth of Forth, 14 mi. E. of Dunfermline by road. Pop. (1961) 2,112. Its golf course and sandy beaches have made it a holiday town. The industries are the making of glass bottles and golf clubs. Alexander III, who created Kinghorn a burgh in 1285, was killed the following year by a fall from his horse on the Pettycur promontory (southwest) where the cliffs were afterward called King's Wud End or King's crag. At Pettycur is a good harbour which has superseded the old Kinghorn harbour. On Kinghorn loch swans and wildfowl can be seen.

Inchkeith, a fortified island in the fairway of the Firth of Forth, 2½ mi. S. by E, of Kinghorn, belongs to the parish of Kinghorn. It is a barren rock, with a harbour and a lighthouse and was visited in 1773 by Samuel Johnson and James Boswell and in 1817 by Thomas Carlyle.

KINGO, THOMAS HANSEN (1634–1703), the chief Danish renaissance poet, was born at Slangerup, Zealand, on Dec. 15, 1634. He studied theology and became a private tutor and later a curate in northwest Zealand, where he wrote a series of poems picturing humorous scenes in village life and a pastoral poem "Chrysillis," evidently inspired by a love affair. The latter, by its splendid imagery and smooth melody, marked the emergence of a great Danish poet.

Kingo became rector of his native village in 1668 and soon attracted the attention of King Frederick III, who was eager to create an elite of talented men to support his absolutist regime and who, in 1677, secured Kingo's election as bishop of Funen. Thereafter he wrote only occasional poetry, in honour of the king and the great men of the time, and the hymns and religious poems which are the most enduring of his works. These were collected in Aandeligt Siunge-Kor ("Spiritual Chorus," 2 vol., 1674 and 1684), chiefly intended for use in private devotion. The best known are the morning and evening songs and the great hymn "Far, Verden, Farvel" ("Fare, World, Farewell"). He was commissioned by the king to compile a new official hymnbook, but his first collection was not approved, and the hymnal, revised by a commission, appeared finally in 1699, still with Kingo as the privileged publisher. It contains about 100 of his own hymns and is popularly known as "Kingo's hymnbook."

Kingo's occasional verse expresses his religiously founded political absolutism and as rhetorical poetry fulfills the demand of the period for pomp and ceremonial. His hymns reveal his sense of the great antithesis between this world and heaven, between sin and grace, and are deeply personal in their realistic and suggestive use of language. They mark the zenith of Danish baroque poetry.

Kingo died at Odense, Oct. 14, 1703. A modern edition of his collected works, edited by H. Brix, P. Diderichsen and J. F. Billeskov Jansen, was begun in 1939 (vol. 7, 1945). (O. A. F.)

KINGS, FIRST AND SECOND BOOKS OF, in the Bible, the last two books of the "Earlier (or Former) Prophets." They were originally reckoned as a single book (Josephus, Talmud, etc.), though modern Bibles follow the Septuagint, where they are called the third and fourth books of "kingdoms," the first and second being our books of Samuel. All four are closely connected. (See SAMUEL, BOOKS OF.)

General Character.-The most noticeable feature in Kings is the recurring interest in the centralization of worship in the Temple at Jerusalem as prescribed in Deuteronomy and enforced by Josiah. To this 2 Sam. vii and xxiv are introductory. Amid the great variety in style and manner which marks the several parts of the history, features which reflect the teaching of Deuteronomy recur regularly in similar stereotyped forms. They point to a specific redaction, and it would seem that the "Deuteronomic" editor who treated the foundation of the Temple, the central event of Solomon's life, as a religious epoch of the first importance, regarded this as the beginning of a new era—the history of Israel under the one sanctuary. Another characteristic feature is the chronological scheme; the events of each king's reign are thrown into a framework on this type: "In the twentieth year of Jeroboam, king of Israel, Asa began to reign over Judah, and reigned in Jerusalem forty-one years." . . . "In the third year of Asa, king of Judah, Baasha began to reign over Israel in Tirzah twenty-four years."

The history moves between Judah and Israel according to the date of each accession; as soon as a new king has been introduced, everything that happened in his reign is discussed. and wound up by another formula as to the death and burial of the sovereign; and to this mechanical arrangement the natural connection of events is often sacrificed. The elaborate synchronisms give an aspect of precision; but in reality the data for Judah and Israel do not agree, and remarkable deviations are sometimes found. (See BIBLE: Old Testament.)

Another characteristic is the retrospective application to the history of a standard belonging to the later developments of

Hebrew religion. Thus the redactor regards the sins of Jeroboam as the cause of the downfall of Israel (2 Ki. xvii. 21 seq), and passes an unfavourable judgment upon all its rulers, not merely to the effect that they did evil in the sight of Yahweh but that they followed in the way of Jeroboam. But his opinion was manifestly not shared by Elijah or Elisha, nor by the original narrator of the lives of these prophets. Moreover, the redactor in 1 Ki. iii. 2 seq. regards worship at the high places as sinful after the building of the Temple, although even the best kings before Hezekiah made no attempt to suppress these shrines. This feature in the redaction displays itself especially in the speeches placed in the mouths of actors in the history.

For his sources the compiler refers chiefly to two distinct works, the "words" or "chronicles" of the kings of Israel and those of the kings of Judah. How much is copied from these works and how much is expressed in the compiler's own language is, of course, uncertain. The history consists usually of an epitome of each reign. It states the king's age at succession (Judah only), length of reign, death and burial, with allusions to his buildings, wars, and other political events. In the case of Judah, also, the name of the royal or queen-mother is mentioned. The use which the compiler makes of his sources shows that his aim was not the history of the past but its *religious significance*.

DIVISION OF THE BOOK

Solomon.—We may divide the book into three sections: (1) the life of Solomon, (2) the kingdoms of Ephraim (or Samaria) and Judah, and (3) the separate history of Judah after the fall of Samaria. The events which lead up to the death of David and the accession of Solomon (1 Ki. i., ii.) are closely connected with 2 Sam. ix.–xx. The unity is broken by the appendix 2 Sam. xxi.–xxiv. which is closely connected: as regards subject-matter, with v.–viii.; the literary questions depend largely upon the structure of the books of Samuel (*q.v.*). It is evident that either the compiler drew upon other sources for the occasion and has been remarkably brief elsewhere, or that his epitomes have been supplemented by the later insertion of material not necessarily itself of late origin. At present 1 Ki. i., ii. are both the close of David's life (no source is cited) and the necessary introduction to Solomon. But both Lucian's recension of the Septuagint (ed. Lagarde) and Josephus, begin the book at ii. 12, thus separating the annalistic accounts of the two. Since the contents of 1 Ki. iii.–xi. do not form a continuous narrative, the compiler's authority ("Acts of S." xi. 41) can hardly have been an ordinary chronicle. The chapters comprise (a) sundry notices of the king's prosperous and peaceful career, severed by (b) a description of the Temple and other buildings; and they conclude with (c) some account of the external troubles. After an introduction (iii.), (a) contains generalizing statements of Solomon's might, wealth and wisdom (iv. 20 seq., 25, 29–34; x. 23–25, 27) and stories of a late and popular character (iii. 16–28, x. 1–10, 13). The Septuagint has many deviations from the Hebrew text, and this, together with the present form of the parallel passages in Chronicles, show that the text was not fixed even at a late period (4th–2nd century B.C.). The account of the end of Solomon's reign deals with his religious laxity (xi. 1–13, now in a Deuteronomic form), as the punishment for which the separation of the two kingdoms is announced; and the rise of the adversaries who, according to xi. 25, had troubled the whole of his reign, and are, therefore, not the penalty for the sins of his old age. Both, however, form an introduction to subsequent events, and the life of Solomon concludes with a brief annalistic notice of his death, length of reign, successor, and place of burial. (See SOLOMON.)

Ephraim and Judah.—In the history of the two kingdoms the redactor follows a scheme determined by the order of succession. The fluctuation of tradition concerning the schism is evident from a comparison with the Septuagint; and all that is related of Ahijah falls under suspicion of being foreign to the oldest history. The story of the man or God from Judah (xiii.) is shown to be late by its conceptions of prophetism and revelation, and by the term "cities of Samaria" (v. 32, for Samaria as a province, *cf.* 2 Ki. xvii. 24, 26; for the building of this city by Omri see 1 Ki. xvi. 24). It is a late Judaean narrative inserted after the Deuteronomic redaction, and breaks the connection between xii. 31 and xiii. 33 seq. The latter describe the idolatrous worship instituted by the first king of the schismatic north, and the religious attitude occurs regularly throughout the compiler's epitome. however brief the reigns of the kings. The brief reign of Elah preserves an important extract in xvi. 9, but the date in v. 10*a* (LXX. omits) presupposes the late finished chronological scheme. Zimri's seven days receive the inevitable condemnation, but the older material embedded in xri. 1 jb–18 is closely connected with *v.* 9 and is continued in the non-editorial portions of Omri's reign (xvi. 21 *seq.*, length of reign in *v.* 23, and v. 24).

As regards Judah, the vivid account of the accession of Rehobosm in xii. 1–16 is reminiscent of the full narratives in 2 Sam. ix.–xx. and 1 Ki. i., ii. (*cf.* especially v. 16 with 2 Sam. xx. 1). Ch. xii. 15*b* refers to the prophecy of Ahijah (see above) and "unto this day," *v.* 19, cannot be by a contemporary author; v. 17 (LXX. omits) finds a parallel in 2 Chron. xi. 16 seq. and may represent an Ephraimite standpoint. The Judaean standpoint is prominent in *vv.* 21–24, where (a) the inclusion of Benjamin and (b) the cessation of war (at the command of Shemaiah) conflict with (a) xi. 32, 36, xii. 20 and (b) xiv. 30 respectively. Rehoboam's history. resumed by the redactor in xiv. 21–24, continues with a brief account of the spoiling of the Temple and palace by Sheshonk (Shishak). (The incident appears in 2 Chron. xii. in a rather different context, *before* the details which now precede v. 21 *seq.*) The reign of Abijam is entirely due to the editor, whose brief statement of the war in xv. 7*b* is supplemented by a lengthy story in 2 Chron. xiii. (where the name is Abijah). The account of Asa's reign contains a valuable summary of his war with Baasha xv. 16–22; the isolated *v.* 1 j is possibly related to v. 18 (*cf.* also rii. 51). Jehoshaphat is dealt with in xxii. 41–50 after the death of Ahab; but the Septuagint, which follows a different chronological scheme (placing his accession in the reign of Omri), gives the summary (with some variations) after xvi. 28.

THE OVERTHROW OF OMRI'S DYNASTY

Ahab to Jehu.—The history of the few years between the close of Ahab's life and the accession of Jehu covers about one-third of the entire book of Kings. This is due to the inclusion of narratives. partly of a political character, and partly interested in the work of prophets. The climax is the overthrow of Omri's dynasty by the usurper Jehu, when, after a period of close intercourse between Israel and Judah, their two kings perished The annals of each kingdom would naturally deal independently with these events, but the present literary structure of 1 Ki. xvii.–2 Ki. xi is extremely complicated by the presence of the narratives referred to As regards the framework, the epitome of Ahab is preserved in xvi. 29–34 and xxii. 39; it contains some unknown references (his ivory house and cities), and a stern religious judgment upon his Phoenician alliance, on which the intervening chapters throw more light. The colourless summary of his son, Ahaziah (xxii. 51–53), concludes in 2 Ki i. 17 seq. where *v.* 18 should precede the accession of his brother, Jehoram (v. 17*b*). Jehoram is again introduced in iii. 1–3 (note the variant synchronism), but the usual conclusion is wanting. In Judah, Jehoshaphat was succeeded by his son, Jehoram, who had married Athaliah, the daughter of Ahab and Jezebel (viii. 16–24); to the annalistic details (*vv.* 20–22) 2 Chron xxi. 11 sqq. adds a novel narrative. His son, Ahaziah (viii. 25 sqq.) is, like his father, denounced for his relations with Israel. He is again introduced in the isolated ix. 29, and Lucian's recension adds after x. 36 a variant summary of his reign but without the regular introduction. Further confusion appears in the Septuagint, which inserts after i. 18 (Jehoram of Israel) a notice corresponding to iii 1–3, and concludes "and the anger of the Lord was kindled against the house of Ahab." This would be appropriate in a posiiion nearer ix. *seq.*, where the deaths of Jehoram and Ahaziah are described.

In 1 Ki. xx., xxii 1–28 (xxi. follows xix. in the LXX) Ahab is viewed rather more favourably than in the Elijah-narratives (xix., xxi.) or in the compiler's summary. Ch xxii. 6, moreover, proves that there is some exaggeration in xviii. 4, 13; the great contest between Elijah and the king, between Yahweh and Baal, has been idealized. Ch. xxii. is important for its ideas of prophetism (es-

pecially *vv.* 19–23; *cf.* Ezek. xiv. g; 2 Sam. xxiv. 1 (in contrast to 1 Chron. xxi. 1); a gloss at the end of v. 28, omitted by the Septuagint, wrongly identifies Micaiah with the well-known Micah (i. 2). Although the punishment passed upon Ahab in xxi. 20 *sqq.* (20*b*–26 betray the compiler's hand; cf. xiv. 10 seq.) is modified in *v.* 29, this is ignorccl in the account of his death, xxii. 38, which takes place at Samaria. The ascension of Elijah (a Ki. ii.) is the introduction to the work of Elisha. Of the stories of Elisha some find him at the head of the prophetic gilds (iv. 1, 38–44, vi. 1–7), in others he has friendly relations with the "king of Israel" and the court. As a personage of almost superhuman dignity he moves in certain narratives where political records appear to have been utilized to describe the activity of the prophets. With vi. 24–vii. 20 (after the complete cessation of hostilities in vi. 23) compare the general style of 1 Ki. xx., xxii.; with the famine in Samaria, vi. 25, *cf.* ibid. xvii.; with the victory, *cf.* ibid. xx. The account of Elisha and Hazael (viii. 7–1j) implies friendly relations with Damascus (in v. 12 the terrors of war are in the future). Ch. ix. 7–10*a* are a Deuteronomic insertion amplifying the message in *vv.* 3–6 (*cf.* 1 Ki. xxi. 20 *seq.*). The oracle in ix. 25 seq. is not that in 1 Ki. xxi. 19 seq. and mentions the additional detail that Naboth's sons were slain. Here his field or portion is located near Jczreel, but in 1 Ki. xxi. 18 his vineyard is by the royal palace in Samaria (cf. xxii. 38 and contrast xxi. 1, where the LXS. omits reference to Jezreel). This variation reappears in 2 Ki. x. 1, 11 *seq.*, and 1;; in ix. 27 compared with 2 Chron. xxii. 9; and in the duplication of an historical incident, viz., the war against the Aramaeans at Ramoth-Gilead (a) by Jehoshaphat and Ahab, and (b) by Ahaziah and Jehoram, in each case with the death of the Israelite king, at Samaria and Jezreel respectively (*see* above, and observe the contradiction in 1 Ki. xxi. 29 and xxii. 38). These and other questions here are involved with (a) the probability that Elisha's work belongs rather to the accession of Jehu, with whose dynasty he was on most intimate terms until his death some 45 years later (2 Ki. xiii. 14–21), and (b) the problem of the wars between Israel and Syria which appear to have begun only in the time of Jehu (x. 32). (See ELIJAH, ELISHA.)

Dynasty of Jehu. — There is no editorial introduction to Jehu (x. 32 sqq.). The summary mentions the beginning of the Aramaean wars, the continuation of which is found in the redactor's account of his successor, Jehoahaz (xiii. 1–9). But xiii. 4–6 modify the disasters, and by pointing to the "saviour" or deliverer (*cf.* Judges iii. 9, 15) seem to anticipate xiv. 27. The self-contained account of Jehoash (xiii. 10–13) is supplemented (a) by the story of the death of Elisha (av. 14–21), who would seem to have flourished *after* the rise of Jehu and not before, and (b) by some account of the Aramaean wars (*vv.* 22–25). Here, *v.* 23 is noteworthy for the sympathy towards the northern kingdom (similarly *vv.* 4–6). (c) The defeat of Amaziah of Judah appears in xiv. 8–14 after the annals of Judah, although from an Israelite source (*v.* 11b Eethshemesh is defined as Judaean.)

In Judah Jehu's reform and the overthrow of Jezebel (ix., x. 15–28) find their counterpart in the murder of Athaliah and the destruction of the temple of Baal (xi. 18). The editorial conclusion of the reign of Ahaziah, the introduction to that of Athaliah, and the sources for both are wanting. The lengthy document describing the accession of Joash and the abruptly introduced priest, Jehoiada, shows an obvious interest in the Temple and temple-procedure; and both xi. and xii. resemble xxii. seq. Azariah (Uzziah) is briefly summarized in xv. 1–7, hence the notice in xiv. 22 seems out of place; perhaps the usual statements of Amaziah's death and burial (cf. xiv. 20*b*, 22*b*), which were to be expected after a. 18, have been supplemented by the account of the rebellion (va. 19, 20*a*, 21). Both xiv. 22 and xv. 5 presuppose fuller records of which 2 Chron. xxvi. 6–7, 16–20 may represent later and less trustworthy versions. The chronological notes for the accession of Azariah imply different views of the history of Judah after the defeat of Amaziah; with xiv. 17, cf. xiii. 10, xiv. 2, 23, but contrast xv. 1, and again *v.* 8.

The important reign of Jeroboam II. of Israel is dismissed as briefly as that of Azariah (xiv. 23–29). Of his successors Zechariah, Shallum and Menahem only the briefest records remain, now embedded in the editorial framework (xv. 8–25). The summary of Pekah (?the same as Pekahiah) contains excerpts which form the continuation of the older material in v. 25 (cf. also vv. 10, 14, 16, 19, 20). For a similar adjustment of an earlier record to the framework, see above on 1 Ki. xv. 25–31, xvi. 8–25. Two accounts of the fall of Samaria are given, one under the reign of the contemporary Judaean Hezekiah (xvii. 1–6, xviii. 9–12). Reflections on the disappearance of the northern kingdom appear in xvii. 7–23 and xviii. 12; the latter belongs to the Judaean history. The former is composite: xvii. 21–23 (cf. v. 18) look back to the introduction of calf-worship by Jeroboam I., and agree with the compiler's usual standpoint; but vv. 19–20 include Judah and presuppose the exile. The remaining verses survey types of idolatry partly of a general kind (vv. 9–12, 16*a*), and partly characteristic of Judah in the last years of the monarchy (vv. 16b. 17). The brief account of the subsequent history of Israel in xvii. 24–41 is not from one source; the piety of the new settlers (v. 32–34*a*, 41) conflicts with the later point of view in 34*b*–40. The last-mentioned supplements the epilogue in xvii. 7–23, forms a solemn conclusion to the history of the northern kingdom, and is apparently aimed at the Samaritans.

Later History of **Judah.**—The summary of Jotham (xv. 32–38) alludes to the hostility of Pekah (v. 37) upon which the Israelite annals are silent. This is resumed in the account of Ahaz (xvi. 5 *sqq.;* v. 6 is confused), and is supplemented by a description, evidently from the Temple records, in which the ritual innovations by "King Ahaz" are described (*vv.* 10–18). The summary of Hezekiah (xviii. 1–8) emphasizes his important religious reforms and includes two references to his military achievements. Of these v. 7 is supplemented by *(a)* the annalistic extract in *vv.* 13–16, and (b) narratives in which the great contemporary prophet, Isaiah, is the central figure. (On these see HEZEKIAH ISAIAH.) In the accounts of the reactionary kings Manasseh and Amon, xxi. 7–1j, refer to the exile and find a parallel in xxiii. 26 *seq.;* and xxi. 10 sqq. are replaced in 2 Chron. xxxiii. 10–20 by a novel record of Manasseh's penitence (see also ibid. *v.* 23 and note omission of 2 Ki. xxiii. 26 from Chron.).

Josiah's reign forms the climax of the history. The usual framework (xxii. 1; 2, xxiii. 28, gob) is supplemented by narratives dealing with the Temple repairs and his reforms. These are closely related to xi. scq. (cf. xxii. 3–7 with xii. 4 sqq.), but have signs of revision; xxii. 16 scq., xxiii. 26 seq., point distinctly to the exile, and xxiii. 16–20 are an insertion (the altar in *v.* 16 is already destroyed in v. 15) after 1 Ki. xiii. The reforms of Josiah are described in terms that point to an acquaintance with the teaching of Deuteronomy which promulgates the reforms themselves. (See DEUTERONOMY, JOSIAH.)

For the last four kings of Judah, the reference to the worship at the high places (presumably abolished by Josiah) are wanting; xxiv. 3 seq., and probably v. 2, which treat the fall of Judah as the punishment for Manasseh's sins, are a Deuteronomic insertion; *v.* 13 scq. and v. 1j *seq.* are duplicates. With xxiv. 18–xxv. 21 cf. Jer. lii. 1–27 (the text of the latter, especially vv. 19 sqq., is superior); and the fragments ibid. xxxix. 1–10. Ch. xxv. 22–26 appears in much fuller form in Jer. xl. 7–9, xli. 1–3, 17 seq. It is noteworthy that Jeremiah (in contrast to Isaiah, above) does not enter into the history in Kings. The book of Chronicles in general has a briefer account of the last years, and ignores both the narratives which also appear in Jeremiah and the concluding hopeful note struck by the restoration of Jehoiachin (xxv. 27–30).

Conclusions. — It would seem that there was an independent history of (north) Israel with its own chronological scheme. It was based upon annals and fuller political records and at some period apparently passed through circles where the purely domestic stories of the prophets (Elisha) were current (cf. similarly the prophetic narratives in the books of Samuel). This was ultimately taken over by a Judaean editor who was under the influence of the far-reaching reforms ascribed to the 18th year of Josiah (621 B.C.). Certain passages seem to imply that in his time the Temple was still standing and the Davidic dynasty uninterrupted. On the other hand this could apply to the second

Temples and to the resumption of the Davidic monarchy under Zerubbabel; and if the object of the compiler was to show from past history that "the sovereign is responsible for the purity of the national religion" (G. F. Rfoore), a later date would satisfy the conditions. Moreover, although the phrase "unto this day" sometimes seems to presuppose a pre-exilic date, it is retained even in the very late books of Chronicles. Again, not only is the history carried down to the death of Jehoiachin, but the chronological scheme (480 years from the beginning of the Temple to the return from Babylon) points to a date subsequent to 537.

One may contrast the Israelite detailed narratives (relatively early) with those of Judaean origin (often secondary, and with an anti-Israelite bias). The sympathetic treatment of the northern history in II Kings xiii, 4 *seq.* 23, xiv, *26.* has literary parallels in the Deuteronomic redaction of Judges; and is quite distinct from the hostile (Judaean) feeling to the north which is also Deuteronomic. In other words, a twofold Deuteronomic redaction of Kings can be traced; and, as the northern prophet Hosea (*q.v.*) approximates the Deuteronomic standpoint. it is possible that the first Deuteronomic compilation of Kings originated outside Judah. An Israelite source could be drawn upon for an impartial account of Judaean history, and the book of Jeremiah. with its strong Deuteronomic colouring, takes a sympathetic view of (north) Israel.

Although ultimately Judaean writers rejected as heathen a people who claimed to be followers of Yahweh, the violent anti-Samarian feeling had once been less prominent; and it may reasonably be supposed that relations between north and south had been closer. But the age wherein the composition of the book of Kings may be placed has been left exceptionally obscure; the Chronicler's history (Chron.–Ezra–Neh.) has its own ideas of the course of events, and it has virtually superseded both Kings and Jeremiah, which now have an abrupt conclusion.

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KING'S BENCH, COURT OF: *see* QUEEN'S BENCH, COCRT OF.

KINGS CANYON NATIONAL PARK lies in the Sierra Nevada mountains of California. It is adjacent to Sequoia National park and is under a common administration, with headquarters at Three Rivers, Calif. Kings Canyon National park, containing 454,650 ac., was established by act of congress in 1940 and assimilated the 2.534-ac. General Grant National park.

Like Sequoia and Yosemite National parks, Kings Canyon National park gives protection to groves of *Sequoia gigantea,* the Sierra redwood. The most spectacular feature of the park, however, is Kings canyon on the south fork of Kings river. This is a glaciated canyon similar to Yosemite, carved out of the westward-sloping fault block of the Sierras.

Kings Canyon and Sequoia National parks contain many lakes, 900 mi. of trails, and large wilderness areas. The John Muir trail follows the crest of the mountains from Sequoia through Kings Canyon to Yosemite. Fishing is considered good. Deer, bear, bighorn sheep and other wildlife may be seen but may not be hunted. The General Grant tree, principal attraction of the General Grant grove, is five feet shorter and two feet greater in diameter than Sequoia park's famous General Sherman tree.

See SEQUOIA NATIONAL PARK for information on *Sequoia gigantea,* accommodations at the parks, nearest cities and dimensions of the General Sherman tree. (J. E. CL.)

KING'S EVIL, scrofula (cervical lymphadenitisj, a disease once deemed capable of cure by the royal touch. The practice of "touching" for the "king's evil" cannot be traced back to an earlier date than the reigns of Edward III in England and of St. Louis (Louis IX) in France; consequently, it is believed that the performance of healing by the touch emanated in the first instance from the French crusader-king, whose miraculous powers were subsequently transmitted to his descendant and representative, Isabella of Valois, wife of Edward II of England. Her son, Edward III, was the first English king to order a public display of an attribute that had hitherto been associated with the Valois kings alone. From his reign dates the use of the "touchpiece," a gold medal given to the sufferer as a kind of talisman. originally the angel coin, stamped with designs of St. Michael and a three-masted ship.

The actual ceremony seems first to have consisted of the sovereign's personal act of washing the diseased flesh with water, but under Henry VII the use of an ablution was omitted, and a regular office was drawn up for insertion in the Service Book. The king now merely touched his afflicted subject in the presence of the court chaplain who offered up certain prayers and afterward presented the touchpiece, pierced so that it might be suspended by a ribbon round the patient's neck. The Hanoverian kings declined to touch, and there exists no further record of any healing ceremony thenceforward at the English court. The practice. however, was continued by the exiled Stuarts, and was constantly performed in Italy by James Stuart, "the old Pretender," and by his two sons.

See A. *M.* Hocart, *Kingship* (1927).

KINGSLEY, CHARLES (1819–1875), English clergyman, poet and novelist, was born on June 12, 1819, at Holne vicarage, Dartmoor, Devon. His early years were spent at Barnack in the Fen country and at Clovelly in North Devon. The scenery of both made a great impression on his mind, and was afterward described with singular vividness in his writings. He was educated at private schools and at King's college, London, after his father's promotion to the rectory of St. Luke's, Chelsea. In 1838 he entered Xfagdalene college, Cambridge, and in 1842 he was ordained to the curacy of Eversley in Hampshire, to the rectory of which he was not long afterward presented, and this, with short intervals. was his home for the remaining 33 years of his life. In 1844 he married Fanny, daughter of Pascoe Grenfell, and in 1848 he published his first volume! *The Saint's Tragedy.* In 1859 he became chaplain to Queen Victoria; from 1860 to 1869 he was professor of modern history at Cambridge. In 1873 he became a canon of R'estminster. He died at Eversley on Jan. 23, 1875.

Kingsley threw himself heartily into the movement known as Christian Socialism, of which Frederick Denison Maurice was the recognized Ieader, and for many years he mas considered as an extreme radical in a profession the traditions of which were conservative. While in this phase he wrote his novels *Yeast* and *Alton Locke,* in which he showed sympathy with the aims of the Chartists. Yet even then he considered that the true leaders of the people were a peer and a dean, and there mas no real inconsistency in the fact that at a later period he was among the defenders of Governor Eyre in the measures adopted by him to put down the Jamaican disturbances. He looked rather to the extension of the co-operative principle and to sanitary reform for the amelioration of the condition of the people than to any radical political change. His politics might therefore have been described as Toryism tempered by sympathy, or as Radicalism tempered by hereditary scorn of subject races. He was bitterly opposed to what he considered to be the medievalism and narrowness of the Oxford Tractarian movement. In *Macmillan's Magazine* for Jan. 1864 he asserted that truth for its own sake was not obligatory with the Roman Catholic clergy, quoting as his authority John Henry Newman (*q.v.*). In the ensuing controversy Kingsley was completely discomfited. He was a broad churchman, who held what would be called a liberal theology, but the more orthodox and conservative elements in his character gained the upper hand as time went on.

As a novelist his chief power lay in his descriptive faculties. The descriptions of South American scenery in *Westward Ho!,* of the Egyptian desert in *Hypatia,* of the North Devon scenery in *Two Years Ago,* are among the most brilliant pieces of word-painting in English prose writing; and the American scenery is even more vividly and more truthfully described when he had seen it only by the eye of his imagination than in his work *At Last,* which was written after he had visited the tropics. His

sympathy for children taught him how to secure their interests His version of the old Greek stories entitled *The Heroes,* and *Water-babies* and *Madam How and Lady Why,* in which he deals with natural history, rank high among books for children

In person Charles Kingsley was tall and spare. sinewy rather than powerful. and of a restless excitable temperament. His complexion was swarthy, his hair dark. and his eye bright and piercing. His temper was hot.. kept under rigid control; his disposition tender. gentle and loving. with flashing scorn and indignation against all that was ignoble and impure; he was a good husband, father and friend. One of his daughters, hlary St. Leger Kingsley (Mrs. Harrison), bccnme well known as a novelist under the pseudonym of "Lucas Malet."

Kingsley's life was written by his widow in 1877, entitled *Charles Kingsley, his Letters and Memoirs of his Life,* and presents a very touching and beautiful picture of her husband, but perhaps hardly docs justice to his humour, his wit, his overflowing vitality and boyish fun.

The following is a list of Kingsley's writings:—*Saint's Tragedy,* a drama (1848); *Twenty-five Village Sermons* (1849); *Alton Locke,* a novel (1850); *Yeast,* a novel (1851); *Phaeton, or Loose Thoughts for Loose Tkinkrrs* (1852); *Sermons on National Subjects* (1st series, 1852); *Hypatia,* a novel (1853); *Glaucus, or tha Wonders of the Shore* (1855); *Sermons on National Subjects* (2nd series, 1854); *Alexandria and her Schools* (1854); *Westward Ho! a* novel (1855); *Sermons for the Times* (1855); *The Heroes,* Greek fairy tales (1856); *Two Years Ago,* a novel (1857); *Andromeda and other Poems* (1858); *Thr Good News of God,* sermons (1859); *Miscellanies* (1859); *Limits of Exact Science applied to History* (Inaugural Lectures 1860); *Town and Country Sermons* (1861); *Sermons on the Pentateuch* (1863); *Water-babies* (1863); *The Roman and the Teuton* (1864); *David and other Sermons* (1866); *Hereward the Wake,* a novel (1866); *The Ancient Régime* (Lectures at thr Royal Institution, 186;) ; *Water of Life and other Sermons* (1867); *The Hermits* (1869); *Madam How and Lady Why* (1869); *At last* (1871); *Town Geology* (1872); *Discipline and other Sermons* (1872); *Prose Idylls* (1873); *Plays and Puritans* (1873); *Health and Education* (1874); *Westminster Sermons* (1874); *Lectures delivered in America* (1875). He was a large contributor to periodical literature; man?; of his essays are included in *Prose Idylls* and other works in the above lict. His contributions to the *Christian Socialist* and *Politics for the People* were frequently signed "Parson Lot."

KINGSLEY, HENRY (1830–76), English novelist, younger brother of Charles Kingsley, was born at Barnack, Northamptonshire on Jan. 2, 1830. In 1853 he left Oxford, where he was an undergraduate at Worcester college, for the Australian goldfields. This venture, however, was not a success, and after five years he returned to England. He then wrote *Recollections of Geoffrey Hamlyn* (1859), a novel of Australian life. This was the first of a series of novels of which *Ravenskoe* (1861), his best work, and *The Hillyars and The Burtons* (1865) are the best known. He edited for 18 months the *Edinburgh Daily Review,* for which he had acted as war correspondent during the Franco-German War. He died at Cuckfield, Sussex, on May 24, 1876.

See a memoir by C. K. Shorter prefixed to a reprint (1894) of Kingsley's novels.

KINGSLEY, MARY HENRIETTA (1862–1900), English traveler in and writer on West Africa, in whose memory the African society (now the Royal African society) was founded in 1901 "for enquiry into native law and custom, and for the mutual enlightenment of the black and white man." was born in Islington, London, on Nov. 13, 1862. She was the daughter of George Henry Kingsley (1827–92), an enthusiastic traveler seldom at home. and the niece of Charles Kingsley (*q.v.*). She spent a secluded life until the age of 30 when the death of her parents freed her and she decided to go to West Africa to study African religion and law During 1893–94 she visited Kabinda. Old Calabar. Fernando Póo and the lower Congo, partly to collect West African beetles and fresh-water fish for the British museum. In Dec. 1894 she sailed again for West Africa and in less than a year visited the French Congo, ascending the Ogooué (Ogowe) river and passing through the dangerous and largely unknown country of the Fan (or Fang) tribe from Lambaréné to Agonjo on the Rembwe. She then visited Corisco Island and climbed Mt Cameroons (13,-352 ft.) from a direction not previously attempted. From these journeys she brought back valuable collections, including a fish. new to science, from the Ogowe. Everywhere she had the respect and assistance of both Africans and Europcans, and the knowledge of trade conditions that she acquired subsequently proved of considerable value to West African merchants in Britain. Her adventures appeared in *Travels* in *West Africa* (1897) and her opinions in *West African Studies* (1899). Between 1896 and 1899 Mary Kingsley lectured extensively in the British Isles at the request of academic and scientific societies and also the Manchester and Liverpool Chambers of Commerce, thus making known the conditions of life and government in West Africa Her plans to revisit that region were altered by the South African War. in nhich she nursed sick Boer prisoners at Simonstown until her death of enteric fever on June 3, 1900.

Mary Kingsley's inherited love of adventure, her physical and moral courage, and her disregard of the conventions of her time enabled her personally to investigate conditions in Africa and then to fight to better them by word of mouth and by her pen. Her unique knowledge gave her power, and her enjoyment of this, together with her conviction that she knew what was best for the African, sometimes prejudiced her judgment of those who held different opinions.

See Cecil Howard, *Mary Kingsley* (1957). (**R. W.** SL.)

KING'S LYNN, a municipal borough and seaport in the King's Lynn parliamentary division of Norfolk, Eng.. on the estuary of the Great Ouse near its outflow into the Wash. 44 mi. W N.W of Norwich by road. Pop. (1951) 26,176. Area 10.4 sq.mi. The town ranked high among English ports from early times and retains many old houses and streets. As Lynn owes its origin to the trade which was carried by the Ouse and its tributaries, its history dates from the period of settled occupation by the Saxons. It belonged to the bishops of Thetford before the Conquest. Herbert de Losinga (*c.* 1054–1119) granted its jurisdiction to the cathedral of Norwich, but this right was resumed by a later bishop, John de Gray, who in 1204 had obtained from John a charter establishing Lynn as a free borough. A grant in 1206 gave the burgesses a guild merchant. Henry VIII granted Lynn two charters. the first (1524) incorporating it under a mayor and aldermen; the second (1537) changing its name to King's Lynn. Lynn, which had declared for the crown in 1643 and was captured by the parliament forces, surrendered its privileges to Charles II in 1684, but recovered its charter on the eve of the revolution. The parishes of Gaywood and West Lynn were added to the borough in 1935.

On the land side the town was formerly defended by a fosse, and there are remains of the old wall. including the 15th-century South gate. The river by-channels—the "fleets"—recall the similar *flete* of Hamburg. In the park area of the Walks is the octagonal Perpendicular Red Mount chapel. an unusual structure dating to about 1485 and once visited by pilgrims. The twin-towered church of St. Margaret, with a fine Early English chancel, was begun in the 12th century and much added to; its two great 14th-century brasses are famous. The St. Nicholas chapel-of-ease was completed in 1419. In South Lynn is All Saints' church, a cruciform Decorated building. There remain the slim tower of Greyfriars (Perpendicular) and Thoresby college, a 1jth-century ecclesiastical establishment. In the old grammar school, founded in the reign of Henry VIII and now removed. the murderer Eugene Aram taught. The Guildhall has a Renaissance porch and many municipal relics; St. George's guildhall, built about 1410 and restored in 1951, is used for a July festival of the arts. Among the many buildings of interest are the custom house (1683); Clifton house. a merchant's home of the 17th century; the 18th-century courthouse; and many houses of the past merchants of King's Lynn. The chief industries are the making of artificial manures, the refining of beet sugar, the canning and quick freezing of fruit and vegetables, light engineering. timber importing and all the activities of a small port dealing with traffic from Baltic and North sea ports. There is some fishing. The Tuesday cattle and corn markets and Tuesday and Saturday general and provision markets date from 1524.

Fanny Burney was born there; and Margery Kempe, the 15th-century mystic and writer of a personal and travel journal, was the daughter of a mayor and wife of a burgess of the town.

KINGSPORT, a city of Sullivan county, Tenn., U.S., in the ridge and valley province of the northeastern part of the state, 25 mi. W. of Bristol (*q.v.*) and 21 mi. N.W. of Johnson City (*q.v.*). Kingsport's history dates from the late 18th century, when it was a boat landing for shipping on the Holston river; in 1774 Col. James King established a mill at the mouth of Reedy creek and later built an ironworks and a nail factory. But the modern city is a 20th-century development: in 1909 a railroad was built to Kingsport and in 1915 a civic improvement association made plans for the orderly development of industry. The city was chartered in 1917 and has had a council-manager form of government since that time. Kingsport has one of the largest book manufactories, a paper mill and plants that produce chemicals, plastics, glass, leather, textiles and machinery. Nearby mountains and TVA lakes provide recreational facilities.

For comparative population figures *see* table in TENNESSEE: *Population.* (F. B. W.)

KING'S REGULATIONS, the regulations governing the organization and discipline of the British navy and army, issued in volume form under the authority of the king.

KINGSTON, the chief city of Frontenac county, Ont., Canada, and port on the north shore of Lake Ontario at the confluence of the lake and the St. Lawrence river and at the mouth of the Cataraqui river and Rideau canal; it is 165 mi. N.E. of Toronto and 185 mi. S.W. of Montreal. This strategic location, originally called Cataraqui, was the site of Indian councils in 1673 when the governor of New France, the comte de Frontenac, erected a fortified trading post: La Salle. as commandant in 1675, strengthened and rebuilt the fort. Fort Frontenac was a key outpost of exploration and defense against the Iroquois and the English until its destruction in 1758 by the British. In 1783 the site was occupied by United Empire Loyalists who named it Kingston; nithin the next decade it became the principal naval base of Lake Ontario and as such held considerable military importance during the War of 1812. Kingston was incorporated as a town in 1838 and as a city in 1846; from 1841 to 1844 it was the seat of government for the united provinces of Upper and Lower Canada.

Port facilities include an inner and outer harbour, a 2,500,000-bu. grain elevator, and shipbuilding, salvage and dry-dock facilities. Principal industrial products include aluminum sheets, foils and shapes; diesel locomotives and engines; ships; mining equipment; synthetic yarns; storage batteries; leathers; and ceramics Military establishments include the Royal Military college, National Defence college and Canadian Army Staff college. Queen's university. St. George's cathedral (Anglican) and St. Mary's cathedral (Roman Catholic) are examples of the large number of limestone buildings. Pop. (1961) 52.105. (F. G. R.)

KINGSTON, a city of New York, U.S., 90 mi. N. of New York city in the Catskill mountains; the seat of Ulster county. Kingston was one of the two first white settlements on the Hudson river above New York city; its origins may be traced to a temporary fur trading post established at the mouth of the Rondout creek within a year or two after Henry Hudson's explorations of the river in 1609. The first permanent settlement, called Esopus, was made by the Dutch in 1658, when Gov. Peter Stuyvesant laid out plans for a stockade with 40 houses. Three years later he issued a charter to the settlement and renamed it Wiltwyck ("wild town"). When the loosely organized Dutch colonies were taken over by the British in 1664, the name Wiltwyck was changed to Kingston. The year 1777 was a year of firsts for this historic city. The first state senate met there, the first state constitution was adopted, the first state supreme court sat under John Jay and Kingston became the first state capital when the legislature convened in September. A month later the British, in revenge for Kingston's spirit of independence, burned the town almost to the ground. But "the colonial city" survived and in April 1805 it was incorporated as a village. On March 29, 1872 the combined villages of Kingston, Rondout, Wiltwyck and Wilbur became the chartered city of Kingston.

The city is in an area noted for its apple and chicken production and is also one of the largest mushroom growing areas. Kingston's economy expanded rapidly after the completion in 1828 of the Delaware and Hudson canal from Honesdale, Pa., to the Hudson at Kingston. The canal brought coal from Pennsylvania to New York markets and carried cement. limestone, sandstone, bluestone and brick to build New York city until increasing rail competition led to its abandonment in 1899. In Kingston a diversity of economic pursuits developed over the years, and the city is a year-round resort area.

Kingston is in the region made famous by Washington Irving in his story of Rip van Winkle. The Old Dutch church, established in 1661, the senate house and the Kingston-Rhinecliff bridge are noteworthy structures.

For comparative population figures *see* table in NEW YORK: *Population.* (E. P. LI.)

KINGSTON, a borough of Luzerne county in eastern Pennsylvania. U.S., on the north branch of the Susquehanna river opposite Wilkes-Barre (*q.v.*). In 1769 Kingston was settled by pioneers from Connecticut and New England holding claims to the land under the Susquehannah company. Before and after the American Revolution the people of Kingston fought against Pennsylvania claimants for the land and during the Revolutionary War against the British and Indians in the disastrous battle of Wyoming Valley (1778), in which the Americans were defeated, and many of those captured were massacred or tortured by the Indians.

Until 1950 anthracite was the dominant industry in both employment and wealth produced. The subsequent decline in anthracite was offset by Kingston's becoming the residential section for Wilkes-Barre and by opportunities offered in the railway repair shops and factories making baked goods, silk, hosiery, aircraft parts, undergarments, foundry machines and tobacco products. A variety of ethnic groups make up the population. For comparative population figures for the borough *see* table in PENNSYLVANIA: *Population.*

Kingston. which became a borough in 1857, is the home of the Wyoming seminary (1844), one of the first coeducational college preparatory schools in the United States.

See also WYOMING VALLEY. (R. D. Wr.)

KINGSTON, a village in the town of South Kingstown, Washington county, R.I.. U.S., 24 mi. S of Providence. noted for its elm-shaded main street lined with colonial and early federal period buildings, Founded about 1700 on Little Rest hill, the village nas known as Little Rest until 1825. In 1752 the county seat was moved from Tower Hill, the earliest settlement in the area, to Little Rest and from that date to 1854 it was one of the five towns in which the Rhode Island general assembly met. Prior to the American Revolution the village grew rapidly, and became a focal point in the social and political life of the slave-owning planter society whose large estates lay in the surrounding countryside. Loss of the legislative sessions transformed Kingston from a place of flourishing taverns and shops to a quiet relic of a vanished era. though it remained the location of the county courthouse until 1900. The population of the village in the second half of the 20th century was under 5,000.

In 1892 the founding of the Rhode Island College of Agriculture and Mechanic Arts on the outskirts of the village brought new life and an influx of new residents. The college, which became the University of Rhode Island in 1951, expanded rapidly in the following decade.

Near Kingston are some of the best stands of rhododendron and laurel in New England and the Great snamp, noted for wildlife and unusual botanical specimens. A crucial battle in King Philip's War took place there in 1675. (C. A. Co.)

KINGSTON, the capital and chief port of Jamaica, sprawls along the eastern end of the south coast of the island, backed by a line of hills. It is known for its beautiful harbour which is landlocked by a narrow strip called the Palisadoes. The population in 1960 was 123,495, the majority of which were Negroes. Kingston was founded in 1693, after Port Royal had been ruined by an earthquake.

In 1703 Kingston became the commercial, and in 1872 the political capital of Jamaica.

On several occasions it was almost entirely destroyed by fire,

and in Jan. 1907 it suffered a violent earthquake. The church of St. Thomas, in King street: mas first built before 1699 but rebuilt after the earthquake in 1907. In the Parade are most of the city's memorial statues and adjoining the Parade are the Victoria gardens. At the eastern limits of the town stands Rockfort, a moated fortress built at the close of the 17th century and last manned in 1865. In Duke street stands the seat of the government, Headquarters house. The Institute of Jamaica in East street maintains a public library, museum and art gallery. The University College of the West Indies. affiliated with London university, is at Mona. 7 mi. from Kingston.

After World War II the foreshore area became an industrial city for new factories which include those for food processing, clothing and shoe production. (S. E. C.)

KINGSTON-UPON-HULL, EARLS AND DUKES OF. These titles were borne by the family of Pierrepont, or Pierrepoint, from 1628 to 1773.

ROBERT PIERREPONT (1584–1643), second son of Sir Henry Pierrepont of Holme Pierrepont. Nottinghamshire, was M.P. for Nottingham in 1601 and was created Baron Pierrepont and Viscount Newark in 1627, being made earl of Kingston-upon-Hull in the following year. He remained neutral on the outbreak of the Civil War, but afterward he joined the king and was appointed lieutenant general of the eastern counties. While defending Gainsborough he was taken prisoner and was accidentally killed on July 25, 1643. while being conveyed to Hull. The earl had five sons, one of whom was Francis Pierrepont (d. 1659), a colonel in the parliamentary army and afterward a member of the Long parliament: and another was William Pierrepont, a leading member of the parliamentary party.

His son HENRY PIERREPONT (1606–1680), 2nd earl of Kingston and 1st marquess of Dorchester, represented Charles I during the negotiations at Uxbridge. In 164j he was made a privy councillor and created marquess of Dorchester; but in 1647 he compounded for his estates by paying a large fine to the parliamentarians. After the Restoration he was restored to the privy council and was made recorder of Nottingham and a fellow of the Royal society. The title of marquess of Dorchester became extinct at his death on Dec. 8, 1680. He was succeeded as 3rd earl of Kingston by Robert (d. 1682), a son of Robert Pierrepont of Thoresby, Nottinghamshire, and as 4th earl by Robert's brother William (d. 1690).

EVELYN PIERREPONT (*c.* 1655–1726), jth earl and 1st duke of Kingston, another brother, had been member of parliament for East Retford before his accession to the peerage. He was made a privy councillor and in 1715 was created duke of Kingston, afterward serving as lord privy seal and lord president of the council. The duke. who died on March 5, 1726, was a prominent figure in society. He was twice married and had five daughters, among whom was Lady Mary Wortley Montagu (*q.v.*), and one son, William. earl of Kingston id. 1713).

The latter's son. EVELYN PIERREPONT (1711–1773), succeeded his grandfather as second duke of Kingston. When the rebellion of 1745 broke out he raised a regiment called "Kingston's light horse." which distinguished itself at Culloden. The duke. who attained the rank of general in the army, is chiefly famous for his connection with Elizabeth Kingston, who claimed to be duchess of Kingston. The Kingston titles became extinct on the duke's death without children on Sept. 23. 1773.

KINGSTON-UPON-THAMES, a royal. municipal and parliamentary borough in Surrey. Eng., 11 mi. S.W. of Charing Cross, London. by road. Pop. (1951) 40,172. Area 2.2 sq.mi. The position of Kingston on the Thames where it was fordable accounts for the origin of the town; its later prosperity was due to the bridge which existed in 1223. The present stone one was built in 1828. In 836 or 838 Kingston was the meeting place of the council under Ecgbert, and in the 10th century some if not all of the West Saxon kings were crowned there. The ancient piece of gray sandstone used as a throne has been removed to near the new guildhall opened in 1935. In Edn-ard the Confessor's time Kingston was a royal manor. The original charters were granted by John in 1200 and 1209, and many other kings gave subsequent charters. All Saints church contains several brasses of the 15th century and the tomb of Thomas, son of Luke Hansard (*q.v.*). An early motion-picture apparatus (invented by E. Muybridge) is in the museum. The grammar school, rebuilt in 1878, is mentioned in 1264 but was refounded in 1561 by Elizabeth I. Kingston, though not the county town, is the administrative centre of Surrey. Itself chiefly residential, it is the main shopping town for a wide and populous area and also has many industries such as general and metallurgical engineering; the manufacture of aircraft, paints and finishes. cameras, wines and leather; there is boatbuilding.

KINGSVILLE, a city of Texas, U.S., 38 mi. S.W. of Corpus Christi on the flat Texas coastal plain; the seat of Kleberg county. The city grew from a tract of 41,820.6 ac. platted on the King ranch in 1903 by the Kleberg Land and Improvement corporation, a King ranch enterprise which started when the St. Louis, Brownsville and Mexico railroad. later the Missouri Pacific, built its connection to the Mexican border.

The King ranch headquarters there has made the city a ranching capital. From an original 15,500 ac. purchased in 1853 for less than two cents per acre, Capt. Richard King, an early steamboat captain. and his heirs built a cattle empire of nearly 1,000,000 ac. Over 50,000 cattle graze its ranges. Ranch holdings have been established also in Kentucky and Pennsylvania and the "running w" brand has been exported to King ranch properties in Cuba, Australia, Argentina and Brazil.

The ranch has pioneered in livestock and agricultural research. Its Santa Gertrudis breed, a Brahman-Shorthorn cross, was the first breed of beef cattle to be developed in the western hemisphere.

A quarter horse breeding program was expanded to include thoroughbreds. Assault, Middleground and Bold Venture were notable Kentucky Derby victors from the King ranch, in 1946, 1950 and 1936, respectively.

Kingsville is also a petroleum centre. The King ranch gas plant, capable of processing 800,000~000cu.ft. of natural gas per day, and a petrochemical plant are major economic influences in the community.

A U.S. naval auxiliary air station for jet training is east of the city. The state-supported Texas College of Arts and Industries, chartered in 1917, is on the west. The city has a council-manager form of government, in effect since 1952.

For comparative population figures see table in TEXAS: *Population.* (H. LA.)

KINGSWOOD (Bristol), an urban district in the South East Bristol parliamentary division of Gloucestershire. Eng., lying on the eastern boundary of Bristol. Pop. (1951) 16.921. Area 2.4 sq.mi. The district. which includes the distinct township of Hanham, takes its name from the royal forest which covered these parts. The main industries are the making of boots (especially heavy boots), corsets, brushes. food products and engineering. There is an annual horticultural show. Kingswood park has an amphitheatre. In 1739 the Methodist pioneers George Whitefield, John Wesley and others preached on Hanham mount, following the Baptists who fled from Bristol to preach in the woods in 1658. An electric beacon marks the site of the "open-air cathedral" and great Whitsuntide processions still take place. The cricketing family of Grace practised medicine in Kingswood and the district.

KING-TE-CHEN, an historic centre of porcelain manufacture in China. It lies in northeast Kiangsi at the mouth of a valley rising across the Anhwei border and from the upper reaches of which King-te-chen draws its supplies of clay and kaolin. There are workable coal-beds in the vicinity of the town. The industry had its beginnings as far back as the Ch'en dynasty (A.D. 557–587) and early in the 11th century during the reign of King Te of the Sung dynasty it began to make porcelain for imperial use. The town then adopted the name of the emperor.

KINGUSSIE, a small burgh of Inverness-shire. Scot.. lying 750 ft. above sea level, on the left bank of the Spey, 43 mi. S.S.E. of Inverness by road. Pop. (1951) 1,075. It was founded toward the end of the 18th century by the duke of Gordon, in the hope of its becoming a centre of woolen manufactures; but the place grew popular as a health resort because of its position in the wild

mountain country. It has a Highland folk museum (*Am Fasgadh*) and a golf course. Sheep farming is the main local industry. On the right bank of the Spey, crossed at Kingussie by a bridge, is Ruthven, where James Macpherson (*q.v.*) was born.

KING WILLIAM'S TOWN, a town in Cape province, Union of South Africa, in lat. 32° 51′ S., long. 27° 22′ E. Pop. (1951) 12,480 (including 6.397 Europeans). On the left bank of the Buffalo river, 41 mi. by rail west-northwest of East London, King William's Town (locally called King) stands at the foot of the Amatola mountains. 1,314 ft. above sea level in a thickly populated agricultural district. It is an important trading centre for the Transkeian territories and the Ciskei district and in 1934 became headquarters of the Ciskeian general council: which administers native affairs. Its industries include soap and candle-making, cotton milling and clothing manufacture. tanning and boot-making, engineering and bus-body building and furniture-making. The town is well laid out and has a Kaffrarian museum, botanical gardens and a training college. It was founded as a mission station by John Brownlee in 1825. Named after King William IV, it became a borough in 1860 when it was visited by Prince Alfred. Many of the colonists in the surrounding district are descendants of the members of the German legion, who, when the legion was disbanded after the Crimean war. were provided with homes in Cape Colony. This explains the names of such settlements as Berlin, Potsdam, Braunschweig and Frankfort.

KINKAID, THOMAS CASSIN (1888–), **U.S.** naval officer, commander of the 7th fleet, operating in the Pacific area, during World War II, was born April 3, 1888, in Hanover, N.H., the son of a naval officer. He graduated from the United States Naval academy. Annapolis. Md., in 1908. In World War I he served with the British admiralty and later with the U.S. navy as gunnery officer of the U.S.S. "Arizona." In World War II, he participated in the battles of the Coral sea, Midway, Solomon Islands and Santa Cruz Islands as a cruiser division commander. He commanded a carrier task group in the naval battle of Guadalcanal, and then the North Pacific fleet. In Nov. 1943 he took command of the U.S. 7th fleet and of Allied naval forces in the southwest Pacific. A series of brilliant operations culminated in the battles of Surigao strait and Leyte gulf. From Jan. 1946 until his retirement, as admiral, May 1, 1950, he commanded the eastern sea frontier and the Atlantic reserve fleet. (J. B. HN.)

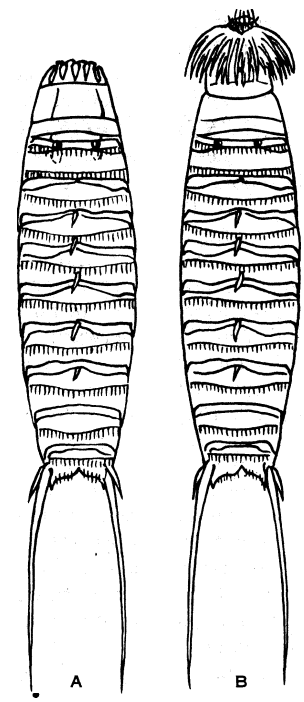
KINKAJOU (*Potos flauus*), the single species of an aberrant genus of the raccoon family (Procyonidae). A native of the forests of the warmer parts of South and Central America, the kinkajou is about the size of a cat. of a uniform pale, yellowish-brown colour, nocturnal and arboreal in habits, feeding on fruit. honey, eggs and small birds and mammals. It is often tamed as a pet. (*See* CARNIVORA.)

KINKEL, JOHANN GOTTFRIED (1815–1882), German poet. was born on Aug. 11. 1811, at Obercassel, and in 1846 became extraordinary professor of art at Bonn. He had already published his *Gedichte* (1843), and his prettily told verse tale. *Otto der Schütz, eine rheinische Geschichte in zwölf Abenteueren* (1846; 75th ed. 1896). Captured fighting in the revolutionary outbreak of 1348, he was sentenced to imprisonment for life but escaped from Spandau in 1850. He spent some time in the United States, and in England. until 1866. when he became a professor at Zurich. There he died on Sov. 13, 1882. His works include an unfinished lyric-epic cycle, *Der Grobschmied von Antwerpen* (1868), and a history of Christian art (1845).

KINO (or CHINO, CHINUS, CHYNUS, QUINO), **P. FRANCISCO EUSEBIO** (1645–1711). Jesuit missionary, born in Segno. northern It. He was educated in Jesuit schools at Trento, It., Hall and Ingolstadt. Ger. In 1681 he was assigned to the new world and traveled to Mexico where he wrote his famous *Exposicidn Astronómica de el Cometa, etc.* Here he joined the Atondo expedition to the Californias which failed and was reassigned in 1687 to the northern mission field of Pimeria Alta (now northern Sonora. Mex., and southern Arizona). He devoted the rest of his life converting the Pima peoples, mapping the unknown desert lands, proving that lower California was a peninsula rather than an island. creating Christian missions and cattle ranches that were the foundations upon which the present-day civilization in the area rests. His letters, diaries and maps have added to the knowledge of prehistory, ethnohistory and history of Pimeria Alta and Baja California. Kino died on March 15, 1711, while dedicating a chapel in the town of Magdalena, Sonora, Mex.

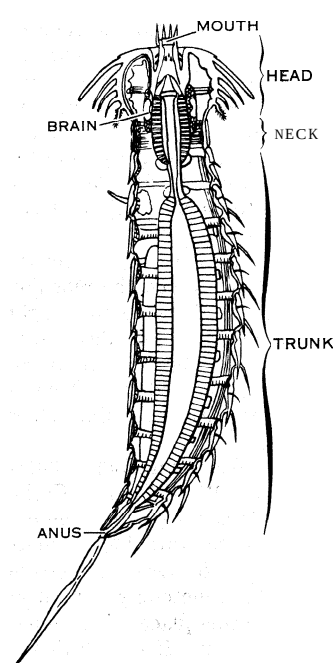
BIBLIOGRAPHY.—H. E. Bolton, *Rim of Christendom* (1936), and trans. and ed. of *Kino's Historical Memoir of Primeria Alta* (1948); F. C. Lockwood, *With Padre Kino on the Trail* (1934); Ernest J. Burrus, *Kino Reports to Headquarters* (1954). (C. C. Do.)

KINORHYNCHA, a class of minute (some microscopic) wormlike animals (phylum Aschelminthes) which dwell chiefly in the slime of the ocean floor, though some species live in sand and others in vegetation. Usually they inhabit the littoral or shore region in shallow waters (areas periodically exposed to the air). but specimens have been taken at depths of several hundred metres. Species which live among algae feed largely on diatoms. while burrowing forms ingest fine organic detritus, mud and sand. The entire body, yellowish or brownish in colour, is covered by a cuticle which in many places is prolonged into spines. From 0.2 to 1 mm. long. the body is externally divided into segments. The first, enlarged and bearing a conspicuous crown of recurved spines, is called the head; the second segment is termed the neck; the remaining segments collectively. the trunk. The mouth. at the anterior tip of the head, is guarded by a circle of spines (stylets) and opens into a tubular digestive system. At rest, the head is withdrawn into the front end of the body.



REDRAWN, WITH MODIFICATIONS, AFTER TELINKA

FIG. 1.—SPECIMENS OF ECHINODERES (A) WITH HEAD DRAWN INTO THE BODY AND (B) WITH HEAD PROTRUDED (GREATLY ENLARGED)



REDRAWN FROM BRONN'S "TIERREICHS," AFTER REMANE

FIG. 2.—MEDIAN SECTIONAL VIEW OF A KINORHYNCHA SHOWING GENERAL PLAN OF ORGANIZATION (GREATLY ENLARGED)

Alternate thrusting forward and withdrawing of the head produces a squirming movement which is the chief means of locomotion.

The sexes are separate and similar externally. Laid eggs are unknown and full details of development remain to be reported, although many larval stages have been recognized.

In 1928 Karl Zelinka prepared a comprehensive monograph on the group. About seven genera of adult worms have been recognized (*Echinoderes, Echinoderella, Centroderes, Campyloderes, Semnoderes, Trachydemus* and *Pycnophyes*).

In addition, many provisional genera have been proposed for larval forms, for most of which the adult stage is unknown.

See L. H. Hyman, *The Invertebrates'* vol. 3 (1951); A. Remane, "Kinorhyncha" in Bronn's *Klassen und Ordnungen des Tierreichs* (1936). (H. J. V. C.; MN. S.)

KINROSS-SHIRE, a county of Scotland, bounded on the north and west by Perthshire, on the southwest by Clackmannanshire and on the south and east by Fife. Pop. (1951) 7.418. Area 81.9 sq.mi. It is the least populated county in Scotland and, excepting Clackmannanshire, the smallest.

In the north and west it includes several summits of the Ochil hills, consisting of volcanic lava and agglomerates of Lower Old Red Sandstone age. In the east are the Lomond hills and in the south Benarty and the Cleish hills, where hard caps of intensive basalt have preserved the soft sandstones and marls of the Upper Old Red Sandstone which have been denuded to a lower level in the central lowland or plain of Kinross. Gravel, sand and other glacial detritus overlie wide areas. The lowland borders Loch Leven (*q.v.*), which is less noted for scenic beauty than for its historical associations and trout fishing. On the Devon river, which forms part of the boundary with Perthshire, there is beautiful scenery, notably at the gorge of the Devil's Mill, at Rumbling Bridge and at Caldron Linn. The parishes of Kinross and Orwell, previously part of Fife, seem to have been constituted a shire about the middle of the 13th century. At the date of Edward I's ordinance for the government of Scotland (1305) this shire had become a hereditary sheriffdom, John of Kinross then being named for the office. Close to the town of Kinross, on the margin of Loch Leven, stands Kinross house, built in 1685 by Sir William Bruce. Burleigh castle, east of Milnathort, gives title to Lord Balfour of Burleigh.

A little less than half of the 297 holdings in 1954 exceeded 100 ac., the average size being 105 ac. Oats, with 6,968 ac. in 1953, is the principal crop, and wheat and barley are grown. Swedes (turnips) and potatoes are the chief green crops. The raising of livestock is widely pursued (10,000 cattle and 32,000 sheep in 1953). There are many dairy farms.

Milnathort, with a bacon factory and a meal mill, is the marketing centre for livestock. Linen is manufactured and the spinning of the better class of wools is carried on.

Kinross, the county town and the only small burgh, had a population of 2,496 in 1951 and is of considerable antiquity. It has honourable associations with the sport of curling. The headquarters of the Scottish Gliding union are at Balado airfield. 2¼ mi. W. There are no county districts, the county being in itself a district. Kinross unites with West Perthshire to return one member to parliament. It forms a sheriffdom with Fifeshire and the sheriff substitute at Dunfermline also officiates at Kinross.

KINSALE, a market town and seaport of County Cork, Ire., on Kinsale harbour, the estuary of the Bandon river, 15 mi. S. of Cork by road. Pop. of urban district (1956) 1,612. Kinsale is said to derive its name from the headland in the sea. The present town is mostly of the 18th century, with narrow winding streets climbing Compass hill, but at an early period it belonged to the De Courcys, a representative of whom was created baron of Kinsale or Kingsale in 1181.

Kinsale received a charter of incorporation from Edward III, having previously been a borough by prescription. It was the scene of an engagement between the French and English fleets in 1380, was forcibly entered by the English in 1488, captured by the Spaniards and retaken by the English in 1601. Until the 18th century it remained an English town, the Irish living outside the walls. It was the scene of the landing of James II and of the French army sent to his assistance in 1689, and was taken by the earl of Marlborough in 1690.

The parish church of St. Multose is said to have been founded as a conventual church in the 12th century. Kinsale, with the neighbouring villages of Scilly and Summer Cove, is much frequented by visitors, and is the headquarters of the South of Ireland Fishing company, with a fishery pier and a harbour. The general trade is of little importance because of the proximity of Cork harbour and city. although Kinsale was for centuries a more important port until Cork and its river approaches were developed by land reclamation and dredging.

KINSEY, ALFRED CHARLES (1894–1956), U.S. zoologist who made an extensive study of the sexual life of human beings. He was born in Hoboken, N.J., June 23, 1894, educated at Bowdoin college, Brunswick, Me., and Harvard, and was professor of zoology from 1920 and director of the Institute for Sex Research, Indiana university, from 1947 to the time of his death, Aug. 25, 1956. His inquiries into human sex life resulted in the founding of the Institute for Sex Research and the publication of two books. *Sexual* Behavior *in the Human Male* (1948) and *Sexual Behavior in the Human Female* (1953). These books were based on 18.500 personal interviews. He reported that a wide variation apparently exists in human sexual behaviour. Although scrupulous interviewing techniques were followed and certain statistical criteria met, the study presented certain statistical and interview problems which were criticized. (F. PA.)

KINSHIP. Kinship plays an important part in all human societies, both in the regulation of behaviour between persons and in the formation of social, political and territorial groups. Even in modern western society, where its range of operation is restricted, the domestic family survives as a basic social unit. In the simpler societies a wide range of activities are regulated by kinship. and it is among them that kinship systems are seen in their most developed form.

Two persons are considered kin to each other when they are linked by socially recognized bonds of descent or marriage. whether real or fictional. The young child may grow up in the care and protection of its physical parents or, in some societies, may be reared by people who are not its physical parents, and it may take its place in society as the child of others. Everywhere a person derives his position in society in some measure from his parentage. He is expected to act in a specific way toward certain people because they are his kinsfolk. He is classed with them by outsiders whether he likes it or not. One's status may be less dependent on ancestry than on social parentage, which may determine one's inheritance, social position and kin groups.

Writers on kinship therefore distinguish, where necessary, between physical parents and foster parents; and between both of these and the social parents in whom a child acquires rights and privileges, duties and obligations, and who give it its social personality. The ties linking the child to its social parents are repeated for its brothers and sisters. thus linking it to them; and since every child is potentially a parent, these ties are extended through the generations. Thus social parenthood generates a web of links between persons that is called cognatic or consanguineous kinship. Two persons are said to be cognates when they trace descent from a common ancestor. The marriage bond between spouses is reinforced by their common ties to their children. Indeed, among some peoples a marriage is not finally ratified until children have been born. Bonds of affinity or marriage supplement those of descent, and two persons are referred to as affinal kin when they are linked through marriage. The study of kinship is the investigation of how social ties of descent and marriage are established, elaborated, fabricated, modified, forgotten or suppressed; how these ties are related to other manifestations of personal and social action; how sexual alliances are distinguished from social kinship.

When a person addresses or talks about one of his kinsfolk he may call that person either by his or her own name or by some term (*e.g.*, "mother," "uncle," "niece") specific to the relationship between them. There is great variety in the way in which different peoples apply terms of this kind, and early writers paid great attention to these systems of kinship terminology. The systems were classified according to several criteria, and connections were sought between terminology and other aspects of customary behaviour. More attention has now been given to aspects of kinship other than terminology. (*See* KINSHIP TERMINOLOGY.)

The Nuclear Family. — Parenthood manifests itself in the formation of a family. The task of rearing an infant is not shared equally by all members of the community into which it is born, nor does it acquire the same claim on the resources of all members. Usually it is primarily associated with its parents. The association of a married couple with their young children is called a nuclear family, and it is frequently a discrete residential and economic unit with its own dwelling and its own property. If the children leave to found families of their own, its numbers decline; and it disappears with the death of the parents. It is therefore not a

permanent division of society (F. Le Play called it the unstable family) for continually new families are being founded and old families are fading away.

A multiplicity of tasks are carried out within the family, particularly in the simpler societies, and it is organized accordingly. There is a division by generations by sex; the children interact with their siblings, as well as with their parents. The family is not only a reproductive unit, but also a unit of economic co-operation, training and mutual assistance.

Social and physical parenthood are distinct concepts, yet typically it is within the nuclear family that sexual reproduction takes place. The marriage bond ensures that a child grows up with two social parents, while uithin the family the prohibitions of incest maintain the separation of parents and children and require that the children seek their mates outside the family.

Among most peoples, the day-to-day running of a household calls for the co-operation of a man and a woman and, sooner or later, of growing children. This co-operation is assured by the organization of the nuclear family. Even in western society, with its minute division of labour, it is difficult for a woman to earn her living and at the same time to rear her children without the help of a man. while it is even harder for a man to rear children of his own. Where each domestic unit must largely provide its own food, clothing and shelter, these difficulties are increased, particularly when one sex may not perform tasks normally done by the other.

Formal authority within the nuclear family is usually vested in the man, though in some matrilineal (see Descent Systems, below) societies, jural authority over his wife and children is largely vested in a brother of his wife. Sometimes the wiie rules the household while the husband handles the family's external affairs. Everywhere the training of children represents an investment of time and effort, if not of money, which is generally borne by the nuclear family. Children grow up in the family, and it is the base from which the adult members make their contacts with the mider society. Children acquire knowledge of their culture from their parents, though a considerable amount of teaching is done by older siblings and other playmates outside the family, whether or not there are specialized pedagogic institutions such as kindergartens, schools and universities. Those who are unable to fend for themselves because they are either too young or too weak look to their immediate kin for support; while in old age it is, in general, to their grown-up children that people look for care and attention. Indeed. in many societies the desire for children is phrased in terms of their value as helpers in the productive tasks and as supports in old age.

Resources outlive the people who manipulate them, and some provision has to be made for transferring the control of resources from one generation to the next. Title to resources often does not pass until death, when it is inherited by an heir, usually a close relative, but access and effective control may well have been abandoned in favour of the next generation many years earlier. Where part of the inheritance cannot be divided and yet is indispensable for maintaining a family, transfer of title to it may precede death, as, for example, in Norway and Ireland, where a peasant transfers title in his farm to a son when the latter marries.

The nuclear family provides for the continuous association of parents and children for a generation, but not for longer. In a kinship system, continuity over the generations is achieved in two ways. First, the interpersonal relations developed in the nuclear family persist even when the members of the family are dispersed. Secondly, in some societies, nuclear families are submerged in larger domestic units that encompass several generations (see Larger Domestic *Units,* below).

The elementary or simple family is the unit consisting of a man and wiie and all their children, whether young or old, living at home or outside it, married or unmarried. This unit has a longer life than the nuclear family, and most people in the course of their lives belong to two or more elementary families. In one, their family of orientation, they are children; in the others, their families of procreation, they are parents. Thus each elementary family is simultaneously a family of procreation for the parents and a family of orientation for their children. Interlocking elementary families provide the framework on which the web of kinship is constructed.

Descent Systems.—By virtue of his acknowledged social parentage, a person may succeed to an office, inherit property and become a member of a descent group. Often many persons (*e.g.*, all sons except the eldest) may be excluded from succession; some persons (*e.g.*, daughters) may not inherit; but in general everyone can claim membership in some group or set of kin. W. H. R. Rivers and later writers have stressed this distinction between succession, inheritance and descent, but in any society all three are closely related and often run in the same direction. This discussion mill be based on descent rather than on succession or inheritance, for it has the widest application.

Everyone has two parents, four grandparents, eight, great-grandparents and so on; there is no theoretical limit to the total number of his ancestors, and all the descendants of each of these ancestors are potentially kin to him. If no limitation were placed on the recognition of kinship, everyone would be kin to everyone else. Indeed, at one time in Europe it was fashionable to show how thousands of eminent people could trace descent from Charlemagne. But in most societies some limitation is put on the recognition of kinship, so that a person regards at least some of his associates as not his kin.

In urban Europe of the 20th century, for instance, there are few men who associate with their wife's brother's wife's mother, even though they might recognize some link of descent or affinity, and even though specific kinship terms may exist for such categories. On the other hand, in Australian aboriginal society, where numbers were small. everyone with whom a person came into contact was regarded as a kinsman; social intercourse was impossible until the kinship connection between them had been ascertained. In China, despite the much larger number of persons who were in social contact with one another, there was a large-range kinship system, and kinship through males was recognized uidely.

It is characteristic that kinship may be recognized further in one direction than in another; so, for example, that links through men may be remembered while those through women may be forgotten, or the reverse may hold. People tend to remember or forget the names of their relatives in conformity with the directions and extent to which they recognize kinship.

Unilineal Descent Systems.—One method of limiting the recognition of kinship is to emphasize the relationships through one parent. Unilineal kinship systems, as they are called, are of two main types—agnatic or patrilineal systems, in which the relationships through the father are emphasized; and matrilineal systems, where the maternal relationships are stressed. Under patriliny a man (or woman) is linked to his patrikin, *i.e.*, his sons and daughters, his sons' children, his sons' sons' children and so on; but he is in certain respects cut off from his daughters' children, his sons' daughters' children and so on, for these are linked to their own agnatic kin. The people who are linked to him are thereby linked to each other and may form a group persisting through the generations, possessing its own internal organization and specific interests. An enduring group of this kind is called a patrilineal lineage or patrilineage.

Each male member of a patrilineage is the potential founder of a branch or segment of the original lineage. Thus in some societies each lineage is a segmented group, dividing into major segments each of which is divided into lesser segments and so on. Groups of this kind may be kept in being by the common interests of their members in rights in land and in the control of marriages of members of the group; by obligations of mutual assistance; or by adherence to an ancestor cult. In some stateless societies, lineages wage war and maintain law and order.

An emphasis on matrilineal descent gives rise to groups of matrikin, consisting of a woman, her sons and daughters, her daughters' children, her daughters' daughters' children and so on. Matrilineages are usually not so highly segmented as patrilineages. Whereas at least the smaller segments of a patrilineal system are formed around a core of men living in close proximity, two modes of residence are found with matrilineages. The local group may be

organized around the women of a matrilineage, consisting of them. their husbands and children; or it may be based on the men of the matrilineage, consisting of them, their wives and children. In the first instance, the group of local women may require the counsel and leadership of a man of their matrilineage, who must live locally with his family; conversely, some of the women of the matrilineage may be married to men who are acting as local leaders for their own sisters; the kinship basis of the local group is then complicated and it may split into several units of kin. Similarly, in the second instance, competition among brothers for the allegiance and support of their sisters' sons may split a matrilineal group of organized co-resident men. In both instances, the larger matrilineal segments tend to disappear as effective social units The same arguments do not apply to patrilineages, for a local group of males does not usually need a female leader, while quarrels between brothers merely emphasize the lines of internal segmentation.

In systems of "double descent," patrilineal and matrilineal principles are found in the same society, each in its specific context. Thus among the Yako of Nigeria a man lives with his male patrikin. after an initial period of living with his wife's relatives, and cultivates land controlled by his patrilineage. He also belongs to a matrilineage whose members are dispersed, but who provide priests for certain cults. He inherits movable property from his matrikin and is most closely connected with their marriages. Unilineal descent, either patrilineal or matrilineal, can generate organized groups persisting through the generations. In double unilineal systems there are two series of enduring groups, and each person belongs to one or more groups in each series.

Cognatic Descent Systems.—Unilineal systems differ radically from cognatic systems, in which everyone has obligations and duties of much the same kind toward both his paternal and maternal kin and, conversely, can expect rights and privileges from them. In patrilineal descent, an individual is allied to his father's brothers' children, but not to his mother's sisters' children; in matrilineal descent the reverse holds. In a double unilineal system he is allied to both these kinds of parallel cousins but usually in different contexts. In no kind of unilineal system does he share group membership with his cross-cousins; *i.e.,* his father's sisters' children and his mother's brothers' children. In a cognatic system, honever, he is in some sense allied to all his cousins, with a possible division between, on the one hand, paternal or patrilateral cousins (*i.e.,* father's brothers' children and father's sisters' children) and, on the other, the maternal or matrilateral cousins (his mother's siblings' children). The kinship system of the United States and most European societies is cognatic.

Whereas unilineal systems give rise to groups with fixed membership, cognatic systems do not. I have my own cousins, but some of their cousins are strangers to me; my set of cognates overlaps, but does not coincide, with theirs. One of the best-known cognatic systems is that of the Germanic peoples, among some of whom compensation paid after homicide was provided by all persons who were fourth cousins or closer cognatic relatives of the slayer, and was distributed among similar relatives of the dead person.

Variant Systems.—A variant of unilineal systems is one in which an individual may choose whether he will belong to his father's group or to his mother's, but he cannot simultaneously belong to both, at least not in the same degree. Among the Mundugumor of New Guinea a man belongs to his mother's group but a woman belongs to her father's.

Some societies apparently do not display the formal regularities of either unilineal or cognatic kinship. Persons are free to choose whether they ally themselves with their father's relatives or with their mother's or with those of a spouse, and they may shift from one to the other. Omnidirectional kinship systems, as these are sometimes called, generate impermanent groupings of kinsfolk, each grouping containing kin of various kinds. There the emphasis is on the person-to-person links of diverse types through which new members gain a foothold in the unit, rather than on the rights and duties associated with a specified kinship link. Every person has a large number of kinship links which he may or may not utilize; not all people utilize the same kind of link, and every cluster of kinsfolk can recruit its members from a large number of other units.

Succession and Inheritance.—Succession and inheritance tend to follow in the same line as descent, whether patrilineal or matrilineal. In double unilineal societies, certain positions may be filled patrilineally and others matrilineally, while some kinds of property may be inherited in one line, other kinds in the other. But this is also true to some extent in unilineal societies. Among almost all peoples, however. men rather than women exercise political functions, and this gives a patrilineal colour to some systems which are basically cognatic. Thus in England the patrilineal inheritance of surnames and noble titles and the succession through males of certain landed estates is often thought to show that the country is strongly patrilineal. although after 1926 the law of intestacy was completely cognatic. Similarly, under modern conditions. the breakdown of many matrilineal systems has been misinterpreted as evidence of a transition to patriliny, when in fact a narrow-range omnidirectional system has been developing.

Holders of important hereditary posts are succeeded by their heirs, but in some societies every person is thought of as occupying an institutionalized position in society which, when he or she dies, must be filled by a successor.

Thus among the Bemba, an African Bantu tribe, when any man dies, his name, his guardian spirit and his bow are all inherited by a kinsman, who also takes over the dead man's place in the kinship system and uses kinship terms appropriate for the dead man. Among the Cewa, another Bantu-speaking group, each old woman should nominate a granddaughter as her successor, who is known by her grandmother's name.

Patterns of Residence.—When a couple marry, they may move to some new abode (neolocal residence); or the bride may go to join her husband's people (virilocal residence); or the groom may move to his wife's group (uxorilocal residence). In a few societies, the couple never set up a joint household at all; in others they alternate between her group and his group (bilocal residence); in still others bride and groom may already be neighbours before they marry. There is clearly some connection between customs of residence and descent, for no society is known in which descent is markedly patrilineal and residence invariably uxorilocal; yet there are both virilocal and uxorilocal matrilineal societies, and even in patrilineal societies there are usually some couples living uxorilocally. Yet if children do not leave their natal home before they marry, uxorilocal residence causes dispersal of the patrilineal group, and virilocal residence implies matrilineal dispersal; spatial dispersion sooner or later leads to disintegration of the kin group.

In some matrilineal societies, boys move from their natal homes to join their male matrikin before they marry, so that virilocal residence can then be combined with a system of groups of localized male matrikin; analogous arrangements for patrilineal societies are unknown. Among matrilineal virilocal peoples, where men stay in their natal homesteads, marriage with a father's sister's daughter may reduce the discrepancy between ties of descent and local solidarity.

The nuclear family founded by a married couple may be an independent domestic unit, even though it is located near the dwellings of the kin of one or the other spouse. Alternatively it may form part of a larger domestic unit of longer life, as discussed below.

Larger Domestic Units.—In a great many societies the domestic family, *i.e.,* the smallest clearly defined household unit, corresponds with the nuclear family. This is the ideal characteristic of western society, where a married couple seeks to set up housekeeping on its own. In some societies the domestic family is larger. however, containing a number of nuclear families whose members live in close proximity, if not under the same roof, share rights in property and acknowledge a common head. These composite families are of many kinds. In a compound family two or more families of procreation live together, as when a married couple have living with them a child by a former marriage of one or other spouse; in the polygynous compound family a man lives with his several wives and children; in the polyandrous compound fam-

ily, as found among the Todas of southern India, a woman lives with her husbands and children. A fraternal joint family is a household containing several brothers, their wives and unmarried children.

Other forms of joint, or extended, family include what is sometimes called the patrilineal grand-family, *i.e.*, a man living with his wife or wives, his married sons, the sons' wives and the sons' children; the corresponding matrilineal grand-family contains a married couple, their married daughters, the daughters' husbands and children. These three-generation grand-families often break up on the death of the founding couple, or as married couples break away to begin the formation of similar units on their own. If they persist as social groups, as sometimes happened in China, they change their form as the founders die off; there are then a number of siblings in the oldest surviving generation, with their spouses, while the youngest generation is composed of people who are not first but second cousins to each other.

Some matrilineal peoples, *e.g.*, the Haida of British Columbia, live in avunculocal joint families. Under this system, boys leave their natal homes during adolescence and join the household of one of their mother's brothers; girls remain at home until they marry, when they move to their husbands' households. Hence, in a long-established household dwell a man and his wife, his unmarried daughters and preadolescent sons, some of his sisters' adolescent sons and some of his sisters' married sons with their wives and young children.

Co-residence of this kind may arise for several reasons. Where a man needs the help of his kinsmen in productive tasks, or relies on their support against outside attack, or can gain access to resoul-ces only by associating with them, or cannot escape from their authority, he may be compelled to live with them.

Importance of the Nuclear Family. — Even when it does not stand alone as an independent domestic unit, the nuclear family is not entirely submerged in a wider composite group. Within the homestead, each nuclear family may have its own room or separate hut; rights in some property may not be shared equally; children may develop closer affective ties with their own parents than with other adults in the composite family; and it is usually the nuclear family which forms the potential core of a new composite family, seeking to break away from the old unit. Thus, for example, in several African societies where people live in patrilineal grand-families, the "house-property complex" prevails, whereby a man allocates part of his property to each of his wives. On his death, each portion is inherited by the sons of the wife to whom it had been allocated, and sons by other wives have only reversionary rights.

The nuclear family is normally the human unit within which children are born, reared and instructed; it is a unit of economic co-operation and provides the basis for security in illness, infirmity and old age. Family membership supplies a person with a set of kin, with a status in society and with a position within corporate kin groups. These functions are performed in varying degrees in different societies. In western society, many of these tasks have passed to other institutions, yet the nuclear family persists as a social, reproductive and residential unit. In other societies the nuclear family is partially submerged in a larger family unit, while yet retaining its identity in certain contexts.

Only rarely is it completely absent, as formerly among the matrilineal Nayars of Malabar. There the local residential and property-holding unit was a matrilineage segment of about 25 members. Each child was reared by its mother and her matrikin and became a member of her group. Its physical father might be unknown, for its mother might be maintaining liaisons, regularized or casual, with several men simultaneously; their obligations toward the child mere limited to meeting the mother's delivery expenses. The child had in effect no social father; its mother's male matrikin were its foster fathers; there were no families of any kind, but merely groups of matrikin. Among the patrilineal Ngoni tribes of central Africa, the nuclear family existed only in attenuated form for, on weaning, a child left its parents and was reared by its grandparents.

In addition to affiliation to a grouping of kin, either permanent or impermanent, every person retains some ties with close relatives who do not belong to his own group. and through these ties he acquires an interest in the kin groups to which these relatives belong. Thus in many patrilineal societies a man is in. close touch with his mother's brothers and has a significant interest in the patrilineal group to which they belong. Similarly, in some matrilineal systems a man has certain obligations toward his father's matrilineal group, although this is not the group to which he mainly belongs. Links to more distant relatives, as to a mother's mother's brother in a patrilineal system, may be purely interpersonal and are then not extended to the whole of the mother's mother's brother's patrilineal group.

Unilineal emphasis may conflict with the sentiments of attachment developed within the nuclear family. A man may be denied the affiliation of his own children, as in matrilineal systems, and must fall back on his sisters' children; in patrilineal systems, a woman belongs to one group and her children to another. Among the Nayars this potential conflict was resolved by eliminating the nuclear family entirely. In other unilineal societies, this conflict is partly resolved by utilizing the links a person has to groups to which he does not mainly belong and to relatives not in his own group.

A person often behaves in contrasting manner toward those of his own group and toward those to whom he is related in the suppressed line; as when in a patrilineal society he is reserved and deferential to his father but jokes and laughs with his mother's brothers. Some patrilineal peoples believe that witchcraft is transmitted matrilineally, and "joking relationships" are sometimes maintained with relatives in the suppressed line.

The importance of ties to close kin outside the nuclear family is shown in many patrilineal Oceanic societies where a man acts as counselor and friend, sponsor and patron, to his sisters' children. The paternal aunt also may play a special role in patrilineal societies. Even in Europe, during the middle ages and earlier. a person's mother's brother is often reported as being a special kind of companion, to whom he or she was linked by a bond of disinterested and easy-going affection, in contrast with the more respectful and formalized ties to the father. In some matrilineal societies these relationships are reversed, as in the Trobriands, where a young man works under his mother's brother's direction but has a close friend and companion in his father.

Attitudes toward parents and grandparents are similarly contrasted. A child may be disciplined and instructed by his parents and yet be in league with his grandparents, who joke with and pamper him. Such a behavioural pattern is familiar in western society. A man competes with his father for control of the family wealth, and in his turn he is challenged by his own children; but he associates easily with his grandparents, who have already retired from active participation in affairs, and with his grandchildren. who have not yet begun.

The Regulation of Marriage. — When a person marries, his or her choice of spouse is restricted because of kinship ties. Marriage within the elementary family is almost universally prohibited, and sexual intercourse regarded as incestuous. Marriage is also prohibited within many kin groups. Under the rule of exogamy, in a patrilineal society a person may be required to choose a spouse from some patrilineal group other than his own. He may be restricted to certain groups, or even to only one, and he may be prevented from marrying a woman belonging to another generation. In some unilineal societies, marriage prohibitions are also applied to close cognatic kin. For example, among the patrilineal Zulu, a man may not marry a woman of his own or his mother's patrilineage. however distant the genealogical connection; he is also prohibited from marrying any of his first cousins. In many patrilineal societies, however, a man must or should marry into either his mother's group or into the group into which his father's sister married. Similarly. in matrilineal societies a man may be enjoined to marry a woman belonging to his father's group or to that into which his mother's brother married. In this may ties of affinity between kin groups are renewed through the generations.

By the custom of preferential or prescribed cross-cousin marriage, a man is encouraged or required to marry one of his mother's

brothers' daughters, or one of his father's sisters' daughters. Where a man and his sister marry a woman and her brother respectively, it is possible in the next generation for a man to marry a woman who is simultaneously mother's brother's daughter and father's sister's daughter to him. Arrangements of this kind prevail in many parts of the world, though they do not al ays apply to all marriages contracted in a society.

Cross-cousin marriage also acts as a device for resolving conflicts within the nuclear family in unilineal systems. In a patrilineal society, a woman can share membership of her natal patrilineage with her daughter's children if her brother's son marries her daughter; similarly in a matrilineal society, a man and his son's children belong to the same group of matrikin when his sister's daughter marries his son. The Ashanti provide an example of a people with preferred cross-cousin marriage. They are organized in localized matrilineal lineage segments which have recognized leaders who control the allocation of lineage land. Although there are no organized groups of agnates, the link between a man and his own child is stressed emphatically by various mystical notions. The ideal match is stated to be marriage between cross-cousins, preferably between a man and his mother's brother's daughter. Yet despite this expressed preference, it appears that in 1910 only about 14% of all marriages were between cross-cousins, and in later times even fewer marriages were of this type.

Social relations between rival groups can be maintained by the web of links automatically generated by cognatic kinship. Thus, commonly, the intermediary who negotiates peace in a feud is related to both sides. In unilineal systems affinal links are used in the same way. One of the most striking examples of political relations expressed through marriage was the complex tangle of affinal bonds which linked all the monarchies of Europe; similarly. among the Lele of the Congo, a whole village may stand in the relationship of son-in-law or father-in-law to its chief. Arrangements of this kind not only operate at the political level, but may affect the marriages of ordinary people. Indeed it is said that in some simple societies all marriages are marriages of state. For example, a wife from a distant Ngoni village ranked higher than one from nearby, for the former provided her husband with a set of affines in a locality where previously he had lacked allies.

The Fabrication of Kinship Ties.—When children are born in wedlock their physical and social parentage usually coincide; indeed, there is often a presumption that a woman's husband is the physical father of her child even when evidence is lacking. In western society a child born out of wedlock can subsequently acquire full, or nearly full, rights of descent by the marriage of its physical parents; and by the custom of adoption, a child renounces all or most of its rights in its physical parents in return for acquiring roughly similar rights in another couple who become its social parents. In other societies, particularly where the continuity of a line of descent is valued highly, arrangements exist whereby the social father may be a dead man, or not a man at all, but a woman.

The mutual rights and obligations possessed by a married couple are acquired by the ceremonies and formalities of marriage and often by the transfer of property between the bride's people and the groom's people. These ceremonies and transfers can be arranged by others acting as proxies for the principals in the marriage, and in this way rights and obligations can be acquired on behalf of persons not able to exercise or meet them personally. Some of these rights relate to the marital relationship, such as mutual rights of sexual relations, to adequate clothing and shelter and to the provision of meals.

A husband may have other rights in his wife in her capacity not as a wife but as a mother; these are rights to the custody and affiliation of the children she bears, either by him or by another. In matrilineal societies most, if not all, of the rights in a woman as a mother remain with her matrikin and do not pass to her husband, even though he may acquire substantial rights in her as a wife. In patrilineal societies most rights in a woman as a mother pass at marriage to her husband or to his patrikin.

The custom of "marriage" between two women which occurs in some patrilineal societies is related to this transfer of rights. Thus among the patrilineal Zulu, when an eminent man dies leaving a daughter but no sons, the daughter sometimes "marries" another woman and thereby can claim the latter's children as members of her patrilineage. Thus her father's agnatic line is perpetuated and his ancestral wrath avoided. An analogous custom is that whereby, in the absence of sons, a daughter succeeds to the British throne and transmits the succession to her children as though she were a man.

Sometimes the social father is dead before his wife is married or his "child" conceive'd. Thus among the Nuer, if a man dies unmarried, his brother may arrange a "marriage" between a woman and the dead man. The children of the woman inherit as children of the dead man. In this ghost marriage the live brother acts as foster father to the children. He is often their physical father, though the same rules of descent are followed should they be born in adultery; but he is not their social father.

Where rights in a woman pass to the husband, they may apply to all the children borne by his wife or merely to those of which he is the physical father. Thus an impotent man may acknowledge a child of his wife by one of his kinsmen so as to acquire descendants, or he may claim the allegiance of children born in adultery at the same time as he takes action against the paramour in defense of his sexual rights. Similarly, when he dies, in some societies his rights in his wife as a mother persist, and children borne by his widow count as if they were his own children. Where a kinsman of the dead man cares for his widow and begets children by her who regard the dead man as their social father, we speak of the "true levirate." The custom whereby a widow remarries a kinsman of her dead husband and bears children by him who regard her new husband as their social father is correctly described as "widow inheritance." Fabrication of maternity is also met with. In some societies where the sororate is practised, a woman's kin are under an obligation to provide her husband with another wife, often one of her sisters, should she die or be barren or bear daughters only. The new wife is then regarded as the social mother of the children previously borne by her kinswoman.

Quasi Kinship and Pseudo Kinship.—The forms and usages of kinship may be extended to relationships in other contexts. One of the best-known extensions is by blood brotherhood, particularly prevalent in Africa. Thus among the Azande a man may enter into a compact of blood brotherhood with someone who is not a kinsman. The two men then act toward one another with familiarity and render mutual assistance; it is believed that if one seduces the wife of the other he will automatically die; their alliance is in some measure extended to the kin groups to which they belong. In Japan certain craftsmen become quasi fathers to some of their assistants, among whom they distribute their patronage and favours in return for quasi-filial services. Those with the same quasi father are quasi brothers to each other, and he is quasi grandfather to their quasi children.

These relationships of quasi kinship are supplementary to those of true kinship and usually operate over a narrower field. Thus in the Roman Catholic Church, there is spiritual kinship between a sponsor and his or her godchild, and they may not marry one another; this prohibition extends to the child's social parents, but does not apply to the child's siblings or other kin.

The fiction that the grand doge of Venice was wedded to the sea suggests instances in which political offices are said to be connected to one another by kinship. Thus among the peoples of the Luapula river, Northern Rhodesia, a village headman may be called the brother of another headman. the nephew of a third and the son-in-law of a fourth. These links of "perpetual kinship" endure beyond the death of an incumbent of the headman's position and are taken up by his successor. This can be explained historically by reference to the founding of new villages. when the contemporary headmen may have stood toward one another in the relationships which are now perpetuated; these relationships symbolize the enduring political alliances between the organized groups led by the several headmen.

Sometimes the idiom of kinship is used to cover the whole of society, as when we speak of a king as "father of his people." The notion of common descent of a wide community is often found

among the simpler peoples, but frequently the population of a society is divided into several sections, each recruited by descent from its own founding ancestor. Members of 100 or more homologous sections may be found in the same community; in other societies, there are merely two such divisions, with or without a myth of common descent, known as moieties. Moieties may be either patrilineal or matrilineal and are often exogamous, so that a person of one moiety has to find a spouse in the other. Where patrimoieties and matrimoieties coexist, as in parts of Australia. society is divided into four groups or sections, such that a man of one section should marry a woman from only one of the other three sections, while the children belong to a section different from both of their parents. Where. in addition, a man is prohibited from marrying a woman of his mother's patrikin group, as among the Aranda, an eight-section system is found.

Morphologically intermediate between moieties and lineages are clans. These are associations of lineages or lineage segments which have certain interests in common, often the regulation of marriage. Whereas members of a lineage can usually trace out their genealogical relationship to one another, clan members may believe themselves to be related without necessarily being able to specify the connection. In some clans even the notion of common descent is lacking. Clans may be matrilineal or patrilineal; they are sometimes territorially dispersed and may be totemic. If a lineage as a whole is not exogamous, the term clan is sometimes used for its largest exogamous segments. Where there are divisions intermediate between the clan and the smaller lineages or lineage segments, these are called subclans.

Thus in some societies there is a hierarchy of groups, all recruited either patrilineally or matrilineally. For example, all the Gusii people of Kenya claim to be descended patrilineally from their eponymous ancestor MoGusii. His descendants are divided into several patrilineal segments, called tribes, each of which has a distinctive totem and each of which sometimes functions as a unit in the face of external attack. Each tribe is divided into patrilineal segments, exogamous and politically autonomous, called clans, occupying discrete territories. Kinship terms are used between clanmates; within the clan, men fight with clubs, whereas they may attack nonclansmen with spears. Clans are divided into subclans, within which criminal compensation for homicide does not pass. Each subclan is divided into a number of smaller lineage segments, and so on down to the polygynous grand-family, whose head allots land to his wives and married sons and arranges loans of cattle between them. The nuclear family is the unit for cultivating, storing produce and preparing meals.

In societies like the Gusii, lacking a centrally organized judicial and administrative system, many of the tasks of government are performed by unilineal groups This can happen even where kin groups are not built up in a hierarchy of lineage segments and clans. Thus the Plateau Tonga have neither a unitary state nor a segmented lineage system. People are grouped into small associations of dispersed matrikin, rarely of more than three-generation depth, which readily split as numbers increase and members disperse farther. Yet these groups, apart from regulating marriage and inheritance, also help to preserve law and order by acting in concert to defend the rights of their members and to take vengeance.

It is clear that relations between large enduring groups, even when phrased in the language of kinship, are of a different order from those obtaining within the nuclear family or between a man and those kinsfolk with whom he is in personal contact and to whom he traces a connection through known and remembered people. These political relations may be called pseudo kinship. Within the range of close kin it is sometimes possible to give formal recognition to a change in relations by repudiating kinship (*e.g.*, by deleting a name in a family Bible or by removing an intended beneficiary from a will); or by reaffirming an existing relationship (*e.g.*, by providing a worthy son-in-law with another wife).

Changes in pseudo-kinship relations between large groups are ratified in other ways, for example, by the revision of genealogies. When a man dwells among his wife's patrikin, his own patrilineal descendants may in time become assimilated to their host group, and the woman through whom they trace relationship will be said to have been a man. In this and other ways, the genealogy relating groups to one another becomes a summary of existing political relations rather than a record of former descent. In particular. many genealogies are continually foreshortened, so that the number of generations from the present back to the founder of the society or unit remains constant; this makes the genealogies unusable for dating past historical events.

The Development of Kinship Studies.—The modern study of kinship began in 1861 with the publication of works by J. J. Bachofen and H. S. Maine; the former asserted that in the earliest times primeval promiscuity was followed by a system in which women were leaders in state and home, and descent was matrilineal; the latter was more modestly concerned with showing the importance of kinship for the early Indo-Europeans. J. F. McLennan, like Bachofen, tried to write universal history, but in his scheme primeval promiscuity was followed by stages of polyandry, through matriliny to patriliny.

Similar interests stimulated L. H. Morgan, whose speculations were backed by a wide collection of evidence, principally of systems of kinship terminology, from many parts of the world. In the same tradition were the writings of F. Engels, E. B. Tylor, E. A. Westermarck, W. H. R. Rivers, R. Briffault and others. In the 20th century writers became less ambitious in suggesting evolutionary schemes, while some eschewed them completely; at the same time interest, as mentioned above, increased in aspects of kinship other than terminology.

Most studies of kinship relate to the simpler societies, for it is there that the most elaborate and pervasive kinship systems are found. The early ethnographers sometimes provided reliable accounts, but their work was increasingly superseded by F. Boas, B. Malinowski and A. R. Radcliffe-Brown and their pupils. More information has been collected on contemporary relations between kin, supplementing statements of what form these relations ought to take; the interdependence of kinship, territorial, judicial and political systems has been explored; some attempt has been made to collate information collected from a number of similar or neighbouring societies, though this last task has not received as much attention as many would wish for.

The comparatively small part that kinship has played in western society since the middle ages has largely restricted studies there to relations within the elementary family (***see*** FAMILY), but modern accounts of peasant communities have described kinship behaviour in a wider frame of reference. *See* AVUNCULATE; CLAN; COUSIN MARRIAGE; COUVADE; DUAL ORGANIZATION; ENDOGAMY; EXOGAMY; FAMILY; GROUP MARRIAGE; KINSHIP TERMINOLOGY; LEVIRATE; MARRIAGE; MATRIARCHY; POLYANDRY; POLYGYNY; SOCIAL ANTHROPOLOGY; SORORATE; TOTEMISM; ***see*** also Index references under "Kinship" in the Index volume.

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KINSHIP TERMINOLOGY. Kinship is one'of the universals in human society. In the daily routine of primitive life, relationship terms are important not only as indicating the status of the person addressed or mentioned with reference to the speaker, but also because there often is no other mode of address. This is related to the widespread prejudice against the vocative use of personal names, for which kinship appellations may be substituted even to the extent of assuming relationship where none exists.

But the significance of kinship terms goes far beyond a mode of address. They are studied by the anthropologist not merely as so many words inviting linguistic analysis and comparison, but as correlates of social custom. Broadly speaking. the use of a specific kinship designation, *e.g.,* the maternal as distinguished from the paternal uncle, indicates that the two receive differential treatment from their nephews and nieces. Further. if a term embraces a number of individuals, the probability is that the speaker is linked to all of them by the same set of mutual duties and claims. although their intensity may vary with the closeness of the relationship.

Sometimes the very essence of a social fabric may be demonstrably connected with the mode of classifying kin. Thus kinship nomenclature becomes one of the most important topics of social organization (see KINSHIP).

The foundation for the scientific study of kinship terminologies mas laid by Lewis H. Morgan (*q.v.*) in his *Systems* of *Consanguinity* and *Affinity* of the Human Family (Smithsonian Contributions to Knowledge, xvii, Washington, D.C., 1871). In this work were assembled comprehensive schedules for every major area of the globe except Africa and Australia, for which data were largely or wholly inaccessible to the author. Morgan grouped all terminologies under two main heads—the "descriptive," which he ascribed to the Aryan, Semitic and Uralian linguistic families; and the "classificatory," which was characteristic of the American Indians, the Polynesians and many of the peoples of Asia. As W. H. R. Rivers notes, no discovery in the whole range of science can more certainly be credited to one man than that of the classificatory system of relationship by Lewis H. Morgan.

Morgan's early interest in kinship systems was historical. Discovering in 1858 that the Ojibwa had a pattern of grouping relatives that was substantially the same as that of the Iroquois. who spoke quite a different language, he set out to collect kinship terminologies systematically in order to demonstrate the unity of the American Indians and their origins in Asia. The discovery that system of terminology used by the Tamil of southern India was practically identical with that of the Seneca, one of the Iroquois tribes, convinced him that he was on the right track, and he extended his inquiries to all parts of the world.

The discovery of the Hawaiian (Malayan) patterns of kinship terminology, which were classificatory to a much higher degree than the American Indian systems, led Morgan to seek an explanation in terms of a postulated development of social institutions and to develop his famous evolutionary stages in *Ancient* Society (1877).

As a result, Morgan became embroiled in the controversies that followed, both between evolutionists and with nonevolutionists, so that his major contributions to the study of kinship terminologies were largely obscured until the later researches of W. H. R. Rivers and others.

CLASSIFICATION OF KINSHIP TERMINOLOGIES

The initial classification of kinship terminologies by Morgan into descriptive and classificatory types was criticized by A. L. Kroeber and Rivers on logical grounds. The descriptive system describes relatives for the most part by "an augmentation or combination of the primary terms of relationship," whereas the classificatory system ranges them into great classes or categories: "All the individuals of the same class are admitted into one and the same relationship, and the same special term is applied indiscriminately to each and all of them" (Systems, pp. 12, 468).

Two varieties of the classificatory type were recognized—the Malayan, which merged all the kindred of one generation under a single category; and the Turanian-Ganowanian, in which certain of the collateral kin of a generation were merged with lineal kin, the remainder having separate terms.

As Kroeber and Rivers pointed out, the distinction between descriptive and classificatory is not borne out by the data. The English words "uncle." "aunt" and "cousin" group relatives into large classes. although the English system generally is nonclassificatory; and, moreover, the collateral terms are rarely built on the primary terms. Rivers attempted to remedy these deficiencies by a tripartite scheme recognizing denotative, descriptive and classificatory types; and he suggested the appellations family. kindred and clan systems, the kindred being a major bilateral unit.

These latter terms, however, are objectionable because they inject the inferential basis of a system into its descriptive definition. Apart from this terminological difficulty, the scheme fails to obviate a logical fault in Morgan's earlier effort. "Classificatory" and "descriptive" do not relate to the same logical universe; hence they are not mutually exclusive terms. "Classificatory" relates to the number of individuals defined, "descriptive" to the technique of defining a relationship. The antithesis to "classificatory" is the concept "individualizing," as Morgan felt, though he failed to express it clearly.

But the purging of the traditional terminology is only a preliminary step in classification. How shall we characterize the relatively simple English system if it embodies both individualizing and classificatory principles? One answer was provided by Kroeber: A kinship terminology is not a logically coherent whole but must be resolved into the several categories recognized. Those enumerated by Kroeber are: (1) the difference of generations; (2) the difference between lineal and collateral kin; (3) the difference of age within one generation; (4) sex; (5) the speaker's sex; (6) the connecting relative's sex; (7) the difference between consanguinity and affinity; and (8) the life or death of the connecting relative.

This pioneer attempt requires both revision and amplification. The concept of seniority might be added to that of relative age; and the reciprocity principle, linking by a common term distinct generations, merits independent status. But while Kroeber's sketch furnishes a valuable instrument for the precise definition and comparison of distinct systems, it does not lead to useful classification of kinship terminologies.

For classification on a world-wide basis it is useful to consider the treatment of collateral as compared with lineal kin in the first ascending and descending generations. This is implicitly the phenomenon that impressed Morgan and that constitutes one of Kroeber's categories. The major logical possibilities are as follows: (1) collateral lines are wholly merged in the lineal within a particular generation (generational or horizontal system); (2) each generation is bisected so that only half the collateral kin are merged in the lineal (bifurcate merging system); (3) the immediate collateral lines are distinguished from the lineal and from each other (bifurcate collateral system); (4) collateral lines are distinguished from the lineal but not from each other (lineal).

In standard samples of these four systems logical coherence prevails: if the father's brother is called father, he addresses his brother's son as son; if there is a separate word for mother's brother, there is likely to be one for nephew. However, discrepancies occur, and a system must sometimes be classed by the preponderance of its affiliations. Taking the classification of uncles for illustration, the scheme may be illustrated by the accompanying table.

The second system, which Morgan and Rivers genetically connect with the first (though in a reverse sense), is not any further

from the third; and the bifurcate collateral system sets off the immediate family as sharply from the rest of the universe as does the English lineal system. All four systems occur in primitive communities, notwithstanding the formerly widespread notion that only the first two, corresponding to Morgan's classificatory types, are so found.

System	Relatives			Criterion
	Father	Father's brother	Mother's brother	
Generational	father	father	father	one "father" term
Bifurcate merging	father	father	mother's brother	two terms; partial merging
Bifurcate collateral	father	father's brother	mother's brother	three terms; no merging
Lineal	father	uncle	uncle	two terms; merging only of collaterals

This fourfold scheme, developed independently by Robert H. Lomie and Paul Kirchhoff, omits certain logical possibilities that occur sporadically. Thus the Chiricahua Apache separate lineal from collateral relatives but merge the father's brother with the father's sister, and the mother's brother a-ith the mother's sister; and the Zulu and some other African tribes classify the father's sister as a "female father" and the mother's brother as a "male mcther." There are, in addition, asymmetrical systems in which the treatment of the father's side follows a different pattern from that of the mother's.

In 1925 Leslie Spier proposed an empirical classification of North American Indian kinship terminologies based primarily on the pattern of grouping siblings and cousins in one's own generation. His Iroquois type groups parallel cousins with siblings but designates cross-cousins by a separate term; the Mackenzie basin type classes all cousins as siblings; the Eskimo type uses a separate term for all cousins; the Omaha type classes the mother's brother's children with the mother's brother and mother; and the Crow type classes the father's sister's children with the father and father's sister. The Salish, Acoma and Yuman types rest on other principles, emphasizing lineal features, specialized grandparental terms, and refined age distinctions. respectively.

Later, G. P. Murdock (Social Structure, pp. 223–224) set up six types of kinship terminology, based on the patterns for grouping cross-cousins (mother's brother's and father's sister's children) in relation to siblings and parallel cousins (mother's sister's and father's brother's children), as follows:

Eskimo type — cross-cousins are equated with parallel cousins but both are separated from siblings.

Hawaiian type — cross- and parallel cousins are called by the same terms as siblings.

Iroquois type — cross-cousins are called by the same terms but differentiated from parallel cousins, who are commonly classed with siblings.

Sudanese type — cross-cousins are called by different terms and also are differentiated from parallel cousins and siblings. Generally descriptive.

Omaha type — parallel cousins are generally equated with siblings but the mother's brother's children are classed with mother's brother and mother; and father's sister's children correlatively are classed with nephew and niece (male speaking) or with son and daughter (female speaking).

Crow type — parallel cousins generally are equated with siblings but the father's sister's children are classed with the father and father's sister; and the mother's brother's children as son and daughter (male speaking) or nephew and niece (female speaking).

Murdock utilizes these six types in association with patterns of descent to establish some eleven major types of social organization into which he groups his sample of 250 societies. In a later selected sampling of world cultures he employs a more elaborate classification of cousins in conjunction with classification of the parental siblings.

A. R. Radcliffe-Brown, who classified Australian societies into two major types, Kariera and Aranda, on the basis of kinship terminology and patterns of preferential marriage, later proposed a fourfold classification in terms of (1) patrilineal systems; (2) matrilineal systems; (3) cognatic (bilateral) systems; and (4) double-descent (both matrilineal and patrilineal) systems.

C. Lévi-Strauss called attention to the significance of preferential marriage, particularly matrilateral cross-cousin marriage, in the social structure of Australia and of south and east Asian populations.

None of these formulations is an entirely satisfactory classification of kinship terminologies generally, since they are not as yet based on an adequate comparison of whole kinship systems in relationship to total social structures. Preliminary attempts in this direction suggest that one broad type is based on unilineal descent and organizes kindred in terms of the lineage principle. Such social structures frequently have corporate features and a complex organization of kinship, and represent essentially specialized adaptations to relatively stable social conditions. Another type is bilateral in character and emphasizes generation and the unity of the sibling group. These structures are usually shallow in depth but provide more flexible adaptation to changing social conditions. Systems based on cross-cousin or other forms of preferential marriage may represent a third major type or, alternatively, important subdivisions of the first two. Such systems have a built-in structure which is bilateral and closely knit in its simple forms but which is also preadapted to lineage forms and a wider range.

Regional summaries are available for many portions of the world; it will be useful to characterize these briefly. In general, similar types of kinship terminologies and social systems are broadly distributed over different continents, but in quite different percentages. Here the concern is primarily with types of kinship terminology.

DISTRIBUTION OF TYPES OF TERMINOLOGY

Australia. — In Australia. kinship forms an important aspect of social life, and the complexities of terminology have been reduced to systematic rules. In general, kinship terminology is bifurcate merging; that is, the father and the father's brother are called by the same term, as are the mother and mother's sister; but distinct terms are used for the father's sister and the mother's brother. Correlatively, parallel cousins are grouped with brothers and sisters. while cross-cousins are differentiated. These patterns are widely extended via clan and moiety groupings, which serve to bring all social relations within the framework of kinship.

Radcliffe-Brown divides all kinship terminologies in Australia into two main types. Type **I,** the widely-distributed Kariera system, is based on marriage with the cross-cousin, the father's sister's daughter or mother's brother's daughter (or, for a female, with the mother's brother's son or the father's sister's son). In type II, the Aranda system, marriage is prohibited with the first cross-cousin but enjoined with the second cross-cousin (*e.g.,* the mother's mother's brother's daughter's daughter). It is probable that a third type should also be recognized. In the Murngin and related systems of northern Australia, marriage is enjoined with the mother's brother's daughter and with others in this kinship category, but is forbidden with the father's sister's daughter. Radcliffe-Brown considered type II to be a development from type **I,** but attempted to fit the Murngin system into the Aranda pattern.

In these Australian systems a noteworthy feature is the absence of terms for affinal relatives. Since marriage is prescribed with particular classes of relatives, there is no need for special terms for connections by marriage since they are already consanguineous relatives.

North America. — North America north of Mexico has predominantly bifurcate merging kinship terminologies in the region east of the Rocky mountains, and predominantly lineal or bifurcate collateral systems in the west and north, although there are many exceptions in western North America. Mexico and Central America are less well known, although Murdock characterizes most of the groups in his "World Ethnographic Sample" as having Hawaiian-type cousin terminology. Much of this latter area has been subjected to long acculturation; in marginal areas Omaha-type

terminological systems in association with lineages or clans have been reported.

Spier's classification, based on cousin terms, still retains validity, although later researches extended and modified his results considerably. The Iroquois type, Morgan's model for the classificatory system, is also found among the bilateral Dakota and the patrilineal Ojibwa, as well as in many other areas. Research has suggested a connection with cross-cousin marriage. Spier's Mackenzie Basin type, with Hawaiian-type cousin terminology, is characteristic of most of the High Plains tribes and a considerable number of the Basin populations. The Omaha system. based essentially on the patrilineal lineage, is found in the Prairie Plains and central California regions. The Crow type, based on matrilineal lineages, is found in the southeastern tribes, the northern Plains, the western Pueblos, central California and, in modified form, on the northern northwest coast. The Acoma type, with a restricted distribution among the Keresan Pueblos, is probably best considered a specialized variant of the Crow type; and the Yuman systems are characterized by an elaboration of age distinctions plus some modification of a lineage principle. The Salish type, with a more restricted distribution in the northwest, has a classification of cousins similar to the Mackenzie Basin type but employs lineal-type terminology in the parental generation. The Eskimo type, similar to the English system, is found among most, but not all. Eskimo groups. The closest cognates are in northeastern Asia, although some of the California systems have Eskimo terminology.

There are no examples in North America of generation systems except possibly the Seri in Sonora; although the Mackenzie Basin systems utilize Hawaiian-type cousin terminology. Lineal systems are little developed except for the Salish and their neighbours. The bulk of the Iroquois, Omaha, Crow and Mackenzie Basin systems fall under the bifurcate merging category; bifurcate collateral systems include various California and Basin peoples, as well as the Eskimo.

For the plains region and neighbouring areas Fred Eggan proposed a classification of kinship systems into (1) generation type and (2) lineage type; and suggested that the neighbouring Iroquois and Dakota types are essentially based on cross-cousin marriage. Murdock presented a preliminary survey of North American kinship systems in terms of the developmental criteria proposed in his reconstruction of social structure.

South America. — Paul Kirchhoff's early summary clarified the terminological situation for northeastern and eastern South America, but mainly called attention to the inadequacy of the data. After that. more adequate field research provided better knowledge of the range of types of kinship terminology, although little is still knonn for many groups.

Lineal and bifurcate collateral systems seem proportionally more prevalent in South America than in North America. Murdock records Hawaiian-type cousin terminology from a number of regions; Crow systems for the Guajiro, Siriono and some of the Ge-speaking tribes of Brazil; Omaha systems for the Araucanians and Sherente; occasional Eskimo-type terminology; and a considerable number of systems with Iroquois terminologies, particularly in the Guianas and the Mato Grosso.

Preferential marriage in a variety of forms is reported for a number of regions, including not only various types of cross-cousin marriage. but also marriage with the sister's daughter—a form not reported for North America.

Asia. — Asia has such a great variety of peoples and cultures that any brief characterization of kinship terminology is difficult. In northern Asia, particularly in the northeast, lineal and bifurcate collateral systems with Eskimo or other cousin terminology are common. Among central Asian pastoral peoples, seniority is of great social importance, and differences in generation are sometimes disregarded or systematically arranged to facilitate adoption and inheritance. The social systems of central Asia depend on strict genealogical control in the patrilineal line and on the ranking of lineages in terms of seniority. In some groups, notably the Kazak and some of the Mongol groups, terminology follows the Omaha pattern, at least in part.

In eastern Asia, the early Chinese system was bifurcate merging and was probably based on cross-cousin marriage. Their modern, more complex system is perhaps best classified as bifurcate collateral, and as employing descriptive modifiers with basic terms. Japan and Korea are lineal and bifurcate collateral, respectively. and both use Eskimo cousin terminology, but there are local and regional variants.

In southeastern Asia a number of the Tibeto-Burman tribes are bifurcate merging and have Omaha-type systems, sometimes in conjunction with preferential marriage. Groups like the Kachin of northern Burma organize their society in terms of matrilateral cross-cousin marriage.

South Asia, and in particular India, is characterized by bifurcate merging or bifurcate collateral terminology. North India in general does not allow cross-cousin marriage and has Hawaiian cousin terms. South India has a general pattern of preferred marriages. usually with the cross-cousin but sometimes with the sister's daughter, and these are reflected in the Iroquois cousin terminology.

In southwestern Asia, both among the Semitic-speaking peoples and the Iranians, bifurcate collateral systems predominate, with descriptive cousin terminology. Preferential marriage with the father's brother's daughter is common, lending a tightly knit character to the patrilineal lineage.

Europe. — The terminological systems of the European populations are, broadly speaking, descriptive or individualizing. Lineal patterns prevail in the parental generation, although occasional bifurcate collateral or derivative terms are found. Eskimo-type (or "English") cousin terms are general. This striking degree of unity reflects the underlying linguistic relationships as well as cultural similarity. G. S. Ghurye concluded from a study of Indo-European kinship terminology that the early social structure was likeaise of a similar type: an extended family unit of three or four generations with patrilocal residence and patrilineal descent but with bilateral kinship organization (***Family*** and ***Kin,*** p. 42).

A comparison of European kinship terminologies by Munro Edmonson in terms of "set-types" indicated regional variations within the general European pattern. The commonest pattern is differentiation by sex of the referent, which characterizes all of the Germanic systems and most of the rest The next most common pattern is an undifferentiated set-type characteristic of Spanish and other Romance language groups. A third pattern, which he calls the Swedish set-type, is found mainly in Scandinavia

Edmonson finds European kinship terminology dominated by four concepts, each with a distinctive geographical focus. Lineality he finds characteristic of northwestern and southwestern Europe; a three-generational division is characteristic of northwestern Europe; a five-generational system is characteristic of southern and eastern Europe; and differentiation in terms of sex of referent is primarily found in northern and central Europe. These concepts he believes to be primarily cultural and historical in nature ("Kinship Terms and Kinship Concepts," pp. 399 ff.).

Africa. — African terminological systems are as yet inadequately known, but bifurcate merging systems predominate south of the Sahara with a variety of subtypes; and bifurcate collateral systems with descriptive cousin terms are common in the north. While African social structures are overwhelmingly patrilineal in descent and patrilocal in residence, there are important areas of matrilineal descent, mainly in association with avunculocal residence. Murdock's "World Ethnographic Sample" permits preliminary characterization of African regions in terms of the classification of parental relatives and cousin terminology.

For the Pygmies, Bushmen and Hottentots the present inadequate data suggests a variety of terminological patterns. The Hottentot have bifurcate merging parental terminology with Iroquois cousin terms and some tendency to develop Omaha patterns. The Bushman are bifurcate collateral or lineal, with Eskimo-type cousin terminology. Little is known of Pygmy terminology.

The southern Bantu have generally bifurcate merging terminologies with Iroquois cousin terms, but there are occasional bifurcate collateral patterns and some development of Omaha systems. The central Bantu add Crow and Hawaiian cousin patterns to this as-

semblage; further research in the Congo region will undoubtedly add new forms and variants.

The northeastern Bantu are likewise bifurcate merging, with Omaha, Iroquois and Crow cousin terminologies; the equatorial Bantu have these patterns with Hawaiian cousin terms. The Guinea coast tribes have bifurcate merging systems for the most part, but with some descriptive types; the cousin terms are divided mainly among descriptive, Omaha and Hawaiian patterns with occasional generation types.

The western Sudan is generally bifurcate merging with Hawaiian, Crow, Iroquois and Murngin cousin terminologies; and parallel patterns are found in the Nigerian plateau with Crow and Omaha patterns added. The eastern Sudan has descriptive cousin terminologies in addition to Hawaiian and Iroquois. The upper Nile region is likewise bifurcate merging, with a concentration of Omaha systems plus descriptive cousin patterns.

For the Horn and Ethiopia, bifurcate collateral parent terms become more characteristic, with a shift to descriptive cousin terms. This pattern is likewise found in the Moslem Sudan, though there are bifurcate merging systems with Hawaiian or Iroquois cousin terms as well. The Sahara region is generally bifurcate collateral with descriptive or Eskimo-type cousin terms. In northern Africa bifurcate collateral parental terminology with descriptive cousin terms is reported for a few groups, but kinship patterns of this region are little known.

If Murdock's sample is generally representative, about 33% of African tribes have Iroquois-type cousin terminology, about 20% have Hawaiian, 20% descriptive, 18% Omaha, 8% Crow and 1% Eskimo, omitting a few variant forms. There are also, as noted above, some patterns of terminology in the parental generation which are largely confined to Africa. Thus the Zulu pattern divides the father's relatives from the mother's, while grouping their siblings together regardless of sex. But more detailed studies of individual systems are necessary for an adequate classification and understanding of the significance of the combinations found.

Indonesia and Oceania.--Oceania has been of great interest to students of kinship ever since Morgan based his Malayan type on Polynesian terminologies. Morgan would have been highly interested in the later discovery of generation systems in the Philippines but puzzled that their next-door neighbours had lineal systems with Eskimo cousin types, not too different from the European patterns. In general the more complex and varied terminological patterns are found in the Indonesian region; and the terminology becomes simplified in content and pattern as one moves eastward in the Pacific, at least among Malayo-Polynesian speakers. The Papuan tribes of interior New Guinea are little known.

Western Indonesia has lineal, descriptive, bifurcate merging and bifurcate collateral terminologies, with a variety of cousin patterns, some of which are correlated with preferential marriage patterns. Eastern Indonesia has primarily lineal and bifurcate merging patterns, with Hawaiian cousin terms predominating, but with Eskimo and Iroquois as well. The Philippines have primarily lineal or generational parental groupings, with Eskimo or Hawaiian cousin terms. There the social structure is generally bilateral, with no unilineal descent groups.

The Papuan groups in New Guinea are generally patrilineal, with bifurcate collateral or bifurcate merging patterns in the parental generation, and with Omaha, Iroquois or Hawaiian cousin terms. Preferential marriage patterns are common in New Guinea and affect the terminological patterns.

Western Melanesia is primarily matrilineal in descent with a number of types of preferred marriage, mainly with cross-cousins. Bifurcate merging patterns predominate, with Crow, Iroquois and Hawaiian cousin terms. Eastern Melanesia is more varied in social structure, but with general bifurcate merging terms in the parental generation and with Omaha, Crow, Hawaiian and Iroquois cousin terms.

Micronesia shows a predominance of matrilineal descent and has generally bifurcate merging terms with Crow or Hawaiian cousin patterns, although a few groups have generation systems.

Western Polynesia has bifurcate merging or generation systems with Hawaiian cousin terms, plus occasional Omaha, Eskimo and Iroquois groupings. Eastern Polynesia has almost entirely generation systems with Hawaiian cousin patterns.

Murdock *(Social Structure,* pp. 349–50) reconstructed an original social organization of Hawaiian type for the Malayo-Polynesian speech community on the basis of the wide distribution of this type in Oceania and the possibility of explaining the variant types in terms of derivation or development. But later studies of bilateral social systems in Indonesia and the Philippines suggest repeated development of the Hawaiian pattern of kinship terminology, and close comparison may indicate the conditions under which it tends to arise.

HISTORICAL AND SOCIOLOGICAL INTERPRETATIONS

Morgan inaugurated both historical and sociological interpretations of kinship terminology. He assumed that kinship systems arose in connection with social systems, but changed so slowly that they might survive changes in social conditions and thus reflect earlier conditions of society. He also early rejected the possibility that the same kinship system could arise independently in separate areas, and he accepted the similarity of systems as proof of racial identity. Hence he mistakenly inferred the unity of the Dravidians and the American Indians, and that of the Zulu and the Hawaiians as well. Part of his difficulties were the result of the fact that most of the American Indians east of the Rockies did have similar kinship terminologies, in terms of the broad patterns that he had established, but his failure to recognize the possibility of independent development led him to untenable conclusions.

Sociologically Morgan viewed his nomenclatures as indexes of family life. The Malayan system seemed to be the simplest; and since it could be explained on the basis of a "communal family," and the Ganowanian (American Indian) system could develop from it by the addition of clans, the Malayan system was assumed to be the earliest and to furnish some evidence for a still earlier system of promiscuity from which mankind had emerged. Later the descriptive terminology developed with the rise of property rights and the custom of transmitting them only to direct descendants. These arguments laid the basis for his proposed series of evolutionary cultural stages, starting from an assumed promiscuity and ending with the monogamous family.

This theory of family evolution is no longer tenable. In the arguments that ensued. however, many valid ideas and insights of Morgan were discarded along with his theories of family evolution. In England, McLennan attacked Morgan's use of terminologies as evidence for social institutions on the grounds that they mere merely a system of mutual salutations without any firm relations to rights and duties in social life. Morgan's speculations led Kroeber initially to reject sociological interpretations almost entirely and to develop an alternative type of explanation in terms of psychological and linguistic principles.

Rivers returned to Morgan's position that kinship terminology "has been rigorously determined by social conditions," and that "systems of relationship furnish us with a most valuable instrument in studying the history of social institutions" *(Kinship and Social Organization,* Constable and Co. Ltd., London, 1914, p. 1), and attempted to demonstrate a close correlation between Melanesian systems of terminology and existing patterns of cross-cousin marriage, with considerable success. His further attempt to infer recent forms of marriage, no longer practised, from the terminology is more controversial since there are alternate explanations which he failed to consider.

Kroeber rejected Rivers' extreme views as to determinism, insisting that "the infinitely variable play of the variable factors forbids any true determinations of causality of a sweeping character," and maintained that kinship terms were linguistic phenomena subject to alterations of a linguistic character. However, he did not sufficiently consider that language represents reality, and that insofar as it relates to social phenomena it is likely to mirror them, even though imperfectly. Kroeber later receded from his extreme position and recognized that kin term systems reflect both "unconscious logic and conceptual patterning *as*

well as social institutions" *(The Nature of Culture,* The University of Chicago Press, copyright 1952 by The University of Chicago, p. 171).

Rivers' general views and their documentation with field studies stimulated both more adequate collections of data and an increasing interest in correlations of social custom with nomenclature. His correlations between certain aspects of kinship terminology and cross-cousin marriage were generally accepted, and his suggestions with regard to the probable occurrence of cross-cousin marriage in northern North America on the basis of Morgan's schedules were later fully substantiated. His development of the genealogical method for collecting kinship and other social data was an important advance over Morgan's rather clumsy schedules.

In England Bronislaw Malinowski, on the basis of his extensive field research in the Trobriand Islands, emphasized the importance of the domestic family in the development of kinship patterns and attitudes; and Radcliffe-Brown, a student of Rivers, developed the conception of a kinship system as involving both terminology and patterns of social behaviour and attempted to isolate structural factors that might underlie both terminological patterns and particular rights and duties of kinsmen.

In the United States attempts were made by Lowie, Gifford, Spier, Sapir, Lesser and others to explain various aspects of kinship patterning in terms of particular social institutions, such as clans, the levirate and sororate, special marriage patterns and so on. These resulted in the establishment of preliminary correlations, but without clear cut cause and effect relationships. In some cases multiple factors were evidently involved; in others, possible lags in terminology. Diffusion or borro ing presents a further complication, since adjacent tribes often have similar features, although similar forms often are widely distributed.

Murdock (*Social Structure*) attempted to test many of these assumptions explicitly, both with regard to the correlations of various institutions or behaviour patterns with particular aspects of terminology, and in terms of isolating a regular pattern of change from one type of social system to another. Using simplified models based on terms for cousins and on residence and descent patterns. he postulated changes for which he marshaled a considerable amount of evidence. Eggan and Spoehr also found evidence of regular patterns of change in Indian tribes of the southeastern U.S. under the influence of common acculturative patterns; and there is mounting evidence that kinship terminologies are sensitive reflectors of social change rather than the stable systems that Morgan envisaged.

As a result of such studies there is less interest in classification of terminological systems as such, and more in understanding such systems as part of the larger kinship system and social structure. Such sociological principles as Radcliffe-Brown's unity of the sibling group and unity and solidarity of the lineage group have achieved growing acceptance in the interpretation of the nature of kinship and social systems, and have been important in the development of social anthropology in Great Britain and elsewhere. In the United States the basic concern with cultural history in anthropology has resulted in a preoccupation with problems of social and cultural change that resulted in significant additions to the interpretation of kinship systems.

Linguists have become interested in terminological systems as linguistic phenomena, following some of Kroeber's early suggestions, and F. G. Lounsbury and J. H. Greenberg have made important contributions in this direction.

The continued recognition of linguistic and logical factors does not invalidate the sociological significance of relationship terminologies. When all allowances are made for disturbing factors, a host of correlations remains between kinship features and sociological factors. When more intensive comparative studies of large linguistic families and culture areas are available, it will be possible to balance the relative importance of sociological and other factors as determinants. In the meantime, kinship terminologies provide important leads to social systems.

See also KINSHIP; COUSIN MARRIAGE; FAMILY; GROUP MARRIAGE; MARRIAGE; SOCIAL ANTHROPOLOGY.

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(R. H. Lo.; F. R. E.)

KINSTON, a city of North Carolina, U.S., the seat of Lenoir county, on the northern bank of the Neuse river near the site of the principal encampment of the Neuse Indians, is in the approximate geographical centre of the North Carolina coastal plain. It was established as a trading post for planters in the 1740s. Incorporated as Kingston by legislative act in 1762, the name was changed to Kinston by a second act of incorporation in 1784. It has a council-manager form of government, in effect from 1948.

An important tobacco market, with several sales warehouses and processing plants, Kinston is also a shipping point for other agricultural products and has shirt factories, a cotton mill, a meat-packing plant and a large synthetic fabric factory. For comparative population figures *see* table in NORTH CAROLINA: *Population.* (DA. ST.)

KIOWA. This American Indian tribe of the western plains is generally considered a separate linguistic stock, but may prove related to the Tanoan Pueblo. They were nonagricultural, unsettled, warlike, predatory, and with the Comanche raided the frontier Mexicans, Texans, Americans and Indians. Their culture is of southern Plains type. About 1,600 survive in Oklahoma.

See J. Mooney, *Bur. Am. Ethn. Report,* xvi., 1898. (A. L. K.)

KIPCHAK, Mongol designation of the khanates generally known as the Golden Horde (Western Kipchak) and the White Horde (Eastern Kipchak), both ruled by successors of Genghis Khan. The Golden Horde (*q.v.*) was, at the height of its expansion: of huge extent, reaching from the Dnieper far into Central Asia. During a temporary decline in its power in the second half of the 14th century, the White Horde became dominant, but its importance was short-lived. *See* CUMANS.

KIPLING, RUDYARD (1865–1936), British author, was born in Bombay on Dec. 30, 1865. His father, John Lockwood Kipling (1837–1911), an artist of considerable ability, was from 1875 to 1893 curator of the Lahore museum in India.

Kipling was educated at the United Services College, Westward Ho, North Devon, which is the scene of his story *Stalky and Co.* On his return to India he became at the age of 17 sub-editor of the Lahore *Civil and Military Gazette.* In 1886, in his 21st year. he published *Departmental Ditties,* a volume of light verse chiefly satirical, only in two or three poems giving promise of his authentic poetical note. In 1887 he published *Plain Tales from the Hills,* a collection mainly of the stories contributed to his own journal. During the next two years he brought out, in six slim paper-covered volumes of Wheeler's Railway Library (Allahabad), *Soldiers Three, The Story of the Gadsbys, In Black and White, Under the Deodars, the Phantom Kickshaw* and *Wee Willie Winkie,* at a rupee apiece. These were in form and substance a

continuation of the *Plain Tales.* This series of tales, all written before the author was 24, revealed a new master of fiction. They were unequal, as his books continued to be throughout; the sketches of Anglo-Indian social life being generally inferior to the rest. The style was to some extent disfigured by jerkiness and mannered tricks But Kipling possessed the supreme spell of the story-teller to entrance and transport. The freshness of the invention, the variety of character, the vigour of narrative, the raciness of dialogue, the magic of atmosphere, were alike remarkable. The soldier-stories, especially the exuberant vitality of the cycle which contains the immortal Mulvaney, established the author's fame throughout the world.

The new author's talent was quickly recognized in India, but it was not till the books reached England that his true rank was appreciated and proclaimed. Between 1887 and 1889 he travelled through India, China, Japan and America, finally arriving in England to find himself already famous. His travel sketches, contributed to *The Civil and Military Gazette* and *The Pioneer,* were afterwards collected (the author's hand having been forced by unauthorized publication) in the two volumes *From Sea to Sea* (1889). A further set of Indian tales, equal to the best, appeared in *Macmillan's Magazine* and were republished with others in *Life's Handicap* (1891). In *The Light that Failed* (1891, after appearing with a different ending in *Lippincott's Magazine)* Kipling essayed his first long story (dramatized 1905), but with comparative unsuccess. In his subsequent work his delight in the display of descriptive and verbal technicalities grew on him. His polemic against "the sheltered life" and "little Englandism" became more didactic. His terseness sometimes degenerated into abruptness and obscurity.

But in the meanwhile his genius became prominent in verse. Readers of the *Plain Tales* had been impressed by the snatches of poetry prefixed to them for mottoes, certain of them being subscribed "Barrack Room Ballad." Kipling now contributed to the *National Observer,* then edited by W. E. Henley, a series of *Barrack Room Ballads.* These vigorous verses in soldier slang, when published in a book in 1892, together with the fine ballad of "East and West" and other poems, won for their author a second fame, wider than he had attained as a story-teller. In this volume the Ballads of the "Bolivar" and of the "Clampherdown," introducing Kipling's poetry of the ocean and the engine-room, and "The Flag of England," finding a voice for the Imperial sentiment, which—largely under the influence of Kipling's own writings—had been rapidly gaining force in England, gave the key-note of much of his later verse. In 1898 Kipling paid the first of several visits to South Africa and became imbued with a type of Imperialism that reacted on his literature, not altogether to its advantage. Before finally settling in England Kipling lived some years in America and married in 1892 Miss Caroline Starr Balestier, sister of the Wolcott Balestier to whom he dedicated *Barrack Room Ballads,* and with whom in collaboration he wrote the *Naulahka* (1891), one of his less successful books.

The next collection of stories, *Many Inventions* (1893), contained the splendid Mulvaney extravaganza, "My Lord the Elephant"; a vividly realized tale of metempsychosis, "The Finest Story in the World"; and in that fascinating tale "In the Rukh," the prelude to the next new exhibition of the author's genius. This came in 1894 with *The Jungle Book,* followed in 1895 by *The Second Jungle Book.* With these inspired beast-stories Kipling conquered a new world and a new audience, and produced what many critics regard as his most flawless work. His chief subsequent publications were *The Seven Seas* (poems), 1896; *Captains Courageous* (a yarn of deep-sea fishery), 1897; *The Day's Work* (collected stories), 1898; *A Fleet in Being* (an account of a cruise in a man-of-war), 1898; *Stalky and Co.* (mentioned above), 1899; *From Sea to Sea* (mentioned above), 1899; *Kim,* 1901; *Just So Stories* (for children), 1902; *The Five Nations* (poems, concluding with what proved Mr. Kipling's most universally known and popular poem, "Recessional" originally published in *The Times* on July 1S. 1897, on the occasion of Queen Victoria's second jubilee), 1903; *Traffics and Discoveries* (collected stories), 1904; *Puck of Pook's Hill* (stories), 1906; *Actions and Reactions* (stories), 1909; *Rewards and Fairies* (1910, a companion volume to *Puck of Pook's Hill);* 24 poems contributed to a *History of England* (1911) for young people, in which he joined C. R. L. Fletcher; *The Irish Guards in the Great War* (1925), the most notable of his war books; *Debits and Credits* (1926); and *A Book of Words* (1928), a collection of speeches and addresses delivered between 1906 and 1927. Of Kipling's longer narratives *Kim* is the most successful; picaresque in design it gives a series of delightful pictures of Indian life, and is a classic in its kind. In *Puck of Pook's Hill* and *Rewards and Fairies* Kipling sought to create for children a semi-historical mythology of the English country-side; this patriotism was to be rooted in the sense of the history of the land beneath their feet, in the "instinct of inherited continuity," to use a phrase from one of his addresses. But everything he wrote, even to a farcical extravaganza inspired by his enthusiasm for the motor-car, breathed the meteoric energy that was the nature of the man. A vigorous and unconventional poet, a pioneer in the modern phase of literary Imperialism, and one of the rare masters in English prose of the art of the short story, Kipling had already by the opening of the 20th century won a conspicuous place which was recognized by the award of the Nobel prize for literature in 1907. He died in London, Jan. 18, 1936.

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KIPPER, properly the name by which the male salmon is known at the approach of the breeding season, when he develops a sharp cartilaginous beak, known as the "kip" from which "kipper" is said to be derived From the practice of rendering the breeding (*i.e.,* "kipper") salmon fit for food by splitting, salting, and smoke-drying them, the term "kipper" is also used of other fish, particularly herrings, cured in the same way. A "bloater" as distinct from a "kipper" is a herring cured whole without being split open

KIRBY, WILLIAM (1759–1850), English entomologist, was born at Witnesham, Suffolk, on Sept. 19, 1759. He was educated at Caius college, Cambridge, and after taking orders in 1782. spent his entire life at Barham in Suffolk. His *Monographia Apum Angliae* (2 vol., 1802), the first scientific treatise on English bees, brought him to the notice of the leading entomologists of his own and foreign countries; and his *Introduction to Entomology* (4 vol., 1815–26; 7th ed., 1856), written in collaboration with W. Spence, was equally successful. Kirby died on July 4, 1850.

KIRBY, WILLIAM (1817–1906), Canadian novelist, is remembered chiefly for his historical romance of life in Quebec under the French regime, *The Golden Dog* (1877). Born in Kingston-upon-Hull, Eng., on Oct. 13, 1817. he emigrated to the United States with his parents as a boy, and settled in Niagara, Ont., in 1839. He edited the *Niagara Mail* for more than 20 years, and was collector of customs at Niagara (1871–95). He was elected a charter fellow of the Royal Society of Canada in 1883. He died at Niagara on June 23. 1906.

Kirby wrote five books in all: *The U.E.* (1859), a Spenserian verse epic describing the migration of the United Empire Loyalists; *The Golden Dog; Memoirs of the Servos Family* (1884); *Canadian Idyls* (1894), a series of poems illustrative of Canadian scenery, customs and history; and *Annals of Niagara* (1896), a prose history of the Niagara district. *The Golden Dog* is his masterpiece. Into this romantic story of the life and times of the intendant François Bigot in New France, he wove all his aristocratic and conservative values, his beliefs in chivalry, in rank, in loyalty to crown and empire. in tradition and religious devotion. It has become a classic of Canadian literature.

See W. R. Riddell, *William Kirby* (1923); Lorne Pierce, *William Kirby* (1929). (*D.* P.)

KIRCHHEIM-UNTER-TECK, a town in the *Land* of Baden-Württemberg, Ger., on the Lauter, at the northwest foot of the Rauhe Alb, 15 mi. S.E. of Stuttgart by rail. Pop. (1950) 20,138. The town has a former royal castle built in 1538. The manufactures include hosiery, soap, pianofortes, machinery, furniture, chemicals and cement.

KIRCHHOFF, GUSTAV ROBERT (1824–188j), German physicist who established spectroscopy on a sound theoretical basis, was born at Konigsberg on March 12, 1824, and was educated at the university of his native town. After acting as *Privatdozent* (official but unpaid lecturer) at Berlin (1847–50), he became extraordinary professor of physics at Breslau in 1850. Four years later he was appointed professor of physics at Heidelberg, and in 1875 he was transferred to Berlin, where he died on Oct. 17, 1887. Kirchhoff's contributions to experimental and mathematical physics were numerous and important. In his work in electricity Kirchhoff was greatly influenced by Wilhelm Weber. He modified the resistance bridge as designed by Sir Charles Wheatstone *(see* WHEATSTONE'S BRIDGE), and developed a theorem which gives the distribution of currents in a network. Kirchhoff extended Georg S. Ohm's theory for a linear conductor to the case of conductors in three dimensions, and so generalized the equations dealing with the flow of electricity in conductors. He also tried to establish a connection between electrostatic and electrodynamic conceptions of electricity. Another important piece of work was the demonstration that an electric disturbance is propagated along a wire with the same velocity as light is propagated in free space. In other papers, various miscellaneous topics were treated—the thermal conductivity of iron, crystalline reflection and refraction, certain propositions in the thermodynamics of solution, vaporization and chemical reaction. An important part of his work was contained in his ***Vorlesungen über mathematische Physik*** (4 vol., 1874–94), in which the principles of dynamics, as well as various special problems, were treated in a somewhat novel and original manner.

His name is best known for the researches (1860), in conjunction with R. W. von Bunsen, on the development of spectrum analysis. He can scarcely be called an inventor, for not only had many investigators already used the prism as an instrument of chemical inquiry, but considerable progress had been made toward the explanation of the principles upon which spectrum analysis rests. But to him belongs the merit of having, most probably without knowing what had already been done, enunciated a complete account of its theory and established the method on a solid basis. Kirchhoff gave the explanation of the Fraunhofer lines and thus opened up to investigation a new field in spectrum analysis applied to the composition of celestial bodies.

Kirchhoff's work is collected in ***Gesammelte Abhandlungen*** (1882; supplement, 1891). *See* W. Voigt, ***Zum Gedachtniss von G. Kirchhoff*** (1888).

KIRCHNER, ERNST LUDWIG (1880–1938), one of the leading German artists in the first half of the 20th century, was born in Aschaffenburg, May 6, 1880. In 1905 he helped to found the *Brücke* ("bridge"), a community of artists which gave the initial spark to Expressionism and changed the tenor of German art. At first under the influence of ***art nouveau*** and Edvard Munch, Kirchner reached the height of his powers after he moved to Berlin in 1911 and painted a series of street scenes, which are remarkable for their intensely emotional content, sensitive line and often violent colour. His work as print maker, especially his woodcuts, shares significance with his paintings. He left the largest body of graphic work of any artist in his time. He continued working in various mediums in Switzerland where he went in 1917 and where he came under the spell of Alpine landscape and peasant life. He died near Davos, Switz., on June 15, 1938.

See Peter *Selz, German Expressionist Painting* (1957). (P. H. S.)

KIRGHIZ. The term Kirghiz or Kirgiz is now applied almost exclusively to the Kirghiz population of the Socialist Soviet Republic of Kirghizia, numbering in 1939 about 708,000. Some thousands are also to be found in the neighbouring Soviet republics, as well as in Sinkiang. Mongolia and Afghanistan. The Kirghiz are of Turkic stock and are believed to have originated in the upper reaches of the Yenisei river whence most of them migrated to their present habitat between the 10th and 13th centuries A.D. The traditional occupation of the Kirghiz was stockbreeding and they were nomads by inclination. After the introduction in the late 1920s of a policy of collectivization, however, they became largely stabilized and by mid-20th century were extensively employed in agriculture and to a minor extent in industry. Until 1917 the Kirghiz were largely illiterate but education made considerable progress under the Soviet regime. The language was systematized and a written language using the Cyrillic character evolved.

In Russian and other literature of the 18th and 19th centuries the term Kirghiz was frequently and wrongly applied to the Kazakhs, an ethnically distinct people. This was apparently to distinguish the latter from the Cossacks (Kazak in Russian), the real Kirghiz being referred to as Kara Kirghiz; *i.e.*, Black Kirghiz.

(G. E. WR.)

KIRGHIZIA, a Soviet Socialist republic of central Asia, bounded on the north by Kazakhstan, on the east and southeast by China (Sinkiang), on the south and southwest by Tajikistan and on the west by Uzbekistan. The Kirghiz republic, carved out of the former Turkistan A.S.S.R. in 1924, lies between 43° 24′ N. and 39° 17′ N. and 69° 15′ E. and 80° 15′ E.

Physical Geography.—The country is mountainous, most of it lying more than 5,000 ft. above sea level. It contains the western part of the Tienshan system whose two main peaks, Pobeda (24,406 ft., the second highest in the U.S.S.R.) and Khan Tengri (22,949 ft.), are on the Soviet-Chinese frontier. These two glacier-covered peaks also form a knot from which the Kunghei Ala-Tau range extends to the west and the Kokshaal-Tau to the southwest, the latter's crest being the Soviet-Chinese frontier. The Kunghei Ala-Tau is prolonged to the west by the Kirghiz range, while the Kokshaal-Tau is continued by the Alai range. The major part of Kirghizia is enclosed by this mountain fork.

On a high plateau in the east is Lake Issyk-Kul (*q.v.*) (the deepest lake in the U.S.S.R. except the Caspian sea). The Terskei Ala-Tau range (17,323 ft. the highest peak) is the third chain extending westward from the Pobeda-Khan Tengri massif, but it skirts the south of Lake Issyk-Kul. The main mass of this plateau is about 124 mi. wide and consists of broad basins lying about 10,000 ft. above sea level and running in an east-west direction. Two important rivers have their sources here: the Chu flows to the north through a deep cleft between the Kunghei Ala-Tau and Kirghiz ranges, then turns to the northeast and for about 90 mi. forms the boundary between Kirghizia and Kazakhstan; the Naryn river, a right-bank tributary of the Syr Darya, flows eastward and enters the Fergana valley north of the Fergana range, which branches in a northwesterly direction from a mountain knot, where the Kokshaal and Alai ranges join.

Western Kirghizia is lower than the east and is roughly U-shaped, opening to the west and embracing the Fergana valley from the north and south. The main part of the valley, however, is part of Uzbekistan. with an eastern section belonging to Tajikistan. The Syr Darya river (*q.v.*), here called Kara Darya, rises in the southuest of Kirghizia.

The climate varies with altitude and exposure. Slopes exposed to the west or north receive winds bearing more moisture and have less sun and are therefore more favourable to vegetation. Rainfall increases steadily with altitude up to 10.000 ft., after which precipitation takes the form of snow, even in summer, and hard frosts occur at night. At Frunze (2,539 ft.) the yearly rainfall amounts to 14.3 in. and at Przhevalsk (5,799 ft.) to 18.1 in.; the January mean temperatures are the same at both places (25° F.), but the July average at Frunze is 7j° F. while at Przhevalsk it is 6j° F.

The prevailing vegetation, depending on the precipitation and the altitude, is alpine and subalpine meadow, with luscious grass and many flowers. Forests are rare, except in the valley bottoms and along the northern slopes; where they do occur they are coniferous in type, consisting of fir and two species of spruce. with some maple. ash. aspen and the arborescent juniper. The northern slopes may be divided into a fertile belt of loess north of the

Kirghiz range, extending east and west of Frunze; a zone of cultivation to 4.000 ft.; the coniferous trees to 8,000 ft.; and subalpine and alpine pastures to 11,000 ft.. with perpetual snow above. The Kirghiz part of the Fergana valley, around Jalal-Abad and Osh, is also fertile land. In a few valleys apples, pears, plums. apricots and walnuts grow wild. Animal life is scarce, though birds are numerous on the lower slopes. The mouflon, antelope and marmot are found.

History. — The Kirghiz are of Turkic race (see TURKS OR TURKIC PEOPLES) and until the 12th century they lived in the Siberian steppes lying between Lake Baikal and the Yenisei river. The Chinese chroniclers knew of them and referred to them as "Kha-kia-tz" (Khakas) in the 10th century and as "Ki-Ii-ki-tz" in the 13th. Attacked by Jenghiz Khan at the beginning of the 13th century, they moved southwest and occupied the highlands of the Tienshan and Pamir region. They never formed a state and continued their nomadic life, moving their flocks of sheep and cattle to the high pastures in summer and spending the winter in the low valleys, living in *auls* (villages). in houses built of mud. with flat roofs on which the hay for winter use was stored. Their livestock supplied them with milk, meat, wool and leather. They also had small. sturdy horses for riding and yaks and two-humped camels as pack animals.

The Mongols stormed and sacked the prosperous oasis-cities lying much lower in the valleys of the Syr Darya and Amu Darya. They conquered the whole of Turkistan and founded an empire there which lasted three centuries; but the Kirghiz, protected by the wildness of their mountains and the fact that they populated a region which did not lie across a major invasion route. were not conquered. The emirs of Bukhara, an Uzbek state, never seriously attempted to subject the Kirghiz highlanders. At the beginning of the 18th century the Kirghiz had to fight the Kalmyks; later the khans of Kokand made an attempt to extend their rule to the Kirghiz, but the latter succeeded in preserving their ireedom.

This situation changed in the mid-19th century with the progress of the Russian conquest of Turkistan. The Russo-Chinese treaty signed in Peking on Nov. 2 (14), 1860, fixed the frontier between the two empires which has not changed since. In 1868 Russian fortresses were built at Naryn and Karakol (renamed Przhevalsk) and Russian colonization began on the lorn-lying fertile lands in the north round I'ishpek (now Frunze) and in the west in the Kirghiz part of the Fergana valley. On the eve of World War I there were 61 Russian settlements in the north and 50 in the west.

The Kirghiz first revolted against the Russians in 1898, Diikchi Ishan leading the abortive rising. The second revolt was more serious. It broke out in 1916 and was known as the *Merdikar* (Persian, "workmen") rising because it was provoked by a tsar's conscription order for noncombatant military service. During this rebellion about 150,000 Kirghiz died: some were killed by punitive expeditiuns, some by Russian colonists. some perished from hunger in the Chinese Sinkiang where they had sought refuge. When a Kirghiz leader, Kanat, son of Xyuke. was brought to trial, he accused his Russian judges of leaving his people nowhere to lay their heads. Later, in despair, he killed himself.

Xiter the Russian revolution of 1917 Kirghizia ior a time mas a no man's land. From 1920, except in low-lying areas, it was the theatre of the anti-Russian *Basmachi* guerrilla warfare in which the Kirghiz participated. On Oct. 14, 1924, Kirghizia (until then theoretically a part of the Turkistan A.S.S.R.) became an autonomous region (*avtonomnaya* oblast) of the Russian S.F.S.R., under the erroneous name of Kara-Kirghiz, because at that time the Russians continued to apply the name Kirghiz to the Kazakhs. On Feb. 1, 1926, it became the Kirghiz Autonomous Soviet Socialist Republic of the R.S.F.S.R. and only on Dec. 5, 1936, was it proclaimed the Kirghiz Socialist Soviet Republic.

Until 1929 the Kirghiz people could still lead their own way of life, but then came the collectivization of agriculture and of livestock breeding. The results were catastrophic: between 1928 and 1935 the number of sheep and goats fell from 5,906,000 to 963,600 and that of cattle from 1,084,000 to 314,400. The Soviet government accused the local Kirghiz leaders of sabotage. Yusup Abdurakhmanov, the premier, Abdukerym Sydykov, chairman of the Kirghiz Planning commission, and Taras Ryskulov, who became deputy chairman of the supreme soviet oi the R.S.F.S.R., disappeared in the great purge of 1937. By Sept. 1952 the Kirghiz Communist party had 39,250 members and 7,017 candidates, while the Kirghiz Communist Youth league in Jan. 1953 had about 129.000 members.

Population. — In 1959 the population of the republic. was 2,063,000. In Frunze (*q.v.*), the capital, the population in 1959 was 217,000. The population of Osh in 1959 was 65,000.

The Kirghiz are Sunni Moslem.

Education. — In 1951 the republic had 1,650 primary and secondary schools with 330,000 pupils. There were also 26 secondary technical schools and six institutions of higher education, including the Kirghiz State university, with a total of about 20,000 students. In Kirghiz schools the language of teaching was Kirghiz, written from 1941 in the Russian alphabet. A Kirghiz Academy of Sciences was inaugurated on Dec. 24, 1934.

Economy. — The area of arable land was increased between 1913 and 1940 from 1,580,000 ac. to 2,470,000 ac., of which 80% was under grain, 11% occupied by industrial crops (cotton, hemp, sugar beet, tobacco) and the rest under fodder. By 1953 there were 145 *kolkhozy* (collective farms), 44 *sovkhozy* (state farms) and 70 machine and tractor stations.

Before World War I there was almost no industry in Kirghizia. By 1950 coal, oil, lead and zinc ores, sulfur and mercury were being extracted; woolen, cotton and silk fabrics were being manufactured: and sugar and tinned meat were being produced. In 1950 about 180,000,000 kw.hr. electricity were generated.

See S. N. Ryazantsev, Kirghizia (1951); and also books quoted in UZBEKISTAN. (K. SM.)

KIRIN: see MANCHURIA.

KIRJATH-SEPHER, a town of ancient Palestine, later named DEBIR. In Josh. xv, 15–19 (and Judg. i, 11–15) it is stated that the town was in the Hebron region and was taken from the Canaanites by Caleb's son-in-law Othniel, otherwise known as the first judge of Israel after the conquest of Canaan by Joshua. Josh. x, 38–39 gives a varying tradition, according to which Debir was destroyed by Joshua himself. All different biblical references to the location of the town agree remarkably well with the large mound of Tell Beit Mirsim, southwest of Hebron. standing on the border between Jordan and Israel. There W. F. Albright directed four campaigns of excavation between 1926 and 1932, finding exceptionally clear stratification, from which he was able to give the first comprehensive description of Palestinian pottery sequences between c. 2300 and 588 B.C. The Canaanite town of the 14th–13th centuries B.C. had been destroyed by the Israelites toward the end of the 13th century and the town was finally wiped out by the Chaldeans c. 588 B.C. It was never reoccupied in history.

See W. F. Albright, *The Archaeology* of Palestine *and* the Bible, 3rd ed. (1935); "The Excavation of Tell Beit Mirsim," *Annual of* the *American* Schools of *Oriental Research,* vol. xii, xiii, xvii, xxi–xxii (1932–43). (W. F. A.)

KIRK, SIR JOHN (1832–1922), British naturalist and administrator, son of the Rev. John Kirk, was born at Barry, near Arbroath. on Dec. 19, 1832. and died on Jan. 15, 1922. He was educated at Edinburgh for the medical profession, and after serving on the civil medical staff in the Dardanelles throughout the Crimean War, was appointed in Feb. 1858 physician and naturalist to David Livingstone's second expedition to central Africa. He was by Livingstone's side in most of his journeyings during the next five years, and was one of the first four white men to behold Lake Nyassa (Sept. 16, 1859). He was finally invalided home on May 9, 1863. The reputation he gained during this expedition led to his appointment in Jan. 1866 as acting surgeon to the political agency at Zanzibar. In 1867 he was made vice-consul of Zanzibar, and in 1868 became assistant political agent, being raised to the rank of consul-general and agent in 1873. Kirk resigned his post (July 1887), retiring from the consular service. The 21 years spent by him in Zanzibar covered the most critical period of the history of European intervention in east Africa, and during the greater part of that time he was the virtual ruler (see ZANZIBAR).

In 1889–90 Kirk was a plenipotentiary at the slave trade conference in Brussels and was one of the delegates who fixed the tariff duties to be imposed in the Congo basin. As a naturalist Kirk took high rank; many species of the flora and fauna of central Africa were made known by him, and several bear his name; *e.g.,* the Otogale kirkii (a lemuroid), the *Madoqua* kirkii (a diminutive antelope), the *Landolphia* kirkii and the *Clematis* kirkii.

KIRKCALDY, a royal, large and parliamentary burgh and

seaport of Fifeshire, Scot. Pop. (1961) 52,371. It lies on the north side of the Firth of Forth, 13½ mi. E. of Dunfermline by road In 1847 Michael Nairn started a factory for handmade floorcloth, using a canvas base on which were put layers of paint. In 1877 this was turned over to the manufacture of linoleum and the town is still one of Britain's largest manufacturers of linoleum. Other industries include malting, flax-spinning. coarse linen and rope and twine making, and the manufacture of furniture. The town lies near the area of the Fifeshire coal field which employs many of the inhabitants.

Although Columba is said to have planted a church there, the authoritative history of the town does not begin for several centuries after the era of the saint. In 1240 the church was bestowed by David, bishop of St. Andrews, on Dunfermline abbey. and in 1334 the town with its harbour was granted by David II to the same abbey, by which it was conveyed to the bailies and council in 1450, when Kirkcaldy was created a royal burgh. The royal charter was confirmed by Charles II in 1662. In the course of the 16th century it became an important coinmercial centre and seaport, the salt trade of the district being then the largest in Scotland. Flemish influence is shown in a group of 15th-century houses overlooking the harbour which now belong to the National Trust for Scotland. In 1644 Kirkcaldy was made a free port and six years later it was assessed as the sixth town in the kingdom. After the union its shipping fell off. Jacobite troubles and the American War of Independence accelerating the decline. But its linen manufactures, begun early in the 18th century, restored prosperity. It is called the "lang toun" because after it absorbed Linktown and Abbotshall on the west, and Pathhead. Sinclairtown and Gallatown on the east, its main street reached a length of nearly 4 mi. The area was extended in 1930 by the absorption of Dysart (*see* below), and again in 1939 by the addition of about 2.7 sq.mi.; and in 1950 a further 0.85 sq.mi. was added. The parish church was mainly rebuilt in 1809, but has a Norman tower. The high school (1894) succeeded the burgh school (1582), where Edward Irving taught from 1812 to 1818 and Thomas Carlyle from 1816 to 1818. Kirkcaldy was the birthplace (1723) of Adam Smith.

To the west lies Beveridge park and to the north Ravenscraig park with the ruins of Ravenscraig castle (*c.* 1440). Both these parks and also Dunnikier park were presented to the town. which was given the house and grounds of Forth park, whose former owner, John Nairn, presented a museum and art gallery as part of a World War I memorial. Kirkcaldy harbour has an inner and outer division, with wet docks and wharves. Kirkcaldy returns one member to parliament.

Dysart.—This formerly separate royal burgh, merged with Kirkcaldy, May 16, 1930, was a seat of the salt industry in the 1 jth and 16th centuries. During the time of the alliance between Scotland and Holland, which was closer in Fifeshire than in other counties, Dysart became known as Little Holland. The town is mentioned as early as 874 in connection with a Danish invasion. Its name is said to be a corruption of the Latin *desertum,* "a desert," which was applied to a cave on the seashore occupied by St. Serf. From James V the town received the rights of a royal burgh. In 1559 it was the headquarters of the lords of the congregation and in 1607 the scene of the meetings of the synod of Fife known as the Three Synods of Dysart.

KIRKCALDY OF GRANGE, SIR WILLIAM (c. 1520–1573), Scottish politician, was the eldest son of Sir James Kirkcaldy of Grange (d. 1556). Sir James was lord high treasurer of Scotland from 1 j3; to 1543 and was a determined opponent of Cardinal Beaton, in whose murder (1546) he was assisted by William Kirkcaldy. In July 1547 he was captured by the French and sent as a prisoner to Normandy, whence he escaped in 1550. He was employed in France as a secret agent by Edward VI, being known as Corax; and later he served in the French army. The sentence passed on Kirkcaldy for his share in Beaton's murder was removed in 1556. and he returned to Scotland in 1557. He was one of the leaders of the lords of the congregation in their struggle with the regent. Mary of Lorraine. He opposed Queen Mary's marriage with Darnley, and was forced to seek refuge in England (1566). Returning to Scotland, he was accessory to the murder of Rizzio, but he had no share in that of Darnley; and he was one of the lords who banded themselves together to rescue Mary aiter her marriage with Bothwell. After the fight at Carberry Hill the queen surrendered to Kirkcaldy, and he was mainly responsible for her defeat at Langside. Aiter the murder of Murray, Kirkcaldy ranged himself definitely among the friends oi the imprisoned queen. Defying the regent Lennox, he began to strengthen the fortifications of Edinburgh castle, of which he was governor, and which he held for Mary, and early in 1573 he refused to come to an agreement with the regent Morton because the terms of peace did not include a section of his friends. After this some English troops arrived to help the Scots, and in May 1573 the castle surrendered. Strenuous efforts were made to save Kirkcaldy from the vengeance of his foes, but they were unavailing; he was hanged on Aug. 3, 1573.

See Sir James Melville, *Memoirs,* ed. T. Thomson (Edinburgh, 1827); J. Grant, *Memoirs and Adventures of Sir W. Kirkcaldy* (Edinburgh, *1849);* L. A. Barbé, *Kirkcaldy of Grange* (1897); and A. Lang, *History of Scotland,* vol. ii (1902).

KIRKCUDBRIGHT, a royal and small burgh and county town, Kirkcudbrightshire, Scot. Pop. (1961) 2,448. It guards the lowest crossing of the River Dee, 6 mi. from the sea, and is a market town and dairying centre and also a favourite resort of artists. The old form of the name was Kilcudbrit. from the Gaelic *Cil Cudbert,* "the chapel of Cuthbert," the saint's body having lain there for a short time during the seven years between its exhumation at Lindisfarne and the reinterment at Chester-le-Street. The estuary of the Dee is divided near its head by the peninsula known as St. Mary's isle. The harbour is good, but its usefulness is impaired by the distance to which the sea retreats. The market cross (1610) stands in front of the old courthouse, or tolbooth, in which John Paul Jones was once imprisoned for murder. The Hornel museum contains the best collection of Galloway literature and many manuscripts and works of art.

The ruins of the third and last castle built at Kirkcudbright, called Kirkcudbright castle or Maclellan's house, founded in 1582 by Sir Thomas Maclellan of Bombie (ancestor of the barons of Kirkcudbright), stand at the end of the old High street. The town was taken by Edward I in 1300. It received its first royal charter in 1455. After the battle of Towton Henry VI crossed the Solway and landed at Kirkcudbright to join Queen Margaret at Linlithgow. On St. Mary's isle was the seat of the Douglases, earls of Selkirk, at whose house Robert Burns gave the famous Selkirk grace:

Some ha'e meat and canna eat,
And some wad eat that want it;
But we ha'e meat, and we can eat,
And sae the Lord be thankit.

Dundrennan abbey, 4½ mi. S.E., was the greatest achievement of Fergus, lord of Galloway, a celebrated church builder of the 12th century. It mas a Cistercian house, colonized from Rievaulx, and was built in 1142. There now remain only the transept and choir, a unique example of the Early Pointed style.

KIRKCUDBRIGHTSHIRE (better known as the Stewartry of Kirkcudbright and also as East Galloway), a county in Scotland, bounded N. and N.W. by Ayrshire, W. and S.W. by Wigtownshire, S. and S.E. by the Solway Firth and E. and N.E. by Dumfriesshire. The area is 896.9 sq.mi. In the northwest part of the county, rugged and desolate, the chief mountains are Merrick (2.765 ft.), the highest in south Scotland. and the group known as the Rhinns of Kells. Toward the southwest the highest hills are Lamachan, Larg and the bold granite mass of Cairnsmore oi Fleet. Between Merrick and Lamachan lies Glen Trool, famous for its wild beauty. In the southeast Criffel, a granite intrusion, stands almost isolated. In the north rises the fine hill of Cairnsmore of Carsphairn and close to the Ayrshire border is the Windy Standard. The coastal belt of the county is mostly level or undulating and glacial deposits cover much of the suriace. Large stretches of sand are exposed in the Solway at low water; there are various small islands off the coast and Murray's Isles, in Wigtown bay, belong to the Scottish National Trust. The whole county is studded with numerous small lochs. The largest are

Loch Doon, 5½ mi. long since its enlargement for a power reservoir, and Loch Ken. The longer rivers include the Cree (25 mi.), which rises in Loch Moan and reaches the sea near Creetown in Wigtown bay; the Dee or Black Water of Dee (so named from the peat with which it is coloured), which rises in Loch Dee and flows southeast and south nearly 50 mi. to the sea at St. Mary's isle in Kirkcudbright bay; the Urr, rising in Loch Urr 27 mi. from its mouth a few miles below Dalbeattie; the Ken (24 mi.), which rises on the confines of Ayrshire, flows mainly southivard and joins the Dee at the southern end of Loch Ken; and the Deugh winding for 20 mi. from its source on Windy Standard before joining the Ken. The Deugh-Ken valley. which divides the northern moorland. is known as the Glenkens. The Nith during its last few miles forms the boundary with Dumfriesshire, to which it almost wholly belongs. Part of the county is included in the Glen Trool National Forest park, and there are many state forests.

Agriculture. — Pastoral rather than arable farming is the rule. Milk and its products, young cattle stock and sheep are the main features of agriculture. Ayrshire cattle predominate on the dairy farms and liquid milk is distributed to other parts of Scotland from creameries at Kirkcudbright, Dalbeattie and Tarff. Large numbers of young dairy stock are reared as well as young stock of the hardy beef breed, the Galloway and Belted Galloway. The hills are fully stocked with hardy breeds of sheep, the Galloway strain of Blackface sheep being in great demand all over Scotland.

Industries. — Granite quarries near Dalbeattie and Creetown are important and sandstone is also quarried. Barytes is mined near Dundrennan and Auchencairn. There is a precast concrete factory at Creetown, and near Cargenbridge a large factory for the production of synthetic fibre. Timber sawmilling and processing are carried on in various centres. The creamery at Kirkcudbright has facilities for butter-making and milk powder production, and cheese is made at Dalbeattie and Tarff.

A hydroelectric undertaking converging on the largest of the power stations! at Tongland, begins with three smaller stations in series at Kendoon, Carsfad and Earlstoun (between Carsphairn and Dalry) and is fed initially by waters from Loch Doon; a fourth power station, Glenlee. is fed by waters from an artificial loch at Clatteringshaws. west of New Galloway.

Historic Buildings. — There are many hill-forts in the south of the county and Threave is the most important castle. It stands on an island in the Dee and was the headquarters of the Douglas clan from 1369 to 1455 when it surrendered to James II. It was presented to the National trust in 1947. There are ruins of two large Cistercian abbeys, Dundrennan (see KIRKCUDBRIGHT) and Sweetheart (7 mi. S. of Dumfries). The latter was founded in 1273 by Devorguilla, who founded Balliol college, Oxford, and she is buried there with the heart of her husband, John de Baliol. Lincluden abbey (1½ mi. N. of Dumfries, on the Nith) was founded in the 12th century for Benedictine nuns. There are many associations with Robert Bruce.

Population. — The population in 1951 was 30,725, of whom 83 could speak both Gaelic and English. There are five small burghs: Kirkcudbright, the county town (1951 pop. 2,499); New Galloway (305); Castle Douglas (3,322); Dalbeattie (3,285); and Gatehouse of Fleet (877). Kirkcudbright and New Galloway are royal burghs. There are 28 parishes. Galloway (Kirkcudbrightshire and Wigtownshire) returns one member to parliament.

KIRKINTILLOCH, a small burgh of Dunbartonshire, Scot. Pop. (1951) 14,826. It is situated 8 mi. N.E. of Glasgow by road, on the Forth and Clyde canal, and the River Kelvin flows past the town, where it receives the Luggie water from the south. The leading industries are iron founding, precast concrete work and engineering.. Slide valves made in Kirkintilloch are installed on large ships in all parts of the world; and the town has the most important Scottish manufacture of mining machinery switchgear. The wall of Antoninus ran through the site of the town, the Gaelic or Cymric name of which (Caerpentulach) meant "the fort at the end of the ridge." The town was granted its charter as a burgh of baronry by William the Lion about the beginning of the 13th century. The lords of the manor at the time of the Scottish wars of independence were the Comyns, the estate being taken from John Comyn, known as "the Red Comyn" and slain by Robert the Bruce in 1306, and given to the Fleming family who held the baronry of Cumbernauld. The cruciform parish church (1644), with crow-stepped gables, is preserved by the town council. Excavations in Peel park, site of the Comyn castle and a Roman fort, throw interesting light on the line of the Antonine wall built by Lollius Crbicas in A.D. 142.

KIRK-KILISSE or **SARANDEKLISIE** (modern Kirklareli), a town of European Turkey, in the vilayet of Kirklareli, 35 mi. E. of Edirne. Population (1955) 19,312, chiefly Bulgarians, Turks and Jews. The Greeks have now left. Kirk-Kilisse is built near the headwaters of several small tributaries of the river Ergene, and on the western slope of the Istranja Dagh. It owes its chief importance to its position at the southern outlet of the Fakhi defile over these mountains, through which passes the shortest road from Shumla to Constantinople. The name Kirk-Kilisse signifies "forty churches," and the town possesses many mosques and Greek churches. It has an important trade with Istanbul in butter and cheese, and also exports wine, brandy, cereals and tobacco. The Turkish army was defeated there in 1912. From 1920 to 1922 the town was in Greek territory.

KIRKLAND, JOSEPH (1830–1894), U.S. novelist and pioneer in the field of realistic fiction in America, was born at Geneva, N.Y., Jan. 6, 1830, and died at Chicago, Ill., April 29, 1894. He wrote only three novels and was 57 when the first. *Zury: the Meanest Man in Spring County,* was published in 1887. He thought that he had begun to write too late and urged his young friend Hamlin Garland to begin writing without delay. It is doubtful, though, that Kirkland could have made the solid contribution to literature that he did had he not been able to draw upon personal experiences gained as a publisher's clerk, railroad auditor, soldier, coal-mine operator and lawyer. Important also in this varied background was the influence of his mother, Caroline Kirkland, whose realistic accounts of the family's life in backwoods Michigan were published in the 1840s.

Covering life on the farm, in the village and during the Civil War, Kirkland's *Zury* (1887), *The McVeys* (1888) and *The Captain* of *Company K* (1891) constitute a trilogy which explores the pioneering period of midwestern life. But his full-length portrait of the farmer Zury Prouder, first of its kind in American fiction, is his most significant contribution to literature.

John Flanagan's edition of *Zury* (1956) contains a helpful introduction and useful bibliography. (C. A. HY.)

KIRKLAND LAKE, a town of 15,575 (1951) inhabitants, in the district of Temiskaming in northern Ontario, Can., 60 mi. N. of Cobalt, on the Ontario Northland railway. It is the centre of the Kirkland Lake gold camp, one of the richest concentrations of gold values in the world, and the most important gold producing locality in Canada outside Porcupine. Among the chief producing mines are Kirkland Lake, Teck-Hughes, Lake Shore, Wright-Hargreaves, Sylvanite, Macassa, Toburn and Golden Gate, and further search for new mines is being carried on constantly both to the west and east. The first gold discovery in the vicinity was made in 1911, through the opening up of the country by railway. Thereafter production steadily increased.

KIRKUK, an important foothill town in eastern Iraq, 35° 30' N., 45° 30' E. The modern city is built on a "tepa" in which are buried the remnants of older settlements going back at least as far as the end of the 3rd millennium B.C. The so-called Kirkuk tablets have been found and excavated in Yorgan-Tepa (about 8 mi. from Kirkuk); they were written in the second half of the 2nd millennium by a hybrid (Semito-Hurrian) population which subsequently was conquered by the Assyrians. It lies on the railroad from Baghdad to be extended to Mosul, and is one of the chief market centres of Kurdistan, in the centre of a corn and fruit district. There is also a considerable sheep industry. The population (1957, 120,593) consists mostly of Kurds. The town exports agricultural products and wood. The Kirkuk oil field is also there.

KIRKWALL, a royal and small burgh, seaport and the capital of the county of Orkney, Scot., in the Orkney and Zetland parliamentary division. Pop. (1951) 4,348. It is at the head of a bay of the same name on the east of the island of Mainland of Orkney, 214 mi. from Leith and 130 mi. from Aberdeen by steamer. Much of the town is old-fashioned in appearance, its main street (nearly 1 mi, long) being in parts so narrow that two vehicles cannot pass each other. Kirkwall has very few manufactures, linen, kelp and straw plaiting being extinct, but

distilling and boatbuilding are carried on. The town is important for its shipping, as a distributing centre for the islands and the seat of the sheriff court. county council and agricultural markets of the island. In Kirkwall are a creamery and an egg-packing station and there is a large trade in black beef cattle. Kirkwall received its first charter from James III in 1486. but as it was disregarded by the earls of Orkney and others, parliament passed an act in 1670 confirming the charter granted by Charles II in 1661. The cathedral of St. Magnus, probably the only "Norman" church in Britain built by Norsemen. was founded by Jarl Rognvald (Earl Ronald) in 1137 in memory of his uncle Jarl Magnus who was assassinated on the island of Egilsay in 1115 and afterward canonized and adopted as the patron saint of the Orkneys.

The remains of Rognvald and St. Magnus were found in the cathedral in 1926. Except that the upper half of the original spire was struck by lightning in 1671 and not rebuilt, the cathedral is complete and is one of the finest pieces of Norman and early Gothic architecture in Scotland. The height and narrowness of this red sandstone building lend it an extra distinction. The cathedral, restored in the 19th century and again in 1915, belongs to the town council.

Of the church of St. Olaf only a fragment survives and nothing remains of the old castle, founded by Sir Henry Sinclair (d. 1400), earl and prince of Orkney and 1st earl of Caithness The earthwork to the east of the town was thrown up by the Cromwellians.

Adjoining the cathedral are the ruins of the Bishop's palace. in which King Haco died after his defeat at Largs in 1263. By this palace are the substantial ruins of the Earl's palace, built about 1600 by Earl Patrick Steuart. Steamers sail regularly to Lerwick, Aberdeen, Leith and to other islands in the Orkneys. Southwest of the town is Grimsetter airport which links the island to the Scottish mainland. (J. GD.)

KIRKWOOD, a suburb of St. Louis. Mo. (*q.v.*).

KIROV (formerly part of Vyatka), an oblast of the Russian Soviet Federated Socialist Republic. U.S.S.R., surrounded by Komi, Udmurt. Tatar and Mari Autonomous Soviet Socialist Republics, and Vologda. Archangel, Perm (Molotov) and Gorki oblasts in 1958. Pop. (1959) 1,919,000 (urban 706,000, rural 1,213,000); area. 47.297 sq.mi. It has on its northern boundary the flat water parting which separates the basins of the Northern Dvina and the Volga, and its surface is an undulating plateau, 800 to 1,000 ft. high, deeply grooved by rivers and assuming a hilly aspect on the banks. A tongue of higher land causes the Vyatka to make its great bend to the west. The Kama flows northward along the east of the region; and the Vyatka and its tributaries, Chepsa and Moloma, drain the remainder of the region. The soils are mainly unproductive clayey and sandy forest soils, with wide expanses of lake and marsh, the remains of the glacial epoch. The boundary between the coniferous and the deciduous forests passes through the centre of the region, and much of the north and east consists of continuous stretches of pine, fir, larch and Siberian cedar, while there are oak and ash forests in the south.

The chief mineral wealth of the region is the iron ore of the northeast and the phosphorite of the upper Vyatka, the latter of which is only just beginning to be exploited. The timber industry is not developed on a large scale, but the peasants make every variety of uooden articles, from spoons to sledges and carts, and sell them at the Gorki fair. Paper manufacture is being introduced, and the match industry is flourishing, especially in the town of Kirov. The climate is extreme. with a short hot summer and a long cold ninter. during which the snow covering is often deep. The average January temperature at Kirov is 8.2° F.. July 67° F.; the rainfall is variable, ample in some years. but deficient in others. Agriculture is insufficient to support the people, who supplement their income by peasant industries, especially woodwork, small metal wares and weaving of homespun, while those in the northeast work at the mines and smelting works, and there is some hunting, especially of squirrels, in the forest. The chief crops are winter rye, oats and flax; and potatoes. barley and buckwheat are grown in lesser quantities. There is some stock raising and pig breeding. The population is mainly Great Russian, much mixed with the Finnish tribes.

KIROV, chief town of Kirov oblast, Russian Soviet Federated Socialist Republic, U.S.S.R., is in 58° 36' N., 49° 40' E., on the Vyatka river: Pop. (1959) 252,000. It is the ancient trading centre, then Khlynov, established by merchants from Novgorod in 1181. It was plundered by the Tatars in 1391 and 1477 and annexed by Moscow in 1489. Its name was changed to Vyatka in 1780 and after the revolution to Kirov. Besides the old trade, the town has a growing industrial importance. It is the chief railway repair shop for the Molotov-Kirov railway, and has a line going north to Kotlas. Its manufactures include matches, textiles, metal wares. agricultural implements.

KIROVOGRAD (formerly ZINOVIEVSK), a town and oblast of the Ukrainian Soviet Socialist Republic, U.S.S.R., in 48° 32' N , 32" 18' E., on the Ingul river. The oblast has an area of 9,189 sq.mi., pop. (1959) 1,218.000; the town, pop. (1959) 127,-000. Its industries include smelting, distilling. brewing, soapmaking, brickmaking, sawmilling and manufacture of makhorka tobacco. It is on the railway and is a collecting centre for a grain-growing and sheep-raising district. It was founded in 1754 and named Elisavetgrad after the empress Elizabeth. After the 1917 Revolution it was renamed for the Bolshevik leader Zinoviev. Later it was named Kirovo.

KIRRIEMUIR, a small burgh in the Strathmore district of Angus (Forfarshire). Scot, 6 mi. W.N.W. of Forfar. Pop. (1951) 3,570. On a height above the glen through which the Gairie flows, it is the centre of a rich agricultural area. The main industry is jute weaving but the town also has oatmeal mills. Sir J. M. Barrie (1860–1937) was born and buried in this town of narrow streets, and in his books made it famous under the name of "Thrums." His birthplace is now a museum belonging to the Scottish National trust.

The original Secession church—the kirk of the Auld Lichts—was founded in 1806 and rebuilt in 1893.

KIRSANOV, a town of the Russian Soviet Federated Socialist Republic, U.S.S.R., in the oblast of Tambov, in 52° 39' N., 42° 42' E., on a small tributary of the Vorona river, and on the railway. It grew rapidly after 1900, and smelting works, steam flour mills and a grain elevator were established there. It was founded in the 18th century.

KIRSCH (KIRSCHWASSER), a potable spirit distilled from a fermented mash of ripe, small, wild black cherries found in the Black forest (*Schwarzwald*) of Germany, across the Rhine in Alsace, France, and in the German-speaking cantons of Switzerland. Geographically these production areas are one, since they all lie around the edges of the Rhenish plateau, but politically they constitute three separate regions.

Commercial distillation of kirschwasser (cherry water), *i.e.*, true cherry brandy, has been known in Germany and Switzerland since the middle ages; in France it came later, when Cadet de Vaux brought the art to Montmorencp valley shortly before the French Revolution. One-third of Switzerland's annual cherry harvest is devoted to production of kirschwasser. It still is primarily the product of small farmer-distillers who ferment and distill the fruit of their orchards and then sell the kirschwasser to blenders who bottle and market it. Some large firms market the product of their own exclusive distillation.

Production methods remain traditional. The fully ripened cherries are mashed in a large nooden tub or vat and allowed to ferment freely. During fermentation the mass is stirred periodically with paddles to assure ample aeration of the whole. Upon completion of fermentation the entire mass—liquid, pulp and cherry stones—is distilled in a pot still. Kirschwasser is distilled off at a low proof—usually between 100 and 110 U.S. proof.

During the mashing some of the cherry stones (pits) are crushed, releasing some of their oils and acids. These include small quantities of hydrocyanic acid, which with benzaldehyde result from the breakdown of amygdalin, and inipart the distinctive bitter almond undertone found in the aroma and flavour of good kirschwasser. Such fruit brandy also contains a higher proportion of methyl alcohol than spirits distilled from other materials, such as grain or molasses.

Kirschwasser is not aged. It is marketed at 90 to 100 proof, in the clear white (colourless) state it comes off the still. Whether labeled kirschwasser or kirsch it is a fruit brandy of pronounced character, with a clean cherry fragrance and bitter almond undertone. It is consumed neat, as brandy, and in cocktails. However, one of its principal uses is as a flavouring. (H. J. GN.)

KIRUNA, mining town of northern Sweden, 880 mi. N. of Stockholm by rail. Pop. (1960) 26.703. The town lies between two great mountains of iron ore: Kiirunavaara and Luossavaara. There lie about 750,000,000 tons of iron ore, yielding about 5,000,000 tons per year. It assays from 58% to 70% pure iron. Normally shipments go out to England and Germany via Narvik on the Norwegian coast. *See* GELLIVARA.

KIRWAN, RICHARD (1733–1812), Irish scientist and author of a long-standard work on mineralogy, was born at Cloughballymore, County Galway, in 1733. In 1766 he mas called to the Irish bar, but in 1768 abandoned practice in favour of scientific pursuits. During the next 19 years he resided chiefly in London, enjoying the society of the scientific men living there. His experiments on the specific gravities and attractive powers of various saline substances formed a substantial contribution to the methods of analytical chemistry, and in 1782 gained him the Copley medal from the Royal society. of which he was elected a fellow in 1780; in 1784 he was engaged in a controversy with Cavendish in regard to the latter's experiments on air. In 1787 he removed to Dublin. where four years later he became president of the Royal Irish academy. He mas one of the last supporters in England of the phlogistic hypothesis, for which he contended in his *Essay on Phlogiston and the Constitution of Acids* (1787), identifying phlogiston with hydrogen. This work, translated by Madame Lavoisier in 1788, was published in French with critical notes by Lavoisier and some of his associates; Kirwan attempted to refute their arguments, but they proved too strong for him, and he acknowledged himself a convert in 1791. His other books included *Elements of Mineralogy* (1784; 3rd ed., 1810), which was the first systematic work on that subject in the English language and which long remained standard; *An Estimate of the Temperature of Different Latitudes* (1787), which attempted to lay the basis for a theory of winds; *Essay of the Analysis of Mineral Waters* (1799); and *Geological Essays* (1799). He died in Dublin on June 1, 1812.

KIRYŪ, major textile centre in Gumma prefecture, Japan, is on the edge of the Kantō plain, about 60 mi. northwest of Tokyo. Pop. (1960) 123.010. Traditionally silk produetion was associated with Kiryū but the decline in world silk consumption after World War II caused most of it to be replaced with rayon production. In the 17th century fine Kiryū silks were worn by samurai and court nobles.

In the 20th century the city became a major production centre for brocades, satins and other fine silks for export.

(C. A. MR.)

KISFALUDY, the family name of two brothers, famous Hungarian writers of the early 19th century.

KÁROLY KISFALUDY (1788–1830), was born at Téte, Feb. 6, 1788, the youngest of eight children. Violent, frivolous and prodigal, Kisfaludy found it difficultto discover his vocation. He left school to become a soldier (1804) but. though he fought courageously in the Napoleonic Wars, he disliked discipline and in 1811 left the army. He went to Vienna where he tried painting, spent a year in Italy, returned to Vienna and then went to Pest where, disowned by his father, he led a precarious existence as a painter. He had been writing since 1805 and he tried his hand at drama as early as 1811 with a historical play, *A tatárok Magyarországon.* Eight years later the manuscript came into the hands of the director of the repertory company of Székesfehérvár, who produced it, first in his home town, then in Pest, making Kisfaludy famous overnight.

Kisfaludy may be considered the real founder of Hungarian drama. Among his best works are the tragedy *Irene* (1820) and the comedy *A kérök* (1817). He stepped into the literary leadership left vacant by Ferenc Kazinczy's growing isolation and in 1822 he began to publish his literary "almanac," *Auróra,* around which gathered the great names of the coming generation of Romantics: József Bajza, Mihály Vorosmarty, Ferenc Kolcsey. Kisfaludy died on Nov. 21, 1830, in Pest. But the movement he started survived him, and Hungarian literature owes much to his gift of literary editorship.

His collected works, *Kisfaludy Károly Minden munkdi,* were edited by J. Bánóczi, 6 vol (1893).

SÁNDOR KISFALUDY (1772–1844), the eldest of the family. was an outstanding poet and already becoming famous when Károly started to write Born in Sumeg, Sept. 22, 1772, he studied at Gyor and Pozsony. From 1792 he was a soldier. and for three years was a member of the Hungarian noble guard in Vienna. He fought against the French and was taken prisoner, and wrote his first love poems. inspired by Petrarch, in Provence. He married in 1800 and in the following year he published his song cycle *Kesergo szerelem* ("Plaintive Love") which met with unprecedented success. Though somewhat monotonous, this collection contains some real gems. *Boldog szerelem* ("Happy Love") followed in 1807. In the same year he published *Regék a magyar eloidokbol,* containing three poetic romances centring on three castles. Though they were neak in construction, their easy style made them popular. In his later years his work lost its vigour He died at Sumeg on Oct. 28, 1844. His collected works, *Kisfalzrdy Sdndor Mznden munkdi,* were edited by D. Angyal, 8 vol. (1892–93). (Ds. SR)

KISH, an island in the Persian gulf. *(See* QAIS.)

KISH (modern Tal al-Uhaimer), one of the most ancient and important cities of Sumer and Akkad, lies in a direct line about 8 miles from Babil, and 10 from Hillaa, in 32° 30' N. 45° E. The site is a very extensive one and was the scene of excavation by a joint expedition of the University of Oxford (Weld) and the Field Museum of Chicago. The city lies on either side of the old bed of the Euphrates, and for descriptive purposes may be divided into eastern and western Kish, in relation to the river. There was also a great canal running through the eastern city. The ruins are extremely extensive. The western flank of the city is guarded by two mounds, probably the fortress of the city, the later mound to the south being known to-day as Tal Khuzna, "the hill of treasure." The fortress consists of a large buttressed rampart, containing large chambers; some pottery of the Hammurabi period has been found here. The two hills stand up about forty feet above the plain, and from them (near the south-west corner of extensive city ruins) runs a massive wall and moat terminating in a low mound, no doubt a fort on the western bank of the old river channel. The city ruins which cover a wide area east of the twin western forts consist of a series of low mounds, which on their northern aspect extend as far as the ziggurat. These mounds have been extensively pillaged by illicit diggers and are probably the site from which many contracts have come. They terminate to the north-east in the great stage which rises go ft. above the plain and has received its modern name of Tal al-Uhaimer, the "little red mound," from the great mass of baked bricks of the period of Samsu-iluna which stands out very prominently across the plain and has protected the rest of the tower from erosion. East of the ziggurat is a series of low mounds, identified by Langdon as the ruins of Emete-ursag These ruins cover a wide area and Langdon believes that they are the remains of one of the most extensive temples of Sumer and Akkad. South of the ziggurat and between it and the southern wall there is a wide space which seems originally to have been a city park. In addition to these extensive ruins in western Kish there are also chains of mounds which lead to the new bed of the Euphrates. These can with certainty be identified with the outer defences which Nebuckadrezzar claims to have made. Their great extent is probably responsible for the large dimensions attributed by Herodotus and other ancient authorities to the walls of Babylon *(see* BABYLON). Western Kish must therefore have formed in later times, long after the river changed its course, if not an important city, at least an important element in the outer defences of its successor, the town of Babylon.

Eastern Kish lying about a mile from the ziggurat is much

more extensive and impressive. It consists of two parts, divided by an old canal. Between this and the river bed there are first a series of three mounds, which were probably forts. The most southerly lies on the other side of the river from the fort which guards the end of the wall of western Kish. Between these forts and the canal there lies a mound about three quarters of a mile long and about 25 ft. high, which contained a large number of tablets and some late graves. The canal which lay east of this mound is marked to-day by a long series of narrow mounds, which stand out and are most impressive, especially when half concealed by the mists at dawn. The canal appears to have been reconstructed at various times, and may even have been in use as late as the Abbasid period. If this was so the water must have been brought, as is the case with the modern canal a little distance away, from the new bed of the river near Hillaa. Immediately east of the canal are a series of sites. To the north lies a large flat area, not a mound, covered with plano-convex bricks. It appears that this must have formed an important part of Kish in early Sumerian times, and included the palace of the kings. It was entirely abandoned about 3000 B.C. Further down the canal and south-east of this area lies the great horse shaped Tal Bandar, "the harbour mound," a very descriptive name. This mound which is about 60 ft. high and 280 ft. in its greatest dimension from east to west, probably dates from the first Babylonian dynasty. It does not seem to have been a temple, but at present its purpose is quite undetermined. Immediately south of the "harbour mound" is a further mound, about 40 ft. above the plain and about $2\frac{1}{2}$ acres in extent. A short distance south of this, and immediately opposite the city ruins on the west bank of the canal, lie the most impressive ruins of eastern Kish. They consist of two great stage towers and a huge temple area, adjoining which there are extensive city ruins. The central mounds, known to-day as *Inghara,* a word of uncertain meaning, include two ziggurats joined together by a mass of ruins, and a mass of temple débris on the slopes of the mounds. The tower is 75 ft. high and the spur to the north is 3 ac. in extent and almost as high as the tower. All around is a large area covered with temples in ancient times. To the east of the old temple area there are extensive city ruins which are protected to the east by two forts. The residential quarter covers nearly $\frac{1}{4}$ sq.m. and is in most places about 30 ft. high. The upper strata at least are Neo-Babylonian.

It seems probable that the eastern forts mark the limits of the ancient city of Kish. Two miles, however, to the east, in a region of sand and desolation, lie the great mounds called by the Arabs Abu Sudaira, "the father of the Christ's Thorn," so-called from the single evidence of vegetation, a single shrub of *Ziziphus Spina Christi* which grows on the top. The mounds are irregular in shape and the lower summit is crowned with the remains of a Parthian tower. The whole surface is strewn with pottery of various dates, including some as late as Arab glazed pottery. There are Nebuchadrezzar bricks, and extensive traces of a cemetery, probably of no great antiquity. The mounds still await excavation. Farther east there is a further series of mounds; indeed the whole region between the Tigris and Kish contains abundant traces of intensive habitation. Some miles away, in 1925, Langdon excavated an early site at Jemdet-Nazr, "the hill of the Saviour." This mound, at present far from water, is probably on the site of some old stream bed, as the vegetation suggests traces of underground water. Langdon found here the remains of an ancient city whose pottery consisted entirely of painted ware. Its name and history are unknown. It certainly is of great antiquity from the pictographic tablet and the pottery, but nothing more is known. From the enormous numbers of pottery sickles lying on the surface it must once have been the centre of an agricultural district.

The history of Kish is especially interesting from its geographical aspect. In early Sumerian times, though the details have yet to be filled in, the whole region was the centre of a great wheat growing district. It was watered by the Euphrates and the water from the river was conducted in all probability across the present desert regions towards the Tigris, although this area has not as yet been fully explored archaeologically. This agricultural prosperity dates from as early in Sumerian times as it is possible at present to identify with any certainty. The city of Kish itself formed the dominating fortified city of the region, just as to-day so many walled cities in China dominate an agricultural area. Sargon, himself a native of Kish, abandoned the city after making war on it and during the dark period which followed little is known of the city, which may have been one of the very earliest sites of Sumerian civilization in Mesopotamia. In spite of attempts to do so, Kish never again regained her supremacy, which passed to Babylon (no doubt owing to the change in the bed of the Euphrates, although we have at present no information when this change took place). Towards the end of the third millennium B.C. Hammurabi and his successor did much work on the rebuilding of the temples, and Kish remained an important city as one of the most revered religious shrines of Akkad. In Neo-Babylonian times it again entered into a period of prosperity, forming almost an outer suburb of Babylon. The last actual reference to Kish occurs in the Nabonidos Chronicle, 539 B.C. A Greek tomb was found in the place in eastern Kish, but probably western Kish was abandoned in the Persian period. It is curious that in Kish itself apart from this one tomb nothing later than Nabonidos has been found, whereas all the mounds along the Shatt al Nil, to the east of Kish, are strewn with later pottery. Two different processes have been at work: one, political, that which led to the fall of Kish from its predominance, and the other the reduction of so much of the area to entire desolation.

A study of the canals shows that they gradually silted themselves up, but the more easterly, the Shatt al Nil, still remained as a possible supplier of water. Owing however to the lie of the land this canal runs to the east of Kish, and it is clear that the site has been progressively abandoned from the west, although it is probable that in early Sumerian times, when the river still ran past the city, eastern Kish was the earlier site. In spite of the possibility that the canal in the centre of the city was finally repaired in Abbasid times, it is more probable that the true site of Kish was entirely abandoned in ancient times and the city moved about two miles east, where there are abundant traces of later habitation, but where there was already a city at least as early as Nebuchadrezzar. Finally this site was abandoned also. Langdon is inclined to suggest that this final abandonment of the whole site was due to desiccation. The breaking down of the canal system under the Mongols would equally suffice to produce this result. The modern canal, based no doubt on water levels, runs east of Kish quite close to the sites of Abu Sudaira, and is playing an important part in rapidly converting that desolate region into irrigated land

In conclusion, it may be said that the city of Kish depended on the river itself and that, except for ancient prestige and religious sanctity, it ceased to be important when the river deserted it. When the town was reduced to a supply of water from the new bed of the river, that canal was dug more to the east and so produced the Kish of Parthian, Persian and Arab times. When the canal system failed then those sites too melted into the desert. Meanwhile Babylon on the river usurped the place of Kish, and the site continued to be occupied, even though other later towns for various reasons succeeded to Babylon.

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(L. H. D. B.)

KISHANGARH, a town in Jaipur district, Rajasthan, India, and a former principality. The town. founded in 1611, is 18 mi. N.W. of Ajmer by rail. Pop. (1951) 25,696, including a large community of Jain merchants.

Kishangarh state was controlled by the British through the Jaipur subagency of the Rajputana agency. Former area 837 sq.mi.; pop. (1941) 104,127. The state nas founded in the reign of the emperor Akbar, by a younger son of the rajah of Jodhpur. In 1818 it first came into direct relation nith the British government, by entering into a treaty, together with the other Rajput states, for the suppression of the Pindari marauders by whom

the country was at that time overrun. After India became independent Kishangarh acceded to the union of Rajasthan on April 18, 1948. The maharajahs were Rajputs of the Rathor clan.

KISHINEV (Rumanian, CHISINAU), a town of the Moldavian Soviet Socialist Republic. Pop. (1959) 217.096. Kishinev lies on the Byk river, on the railway between Odessa and Jassy and on a direct line to Galati and Bucharest. Kishinev is the seat of the bishop of Bessarabia, and contains a cathedral, an ecclesiastical seminary, a faculty of theology, a college, a museum, a public library, a botanic garden and a sanatorium with sulfur springs. The suburbs are remarkable for their gardens. which produce fruits (especially plums, which are dried and exported), mulberry leaves: tobacco and wine. There is a depot of the government tobacco monopoly in the town, and a school of viticulture. Trade is active, and there are local industries. Kishinev was founded in 1436, but had only 7,000 inhabitants in 1812 when acquired by Russia from Moldavia. The old town is on the banks of the Byk, the new on high crags, 450 ft. above the river. A notable pogrom was committed there in 1903. Rumania ceded Kishinev. with the rest of Bessarabia. to the U.S.S.R. in June 1940, but regained it in 1941 after the axis attack on the Soviet Union, It was again ceded to the U.S.S.R. by the treaty of 1947.

KISHM, an jsland in the Persian gulf. See QISHM.

KISKUNFELEGYHÁZA (FÉLEGYHÁZA), a Hungarian town, county (*megye*) of Bács-Kiskun, 80 mi. S.S.E. of Budapest. Lying at the edge of the drift-sand region it is surrounded by vineyards, orchards, tobacco and rye fields but is chiefly noted for its great cattle market. Local finds point to a long history of settlement but the modern town dates from 1743, when the district was recolonized after the Turkish devastation of the 17th century. Pop. (1960) 33,187 (mun.).

KISLOVODSK, a town and health resort in the N. Caucasus region of the Russian Soviet Federated Socialist Republic, U.S.S.R., situated at an altitude of 2.690 ft., in a deep valley on the north side of the Caucasus. The town is the terminus of a branch line from Georgievsk through Pyatigorsk. Pop. (1959) 79,000. There is a civic electricity and water supply. The limestone hills which surround the town rise by successive steps or terraces, and contain many caves. The mineral waters are strongly impregnated with carbonic acid gas and have a temperature of 51° F.

KISMET, fate, destiny, a term used by Moslems to express all the incidents and details of man's lot in life. The word is the Turkish form of the Arabic *qismat,* from *qasama,* to divide.

KISS, the act of pressing or touching with the lips, the cheek, hand, or lips of another, as an expression of love, affection, reverence or greeting.

For the liturgical *osculum pacis* or "kiss of peace" *see* PAX. *See,* further, C. Nyrop, *The Kiss and Its History,* trans. by W. F. Harvey (1902); J. J. Claudius, *Dissertatio de salutationibus veterum* (Utrecht, 1702); and "Baisers d'étiquette" (1689) in *Archives curieuses* de *l'histoire de France,* series ii, tom. 12 (1834–90).

KISSAR or GYTARAH BARBARYEH, the ancient Nubian lyre. still in use in Egypt and Abyssinia and having instead of the traditional tortoise-shell back a shallow, round bowl of wood, covered with a soundboard of sheepskin.

KISSI, a tribe of about 200,000 inhabiting the region around Kissidugu and Gekedu, near the headwaters of the Niger, mainly in the Republic of Guinea, but partly also in Sierra Leone and Liberia. They are of mixed race, much affected by successive migrations, and are chiefly a forest people, though the northern districts are in the savannah. They subsist mainly on rice. They make no sculpture, but ancient soapstone figures are put to secondary use in the ancestor cult and in divination. Music is well-developed. Social organization is based on patrilineal exogamous lineages, two or three to each village.

See A. Schaeffner, *Les Kissi, une société noire et ses instruments de musique* (Paris, 1951); D. Pauline, *Les Gens du riz* (Paris, 1954).

(W. B. FG.)

KISSINGEN (BAD KISSINGEN), a town and watering place of Germany, in the *Land* of Bavaria, situated on the Franconian Saale, 656 ft. above sea level, 62 mi. E. of Frankfurt am Main and 43 mi. N.N.E. of Wiirzburg by rail. Pop. (1959 est.) 12,718. The salt springs were known in the 9th century, and their medicinal properties were recognized in the 16th, but it was only during the 19th century that Kissingen became a popular resort. The town belonged to the counts of Henneberg until 1394. when it was sold to the bishop of Wiirzburg. With this bishopric it passed later to Bavaria. The three principal springs are the Rakoczy. the Pandur and the Maxbrunnen, of which the first two, strongly impregnated with iron and salt, have a temperature of 51.26" F.; the last (50.72') is like Selters or Seltzer water. At short distances from the town are the intermittent artesian spring Solensprudel. the Schonbornsprudel and the Theresienquelle; and in the same valley as Kissingen are the minor spas of Bocklet and Briickenau. They are all highly charged with salt, and productive government saltworks were at one time stationed near Kissingen.

KISTNA (KRISHNA). a district of Andhra Pradesh. India. Masulipatam is the district headquarters. Area 3,502 sq.mi. The district is in general a flat country, but the interior is broken by a few low hills, the highest being 1,857 ft. above sea level. The principal rivers are the Kistna, which forms the inland half of the district's southwestern boundary with Guntur district. and the Munyeru, Paleru and Naguleru (tributaries of the Gundlakamma and the Kistna). The Kolar lake, which covers an area of 21 by 14 mi., and the Romparu swamp receive the drainage on the north and south sides of the Kistna respectively.

The population (2,076,103 in 1961) is increasing as a result of the growing area of irrigated land. The Kistna delta system of irrigation canals, which are available also for navigation, connect with the Godavari system. The principal crops are rice, millets, pulses, oilseeds, cotton, tobacco and a little sugar cane. There are several factories for ginning and pressing cotton, a sugar factory and a number of rice milling and cleaning works; lace and embroidery are made. The manufacture of chintzes at Masulipatam has decayed, but cotton is woven for domestic use. Salt is evaporated, under government supervision, along the coast. Bezwada, at the head of the delta, is a place of growing importance, as the central junction of the east coast railway system, which crosses the inland portion of the district in three directions. Some sea-borne trade, chiefly coasting, is carried on at the open roadsteads of Masulipatam, on the northeastern side of the delta, and Nizampatam, on its western side.

KISTNA (KRISHNA), a river of southern India. It rises near Mahabaleshwar (Satara district, Bombay) in the Western Ghats, only about 40 mi. from the Arabian sea, and flows across almost the entire peninsula from west to east for a distance of 800 mi. before discharging into the Bay of Bengal. Its source is held sacred and is frequented by pilgrims. From Mahabaleshwar, Maharashtra state, the Kistna runs southeastward in a rapid course into Mysore state. Turning eastward. it later forms about 180 mi. of the boundary between Hyderabad and Andhra states. Flowing eastward across the states of Mysore and Andhra Pradesh it drains into the sea by two principal mouths in southern Kistna, carrying with it the waters of the Bhima from the north and the Tungabhadra from the southwest, Along this part of the coast runs an extensive strip of land formed by the detritus washed down by the Kistna and Godavari. The river is throughout too rocky and too rapid to allow navigation even by small native craft. For irrigation the Kistna is also inferior to its two sister streams, the Godavari and Cauvery. By far the most important of its irrigation works is the weir at Bezwada, where the river narrows between two hills of gneiss and then 'spreads over the alluvial plain. The channel there is 1,300 yd. wide. During the dry season the depth of water is barely 6 ft., but sometimes it rises by as much as 40 ft.

Of the two main canals connected with the weir, that on the left bank breaks into two branches, the one running 39 mi. to Ellore, the other 49 mi. to Masulipatam. The canal on the right bank proceeds nearly parallel to the river, and also sends off two principal branches, to Nizampatam and Comamur. The total length of the main channels is 349 mi. and the total area irrigated 716,500 ac. Another canal links the Tungabhadra with the Penner at Cuddapah.

KITASATO, SHIBASABURO (1856–1931), Japanese doctor of medicine, was born at Kumamoto and studied in Ger-

many under Koch from 1885 to 1891. In 1892 he became director of the Imperial Japanese Institute for Study of Infectious Diseases. He worked with Behring on the tetanus and diphtheria bacilli, and discovered (1894) the bubonic plague bacillus, and (1898) that of dysentery. In 1900 he discovered a second plague bacillus and prepared a new serum for that disease. At various times he investigated outbreaks of plague at Kobé, Osaka and in Manchuria and issued reports on his observations He also studied the mode of infection in tuberculosis and read a paper on this subject at the International Congress of Medicine at Budapest in 1909.

Kitasato was elected an Honorary Fellow of the Royal Society in 1908. In 1915 he resigned his directorship and founded a private institute where he was joined by his former colleagues. Kitasato was created a baron by the emperor of Japan in 1924 and in the following year obtained the Harben gold medal of the Royal Institute of Public Health.

KITCHEN: see HOUSE DESIGN.

KITCHEN CABINET, a kitchen fitting in the shape of an enclosed dresser, fitted with doors, drawers and special containers designed to economize space and to save labour by giving order and handiness to many materials and supplies. The kitchen is the workshop of the home, and any appliance which will make it more efficient is essential equipment.

Although American in origin, the early American kitchen cabinet was an adaptation of the German kitchen cupboard, but included a kitchen table. The first American kitchen cabinets were brought out about the beginning of the 20th century in the middle west.

Most kitchen cabinets are made of wood, either oak, ash, birch or chestnut, but some of the higher priced cabinets are made of steel.

Most kitchen cabinets have containers for flour, sugar, bread and cakes. The upper section is designed for food packets, groceries, crockery, etc. An extending porcelain top table is usually fitted, and in the lower sections are drawers for towels, cutlery, bread and cakes, and a cupboard for pots and pans.

Kitchen cabinets are sometimes designed to incorporate additional units or sections, further to centralize the equipment of the kitchen. These units are placed on either side of the cabinets and are designed to hold such appliances as cooking pans, china and ovenware.

KITCHEN EQUIPMENT: see HOME EQUIPMENT.

KITCHENER, HORATIO HERBERT KITCHENER, EARL (1850–1916), British field marshal and statesman, was the son of Lieut.-Colonel H. H. Kitchener and was born at Bally Longford, County Kerry, on June 24, 1850. He entered the Royal Military academy, Woolwich, in 1868, and was commissioned second lieutenant, royal engineers, in 1871. In 1870 his parents were living at Dinan, and Kitchener volunteered for service in the army of the Loire. He was soon invalided out, but the love of France which impelled him remained. As a subaltern he was employed in survey work in Cyprus and Palestine, and on promotion to captain in 1883 was attached to the Egyptian army, then in course of re-organization under British officers. In the following year he served on the staff of the British expeditionary force on the Nile, and was promoted successively major and lieutenant-colonel by brevet for his services. From 1886 to 1888 he was governor-general of the Eastern Sudan, with headquarters at Suakin.

In 1889 he commanded the cavalry in action against the dervishes at Gamaizieh and Toski. From 1889 to 1892 he served as adjutant-general of the army. He had become brevet-colonel in the British army in 1888, and he received the C.B. in 1889 after the action of Toski.

In 1892 Kitchener succeeded Francis Grenfell as sirdar of the Egyptian army, and three years later, when he had completed his predecessor's work of re-organizing the forces of the khedive, he began the formation of an expeditionary force on the vexed military frontier of Wadi Halfa. The advance into the Sudan was prepared by thorough administrative work on his part which gained universal admiration. The power of the Mahdists was utterly destroyed by the victory of Omdurman (Sept. 2. 1898), for which Kitchener was raised to the peerage as Baron Kitchener of Khartoum. received the G.C.B.. the thanks of parliament and a grant of £30.000. Before Kitchener left the Sudan he went with an escort up the White Nile to Fashoda. and explained to Colonel Marchand that the French flag could not be hoisted in the Khedive's dominions. After Omdurman was taken by the Anglo-Egyptian forces under General Kitchener, the seat of government was again transferred to Khartoum. It speedily arose from its ruins, being rebuilt on a much finer scale than the original city

In 1899 the railway from Wadi Halfa was completed to Khartoum and in 1906 through communication by rail was established with the Red sea.

Little more than a year afterwards, while still sirdar of the Egyptian army, he was promoted lieutenant-general and appointed chief-of-staff to Roberts in the South African War. (See SOUTH AFRICAN WAR.) In this capacity he served in the campaign of Paardeberg, the advance on Bloemfontein and the subsequent northward advance to Pretoria, and on Roberts's return to England in November 1900 succeeded him as commander-in-chief, receiving at the same time the local rank of general. In June 1902 the long and harassing war came to its close, and Kitchener was made a viscount, received a grant of £50,000 and the Order of Merit His method of wearing down the guerrilla resistance of the Boers was severely criticised then and afterwards. But when the Boers submitted Kitchener's influence was felt in the moderation of the peace terms.

Immediately after the peace he went to India as commander-in-chief in the East Indies, and in this position, which he held for seven years, he carried out not only many far-reaching administrative reforms but a complete re-organization and strategical redistribution of the British and native forces. In India he came into severe conflict with the viceroy, Lord Curzon, and he ultimately induced the secretary of state to give the commander-in-chief fuller powers over army expenditure. On leaving India in 1909 he was promoted field marshal, and succeeded the duke of Connaught as commander-in-chief and high commissioner in the Mediterranean. This post, not of great importance in itself, was regarded as a virtual command of the colonial as distinct from the home and the Indian forces, and on his appointment Kitchencr (after a visit to Japan) undertook a tour of inspection of the forces of the empire, and went to Australia and New Zealand in order to assist in drawing up local schemes of defence. In this mission he was highly successful, and earned golden opinions. But soon after his return to England in April 1910 he declined to take up his Mediterranean appointment, owing to his dislike of its inadequate scope, and he was succeeded in June by Ian Hamilton. In the late summer of 1911 he became British agent and consul-general in Egypt.

Egypt.--On the day he landed at Alexandria, Italy was presenting an ultimatum to Turkey. and there is no doubt that Kitchener's presence and his prestige were mainly responsible for the safe passage of Egypt through the critical period of the Tripoli and Balkan wars, and that no one but himself would have been able to prevent collisions betuecn the Greek and Italian colonists and the natives. His idea was to keep the country busy with the contemplation of its own affairs, and he initiated a policy of economic reform the effects of which were to be enduring. His programme comprised village savings banks, the five feddan law, the opening of cotton markets all over the country, cantonal courts, the promotion of the Department for Agriculture to a ministry, school buildings, sanitation and press supervision, and the heightening of the Aswan dam—all of absorbing interest to him, all receiving his assiduous care.

At the War Office.—Earl Kitchener (he had just received an earldom for his services in Egypt) came home on leave in June 1914, intending to return in September. But on July 31 all heads of missions were ordered to repair to their posts, and on Aug. 3 Kitchener was actually on board the Channel boat when a message arrived from the prime minister requiring him to stay in England. Three days later he took over the seals of the War

Office, and instantly laid his plans for an army of 70 divisions, coolly calculating that its maximum strength would be reached during the third year of the War, just when the enemy would be undergoing a sensible diminution of his resources in man-power. His scheme, of course, ran clean contrary to all accepted ideas: it had always been held that in time of war, though armies could be expanded, they could not be created, and to imagine otherwise seemed as surprising to England's friends as to her enemies. In the early days of 1916 Kitchener could tell the Cabinet that 67 divisions were afoot and three in the mould; he was met by a representation that England must choose between a diminution of her forces and a reduction of her monetary advances to her Allies. He declined the dilemma. He did not think that England could present either of these conclusions to her Allies without proof positive that expenditure could not be reduced nor national income increased, that her administration was free from extravagance, that her taxable capacity was fully exploited and that all parts of the Empire were pulling their weight. The conflict of opinion was sharp and short, with the upshot that the 70 infantry divisions were assured of their existence, and the way was prepared for the Kitchener armies to take their part in the battle of the Somme which he knew was planned for the coming summer. "I have no fear," he said, "about winning the War; I fear very much we may not make a good peace." If he did not live to take his place at Versailles, at least as regards the creation and placing in the field of the great force which was to hold high England's honour he could review a finished work, for his last division to go overseas took ship the very day on which he himself set out on the journey from which he was not to return.

Kitchener's vision or intuition served him to protest, though vainly, against the concentration of the original B.E.F. so far forward as Maubeuge; his rapid and accurate grasp of a situation caused him to hurry to France after the retreat from Mons to insist, in the name of the Government, on the British Army remaining in the Allied line; and enabled him in 1915 to pronounce that the evacuation of the Gallipoli peninsula could be effected with infinitely less loss than had been gloomily predicted. Apart from these occasions he did little to interfere with the actual conduct of operations in the field. He knew and sympathised with the commanders, gave full consideration to their views, and gave them his entire trust and his unswerving support.

His recruiting work was wonderful. His stirring appeals to the nation received immediate answer. The first call was for 100,000 and was followed by analogous appeals at short intervals. He has been criticized for not making greater use of the existing Territorial Army organizations in the early days—the numbers at the Front might conceivably have, within narrow limits, been increased more rapidly had he done so. He had resolved to transform Great Britain into a great military Power while the struggle was actually in progress and success eventually crowned his efforts.

If clothing and equipping the swarms of new armies presented obstacles at first, the skilfully tapped textile wealth of the country overcame them within a short space of time.

He had no easy task at the War Office, coming there as he did for the first time. There was no precedent for a great soldier occupying the position at a moment of great emergency. He was not familiar with the various ramifications of the existing military organizations. But, on the other hand his countrymen trusted him and were roused to enthusiasm by the magic of his name and his strength of character.

Of the great difficulties which beset the Secretary for War, perhaps the greatest and the most discussed alas that of providing guns and ammunition for a constantly and rapidly increasing army.

Before the end of the War, Kitchener's work was challenged in some quarters on this point; the answer furnished by the dossier of the master-general of ordnance presented a defence of the War Office, whence, as a matter of fact, came the first proposal of high explosive for use in France. To be precise, the Ministry of Munitions was set up during the first week of June 1915. It was not until the end of Oct. 1915 that a single component of ammunition worth speaking of was delivered from the Ministry of Munitions factories or orders, and not until April 1916 that the first complete round, made and filled under the orders and arrangements of the Ministry, was delivered to the army authorities. In other words, the army, for a period of more than 18 months, was furnished with continually increasing supplies under the former arrangements.

If Kitchener did not travel quite easily on political lines, his close personal touch with England's Allies was not the least of his contributions to the War, and his early and constant friendship with France gave him, so to speak, a flying start in gaining the best relationships with her public servants. Russia's rôle was to him a matter of vital importance if the War was to be brought even within his own three years' limit; but in the autumn of 1915 he said to Joffre at Chantilly, "You are calculating on Russia remaining till the end of the War; I am making my calculations on her being out within six months." He had not been afraid to commit himself to serious responsibilities as to arming and equipping the almost weaponless Russian hosts, but even so it is difficult to account for his great influence throughout Russia. He was thus able to criticise Russian methods with a freedom and to press his advice—more especially at the critical moment when Italy was hanging back—with an insistence that would have been tolerated at the hands of no other foreigner.

Proposed Visit to Russia.—Early in May 1916 the Tsar urged that Kitchener should visit Russia, promising that his counsel would be taken to the full even if that counsel included certain transfers of control into British hands. Kitchener was to start from Scapa Flow on June 5 for Archangel. He was asked to examine thoroughly the whole Russian situation: he was given a free hand to make arrangements and conditions which he thought advisable; he was to use all the influence which he had already acquired with the Tsar and the Russian military authorities to set the Russian military house in order, and he was asked to come back to England with all speed.

On the afternoon of the appointed day, Kitchener, having paid a visit to Lord Jellicoe on his flagship, embarked on the "Hampshire," which was directed to proceed on what, with the prevailing wind—as reported—would be the lee side of the Orkneys and Shetlands. The arrangements made for the voyage of the cruiser have been, and perhaps always will be, open to question. It is at least certain that an unswept channel was chosen for her passage and that, under stress of weather, the destroyers who formed her titular escort turned about, leaving the vessel, with her priceless freight, to steam to her doom. The "Hampshire" struck a mine, and went down with nearly all hands. The loss of Kitchener was felt to be a national calamity. The Queen-Mother at once placed herself at the head of a movement to secure a permanent and practical memorial, and in answer to her appeal there poured in from every point of the Empire—from men, women and children of all colours, classes and creeds—the astonishing sum of over £700,000.

On Dec. 10, 1925 a memorial chapter in St. Paul's Cathedral was dedicated to Earl Kitchener and all those who fell in 1914–8.

See Sir George Arthur, *Life of Lord Kitchener* (1920); also Churchill, *The River War* (1899), and the official records of the War in South Africa and the World War. An official narrative of the circumstances of his death, *The Loss of H.M.S. Hampshire* appeared in 1926.

KITCHENER, county seat of Waterloo county, Ontario, Can.. 33 mi. N.W. of Hamilton. The first settlement, about 1807, was known as Sand Hills, then Ebytown after Mennonite Bishop Benjamin Eby. In 1824 it was named Berlin and in 1916 was renamed after Field Marshal Lord Kitchener. It was incorporated as a village in 1854, a town in 1870 and a city in 1912. Most of the first settlers were Pennsylvania Germans and many later settlers came from Germany. There is a large Mennonite community in the surrounding country. Kitchener is situated in one of the more densely populated areas of Canada, being about 12 mi. from the cities of Galt and Guelph and a shorter distance from the large towns of Preston and Hespeler; the city of Waterloo is geographically contiguous to Kitchener, the two being known as twin cities. Kitchener-Waterloo is an important manufacturing centre, particu-

larly in furniture, meat packing, brewing and distilling, rubber goods and textiles. It is also a financial centre, with several insurance company offices. Pop. (1961) Kitchener 73,811, Waterloo 21,214. (G. FN.)

KITCHENETTE, a small space, usually an alcove or closet, with a compact equipment for simple cooking for those who live in small apartments. The specially designed miniature fittings may include an electric or gas stove, a cabinet for dishes and food, a sink with running water and a refrigerator.

The kitchenette is now an integral part of the most luxurious suites in residential hotels and service apartments.

KITE, the name given to several birds of prey, including the common European species (*Milvus ictinus*), recognizable by its forked tail. Formerly extremely common in Britain, where it acted as a scavenger even in London, the kite is now restricted to a few localities in Wales and elsewhere, where it maintains a precarious foothold. In Europe the kite is a summer visitor from Africa. About 25 to 27 in. long, the bird is pale reddish-brown, barred with black; the head is greyish-white.


INDIAN KITE

The kite's nest is built of sticks, rags, etc., in the crotch of a large tree and contains three or four white eggs, spotted with brown and lilac.

The smaller M, ater also inhabits Europe. *M. govinda* is the pariah kite of India, and other species of the genus occur in various parts of the old world. The wide-ranging American swallon-tailed kite (Elanoides *forficatus*) is notable for the length of its wings and tail and its power of flight; the South European black-uinged kite (E. caeruleus), a beautiful little bird, is its ally and others occur elsewhere. The Mississippi kite (*Ictinia mississippiensis*) belongs to an American genus. Other genera occur in South America.

KITES. Kiteflying is the art or sport of sending up into the air, by means of the wind, light frames of varying shapes covered with paper, plastic or cloth (named after the kite bird, a graceful hawk), which are attached to long cords held in the hand or wound on a reel or drum. One tradition holds that kites were invented by the Greek scientist Archytas of Tarentum four centuries before the Christian era, but they have been in use among Asiatic peoples from time immemorial. The sport has long been a national pastime of the Koreans, Chinese, Japanese and Malayans. Kites flying at night over a house were believed to keep evil spirits away. A religious significance is still connected to some ceremonial kiteflying in Asia.

Practical use has been made of kites through the ages: tradition states that a Korean general once suspended a lantern from a kite as an inspiring signal to his troops; another general of an early era supposedly drew a line across a stream by means of a kite, then used the line to draw a cable across and thus began a bridge, a device which has been used by modern engineers; and a Japanese bandit was said to have suspended himself from a large kite in an effort to steal some golden ornamental fishes from a castle tower. Several series of kites were used as signals at the battle of Hastings; lines to begin rescue work have been carried to stranded ships and to men marooned on ice floes; and cameras hung from kites have taken good aerial photographs.

In his famous experiment of 1752, Benjamin Franklin hung a metal key from a kite line and, by attracting electricity from the air during a storm, demonstrated the electrical nature of lightning. Kites were long used for weather observations, instruments being carried aloft to record otherwise unobtainable data. The record height reached by any kite was 23,835 ft. on May 5, 1910, at Mount Weather, Va., using a train of ten kites on piano wire from a ground winch. In the U.S., kites were no longer used for meteorological work after 1931, being superseded by balloons and airplanes.

Military experiments were carried out about the turn of the 20th century in an attempt to lift men into the air to increase the observation powers of armies. Capt. B. S. F. Baden-Powell in 1894 lifted a man 100 ft. with one 36-ft. kite, repeating the feat later with five 12-ft. kites in a train. Alexander Graham Bell, who invented the tetrahedral, or pyramidal, kite, tested on Dec. 6, 1907, a large 208-lb. tetrahedral kite of 3,393 cells, towing it behind a small steamer and lifting both the kite and a man lying in a recess at the kite's centre to a height of 168 ft.

The military forces of most large nations ended their kite experiments with the advent of the airplane. However, it was reported that during World War II some Nazi submarines were equipped with dismountable three-bladed kites, similar to helicopters and designed to be towed by the U-boat on the surface, providing enough lift to hoist an observer aloft and extend the field of vision. Machine gunners in the United States were given antiaircraft training by sending aloft maneuverable kites with the silhouette of an airplane placed as a target on the near surface, hits being noted when the kites were shot down or lowered to the earth.

Types of kites most commonly used are the 3-sticker (hexagonal), Malay (modified diamond) and the box kite. Those with only one flat surface must have tails hanging from the trailing edge to maintain balance. The shape can be designed so that the kite will be self-correcting by incorporating a dihedral (two-sided) angle in the surface or by bowing the main cross stick to a depth of 10% of its length. If not completely self-correcting, the kite will certainly require less tail for stabilization.

In the 3-sticker all sticks are of the same length, crossed and tied in the middle, spread symmetrically, with string run around the border and the whole covered with light material. This makes a flat surface and requires a tail hung from the centre of a short loop attached to the two trailing points. A bridle is composed of three cords connecting the hand line to various points on the kite to hold it into the wind, each of a length equal to half the width of the kite. They lead from the centre and the two highest points to a central knot or ring to which is tied the line to the flier's hand.

The Malay, a tailless a-sticker, has its sticks of equal length crossed and tied with the centre of one at a spot one-seventh the distance from the top of the other. The bridle has two legs, one from the top of the diamond, and the other from the lowest point, meeting a little below the crossing of the sticks. A string pulled tight across the back of the cross stick will bow the surface to give the effect of the dihedral angle, making the kite self-balancing.

The box kite, an invention of the Australian Lawrence Hargrave in the 1890s, is named for its rectangular shape, the frame being twice as long as the width, ends left uncovered and one-third of the length covered around each end. The bridle consists of two lines, one to each end of one of the vertical sticks, meeting a little above the lower edge of the top panel. The kite flies on one edge and needs no tail. The shape can be other than square in cross section; it may be oblong and fly on a wide side with a four-leg bridle; or triangular, round (barrel kite), or even five or six-sided.

Kites in the shapes of birds, men, ships, butterflies, etc., have a novelty appeal. The Chinese favourite fancy kite is the dragon, a ferocious-looking head kite with many smaller flat body kites strung behind on parallel tie lines.

Construction and Flying. — With a little ingenuity most models can be made dismountable for convenience in carrying and storing. Tied joints hold better with many turns of light cord than with a few turns of large. Shellac, glue or varnish is applied to fix the ties. Tails are effective because of resistance to air, not because of weight; therefore, many light cross pieces of material inserted into knots in a line will do well for a tail. Hand reels are easy to design and make, and save much time in rewinding the line. Decoration may take infinite forms.

Kites are best flown in open spaces with few trees or houses, where the wind can blow steadily and close to the ground. Best wind velocity is 8 to zo mi. per hour: less makes it difficult to lift the kites and more makes them hard to handle or may even break

them. Contact of the hand line with high-tension electric lines or wires must be avoided because of the great danger of electrocution through a damp cord. Kiteflying tournaments are annual events in many communities.

See H. W. Fowler, Jr., *Kites* (1953). (H. W. F., JR.)

KIT FOX, a small fox (*Vulpes velox* or *V. macrotis*) native to western North America; it measures less than a yard in length, including the tail. There is a good deal of variation in the colour of the fur, the prevailing tint being gray.

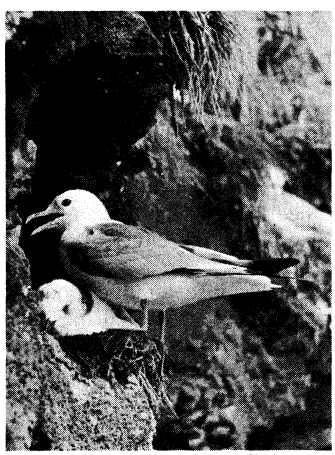
See Fox.

KITTEL, RUDOLF (1853–1929), German Old Testament scholar whose edition of the Hebrew Bible superseded all earlier ones, was born on March 28, 1853, in Eningen. He was a professor in Breslau (1888–98) and then in Leipzig (1898–1924), where lie died on Oct. 20, 1929.

Kittel was one of the first scholars to use archaeological evidence and inscriptions in his study of the political, cultural and religious history of Palestine and Israel from the Stone Age to the Persian period. In *Geschichte des Volkes Israel,* 3 vol. (1909–29), which appeared in several editions, and in *Die Religion des Volkes Israel* (1921; Eng. trans. 1925) he showed that monotheism had its roots in the period of Moses, long before the 8th-century prophets. Kittel's edition of the Old Testament (2 vol., 1905–06) noted all important variants of the Samaritan Pentateuch and the ancient versions, together with modern conjectures. In the 3rd edition, published in the year of his death, for the text of Jacob ben Chayyim printed by D. Bomberg in 1524–25, which subsequent editions had hitherto used as their basis, he substituted the Leningrad manuscript dated A.D. 1008 which his collaborator Paul Kahle had discovered to be the text of Aaron Moses ben Asher, the outstanding Masoretic authority of the Palestinian school *(see* BIBLE).

Kittel's son GERHARD (1888–1948), a New Testament scholar, edited the *Theologische Worterbuch zum Neuen Testament* (1933 *et seq.*).

See R. Kittel's autobiographical sketch in E Stange (ed), *Die Religiontwzssenschaft der Gegenwart in Selbstdarstellungen,* vol. i, pp. 113–144 (1925), and in *Die Universität Leipzig im Jahr der Revolution, 1918–19 (1930)* (Jo. H.)



KARL W. KENYON FROM NATIONAL AUDUBON SOCIETY

RED-LEGGED KITTIWAKE (RISSA BREVIROSTRIS) AND YOUNG AT NEST

KITTIWAKE, the name on both sides of the Atlantic for the sea gull *Rissa tridactyla,* in which the hind toe is reduced to a knob. It inhabits the North Atlantic. Kittiwakes are white, with pearl-gray mantle and black-tipped wings; the feet are yellowish and the bill black in R. *tridactyla;* the bill and feet are red in *R. brevirostris,* which is found in the Bering sea. *(See* GULL.) A subspecies R. *t., pollicaris* inhabits the North Pacific south to Lower California.

KITWE, a town of Northern Rhodesia, Federation of Rhodesia and Nyasaland, and the hub of the copper belt, lies 42 mi. N.W. of Ndola. Pop. (1956) 14.370 (Europeans and employed Africans). Bush country until 1936, Kitwe owes its rapid development to copper mining, though secondary industries have been established. It is planned on modern lines, with pleasant surroundings. an abundance of water and a power supply linked to the Kariba hydroelectric plant.

From Jan. 1, 1961, most of Nkana Mine township was integrated with Kitwe, which is now the main industrial and commercial centre of the region.

The town is connected by rail and tarred roads to all major centres of the federation and the Republic of South Africa. There is an airfield at Nkana-Kitwe but the nearest national airport is at Ndola.

KIVU, an eastern province of the Republic of the Congo, extends south from the equator between the Lomami river and the declivities of Lakes Edward, Kivu and Tanganyika in the Great Rift valley on the eastern frontier. Pop. (1958 est.) 2,276,276, of whom 13,756 were Europeans. Area 100,030 sq.mi. Geologically composed chiefly of metamorphic and crystalline rocks, the province rises in plateaus which have an elevation of about 1,500 ft. in the west but form high mountains near the great lakes. The Ruwenzori range reaches 16,763 ft. and the Virunga volcanoes reach 14,763 ft. in Mt. Karissimbi. These mountains have a peculiar vegetation including giant species of lobelia and groundsel, but much of the province is clothed by equatorial forest. The climate, tempered by altitude, attracted more European farming settlers to Kivu than to any other Congolese province. Adjoining Lake Edward, the Albert national park (3,124 sq.mi.) contains mountain gorilla and buffalo, elephant, black rhinoceros and giraffe.

Kivu is peopled chiefly by Bantu tribes: Bakusu and Warega in Maniema (the western district); Bahema, Bashi and Bahavu in South Kivu district; and Bahunde and Wanianga in the north. Groups of pygmies dwell in the forests and some pastoral tribes originating in Ruanda-Urundi and Uganda occupy heights north and south of Lake Kivu. Eastern Kivu is the most densely populated part of the republic, with concentrations around Beni, Lubero, Lake Kivu, Masisi and Uvira. Provincial headquarters are at Bukavu (formerly Costermansville) at the south end of Lake Kivu, with an estimated population of 33,268 (4,308 Europeans) in 1958. Administratively the province is divided into the districts of North Kivu (headquarters Goma, pop. 11,221), South Kivu (Bukavu) and Maniema (Kindu-Port-Empain, pop. 20.754). Kindu-Port-Empain on the Lualaba river lies at the head of the railway from Albertville (149 mi. S.S.E.) on Lake Tanganyika.

The economy of the province is mainly agricultural. African subsistence farmers also grow cotton (about 25,000 tons annually) and coffee. European plantations in the late 1950s yielded *Arabica* coffee (about 7,000 tons annually), pyrethrum (about 1,000 tons), cinchona, tea, perfume plants, fruit and vegetables. Cassiterite (tin ore) is mined in Maniema and South Kivu (about 10,000 tons annually), as well as gold (about 3,000 kg.) and beryl.

The rail link southward extends through Kamina in Katanga province to the Rhodesian and South African systems. On Lake Tanganyika, Uvira (79 mi. S. of Bukavu) is connected by steamer services with Albertville and with Kigoma, Tanganyika. There are air services to Bukavu and Kindu-Port-Empain. (HE. NI.)

KIVU, a large lake of central Africa, lying in the western rift valley and midway between Lakes Edward and Tanganyika; it discharges into the latter by the Russisi river. It is 55 mi. long and 30 mi. wide at its widest point. It is about 4.790 ft. above sea level and is roughly triangular in outline, the longest side lying to the west.

The coast line is much broken, especially on the southeast, where the indentations have a fiordlike character. The rift valley has dropped down Archaean gneisses and schists but both north and south of the lake are volcanic centres (the lavas are phonolites. etc.), some of which are still active. The lake is deep, and the shores are everywhere high, rising in places in bold precipitous cliffs of volcanic rock.

A large island. Kwijwi, runs in the direction of the major axis of the lake, southwest of the centre. and there are many smaller islands.

The lake has large numbers of fish, but no crocodiles or hippopotamuses. South of Lake Kivu the rift valley is blocked by huge ridges. through which the Russisi now breaks its way to descend 2.000 ft. to the lacustrine plain at the head of Lake Tanganyika.

The lake fauna is fresh water. presenting no affinities with the so-called marine fauna of Tanganyika, but is similar to that shown to have existed in the more northern parts of the rift valley. The former outlet or extension in this direction seems to have been blocked in recent geological times by the elevation of the volcanic peaks.

This volcanic region is of great interest and has various names? that most used being Mfumbiro.

Kivu and Mfumbiro were first heard of by J. H. Speke

in 1861, and first visited by a European, Count von Gotzen, in 1894.

The lake now lies entirely in the Republic of The Congo.

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KIWANIS, an international organization of business and professional men interested in "promoting the adoption and application of higher social, business, and professional standards," and in the development of "intelligent, aggressive and serviceable citizenship." Practically every city, town and village in the United States has a Kiwanis club; the activities of these clubs are recorded in the Kiwanis magazine.

KIWI, the name of the New Zealand flightless birds of the genus *Apteryx*, forming the order Apterygiformes among the ostrich-like birds. The wings are almost entirely aborted; the nostrils are at the tip of the maxilla; the feathers have no aftershaft; and a back toe is present. They are brown birds, about the size of a domestic fowl, with a long beak, and feed largely on earthworms. Their eyesight is said to be poor, their senses of hearing and smell acute. They are nocturnal in habit and can run swiftly. When brought to bay, they use the sharp claws on the feet as weapons. They are now rare. The egg is, relative to the size of the bird, the largest laid by any living species; it measures more than 5 by 3 in., and weighs about 1 lb. The commoner *A. australis* has three races, on North, South and Stewart Islands; the grayer *A. owenii* and slightly larger *A. haastii* are two other species found on South Island.



THE KIWI, THE NOCTURNAL FLIGHTLESS BIRD OF NEW ZEALAND

KIZILBASHES, a nickname meaning "redheads" given by the orthodox Turks to the seven Turkoman tribes who supported the founders of the Safavid dynasty in Persia, in allusion to their red caps. It was applied later to the followers of a Shi'ite sect in eastern Asia Minor The *name* was given *in Afghanistan* to *the* Persian-speaking Turkomans, settled in Kabul and other cities from c. 1737 and engaged in government service and trade.

KIZIL IRMAK, *i.e.*, "Red River" (anc. *Halys*), the longest river in Asia Minor, rising in the Kizil Dagh at an altitude of 6,500 ft., and running southwest past Zara to Sivas and on to Kaisarie. In this section of its course it follows roughly the old east to west drainage of the Anatolian plateau. From the neighbourhood of the Tuz Geul it turns north-north-eastward to the Black sea. This section of its course represents the newer drainage scheme of the plateau occasioned by the gradual subsidence of the southern section of the Black sea. In the neighbourhood of Osmanjik and Vezir Keupri further sections of older lines of weakness are visible in its course. The Kizil Irmak discharges into the Black sea between Sinope and Samsun, where it forms a large delta. The only important tributaries are the Delije Irmak, showing a similar structural pattern in its course flowing in on the right, and the Geuk Irmak on the left bank. The total length of the Kizil Irmak is 715 miles.

KIZIL-KUM, a desert in Asiatic Russia, in the Kazakh S.S.R., stretching southeast of the Aral sea between the river Syr-darya on the northeast and the river Amu-darya on the southwest. It measures some 370 by 220 mi., and is in part covered with drift-sand or dunes, many of which are advancing slowly but steadily toward the southwest. In character they resemble those of the neighbouring desert of Kara-kum (*q.v.*). On the whole the Kizil-kum slopes southwest toward the Aral sea, where its altitude is only about 160 ft. as compared with 2,000 in the southeast. In the vicinity of that lake the surface is covered with Aralo-Caspian deposits; but in the southeast, as it ascends toward the foothills of the Tien-shan system, it is braided with deep accumulations of fertile loess.

KIZLYAR (Kisliar or Kizlar) is a town in the Dagestan A.S.S.R., in the low-lying delta of the Terek river, left of the main stream, between two of the larger secondary branches. The bed of the river is above the level of the town and floods are frequent. The town is 35 mi. inland from the Caspian, in lat. 43° 51' N. long. 46° 40' E. The population is mainly supported by gardens and vineyards irrigated by canals from the river. Kizlyar wine is famous and finds a ready market at Gorki fair. A government vineyard and school of viticulture are situated 3½ mi. from the town. The town proper, which spreads out round the citadel, has Tatar, Georgian and Armenian quarters. The public buildings include the Greek Cathedral, dating from 1786; a Greek nunnery, founded by the Georgian chief Daniel in 1736; the Armenian church of SS. Peter and Paul, remarkable for its size and wealth. Kizlyar is mentioned as early as 1616, but the most notable accession of inhabitants (Armenians, Georgians and Persians) took place in 1715. Its importance as a fortress dates from 1736, but the fortress is no longer kept in repair. The district between the Terek and the Kuma is knonn as the Kizlyar steppe; in the north it provides grazing specially suitable for sheep, while in the south, where there is a good irrigation system, maize, wheat, fruits and vine are grown. It was planned to settle 10,000 hill people from the poverty-stricken regions of southern Dagestan in the Kizlyar steppe.

KJERULF, THEODOR (1825–1888), Norwegian geologist, was born at Oslo on March 30, 1825, and died there on Oct. 25, 1888. He worked under Bunsen at Heidelberg, and in 1858 became professor of geology at Oslo.

The results of his study of Norwegian geology, especially in southern Norway, are embodied in his *Udsigt over det sydlige Norges Geologi* (1879).

KLABUND, pseudonym of ALFRED HENSCHKE (1891–1928), German poet, who was born at Krossen (Oder) on Nov. 4, 1891, and died on Aug. 14, 1928, at Davos, of tuberculosis. In his short life he made a great name in contemporary German literature. His works include volumes of verse, *Morgenrot* (1913), *Klabunds Karussel* (1914), *Die Himmelsleiter* (1916), and others, from which a selection, *Gedichte*, appeared in 1926. Klabund also wrote novels, mainly on historical subjects, ranging from *Mohammed* (1917) to *Pjotr* (Peter the Great, 1923). Among his plays may be mentioned especially the *Kirschblütenfest*, the Japanese play produced originally at Hamburg with an exquisite setting, and the Chinese play *Kreidekreis*, produced at Meissen in 1924. Among his latest dramas was *Cromwell* (1926).

KLACZKO, JULIAN (1825–1906), was born at Wilno in 1825. He studied at Heidelberg university, and early proved his literary and linguistic ability by articles written in German, mainly on the Russo-Polish question, and by his brochure *Die Deutschen Hegemonen* (1849). In 1849 he went to Paris, where he made his fame by his brilliant contributions on literature, politics and art to the Polish and French press, notably to the *Revue des Deux Mondes* in which most of his subsequently published books first appeared. His article "La Poésie Polonaise au Dix-Neuvième Siècle et le Poète Anonyme" (*Revue des Deux Mondes*, Jan. 1, 1862) remains one of the finest existing criticisms on the poet Krasinski. From that date Klaczko wrote almost exclusively in French. At the same time he took an active part in the national and literary life of the Polish exiles in Paris, frequently employing his pen in behalf of the Polish cause, especially during the Rising of 1863. His national sympathies led him to a close study of contemporary politics, the chief fruits of which were: *Etudes de Diplomatie Contemporaine* (Paris, 1866), an exposure of Bismarck's policy which created a considerable impression at the time, and *Deux Chanceliers* (1876). From 1869 to 1870 he was attached to the Austrian foreign ministry. After the Austro-Prussian and Franco-Prussian wars, Klaczko, despairing of support for Poland from either France or Austria, abandoned his political studies, and devoted himself to Italian literature and art. He wrote two very popular books on these subjects: *Causeries Florentines* (1880), crowned by the Académie Française, and

Rome et la Renaissance (1898). He died in Cracow in 1906. His works are characterized by their piercing insight and mordant wit, and by the fascination of his style.

KLADNO, mining town of Czechoslovakia, 18 mi. W.N.W. of Prague. Its growth was due to the coal deposits of the Kladno-Rakovnik field. Prior to 1842 it was a village of no importance. It has now large iron and steel foundries. Pop. (1957 est.) 49,777. Kladno was occupied by Germany in March 1939.

KLAFSKY, KATHARINA (1855–1896), Hungarian dramatic soprano known for her interpretations of Wagnerian roles. Born at St. János, near Moson, Sept. 19, 1855, she was a chorus singer in Vienna in 1874 and later studied with Mathilde Marchesi. She sang the part of Brangane in the first Leipzig performance of *Tristan* (1882), and from 1886 to 1895 established herself at Hamburg as one of the greatest singers in Germany. Besides her Wagnerian roles she was known for her renderings of Donna Anna, Fidelio and Norma. She died at Hamburg. Sept. 22, 1896. Her nephew, Anton Maria Klafsky (b. 1877) wrote religious and orchestral works and edited the masses of Michael Haydn.

See L. Ordemann, ***Aus dem Leben und Wirken von Katherina Klafsky*** (1903).

KLAGENFURT, the capital of the *Bundesland* of Carinthia (Karnten), Austria. lies in a basin near the eastern end of the Worthersee and north of the Karawanken range. Pop. (1961) 71,447. The centre of the attractive and tree-shaded town is New square, with the dragon monument (1590) and the town hall In spite of destruction by fires from the 16th to the 18th centuries some old buildings have been preserved in Herrengasse and around Old square (the old town centre), notably the 16th century *Landhaus,* where the Carinthian diet still sits, with its arcaded courtyard and armorial hall. The principal churches are the Dome and the parish church (baroque interior). The Carinthia local government building stands in a park with the museum, containing antiquities and natural history and art collections. There are numerous modern primary. secondary and technical schools, public gardens and an extensive natural park, the Kreuzbergl. The proximity of the Wörthersee, with municipal swimming baths and passenger boats has made Klagenfurt a tourist centre. The town has good communications: trunk roads, mainline railway and an airport. Industries are various and include iron and woodworking plants and the manufacture of white lead, matches, leather, shoes, alcohol and confectionery. (EH. RR.)

KLAJ (Latinized CLAJUS), **JOHANN** (1616–1656), German poet, was born at Meissen, Saxony, studied at Wittenberg, and went to Niirnberg as a "candidate for holy orders" There, in conjunction with Georg Philipp Harsdorffer, he founded in 1644 the literary society known as the Pegnitz order. In 1647 he received an appointment as master in the Sebaldus school in Nürnberg, and in 1650 became preacher at Kitzingen, where he died in 1656 Klaj's poems consist of mystery plays among which are *Hollenund Himmelfahrt Christi* (Niirnberg, 1644) and *Herodes, der Kindermorder* (Niirnberg, 1645); and a poem, written jointly with Harsdorffer, *Pegnesische Schafergedicht* (1644), which gives in allegorical form the story of his settlement in Kiirnberg.

See J Tittmann, ***Die Nurnberger Dichterschule*** (1847).

KLAMATH MOUNTAINS, a compact rugged region, lying between the ocean and the Cascade mountains in southaestern Oregon and northwestern California. Underlain by a variety of rock types. sandstone, shale, marble, lava and granite. the region has been deeply dissected by the Rogue and Klamath rivers and by many smaller streams. The highest peaks and ridges reach 9,000 ft.; a number of alluvial valley floors are cultivated. Rainfall varies from 20 to 100 in. Most of the land is forested with Douglas fir, pine, redwood and cedar, the basis of an extensive lumber industry, and also hardwoods, oak and madrofio. Brush is common on cutover slopes. (S. N. D.)

KLAMATH RIVER, rising in Lake Ewauna near Klamath Falls, Ore., U S., flows southwesterly 250 mi. to the Pacific ocean at Requa, Calif. Estimated mean seasonal natural flow is 12,473,000 ac.-ft, from a watershed of 15,900 sq.mi. The river is important for irrigation and hydroelectric generation.

The upstream basin section, above Keno, is characterized by broad valleys, great swamps, dry deserts and extensive irrigation developments. With its national wildlife refuges it is one of the most important wildlife nurseries in the nation. Upper Klamath Lake, terminus of Williamson river, feeds Lake Ewauna through one-mile long Link river. Lower Klamath Lake, dried up when its Klamath river connection was closed in 1917, has been developed as a wildlife refuge and for agricultural uses.

The downstream section, characterized by well-forested, mountainous terrain, contains the principal tributary streams: the Shasta, Scott, Salmon and Trinity rivers. (G. V. SK.)

KLAPKA, GEORG (1820–1892), Hungarian soldier, was born at Temişoara (Temesvár) on April 7, 1820, and entered the Austrian army in 1838. Immediately on the formation of the National Hungarian army in 1848, he offered his services, and was at first employed on staff duties; then early in 1849, given command of a corps, he took a conspicuous share in the victories of Kapólna, Isaszeg, Waitzen, Nagy Sarlo and Komárom. Later, after a short period as minister of war, Klapka took command at Komárom, from which fortress he conducted many successful expeditions until the capitulation of Világos in August put an end to the war in the open field. He then brilliantly defended Komárom for two months, and finally surrendered on honourable terms. Klapka left the country at once, and lived thenceforward for many years in exile, at first in England and afterward chiefly in Switzerland. He continued to work for Hungarian independence, especially at moments of European war, such as 1854, 1859 and 1866, when an appeal to arms seemed possible. After the war of 1866 (in which as a Prussian major general he organized a Hungarian corps in Silesia) Klapka was permitted to return to Hungary, and in 1867 mas elected to the Hungarian chamber of deputies, as a supporter of Deák. In 1877 he attempted to reorganize the Turkish army in view of the war with Russia. He died at Budapest, May 17, 1892.

He wrote *Memoiren* (1850); ***Der Nationalkrieg in Ungarn,*** etc. (1851); a history of the Crimean War, ***Der Krieg im Orient . . . bis Ende Juli 1855*** (1855); and ***Aus meinen Erinnerungen*** (translated from the Hungarian, 1887).

KLAPROTH, HEINRICH JULIUS (1783–1835), German orientalist and traveler, whose work formed a new departure for the classification of the eastern languages. especially those of the Russian empire, was born in Berlin on Oct. 11, 1783, the son of the chemist Martin Heinrich Klaproth (*q.v.*). He received an appointment in the St. Petersburg academy, and in 1805 accompanied Count Golovkin on an embassy to China. On his return he was dispatched by the academy to the Caucasus on an ethnographical and linguistic exploration (1807–08), and was afterward employed for several years in connection with the academy's oriental publications. In 1812 he moved to Berlin; but in 1815 he settled in Paris, and in 1816 Humboldt procured for him from the king of Prussia the title and salary of professor of Asiatic languages and literature, with permission to remain in Paris as long as nas requisite for the publication of his works. He died in that city on Aug. 28, 1835. Klaproth's great work *Asia polyglotta* (Paris, 1823 and 1831, with *Sprachatlas),* though later superseded, was a résumé of all that was known on the subject.

KLAPROTH, MARTIN HEINRICH (1743–1817), German chemist who discovered the elements uranium. zirconium and cerium, was born at Wernigerode on Dec. 1, 1743. During a large portion of his life he folloned the profession of an apothecary, and from 1782 he was pharmaceutical assessor of the Ober-Collegium Medicum in Berlin. In 1792 he was appointed lecturer in chemistry to the Artillerieschule, and when the Cniversity of Berlin was founded (in 1810) he was selected to be the professor of chemistry. He died in Berlin on Jan. 1, 1817. Klaproth was the leading chemist of his time in Germany. He was an exact and conscientious norker and did much to improve and systematize the processes of analytical chemistry and mineralogy; his appreciation of the value of quantitative methods led him to become one of the earliest adherents of Lavoisier's antiphlogistic doctrines outside France. He was the first to discover uranium (1789), zirconium (1789) and cerium (1803) and to characterize them as distinct elements though he did not obtain any of them

in the pure metallic state. He rediscovered titanium (*q.v.*) about five years after William Gregor's prior discovery of it (1791) and was responsible for its name. He elucidated the composition of numerous substances, including compounds of tellurium, strontium, beryllium and chromium. His papers, over 200 in number, were collected by himself in *Beitriige zur chemischen Kenntnis der Mineralkörper* (1793–1810) and *Chemische Abhandlungen gemischten Inhalts* (1815). He also published a chemical dictionary (5 vol., with F. Wolfe, 1807–10; supplement, 4 vol., 1815–19) and edited a revised edition of F. A. C. Gren's *Handbuch der Chemie* (1806).

See G. Bugge, ***Buch der grossen** Chemiker* (1955).

KLEBER, JEAN BAPTISTE (1753–1800), French general. the son of a builder, was born on March 9, 1753, at Strasbourg. He was trained as an architect, but obtained a nomination to the military school of Munich. Thence he obtained a commission in the Austrian army, but resigned it in 1783. Returning to France he was appointed inspector of public buildings at Belfort, where he studied military science. In 1792 he enlisted in the Haut-Rhin volunteers, and soon became lieutenant-colonel. At the defence of Mainz he so distinguished himself that though imprisoned with the rest of the garrison, he was promptly reinstated, and in Aug. 1793 promoted general of brigade. He was made general of division for his services in La Vendée, where his intimacy with Marceau began, but was later recalled for advocating lenient measures towards the Vendéans. In 1794 he was reinstated and sent to the army of the Sambre-et-Meuse, distinguishing himself particularly at Fleurus and in the siege of Mainz (1794–95). In the offensive campaign of 1796 he was Jourdan's most active and successful lieutenant. After the retreat to the Rhine *(see* FRENCH REVOLUTIONARY WARS) Kléber declined the chief command and retired early in 1798. He accepted a division in the expedition to Egypt under Bonaparte, but, owing to a head wound which he received at Alexandria, was afterwards appointed governor of Alexandria, as he was unable to take any further part in the campaign.

In the Syrian campaign of 1799 he won the great victory of Mount Tabor on April 15, 1799. When Napoleon returned to France towards the end of 1799 he left Kléber in command of the French forces, when he was forced to make the convention of El-Arish. But when Lord Keith, the British admiral, refused to ratify the terms, he defeated the Turks at Heliopolis, with but 10,000 men against 60,000, on March 20, 1800. He then retook Cairo, which had revolted from the French. He was assassinated at Cairo by a fanatic on June 14, 1800. Kléber was undoubtedly one of the greatest generals of the French revolutionary epoch, though he distrusted his powers and declined the responsibility of supreme command. His conduct of affairs in Egypt at a time when the treasury was empty and the troops were discontented for want of pay, shows that his powers as an administrator were little —if at all— inferior to those he possessed as a general.

Ernouf, the grandson of Jourdan's chief of staff, published in 186: a valuable biography of Kleber. *See* also Reynaud, *Life* of *Merlin de Thionville;* Ney, *Memoirs;* Dumas, *Souvenirs;* Las Casas, *Memorial de Ste Hélène;* J. Charavaray, *Les Généraux morts pour la patrie;* General Pajol, *Kldber;* lives of Marceau and Desaix; M. F. Rousseau, *Kléber et Menou en Egypte* (1900).

KLEBS, EDWIN (1834–1913), German physician and one of the pioneers of bacteriology, was born at Konigsberg on Feb. 6, 1834. He became assistant to Rudolf Virchow at the Pathological institute, Berlin (1861–66), and subsequently professor of pathological anatomy at Berne (1866), Würzburg (1871), Prague (1873), Zurich (1882) and Chicago (Rush Medical college, 1896).

F. H. Garrison *(History of Medicine)* calls him "with Pasteur perhaps the most important precursor in the bacterial theory of infection." Klebs discovered with Friedrich Loffler (*q.v.*) the diphtheria bacillus. He preceded Robert Koch in studying the bacteriology of traumatic infections, basing his researches on cases which occurred in the Franco-Prussian War. In 1876 he succeeded in producing endocarditis by mechanical means combined with general infection. In 1878 he successfully transmitted syphilis to monkeys. in this work antedating the experiments of Ilya Mechnikov and P. P. E. Roux by 25 years. He performed a series of researches on tuberculosis and was able to produce bovine infection by means of milk. He also studied malaria, hemorrhagic pancreatitis and gigantism. Klebs died at Berne, Switz., on Oct. 23, 1913. Apart from monographs and articles. his most important works are a handbook of pathological anatomy (1869–76) and a treatise on general pathology (1887–89). (S Jo.)

KLEE, PAUL (1879–1940), Swiss modernist painter, one of the most inventive and influential artists of the 20th century, was born on Dec. 18, 1879, in Miinchenbuchsee, near Berne, his father being German and his mother Swiss. He studied at the Munich academy. After some works in the field of printing and design (including illustrations for Voltaire's *Candide* in 1911), he turned in 1914, on a visit to Tunisia, to colour—first to uatercolour and after 1918 also to oil painting. He attempted in his pictures to bring the roots of things and their place in the cosmic scheme into an ultimate unity; at the same time he invented his own pictorial means for representing them. In the course of his creations, Klee developed about 30 "schemes," in which he communicated his projects. Classical themes arise from figurations of crossed parallels, flying bodies from tensed surfaces, and light from coloured "dotted seeds." Association leads to a poetic-musical presentation. Klee was also an accomplished musician, and much of his system of form is built up like musical form. From 1911 he belonged to the *Blaue Reiter* group in Munich. From 1921 to 1931 he taught at the Bauhaus in Weimar and Dessau and from 1931 to 1933 at the Dusseldorf academy. Then he returned to Berne, dying at Muralto, near Locarno, on June 29, 1940.

Klee's work is widely represented in galleries of modern art throughout the world. His publications include: *Padagogisches Skizzenbuch* (1925; trans. as *Pedagogical Sketchbook,* 1953); *Das bildnerische Denken* ("Creative Thought," 1956); and *Tagebücher* ("Diaries," 1957). Including unknown works discovered by Felix Klee, the catalogue of Klee's works—paintings, gouaches, drawings, graphics and sculptures—is 9,146 (of which 4,966 are drawings).

See Handzeichnungen von Paul Klee, ed. by W. Grohmann, vol. 1 (1959); W. Haftmann, *The Mind and Work* of *Paul Klee* (1950); W Grohmann, *Paul Klee* (1954) (W. GN.)

KLEIN, (CHRISTIAN) FELIX (1849–192j), German mathematician who was one of the most powerful influences on mathematics during his own lifetime and whose panoramic view of geometry, known as the "Erlangen program," profoundly influenced mathematical development. He was born at Diisseldorf, on Nov. 2j, 1849. After studies at Bonn, Gottingen and Berlin, he became professor of mathematics at the University of Erlangen (1872–75), where his inaugural lecture set forth the views contained in the program. He then taught at Munich, and was professor at the universities of Leipzig (1880–86) and Gottingen (1886–1913). Klein was editor of the *Mathematische Annalen* of Gottingen from 1872. and in 1895 founded the great mathematical *Encyklopädie,* which he continued to supervise. He wrote much and traveled a good deal, lecturing as far afield as the United States. He died at Gottingen on June 22, 1925.

Klein's works on elementary mathematics reached a wide public. Of his more technical writings, *Lectures on the Icosahedron* (2nd ed.. rev. 1914, Eng. trans. by G. G. Morrice) are still stimulating reading, and *Vorlesungen über die Theorie der automorphen Functionen* (with R. Fricke, vol. i, 1897, vol. ii, 1902) is perhaps the most important. (L. R.)

KLEIST, BERND HEINRICH WILHELM VON (1777–1811), German poet, dramatist and novelist, was born at Frankfort-on-Oder on Oct. 18, 1777. After a scanty education, he entered the Prussian army in 1792, served in the Rhine campaign of 1796, and retired from the service in 1799 with the rank of lieutenant. He next studied law and philosophy in his native city, and in 1800 entered the Ministry of Finance at Berlin. Next year his roving, restless spirit got the better of him, and taking leave of absence he visited Paris and other places with his sister, and then settled in Switzerland, on Lake Thun, with the intention of developing his talent in quiet communion with nature. The decision cost him the love of Wilhelmina von Zenge, to whom he had been betrothed. In Switzerland he found friends in Heinrich Zschokke and August Wieland (1777–1819), son of the poet;

and to them he read the draft of his first drama, a gloomy tragedy of the ***Sturm und Drang*** type, in which his genius was already apparent, ***Die Familie Schroffenstein*** (1803), originally entitled ***Die Familie Ghonorez.***

In the autumn of 1802 Kleist returned to Germany; he visited Goethe, Schiller and Wieland in Weimar. At Weimar he began to work on his play ***Robert Guiscard,*** but was so discouraged that he began to doubt his own powers. He then wandered to Leipzig, Dresden and Paris. In Paris in an attack of nerves bordering on madness he burnt the MS. of his play, of which only the first act was saved. On returning to Berlin in 1804 he was transferred to the *Domänenkammer* (department for the administration of crown lands) at Königsberg. There he found Wilhelmina von Zenge married to Professor Krug. At Königsberg he wrote the comedy ***Der zerbrochene Krug,*** a classic in German comedy. On a journey to Dresden in 1807 Kleist was arrested by the French as a spy, and being sent to France was kept for six months a close prisoner at Châlons-sur-Marne. He was released in July, and in August returned to Dresden, where, with Heinrich Müller (1779–1829), he published in 1808 the journal *Phöbus,* in which many of his poems and the tragedy ***Penthesilea*** appeared.

In 1809 he went to Prague, and ultimately settled in Berlin, where he edited (1810–11) the ***Berliner*** *Abendblätter,* which combatted the policy of Hardenberg. Meanwhile he had written the romantic drama ***Das Kathchen von Heilbronn*** (1808) and some admirable short tales, among them ***Michael*** *Kohlhaas,* a story of the days of Luther, which is a landmark in German fiction. The great works of his Berlin period only appeared (*Kleists* ***hinterlassene schriften,*** ed. by J. L. Tieck, 1821) after his death; they were the drama ***Die*** *Hermannschlacht* (1809), in which Varus and the Romans are but names for Napoleon and the French, and ***Prinz Friedrich von Homburg,*** the scene of which is laid in the time of the great elector. The full history of the tragic close of Kleist's life is not clear. He was embittered by the cool reception given to some of his work, and the closing down of the ***Abendblatter*** reduced him to poverty. He had a fatal passion for Henriette Vogel and shot first the lady and then himself on the shore of the Wannsee near Potsdam on Nov. 21, 1811.

His ***Gesammelte Schriften*** were published by Ludwig Tieck, 3 vol. (1826), and in many other editions, including a critical edition by E. Schmidt, 5 vol. (1904–05). His ***Ausgewahlte*** *Dramen* were published by K. Siegen (Leipzig, 1877); and his letters by E. von Bülow, ***Heinrich von Kleists Leben und Briefe*** (1848).

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KLEIST, EWALD CHRISTIAN VON (1715–1750), German poet, was born at Zeblin, near Köslin in Pomerania, on March 7, 1715. After attending the Jesuit school in Deutschkrona and the *Gymnasium* in Danzig, he proceeded in 1731 to the University of Königsberg, where he studied law and mathematics. On the completion of his studies, he entered the Danish army, in which he became an officer in 1736. He served in the Prussian army from 1740 onward. In the course of his garrison duties he met J. W. L. Gleim (*q.v.*) at Potsdam and Lessing at Leipzig. He was mortally wounded at Kunersdorf (Aug. 12, 1759), and died at Frankfort-on-Oder on Aug. 24. Kleist's chief work is a poem in hexameters, *Der Frühling* (1749), for which James Thornson's ***Seasons*** largely supplied ideas. In his description of the beauties of nature Kleist shows real poetical genius, an almost modern sentiment and fine taste. He also wrote some charming odes, idylls and elegies, and a small epic poem *Cissides und Paches* (1759), the subject being two Thessalian friends who die a heroic death for their country in a battle against the Athenians.

Kleist published in 1756 the first collection of his ***Gedichte,*** which was followed by a second in 1758. After his death his friend K. W. Ramler published an edition of ***Kleists samtliche Werke*** in 2 vol. (1760). A critical edition, which includes his correspondence, was published by A. Sauer, in 3 vol. (1880–82). *Cf.* further, A. Chuquet, ***De Ewaldi Kleistii vita et scriptis*** (Paris, 1887), and H. Pröhle, ***Friedrich der Grosse und die deutsche Literatur*** (1872).

KLEMM, GUSTAV FRIEDRICH (1802–1867), German anthropologist and man of letters, whose principal contribution was to the development of the concept of culture, was born in Chemnitz, Saxony, on Nov. 12, 1802, but spent most of his life in Dresden, where he was in charge of the royal library. He wrote several books on folklore and travel and a six-volume work, *Die* ***Frauen*** ("Women," 1854–58). In *Allgemeine Culturgeschichte* ***der*** *Menschheit* ("General Culture History of Mankind," 10 vol., 1843–52), he undertook to write the history of mankind in terms of social organization, technology and beliefs. His ***Allgemeine*** *Culturwissenschaft* ("General Science of Culture," 2 vol., 1854–55) was a description of "the material bases of human culture." E. B. Tylor undoubtedly was much influenced by Klemm in establishing culture as a basic concept of anthropology. Klemm distinguished three stages of cultural evolution: savagery, domestication and freedom. He divided mankind into active and passive races, and believed that peoples differ in mentality and temperament. He died during the night of Aug. 25–26, 1867, in Dresden.

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(LE. A. W.)

KLERK, MICHEL DE (1884–1923), Dutch artist, born in Amsterdam on Nov. 24, 1884, leader of a group of architects in Amsterdam interested mainly in apartment houses. Disregarding P. J. H. Cuypers' watchword—rational building—he desired only to give form to his poetic vision. His work is the expression of feeling, intuitively controlled, and imitation of it, always tempting, has been the more dangerous for this absence of intellectualism. He collaborated with P. L. Kramer and J. J. van der Mey in the Shipping house in Amsterdam in 1913; after that his greatest works were numerous housing blocks in that city, completed respectively in 1913, 1914, 1917, 1920 and 1922, of which that of 1917 is perhaps the most individual and that of 1920 the most acceptable. De Klerk went very far in construction, and it is important to consider the swing and rhythm of his buildings as a whole without allowing the sometimes excrescent detail to become a distraction. It has been said by J. P. Mieras that De Klerk and W. M. Dudok municipal architect of Hilversum, where he erected some notable public buildings, represent the two extremes of the contemporary Dutch movement. Among the Amsterdam group somewhat influenced by De Klerk's manner were P. L. Kramer (*q.v.*), C. J. Rutgers, J. F. Staal and H. T. Wydeveld (housing block, 1924). De Klerk died in Amsterdam on Nov. 24, 1923.

See J. P. Mieras and F. R. Yerbury (eds.), ***Dutch Architecture of the 20th Century*** (London, 1926); J. G. Wattjes, ***Modern Dutch Architecture*** (London, 1928).

KLERKSDORP, a town in the Transvaal, Union of South Africa, 102 mi. S.W. of Johannesburg on the main line and national road to Cape Town, at an altitude of 4,347 ft. Total pop. (1951) 24,277; white pop. 9,138. It is an important gold-mining centre and had five large mines in production in the mid-1950s. Klerksdorp also has several big industries, is an agricultural centre and lies very near the Vierfontein coal fields. In the town are the regional library, five schools, a technical college and a hospital with a nurses' training college.

The old village, on the right bank of the Schoonspruit, was founded in 1838 and was the first Boer settlement in the Transvaal. The modern town, on the opposite bank, dates from 1888.

KLESL, MELCHIOR (1552–1630), Austrian statesman and ecclesiastic, was the son of a Protestant baker. He became bishop of Vienna in 1598. Klesl was the chief and most trusted adviser of the archduke Matthias, whose election to the imperial throne he helped to procure in 1612. His advice that the question of the imperial succession should be postponed until agreement with the Protestant princes could be reached caused the archduke Ferdinand (afterward Emperor Ferdinand) to believe that Klesl was hostile to his candidature. In June 1618, a few months before the death of Matthias, he was seized by order of the archdukes and imprisoned at Ambras in Tirol. In 1622 Klesl, who had been

a cardinal since **1615,** was transferred to Rome by order of Pope Gregory XV, and released from imprisonment. In **1627** Ferdinand II allowed him to return to his episcopal duties in Vienna, where he died on Sept. **18, 1630.**

See J. Frciherr von Hammer-Purgstall, *Khlesls Leben* (1847–51); *A.* Kerschbaumer, *Kardinal Klesl* (1865), *Klesls Rriefe an Rudolfs II. Obersthofmeister A. Freiherr von Dietrichstein,* ed. *by* V. Bibl. (1900).

KLEVE: *see* CLEVES.

KLING or **TLING,** a term used in the Malay peninsula for people of Indian origin, derived from the term Kalinga or Telinga, of which Telugu is probably another form. The Telingas are a people of the Dravidian language group of southern India. The mixed Telinga-Malay population forms a large, industrious community. Moslems of the Madras coast trading to the Malay straits are known as "Kling Islam."

See Winstedt, *Malaya* (1923). (J. H. H.)

KLINGER, FRIEDRICH MAXIMILIAN VON (1752–1831), German dramatist and novelist, was born of humble parentage at Frankfurt am Main, on Feb. **17,** 1752, and had a hard childhood, as he was early left an orphan. He was befriended by Goethe who knew him from childhood. In 1775 Klinger gained a prize offered by the Hamburg theatre with his tragedy *Die Zwillinge,* and in 1776 was appointed *Theaterdichter* (playwright) to the Seylersche Schauspiel-Gesellschaft. In **1778** he entered the Austrian military service and took part in the Bavarian War of Succession. In **1780** he went to St. Petershurg. and became an officer in the Russian army. He married a natural daughter of the empress Catherine, and was made *praeses* of the Academy of Knights in 1799. From 1803 to **1817** he was curator of the University of Dorpat. He then gradually gave up his official posts. He died at Dorpat on Feb. **25, 1831.**

The bitter experiences and deprivations of Klinger's youth are largely reflected in his dramas. It was one of his earliest works. *Sturm und Drang* (1776), which gave its name to this literary epoch. In addition to this tragedy and *Die Zwillinge* **(1776)** the chief plays of his early period of passionate fervour and restless "storm and 'stress" are *Die neue Arria* (1776), *Simsone Grisaldo* (1776) and *Stilpo und seine Kinder* (1780). To a later period belongs the fine double tragedy of *Medea in Korinth* and *Medea auf dem Kaukasos* (1 791). In Russia he devoted himself mainly to the writing of philosophical romances, of which the best known are *Fausts Leben, Taten und Hollenfahrt* (1791), *Geschichte Giafars des Barrneciden* (1792), *Geschichte Raphaels de Aquillas* (1793), and *Der Weltmann und der Dichter* (1798), the finest of them all. In **1803** he summed up his human and literary experiences in *Betrachtungen und Gedanken über verschiedene Gegenstande der Welt und der Literatur.* In this work Klinger gives calm and dignified expression to the leading ideas which the period of *Sturm und Drang* had bequeathed to German classical literature.

Klinger's works were published in twelve volumes (1809–15). A selection will be found in A. Sauer, *Stürmer und Dränger,* vol. i (1883). *See* E. Schmidt, *Lenz und Klinger* (1878); M. Rieger, *Klingrr in der Sturm- und Drangperiode* (1880); and *Klinger* in *seiner Reife* (1896).

KLINGER, MAX (1857–1920), German allegorical painter. etcher and sculptor, was born at Leipzig on Feb. **18, 1857.** He attended the classes at the Carlsruhe art school in 1874, and went in the following year to Berlin, where in **1878** he created a sensation at the academy exhibition with two series of pen-and-ink drawings—the "Series Upon the Theme of Christ" and "Fantasies Upon the Finding of a Glove." The daring originality of these imaginative and eccentric works caused an outburst of indignation; nevertheless the "Glove" series was bought by the Berlin National gallery. From **1883** to **1886** he studied in Paris and then visited Italy. In **1893** lie settled at Leipzig.

His painting of "The Judgment of Paris" caused another storm of protest in 1887, because of its rejection of all conventional attributes and the naïve directness of the conception. His vivid and somewhat morbid imagination, with its leaning toward the gruesome and disagreeable. and the Goyaesque turn of his mind found their best expression in his "cycles" of etchings: "Deliverances of Sacrificial Victims Told in Ovid," "A Brahms Fantasy," "Eve and the Future." "A Life" and "Of Death"; but in his use of the needle he did not aim at the technical excellence of the great masters; it supplied him merely with means of expressing his ideas.

After **1886** Klinger devoted himself more exclusively to painting and sculpture. In his painting he aimed neither at classic beauty nor modern truth, but at grim impressiveness not without a touch of mysticism. His "Pietà" and "Christ in Olympus" are characteristic examples of his art. In sculpture he favoured the use of varicoloured materials in the manner of the Greek chryselephantine sculpture His "Beethoven" (1902) is a notable instance of his work in this direction; others include "Salome" and "Cassandra." His last enterprise was a colossal monument to Richard Wagner, which remained unfinished at his death in Leipzig on July 5, **1920.**

KLINT, KAARE (1888-), Danish architect, who built the Grundtvig church in Copenhagen, was born at Copenhagen on Dec. **15. 1888.** He maintained that it was necessary to acknowledge the present and not falsely endeavour to re-create the past. His work, however, owed something to Danish Gothic. He completed a church and a Y.M.C.A. building at Odense in **1921** and 1923 respectively; the magnificent Grundtvig Memorial church was completed in **1926.**

See Kay Fisker and F. R. Yerbury, *Modern Danish Architecture* (1927)

KLIPSPRINGER, a small African mountain antelope (*Oreotragus saltator).* ranging from the Cape through east Africa to Somaliland and Abyssinia, characterized by its rounded hoofs, thick hair and gold-spangled colouring. It represents a genus by itself. The activity of these antelopes, which always retreat uphill when alarmed. is marvelous.

KLONDIKE, a district in Yukon territory, northwestern Canada, approximately in 64° N. and 140° W. The limits are rather indefinite. but the district includes the country to the south of the Klondike river, which comes into the Yukon from the east and has several tributaries, as well as Indian river, a second branch of the Yukon, flowing into it some distance above the Klondike. The richer gold-bearing gravels are found along the creeks tributary to these two rivers within an area of about 800 sq.mi. Rich gravel was discovered on Bonanza Creek in **1896,** and a wild rush to this almost inaccessible region followed, a population of **30,000** coming in within the next three or four years with a rapidly increasing output of gold, reaching in 1900 the climax of $22,000,000. Thereafter the production steadily declined, until in 1906 it fell to $5,600,000; in 1925 it was only **$988,465** but by 1949 had recovered to $2,951,000, more than half from placer operations. By 1910, most of the population had left the Klondike for Alaska and other regions; so that Dawson (*q.v.*), which for a time was a bustling city of more than 10,000, dwindled to 846 in the year **1961.** As the ground was almost all frozen, the mines were worked by a thawing process. first by setting fires, afterwards by using steam, new methods being introduced to meet the unusual conditions. Later dredges and hydraulic mining were resorted to with success. In recent years the silver-lead ores of Keno and Galena hills, in the Mayo district, have assumed much importance.

KLOPSTOCK, FRIEDRICH GOTTLIEB (1 724–1803), German poet, was born at Quedlinburg, on July **2,** 1724, the eldest son of a lawyer, a man of sterling character and of a deeply religious mind. Both in his birthplace and on the estate of Friedeberg on the Saale, uhich his father later rented, young Klopstock passed a happy childhood; and more attention having been given to his physical than to his mental development he grew up a strong healthy boy and was an excellent horseman and skater. In his thirteenth year Klopstock returned to Quedlinburg where he attended the gymnasium, and in 1739 proceeded to the famous classical school of Schulpforta. Here he soon became an adept in Greek and Latin versification, and wrote some meritorious idylls and odes in German. His original intention of making the emperor Henry I. ("The Fowler") the hero of an epic was under the influence of Milton's *Paradise Lost,* with which he became acquainted through Bodmer's translation, abandoned in favour of the religious epic. While yet at school, he

had already drafted the plan of Der Messias. On Sept. 21, 1745, he delivered on quitting school a remarkable "leaving oration" on epic poetry—*Abschiedsrede* iiber die *epische* Poesie, *kultur-* und *literargeschichtlich erläutert*—and next proceeded to Jena as a student of theology, where he elaborated the first three cantos of the Messias in prose.

Klopstock removed in 1746 to Leipzig, and here joined the circle of young contributors to the Bremer Beitriige. In this periodical the first three cantos of the Messias in hexameters were anonymously published in 1748. In Leipzig he also wrote a number of odes, the best known of which is An meine Freunde (1747), afterwards recast as *Wingolf* (1767). He left the university in 1748 and became a private tutor in the family of a relative at Langensalza. Here unrequited love for a cousin (the "Fanny" of his odes) disturbed his peace of mind. He accepted in 1750 an invitation from Jakob Bodmer (*q.v.*), the translator of Paradise Lost, to visit him in Zurich. Here Klopstock was at first treated with every kindness and respect and rapidly recovered his spirits. Bodmer, however, was disappointed to find in the young poet of the *Messias* a man of strong worldly interests, and a coolness sprang up between the two friends.

At this juncture Klopstock was invited by Frederick V. of Denmark, on the recommendation of his minister Bernstorff, to settle at Copenhagen, with an annuity of 400 talers, with a view to the completion of the *Messias.* On his way to the Danish capital Klopstock met at Hamburg Margareta (Meta) Moller, (the "Cidli" of his odes), an enthusiastic admirer of his poetry, who became his wife in 1754. His happiness was short; she died in 1758, leaving him almost broken-hearted. His grief at her loss finds pathetic expression in the 15th canto of the Messias. The poet subsequently published his wife's writings, Hinterlassene Werke *von* Margareta Klopstock (1759), which give evidence of a tender, sensitive and deeply religious spirit. Klopstock now relapsed into melancholy; new ideas failed him, and his poetry became more and more vague and unintelligible. He turned his attention to northern mythology, which he conceived should replace classical subjects in a new school of German poetry. In 1770, on the dismissal of Bernstorff from office, he retired with him to Hamburg, but retained his pension together with the rank of councillor of legation. Here, in 1773, he issued the last five cantos of the Messias. In the following year he published his scheme for the regeneration of German letters, Die *Gelehrten*repuhlik (1774).

In 1775 Klopstock travelled south, and making the acquaintance of Goethe on the way, spent a year at the court of the margrave of Baden at Karlsruhe. Thence, in 1776. with the title of Hofrat and a pension from the margrave, which he retained together with that from the king of Denmark, he returned to Hamburg where he spent the remainder of his life. His latter years he passed in retirement. The French Republic sent him the diploma of honorary citizenship: but, horrified at the terrible scenes the Revolution had enacted in the place of liberty, he returned it. When 67 years of age he contracted a second marriage with Johanna Elisabeth von Winthem, a widow and a niece of his late wife, who for many years had been one of his most intimate friends. He died at Hamburg on March 14, 1803, mourned by all Germany, and was buried by the side of his first wife in the churchyard of the village of Ottensen.

Klopstock's nature was best attuned to lyrical poetry, and in it his deep, noble character found its truest expression. He was less suited for epic and dramatic representation; for, wrapt up in himself, a stranger to the outer world, without historical culture, and without even any interest in the events of his time, he was lacking in the art of plastic representation such as a great epic requires. Thus the *Messias,* despite the magnificent passages which especially the earlier cantos contain, cannot satisfy the demands such a theme must necessarily make. The poem was translated into seventeen languages and led to numerous imitations. In his odes Klopstock had more scope for his peculiar talent. Among the best are An Fanny; Der *Zürchersee;* Die todte *Clarissa;* An *Cidli;* Die *beiden Musen;* Der Rheinwein; Die *frühen Gräber; Mein Vaterland.* His religious odes mostly take the form of hymns, of which the most beautiful is Die *Frühlingsfeier.* His dramas, in some of which, notably *Hermanns Schlacht* (1769) and Hermann und die *Fürsten* (1784), he celebrated the deeds of the ancient German hero Arminius, and in others, Der Tod Adams (1757) and *Salomo* (1764), took his materials from the Old Testament, are essentially lyrical in character and deficient in action. In addition to Die *Gelehrtenrepublik,* he was also the author of Fragmente iiber *Sprache* und Dichtkunst (1779) and Grammatische Gesprache (1794), works in which he made important contributions to philology and to the history of German poetry.

Klopstock's Werke first appeared in seven quarto volumes (1798–1809). At the same time a more complete edition in twelve octavo volumes was published (1798–1817), to which six additional volumes were added in 1830. More recent editions were published in 1844–45, 1854–55, 1879 (ed. by R. Roxberger, 1884 ed. by R. Hamel) and 1893 (a selection edited by F. Muncker). A critical edition of the Odes was published by F. Muncker and J. Pawel in 1889; a commentary on these by H. Diintzer (1860; 2nd ed., 1878). For Klopstock's correspondence see K. Schmidt, Klopstock und seine Freunde (1810); C. A. H. Clodius, Klopstocks Nachlass (1821); J. M. Lappenberg, *Briefe* von und an Klopstock (1867). Cf. further K. F. Cramer, Klopstock, er *und über* ihn (1780–92); J. G. Gruber, *Klopstocks Leben* (1832); R. Hamel, *Klopstock-Studien* (1879–80); F. Muncker, F. G. Klopstock, the most authoritative biography (1888); F. G. Klopstock, Klopstock, 2. *Juli, 1724.* Zur Feier seines *zweihundertjährigen Geburtstages* (Berlin, 1926); E. Bailly, Etude *sur* la vie *et les* oeuvres de Klopstock (Paris, 1888).

KLUCK, ALEXANDER VON (1846–1934), Prussian general, was born May 20, 1846 at Münster, Westphalia. He took part in the Austro-Prussian War of 1866 and the Franco-Prussian War of 1870, and was twice wounded at the battle of Colombey-Neuilly. In 1906 he was promoted to the rank of general of infantry, and at the outbreak of World War I was inspector-general of the 7th army inspection. He was placed in chief command of the 1st army of the west, which he led in the battles of Maubeuge and St. Quentin and the advance upon the Marne. (See FRONTIER, BATTLES OF THE.) At the battle of the Marne, the faulty disposition of the German forces in fhe line of battle and the success of the Allied offensive compelled Von Kluck to withdraw his army to the Xisne positions. (See MARNE, FIRST BATTLE OF THE.) In March 1915 he was wounded while visiting the front trenches, and was placed on the retired list in Oct. 1916. He gave his account of the earlier operations in Der *Marsch auf* Paris und die *Marne-Schlacht* (1920). He died Oct. 19, 1934.

KLUGE, GÜNTHER VON (1882–1944), German army officer, a leading field commander in World War II, was born in Posen (subsequently Polish Poznan) of an old Prussian military family, Oct. 30. 1882. Commissioned in the artillery in 1901, he served in various staff and command positions during World War I. He rose rapidly in the postwar years and in 1939–40 led the 4th army with outstanding success in the Polish and French campaigns. In Dec. 1941 he was given command of central army group, facing Moscow. After many severe defensive battles, he replaced Gerd von Rundstedt as commander in chief, west, with headquarters near Paris, early in July 1944.

There Field Marshal von Kluge faced the rapidly growing power of the Allied armies in Normandy, and he realized that destruction of his forces was inevitable when Hitler refused either to send reinforcements or to permit him to retreat. He was relieved of his command on Aug. 17. Two days later, despondent over his failure and knowing that Hitler suspected him of complicity in the July 20 assassination plot, Kluge committed suicide near Verdun by swallowing poison.

Though sharing the motives of the conspirators, and having been involved in earlier discussions within the army of plans to overthrow Hitler, Kluge strongly disapproved of assassination and actually had no knowledge of the plot. (P. N. T.)

KLÜVER, HEINRICH (1897–), U.S. experimental psychologist and neurological scientist, whose many contributions to the analysis and understanding of brain-behaviour relations came to be internationally recognized, was born May 25, 1897, in Holstein, Ger. He was educated at the universities of Hamburg and Berlin and at Stanford university, where he received the Ph.D. degree in 1924. He became a U.S. citizen in 1934. Since 1933 he

has been a professor at The University of Chicago.

Kluver's investigations range from eidetic imagery (photographic visual memory) in children, mescal-induced hallucinations (1928), to comparative studies of neural mechanisms in visual perception in man and in loner animals. His *Behavior Mechanisms in Monkeys* (1933) had far-reaching influence on behavioural and neurological science. The Kluver-Bucy syndrome associates his name with the behavioural and physiological effects expected from removal of the temporal lobes in monkeys. This discovery strongly influenced conceptions of the organization of the associative areas of the brain.

In later years Kluver has turned his attention toward the rapidly developing field of neurochemistry (brain porphyrins). His work on the staining of nervous tissue is well known and widely employed by other investigators. (W C H.)

KNAPP, SEAMAN ASAHEL (1833–1911), U.S. agriculturalist and educator, the "father of the county farm agents," is noted for the discovery, application and organization of the so-called farm demonstration method of disseminating agricultural discoveries and new technologies developed at agricultural colleges and experiment stations to the farmer on his own farm.

Knapp was born in Schroon Lake, K.Y., on Dec. 16. 1833, and graduated from Union college, Schenectady, N.Y., in 1856. He later lived and worked in Iowa and Louisiana. He was a farmer. stock breeder, banker, publisher, professor and president of Iowa State college, Ames. He played a large role in the passage of the Hatch Agricultural Experiment Station act of 1887 and a decisive part in the formulation of the Smith-Lever Extension Service act of 1914.

During the boll weevil invasion of Texas, Knapp. in 1904, practised good farming techniques on a demonstration tract to prove their effectiveness in controlling the weevil, and thus originated the demonstration method that successfully challenged farmers to teach themselves new and superior farming methods. The teacher in charge of this farm-by-farm demonstration work which was organized by counties, became known as the county demonstration agent, or county agent (q v.), and the home demonstration program was developed for farm women and the 4-H clubs (*q.v.*) program for farm boys and girls. Knapp's was a radical educational innovation with ever widening applications in the second half of the 20th century, especially in the underdeveloped nations of the world, as a means of transmitting agricultural knowledge and transcending the wide barrier between the agricultural scientist or specialist engaged in research and the working farmer

Knapp died in Washington. D C , on April 1. 1911.

See J C Bailey, *Seaman A Knapp: Schoolmaster of American Agriculture* (1945) (JH C. B)

KNARESBOROUGH, a market town and urban district in the Harrogate parliamentary division of the West Riding of Yorkshire, Eng , 18 mi. W N.W of York by road Pop (1961) 9.311 It stands below a ruined castle on the steep left bank of the Nidd river ahich follows a \\ell-wooded valley hemmed in by limestone cliffs; a high bridge across the river carries the road to Harrogate, 3½ mi. E N E.

Knaresborough (Chenaresburg in Domesday Book), crown property before the Conquest, formed part of William the Conqueror's grant to his follower. Serlo de Burgh, who probably founded Knaresborough castle in 1070. Its remains, mhich include a massive keep, are mainly of the 14th century. In the reign of Stephen, Knaresborough was forfeited by Eustace Fitzjohn, nephew of de Burgh, and mas granted to Robert de Stuteville. From his descendants it passed, through marriage, to Hugh de Morville, one of the murderers of Thomas Becket, mho, with his accomplices, is said to hare remained in hiding in the castle for a whole year. During the 13th and 14th centuries, the castle and lordship changed hands frequently; they mere granted successively to Hubert de Burgh, whose son forfeited them after the battle of Evesham; to Richard, earl of Cornwall, whose son Edmund died aithout issue; to Piers Gaveston, and finally to John of Gaunt, duke of Lancaster, and so to the crown as parcel of the duchy of Lancaster In 1317 John de Lilleburn, who was holding the castle for Thomas, duke of Lancaster, against the king, surrendered under conditions, but managed to destroy all the records of the liberties and privileges of the town before leaving the castle. An inquisition was taken in 1368 to ascertain these privileges, and the jurors found that the burgesses held "all the soil of their borough yielding *7s. 4d.* yearly and doing suit at the king's court." During the Great Rebellion the royalists were obliged to surrender the castle to Lord Fairfax after the battle of Marston Moor, and it was dismantled in 1646.

The Knaresborough grammar school was founded in 1616. The church of St. John the Baptist is Early English, but has numerous Decorated and Perpendicular additions. A charter granted by Charles II, confirming earlier charters. allows a market on Wednesday, which is held in the open market square. The cattle mart is held on Monday.

The main manufactures are clothing. furniture, skin rugs and linen; there is also limestone quarrying and market gardening as well as catering for tourists. Lead ore was found and worked on Knaresborough common in the 16th century.

Notable local personalities include Robert Flower (St Robert), a Morpeth monk who came to Knaresborough in the 13th century to live as a hermit in the cave which bears his name. It nas there that Eugene Aram (*q.v.*), the 18th century murderer, buried his victim. St. Robert's chapel, properly called "The Chapel of Our Lady of the Crag" is a Roman Catholic shrine and place of annual pilgrimage. Mother Shipton (*q.v.*), the 15th-century prophetess, was born in another cave. adjacent to the Dropping well whose waters have petrifying properties. John Metcalfe (Blind Jack of Knaresborough), born in 1717, went blind at the age of four but despite this became an accomplished musician and often acted as a guide through the surrounding forest. He also achieved remarkable success as a builder of houses. roads and bridges Guy Fawkes (*q.v.*) spent his childhood at Scotton, 2 mi. N.W. of Knaresborough.

KNAVE, originally a male child, a boy (*cf* Ger. *Knabe,* "boy"); early used as a name for any lad employed as a servant, and so of male servants in general. The current meaning. a rogue, was, however, an early usage. In playing cards the lowest court card of each suit, representing a medieval servant, is called the knave.

KNEBEL, KARL LUDWIG VON (1744–1834), German poet and translator, was born at the castle of Wallerstein in Franconia on Nov. 30, 1744. After serving for ten years in the Prussian army he became tutor to one of the Weimar princes, and introduced Goethe to the hereditary prince, Charles Augustus. This was the beginning of Goethe's intimate connection with the Weimar court. In 1798 Knebel married the singer Luise von Rudorf, and retired to Ilmenau; hut in 1805 he uent to Jena, where he lived until his death on Feb. 23. 1834. Knebel's *Sammlung kleiner Gedichte* (1815), issued anonymously. and *Distichen* (1827) contain many graceful sonnets, but it is as a translator that he is best known. His translations of the elegies of Propertius. *Elegien des Properz* (1798), and of Lucretius' *De rerum natura,* 2 vol. (1831) are deservedly praised.

Knebel's *Literarischcr Nachlass und Briefwechsel* was edited by K. A Varnhagen von Ense and T Mundt in 3 vol (1835; 2nd ed, 1840). *See* H von Knebel-Doberitz, *Karl Ludwig von Knebel* (1890).

KNEE, in human anatomy, the joint between the thighbone (femur) and the larger leg bone (tibia). The kneecap (patella) lies at the front of this joint, which is of the hinge type. *See* JOINTS AND LIGAMENTS. (F. L. A.; X.)

KNEISEL, FRANZ (1865–1926), violinist. was born at Bucharest, Rum , on Jan. 26, 1865. of German parentage. He studied at the conservatories of Bucharest and (from 1879) Vienna and at 16 became solo violinist at the Hofburg theatre, Vienna. In 1884 he became *Konzertmeister* of the Bilse orchestra in Berlin, and in 1885 took a similar post with tlie Boston Symphony orchestra. In the same year he established in Boston a famous quartet nith which he toured widely in the United States, setting a standard of chamber music playing never approached before in the United States. The quartet gave its last concert on April 3, 1917. From that time Kneisel devoted himself to his

work as head of the violin department of the Institute of Musical Art. New York. a post he had held from 1905. He had earlier made a name also as a conductor. He died in New York city on March 26, 1926.

KNELLER, SIR GODFREY (1648–1723), English portrait painter of German extraction. was born in Lubeck of an ancient family, on Aug. 8, 1648. He studied in the school of Rembrandt. and under Ferdinand Bol in Amsterdam. In 1672 he went to Italy. In Rome. and more especially in Venice, Kneller earned considerable reputation by historical paintings as well as portraits. In 1674 he came to England at the invitation of the duke of Monmouth and was introduced to Charles II. of whom he made many portraits. Charles sent him to Paris. to paint the portrait of Louis XIV, and appointed him court painter; and he continued to hold the same post during the reign of George I. Under William III (1692) he was made a knight. under George I (1715) a baronet, and by order of the emperor Leopold I a knight of the Roman Empire His studio had at first been in Covent Garden. but in his closing years he lived in Kneller hall, Twickenham. He died on Nov 7, 1723. He was buried in Twickenham church, and has a monument in Westminster Abbey. An elder brother, John Zachary Kneller, an ornamental painter, had accompanied Godfrey to England, and had died in 1702. The style of Sir Godfrey Kneller as a portrait painter represented the decline of that art as practised by Vandyck. His works have much freedom, and are well drawn and coloured; but they are mostly slight in manner, and to a great extent monotonous. The colouring may be called brilliant rather than true. Among Kneller's principal paintings are the "Forty-three Celebrities of the Kit-Cat Club," and the "Ten Beauties of the Court of William III.," now at Hampton Court. He executed altogether the likenesses of ten sovereigns, and a number of his works appear in the National Portrait Gallery, London.

KNICKERBOCKER, HARMEN JANSEN (*c.* 1650–*c.* 1716), Dutch colonist of New Amsterdam (New York) and founder of the Knickerbocker family in America, came from Holland about 1674 and in 1682 purchased land near Albany, N.Y. There he lived until 1704, when he bought land near Red Hook in Dutchess county and moved down the Hudson river to his new seat. The oldest son, Johannes Harmenson, remained in Albany county and settled for the remainder of his life at Schaghticoke on land which remained for over 200 years in the Knickerbocker name. His son Johannes (1723–1803), a colonel in the revolutionary army, and his grandson Harmen (1779–1855), a Federalist representative in Congress 1809–11, were well known to Washington Irving, who borrowed their name for use in his *Knickerbocker's History of New York* (1809). Largely owing to this book the name "Knickerbockers" has passed into current use as a designation of the early Dutch settlers in New York and their descendants.

KNIFE, a small cutting instrument, with the blade either fixed to the handle or fastened with a hinge so as to clasp into the handle *(see* CUTLERY). For the knives chipped from flint by prehistoric man *see* ARCHAEOLOGY : *Prehistory;* FLINTS.

KNIGGE, ADOLF FRANZ FRIEDRICH, FREIHERR VON (1752–1796), German author. was born on the family estate of Bredenbeck near Hanover on Oct. 16, 1752. He was attached successively to the courts of Hesse-Cassel and Weimar until 1777, and had no official appointment until 1791 when he became *Oberhauptmann* in Bremen, where he died on May 6, 1796. Knigge, under the name "Philo." was one of the most active members of the *Illuminati,* a society founded by Adam Weishaupt, and later affiliated to the Freemasons. After the *Illuminati* had been suppressed in Bavaria they were dispersed throughout Germany. Knigge denounced the institutions of royalty and nobility with revolutionary fervour. Knigge wrote several novels, but his most famous work was *Über den Umgang mit Menschen* (1788), in which he lays down rules to be observed for a happy life.

Knigge's *Schriften* were published in 12 volumes (1804–06). *See* K. Goedeke, *Adolf, Freiherr von Knigge* (1844); and H. Klencke, *Aus einer alten Kiste (Briefe, Handschriften und Dokumente aus dem Nachlasse Knigges)* (1853).

KNIGHT, DANIEL RIDGWAY (1845–1924), American artist, was born at Philadelphia (Pa.), in 1845. He was a pupil at the École des Beaux-Arts, Paris, under Gleyre, and later worked in the private studio of Meissonier. After 1872 he lived in France, having a house and studio at Poissy on the Seine. He painted peasant women out of doors with great popular success. He was awarded the silver medal and cross of the Legion of Honour, Exposition Universelle, Paris, 1889, and was made a knight of the Royal Order of St. Michael of Bavaria, Munich, 1893, receiving the gold medal of honour from the Pennsylvania Academy of Fine Arts, Philadelphia, 1893. His "Hailing the Ferry" is in the Pennsylvania Academy, Philadelphia, and "The Shepherdess" in the Brooklyn Institute Museum. He died in Paris on March 9, 1924.

KNIGHTHOOD and **CHIVALRY.** These two words, nearly but not quite synonymous, designate a single subject of inquiry, which presents itself under three aspects. It may be regarded in the first place as a mode of feudal tenure, in the second place as a personal attribute or dignity, and in the third place as a scheme of manners.

The first aspect is discussed under the headings FEUDALISM and KNIGHT-SERVICE: we are concerned here only with the second and third. For the more important religious orders of knighthood the reader is referred to the headings ST. JOHN OF JERUSALEM, KNIGHTS OF THE ORDER OF THE HOSPITAL OF; TEUTONIC ORDER; and TEMPLARS.

"The growth of knighthood" (writes Stubbs) "is a subject on which the greatest obscurity prevails": and, though J. H. Round has done much to explain the introduction of the system into England, its origin in Europe is still obscure in many details.

The words *knight* and *knighthood* are the modern forms of the Old English *cniht* and *cnihthád.* Of these the primary signification of the first was a boy or youth, and of the second the period of life between childhood and manhood. But before the middle of the 12th century they had the meaning of the French *chevalier* and *chevalerie.* In a secondary sense *cniht* meant a servant answering to the German *Knecht,* and in the Anglo-Saxon Gospels a disciple is a *leorning cniht.* In a tertiary sense the word was occasionally employed as equivalent to the Latin miles—usually translated by thegn—which in the earlier middle ages was used for the domestic as well as the martial officers or retainers of princes or great personages. Thegn itself, used as the description of an attendant of the king, appears to have meant more especially a military attendant. Besides the king, the ealdormen, bishops and king's thegns themselves had their thegns, and to these it is more than probable that the name of *cniht* was applied.

Around the Anglo-Saxon magnates were a crowd of retainers among whom were some called *cnihtas* who were not always the humblest of their number. In the reign of Edward the Confessor was a large class of landholders who had commended themselves to some lord; their condition in many respects similar to that of a vast number of unquestionably feudal tenants who appear after the Norman Conquest. If consequently the former were called *cnihtas,* it seems probable that the appellation should have been continued to the latter, practically their successors. And if the designation of knights was first applied to the military tenants of the earls, bishops and barons—who although they held their lands of mesne lords owed their services to the king—its extension to the whole body of military tenants need not have been a very violent or prolonged process. Assuming, however, that *knight* was originally used for the military tenant of a noble person, as *cniht* had sometimes been used to describe the thegn of a noble Person, it would, to begin with, have defined rather his social status than the nature of his services. But those whom the English called *knights* the Normans called *chevaliers,* by which term the nature of their services was defined, while their social status was left out of consideration. And at first *chevalier* in its general and honorary signification seems to have been rendered not by *knight* but by *rider,* as may be inferred from the Anglo-Saxon Chronicle, wherein it is recorded under the year 1085 that William the Conqueror "dubbade his sunu Henric to ridere." But, as E. A. Freeman says, "no such title is heard of in the earlier

days of England. The thegn, the ealdorman, the king himself, fought on foot; the horse might bear him to the field, but when the fighting itself came he stood on his native earth to receive the onslaught of her enemies." In this perhaps we may behold one of the most ancient of British insular prejudices, for on the Continent the importance of cavalry was already understood. From the word *caballarius*, which occurs in the reign of Charlemagne, came the words for knight in all the Romance languages. In Germany the chevalier was called *Ritter*, but neither *rider* nor *chevalier* prevailed against *knight* in England. And it was long after *knighthood* had acquired its present meaning with us that *chivalry* was incorporated into our language. It may be remarked too that in official Latin, in England and in all Europe, the word *miles* held its own against both *eques* and *caballarius*.

Origin of Mediaeval Knighthood. — Concerning the origin of knighthood or chivalry as it existed in the middle ages — implying as it did a formal assumption of and initiation into the profession of arms — nothing beyond conjecture is possible. But some of the rudiments of chivalry may be detected in early Teutonic customs, and they may have made some advance among the Franks of Gaul. We know from Tacitus that the German tribes in his day were wont to admit the young man into the ranks of their warriors with much ceremony. The people of his district were called together; his qualifications were inquired into; and, if he were deemed worthy, his chief, his father, or one of his near kinsmen presented him with a shield and a lance. Again, among the Franks we find Charlemagne girding his son Louis the Pious, and Louis the Pious girding his son Charles the Bald with the sword, when they arrived at manhood. It seems certain here that some ceremony was observed which was a thing of recognized importance. It does not follow that a similar ceremony extended to personages less exalted than the sons of kings and emperors. But if it did we must suppose that it applied first to the mounted warriors of the Franks. It was among the Franks indeed that cavalry first acquired the place which it long maintained in Europe. In early society, where the army is the armed nation, the cavalry must consist of the noble and wealthy, and cavalry and chivalry, as Freeman observes, will be the same. Since then we discover in the *Capitularies* of Charlemagne mention of "caballarii" as a class of warriors; it may be concluded that formal investiture with arms applied to the "caballarii" if it was a usage extending beyond the sovereign and his heir-apparent.

In spite of the silence of our records, Stubbs thinks that such kings as Ethelred, Canute and Edward the Confessor could hardly have failed to introduce into England the institution of chivalry then springing up in every country of Europe; it is nowhere mentioned as a Norman innovation. Yet the fact that Harold received knighthood from William of Normandy makes it clear either that Harold was not yet a knight. which in the case of so tried a warrior would imply that "dubbing to knighthood" was not yet known in England, or, as Freeman thinks, that in the middle of the 11th century the custom had grown in Normandy into "something of a more special meaning" than it bore in England.

As a military organization, the feudal system of tenures was better adapted to the purposes of defensive than of offensive warfare. When kings and kingdoms were in conflict, and distant and prolonged expeditions became necessary, it was discovered that the resources of feudalism were inadequate. Then there grew up all over Europe a system of fining the knights who failed to respond to the sovereign's call or to stay their full time in the field; and in England this fine developed, from the reign of Henry II. to that of Edward II., into a war-tax called *escuage* or *scutage* (*q.v.*). In this way funds for war were at the disposal of sovereigns, and the conditions under which feudatories served were altogether changed. Their military service was now far more the result of special agreement. In the reign of Edward I., whose warlike enterprises after he was king were within the four seas, this alteration does not seem to have gone very far. But the armies of Edward III., Henry V. and Henry VI. during the century of warfare between England and France were recruited and sustained to a very great extent on the principle of contract. On the Continent the employment of mercenaries was both an early and a common practice.

Besides the convenience of sovereigns and their feudatories, there were other causes which contributed towards bringing about those changes in the military system of Europe which were finally accomplished in the 13th and 14th centuries. During the crusades vast armies were set on foot in which feudal rights had no place. It was thus established that pay, the love of enterprise and the prospect of plunder were as useful for enlisting troops and keeping them together as the tenure of land and the solemnities of homage and fealty. Moreover, the crusaders who survived an expedition to Palestine were seasoned and experienced although frequently impoverished and landless soldiers, ready to hire themselves to the highest bidder, and well worth their wages.

Knighthood Independent of Feudalism. — To distinguished soldiers of the cross the honours and benefits of knighthood could hardly be refused on the ground that they did not possess a sufficient property qualification — of which perhaps they had denuded themselves in order to get equipment for the Holy War. And thus the conception of knighthood as of something distinct from feudalism arose and gained ground. It was then that the analogy was first detected between the order of knighthood and the order of priesthood, and that a union of monachism and chivalry was effected in the religious orders of which the Knights Templars and the Knights Hospitallers were the most eminent examples. Somewhat later is marked the existence of a large and noble class who either from the subdivision of fiefs or from the effects of the custom of primogeniture were very insufficiently provided for. To them only two callings were generally open, that of the churchman and that of the soldier, and the latter as a rule offered greater attractions. Hence men of birth, although not of fortune, would attach themselves to some prince or magnate in whose military service they were sure of maintenance, and might hope for reward in the shape of booty or of ransom. It is probably to this period and these circumstances that we must look for, at all events, the rudimentary beginnings of the military as well as the religious orders of chivalry. It seems likely enough therefore that there should grow up bodies of knights banded together by engagements of fidelity, although free from monastic obligations; wearing a uniform or livery, and naming themselves after some special symbol or some patron saint of their adoption. And such bodies placed under the command of a sovereign or grand master, regulated by statutes and enriched by endowments would have been precisely what in after times such orders as the Garter in England, the Golden Fleece in Burgundy, the Annunziata in Savoy and the St. Michael and Holy Ghost in France actually were.

Grades of Knighthood. — During the 14th and 15th centuries, as well as somewhat earlier and later, the arrangements of a European army were always and everywhere pretty much the same. Under the sovereign the constable and the marshal or marshals held the chief commands, their authority being partly joint and partly several. Attendant on them were the heralds, who were the officers of their military court wherein offences committed in the camp and field were tried and adjudged, and among whose duties it was to carry orders and messages, to deliver challenges and call truces, and to identify and number the wounded and the slain. The main divisions of the army were distributed under the royal and other principal standards, smaller divisions under the banners of some of the greater nobility or of knights banneret, and smaller divisions still under the pennons of knights or, as in distinction from knights banneret they came to be called, knights bachelors. All knights whether bachelors or bannerets were escorted by their squires. But the banner of the banneret always implied a more or less extensive command, while every knight was entitled to bear a pennon and every squire a pencel. All three flags were of such a size as to be conveniently attached to and carried on a lance, and were emblazoned with the arms or some portion of the bearings of their owners. But while the banner was square the pennon was either pointed or forked at its extremity, and the pencel had a single tail or streamer.

If indeed we look at the scale of chivalric subordination from

another point of view, it seems to be more properly divisible into four than into three stages, of which two may be called provisional and two final. The bachelor and the banneret were both equally knights, only the one was of greater distinction and authority than the other. In like manner the squire and the page were both in training for knighthood, but the first had advanced farther than the second. It is true that the squire was a combatant while the page was not, and that many squires voluntarily served as squires all their lives owing to the insufficiency of their fortunes to support the costs of knighthood. But in the ordinary course of a chivalrous education the conditions of page and squire were passed through in boyhood and youth, and the condition of knighthood was reached in early manhood. Every feudal court and castle was a school of chivalry, and although princes and great personages were rarely actually pages or squires, the discipline through which they passed was not different from that to which less exalted candidates for knighthood were subjected. In many castles, and perhaps in most, the discipline followed simply a natural and unwritten code of "fagging" and seniority, as in public schools or on board men-of-war some 100 years or so ago.

Modes of Conferring Knighthood.— Two modes of conferring knighthood appear to have prevailed from a very early period. In the one the accolade constituted the whole or nearly the whole of the ceremony, in the other it was surrounded with many additional observances. The former and simpler of these modes was naturally that used in war: the candidate knelt before "the chief of the army or some valiant knight," who struck him thrice with the flat of a sword, pronouncing a brief formula of creation and of exhortation which varied at the creator's will.

In this form a number of knights were made before and after almost every battle between the 11th and the 16th centuries, and its advantages gradually led to its general adoption both in time of peace and time of war. On extraordinary occasions indeed the more elaborate ritual continued to be observed. But in England about the beginning of the 15th century it came to be appropriated to a special taking of knighthood When Segar, garter king of arms, wrote in the reign of Queen Elizabeth, he does not even mention that there were two ways of creating knights bachelors "He that is to be made a knight," he says, "is stricken by the prince with a sword drawn upon his back or shoulder, the prince saying, 'Soys Chevalier,' and in times past was added 'Saint George.' And when the knight rises the prince sayeth 'Avencez.'" In our days when a knight is personally made he kneels before the sovereign, who lays a sword drawn, ordinarily the sword of State, on either of his shoulders and says, "Rise," calling him by his Christian name with the addition of "Sir" before it.

Very different were the solemnities which attended the creation of a knight when the complete procedure was observed. "The ceremonies and circumstances at the giving this dignity," says Selden, "in the elder time were of two kinds especially, which we may call courtly and sacred. The courtly were the feasts held at the creation, giving of robes, arms, spurs and the like. The sacred were the holy devotions and what else was used in the church at or before the receiving of the dignity."

But the full solemnities for conferring knighthood seem to have been so largely and so early superseded by the practice of dubbing or giving the accolade alone that in England it became at last restricted to such knights as were made at coronations and some other occasions of State. And to them the particular name of Knights of the Bath was assigned. It is usually supposed that the first creation of Knights of the Bath under that designation was at the coronation of Henry IV.; and before the order of the Bath as a companionship or capitular body was instituted the last creation was at the coronation of Charles II. But all knights were also knights of the spur or "equites aurati," because their spurs were golden or gilt—the spurs of squires being of silver or white metal; the spurs together with the sword were always employed as the leading ensigns of knighthood.

With regard to knights banneret, various opinions have been entertained as to both the nature of their dignity and the qualifications they were required to possess for receiving it at different periods and in different countries. Du Cange divides the mediaeval nobility of France and Spain into three classes: first, barons or ricos hombres; secondly, chevaliers or caballeros; and thirdly, écuyers or infanzons; and to the first, the greater nobility of either country, he limits the designation of banneret and the right of leading their followers to war under a banner or square flag. At any rate to commence with, it seems probable that bannerets were in every country merely the more important class of feudatories, the "ricos hombres" in contrast to the knights bachelors, who in France in the time of St. Louis were known as "pauvres hommes." In England all the barons or greater nobility were entitled to bear banners, but it is clear that from a comparatively early period bannerets whose claims were founded on personal distinction rather than on feudal tenure gradually came to the front, and much the same process of substitution appears to have gone on in their case as that which we have marked in the case of simple knights.

The knight bachelor whose services and landed possessions entitled him to promotion would apply formally to the commander in the field for the title of banneret. If this were granted, the heralds were called to cut publicly the tails from his pennon: or the commander, as a special honour, might cut them off with his own hands.

What the exact contingent was which bannerets were expected to supply to the royal host is doubtful. But in the reign of Edward III. and afterwards bannerets appear as the commanders of a military force raised by themselves and marshalled under their banners: their status and their relations both to the Crown and to their followers were mainly the consequences of voluntary contract not of feudal tenure. It is from the reigns of Edward III. and Richard II. also that the two best descriptions we possess of the actual creation of a banneret have been transmitted to us. Sir Thomas Smith, writing towards the end of the 16th century, says, after noticing the conditions to be observed in the creation of bannerets, "but this order is almost grown out of use in England"; and, during the controversy which arose between the new order of baronets and the Crown early in the 17th century respecting their precedence, it was alleged without contradiction before the privy council that "there are not bannerets now in being, peradventure never shall be." Sir Ralph Fane, Sir Francis Bryan and Sir Ralph Sadler were created bannerets by the Lord Protector Somerset after the battle of Pinkie in 1547, and the better opinion is that this was the last occasion on which the dignity was conferred.

Existing Orders of Knighthood.--On the continent of Europe the degree of knight bachelor disappeared with the military system which had given rise to it. It is now therefore peculiar to the British empire, where, although very frequently conferred by letters patent, it is yet the only dignity which is still even occasionally created—as every dignity was formerly created—by means of a ceremony in which the sovereign and the subject personally take part. Everywhere else dubbing or the accolade seems to have become obsolete, and no other species of knighthood, if knighthood it can be called, is known except that which is dependent on admission to some particular order. It is a common error to suppose that baronets are hereditary knights Baronets are not knights unless they are knighted like anybody else; and, so far from being knights because they are baronets, one of the privileges granted to them shortly after the institution of their dignity was that they, not being knights, and their successors and their eldest sons and heirs-apparent should, when they attained their majority, be entitled if they desired to receive knighthood. It is a maxim of the law indeed that, as Coke says, "the knight is by creation and not by descent," and, although we hear of such designations as the "knight of Kerry" or the "knight of Glin," they are no more than traditional nicknames, and do not by any means imply that the persons to whom they are applied are knights in a legitimate sense. Notwithstanding, however, that simple knighthood has gone out of use abroad, there are innumerable grand crosses, commanders and companions of a formidable assortment of orders in almost every part of the world. (See the section on "Orders of Knighthood" on p. 434.)

Great Britain has nine orders of knighthood — the Garter, the Thistle, St. Patrick, the Bath, the Star of India, St. Michael and St. George, the Indian Empire, the Royal Victorian Order and the Order of the British Empire; and, while the first is undoubtedly the oldest as well as the most illustrious anywhere existing, a fictitious antiquity has been claimed for the second and fourth.

Order of the Garter. — It is, however, certain that the "most noble" Order of the Garter at least was instituted in the middle of the 14th century, although in what particular year this event occurred is and has been the subject of much difference of opinion, since the original records of the order until after 1416 have perished. The dates which have been selected vary from 1344 (given by Froissart, but almost certainly mistaken) to 1351. It is indisputable that in the wardrobe account from Sept. 1347 to Jan. 1349, the issue of certain habits with garters and the motto embroidered on them is marked for St. George's day; that the letters patent relating to the preparation of the royal chapel of Windsor are dated in Aug. 1348; and that in the treasury accounts of the prince of Wales there is an entry in Nov. 1348 of the gift by him of "24 garters to the knights of the Society of the Garter." But the order was not in existence before the summer of 1346. Nobody who was not a knight could under its statutes have been admitted to it, and neither the prince of Wales nor several others of the original companions were knighted until the middle of that year.

Sir Harris Nicolas contends that the order had no loftier immediate origin than a joust or tournament. It consisted of the king and the Black Prince, and 24 knights divided into two bands of 12 like the tilters in a hastilude — at the head of the one being the first, and of the other the second; and to the companions belonging to each, when the order had superseded the Round Table and had become a permanent institution, were assigned stalls either on the sovereign's or the prince's side of St. George's chapel. No change was made in the numbers until 1786, when the sons of George III. and his successors were made eligible notwithstanding that the chapter might be complete. In 1805 another alteration was effectedby the provision that the lineal descendants of George II. should be eligible in the same manner, except the Prince of Wales for the time being, who was declared to be "a constituent part of the original institution"; and again in 1831 it was further ordained that the privilege accorded to the descendants of George II. should extend to those of George I. The descriptions applied to ladies in the records during the 14th and 15th centuries leave no doubt that they were regularly received into the order. The queen consort, the wives and daughters of knights, and some other women of exalted position, were designated "Dames de la Fraternité de St. George," and entries of the delivery of robes and garters to them are found at intervals in the Wardrobe Accounts from 1376 to 1495. The effigies of Margaret Byron, wife of Sir Robert Harcourt, K.G., at Stanton Harcourt, and of Alice Chaucer, wife of William de la Pole, duke of Suffolk, K.G., at Ewelme, which date from the reigns of Henry VI. and Edward IV., have garters on their left arms.

Persons Empowered to Confer Knighthood. — It has been the general opinion, as expressed by Sainte Palaye and Mills, that formerly all knights were qualified to confer knighthood. But it may be questioned whether the privilege was thus indiscriminately enjoyed even in the earlier days of chivalry; the sounder conclusion appears to be that the right was always restricted to sovereign princes, to those acting under their authority or sanction, and to a few other personages of exalted rank and station. In several of the writs for distraint of knighthood from Henry III. to Edward III. a distinction is drawn between those who are to be knighted by the king himself or by the sheriffs of counties respectively, and bishops and abbots could make knights in the 11th and 12th centuries. At all periods the commanders of the royal armies had the power of conferring knighthood; under James I. an ordinance of 1622, confirmed by a proclamation of 1623, for the registration of knights in the college of arms, is rendered applicable to all who should receive knighthood from either the king or any of his lieutenants. But when in 1543 Henry VIII. appointed Sir John Wallop to be captain of Guisnes, it was considered necessary that he should be authorized in express terms to confer knighthood, which was also done by Edward VI. in his own case when he received knighthood irom the duke of Somerset. In the middle ages it was a common practice for sovereigns and princes to dub each other knights much as they were afterwards, and are now, in the habit of exchanging the stars and ribbons of their orders, Long after the military importance of knighthood had practically disappeared, a knight's title was recognized in all European countries, and not only in that country in which he had received it. In modern times, however, by certain regulations, made in 1823, and repeated and enlarged in 1855, not only is it provided that the sovereign's permission by royal warrant shall be necessary for the reception by a British subject of any foreign order of knighthood, but further that such permission shall not authorize "the assumption of any style, appellation, rank, precedence, or privilege appertaining to a knight bachelor of the United Kingdom."

Degradation. — The cases in which a knight has been formally degraded in England are exceedingly few; Dallaway says that only three were on record in the College of Arms when he wrote in 1793. The case of Sir Francis Michell in 1621, whose spurs were hacked from his heels, his sword belt cut, and his sword broken over his head by the heralds in Westminster Hall, was the last until that of Roger Casement (*q.v.*) in 1916.

Roughly speaking, the age of chivalry properly so called may be said to have extended from the beginning of the crusades to the battle of Bosworth. Even in the way of pageantry and martial exercise it did not long survive the middle ages. In England tilts and tourneys were even occasionally held until after the death of Henry, prince of Wales. But on the Continent they were discredited by the fatal accident which befell Henry II. of France in 1599. The golden age of chivalry has been variously located. Most writers would place it in the early 13th century, but Gautier would remove it two or three generations further back. It may be true that, in the comparative scarcity of historical evidence, 12th-century romancers present a more favourable picture of chivalry at that earlier time; but even such historical evidence as we possess, when carefully scrutinized, is enough to dispel the illusion that there was any period of the middle ages in which the unselfish championship of "God and the ladies" was anything but a rare exception.

The Spirit of Chivalry. — It is difficult to describe the true spirit and moral influence of knighthood, if only because the ages in which it flourished differed so widely from our own. At its very best, it was always hampered by the limitations of mediaeval society. Moreover, many of the noblest precepts of the knightly code were a legacy from earlier ages, and have survived the decay of knighthood just as they will survive all transitory human institutions, forming part of the eternal heritage of the race. Indeed, the most important of these precepts did not even attain to their highest development in the middle ages. As a conscious effort to bring religion into daily life, chivalry was less successful than later puritanism; while the educated classes of our own day far surpass the average mediaeval knight in discipline, self-control and outward or inward refinement. In its own age, chivalry rested practically, like the highest civilization of ancient Greece and Rome, on slave labour; and if many of its most brilliant outward attractions have now faded for ever, this is only because modern civilization tends so strongly to remove social barriers. The knightly ages will always enjoy the glory of having formulated a code of honour which aimed at rendering the upper classes worthy of their exceptional privileges; yet we must judge chivalry not only by its formal code but also by its practical fruits.

Abuses in Practice. — Far too much has been made of the extent to which the knightly code, and the reverence paid to the Virgin Mary, raised the position of women. As Gautier himself admits, the feudal system made it difficult to separate the woman's person from her fief: lands and women were handed over together, as a business bargain, by parents or guardians. In theory, the knight was the defender of widows and orphans; but in practice wardships and marriages were bought and sold as a matter of everyday routine like stocks and shares in the modern market.

Thomas, lord of Berkeley (1245–1321), counted on this as a regular and considerable source of income. Late in the 15th century, in spite of the somewhat greater liberty of that age, we find Stephen Scrope writing nakedly to a familiar correspondent "for very need [of poverty], I was fain to sell a little daughter I have for much less than I should have done by possibility," *i.e.*, than the fair market price. Startling as such words are, it is perhaps still more startling to find how frequently and naturally, in the highest society, ladies were degraded by personal violence. The proofs of this from the *Chansons de Geste* might be multiplied indefinitely. The Knight of La Tour-Landry (1372) relates, by way of warning to his daughters, a tale of a lady who so irritated her husband by scolding him in company, that he struck her to the earth with his fist and kicked her in the face, breaking her nose. Upon this the good knight moralizes: "And this she had for her euelle and gret langage, that she was wont to saie to her husbonde." This was a natural consequence not only of the want of self-control which we see everywhere in the middle ages, but also of the custom of contracting child-marriages for unsentimental considerations. Between 1288 and 1500 five marriages are recorded in the direct line of the Berkeley family in which the ten contracting parties averaged less than 11 years of age: the marriage contract of another Lord Berkeley was drawn up before he was six years old. Moreover, the same business considerations which dictated those early marriages clashed equally with the strict theory of knighthood. In the same Berkeley family, the lord Maurice IV. was knighted in 1338 at the age of seven to avoid the possible evils of wardship, and Thomas V. for the same reason in 1476 at the age of five. Smyth's record of this great family shows that, from the middle of the 13th century onwards, the lords were not only statesmen and warriors, but gentlemen-farmers on a great scale, even selling fruit from the castle gardens, while their ladies would go round on tours of inspection from dairy to dairy. Indeed, economic causes contributed much to the decay of romantic chivalry. It is not surprising, therefore, to find that at least as early as the middle of the 13th century the commercial side of knighthood became very prominent. Although by the code of chivalry no candidate could be knighted before the age of 21, we have seen how great nobles like the Berkeleys obtained that honour for their infant heirs in order to avoid possible pecuniary loss; and French writers of the 14th century complained of this knighting of infants as a common abuse. Moreover, after the knight's liability to personal service in war had been modified by the scutage system, it became necessary in the first quarter of the 13th century to compel landowners to take up the knighthood which in theory they should have coveted as an honour—a compulsion which was soon systematically enforced *(Distraint of Knighthood,* 1278), and became a recognized source of royal income. An indirect effect of this system was to break down another rule of the chivalrous code—that none could be dubbed who was not of gentle birth. This rule, however, had often been broken before; even the romances of chivalry speak not infrequently of the knighting of serfs or *jongleurs.* While knighthood was avoided by poor nobles, it was coveted by rich citizens. It is recorded in 1298 as "an immemorial custom" in Provence that rich burghers enjoyed the honour of knighthood; and less than a century later we find Sacchetti complaining that the dignity is open to any rich upstart, however disreputable his antecedents. Similar causes contributed to the decay of knightly ideas in warfare. Even in the 12th century, when war was still rather the pastime of kings and knights than a national effort, the strict code of chivalry was more honoured in the breach than in the observance. Already about 1160 Peter of Blois had written, "The so-called order of knighthood is nowadays mere disorder"; half a century earlier still, Guibert of Nogent gives an equally unflattering picture of contemporary chivalry in his *De vita sua.* But when the Hundred Years' War brought a real national conflict between England and France, when archery became of supreme importance, and a large proportion even of the cavalry were mercenary soldiers, then the exigencies of serious warfare swept away much of that outward display and those class-conventions on which chivalry had always rested. Several of the best English commanders (*e.g.*, Sir Robert Knolles and Sir Thomas Dagworth) were of obscure birth, while on the French side even Du Guesclin had to wait long for his knighthood because he belonged only to the lesser nobility. The tournament again, which for two centuries had been under the ban of the church, was often almost as definitely discouraged by Edward III. as it was encouraged by John of France; and while John's father opened the Crécy campaign by sending Edward a challenge in due form of chivalry, Edward took advantage of this formal delay to amuse the French king with negotiations while he withdrew his army by a rapid march from an almost hopeless position. A quotation from Froissart will illustrate the extent to which war had now become a mere business. At the battle of Aljubarrota, as also at Agincourt, the handful of victors were obliged by a sudden panic to slay their prisoners. "Lo, behold the great evil adventure that fell that Saturday. For they slew as many good prisoners as would well have been worth, one with another, 400,000 franks."

BIBLIOGRAPHY.—Froissart is perhaps the source from which we may gather most of chivalry in its double aspect, good and bad. The brilliant side comes out most clearly in Joinville, the *Chronique de* Du *Guesclin,* and the *Histoire de Bayart;* the darker side appears in the earlier chronicles of the crusades, and is especially emphasized by preachers and moralists like Jacques de Vitry, Etienne de Bourbon, Nicole Bozon and John Gower. John Smyth's *Lives of the Berkeleys* (Bristol and Gloucs. Archaeol. Soc., 2 vols) and the *Book of the Knight of La Tour-Landry* (ed. A. de Montaiglon, or in the old English trans published by the Early English Text Soc.) throw a very vivid light on the inner life of noble famihes Of modern books, *see* A. Schultz, *Höfisches Leben z. Zeit der Minnesänger* (Leipzig, 1879); S Luce, *Hzst. de* Du *Guesclin et de son Epoque* (2nd ed., 1882); Léon Gautier, *La Chevalerie* (1883); *F.* W. Cornish, *Chivalry* (1901).

(G. G. C.)

ORDERS OF KNIGHTHOOD

When orders ceased to be fraternities and became more and more marks of favour and a means of recognizing meritorious services to the Crown and country, the term "orders," became loosely applied to the insignia and decorations themselves. Thus "orders," irrespective of the title or other specific designation they confer, fall in Great Britain generally into three main categories, according as the recipients are made "knights grand cross," "knights commander" or "companions" In some orders the classes are more numerous, as in the Royal Victorian, for instance, which has five, numerous foreign orders a like number, some six, while the Chinese "Dragon" boasted no less than 11 degrees. Generally speaking, the insignia of the "knights grand cross" consist of a star worn on the left breast and a badge, usually some form of the cross-paty, worn suspended from a ribbon over the shoulder or, in certain cases, on days of high ceremonial from a collar. The "commanders" wear the badge from a ribbon round the neck, and the star on the breast; the "companions" have no star and wear the badge from a narrow ribbon at the button-hole.

Orders may, again, be grouped according as they are (1) PRIME ORDERS OF CHRISTENDOM, conferred upon an exclusive class only. Here belong, or belonged, the well-known orders of the *Garter* (England), *Golden Fleece* (Austria and Spain), *Annunziata* (Italy), *Black Eagle* (Prussia), *St. Andrew* (Russia), *Elephant* (Denmark) and *Seraphim* (Sweden). Of these the first three only, which are usually held to rank *inter se* in the order given, are historically identified with chivalry. (2) FAMILY ORDERS, bestowed upon members of the royal or princely class, or upon humbler individuals according to classes, in respect of "personal" services rendered to the family. In this category are such orders as the Royal Victorian and the Hohenzollern (Prussia). (3) ORDERS OF MERIT, whether military, civil or joint orders. Such have, as a rule. at least three, oftener five classes, and here belong such as the *Order of the Bath* (British) and the *Legion of Honour* (France). There are also certain orders, such as the recently instituted *Order of Merit* (British), which have but one class.

Of the great military and religious orders were the Teutonic Order and the Knights of St. John of Jerusalem *(Johanniter Orden, Malteser Orden)*, for the history of which and the present state *see* TEUTONIC ORDER and ST. JOHN OF JERUSALEM, KNIGHTS OF THE ORDER OF.

Great Britain.— The history and constitution of the "most

noble" *Order* of *the Garter* has been treated above. The officers of the order are five—the prelate, chancellor, registrar, king of arms and usher—the first, third and fifth having been attached to it from the commencement, while the fourth was added by Henry V. and the second by Edward IV. The prelate has always been the bishop of Winchester; the chancellor was formerly the bishop of Salisbury, but is now the bishop of Oxford; the registrarship and the deanery of Windsor have been united since the reign of Charles I.; the king of arms, whose duties were in the beginning discharged by Windsor herald, is Garter Principal King of Arms; and the usher is the gentleman usher of the Black Rod. The chapel of the order is St. George's chapel, Windsor.

The "most ancient" *Order of the Thistle* was founded by James II. in 1687, and dedicated to St. Andrew It consisted of the sovereign and eight knights companions, and fell into abeyance at the Revolution of 1688. In 1703 it was revived by Queen Anne, when it was ordained to consist of the sovereign and 12 knights companions, the number being increased to 16 by statute in 1827. The officers of the order are the dean, the secretary, Lyon King of Arms and the gentleman usher of the Green Rod. The chapel, in St. Giles's, Edinburgh, was begun in 1909. The collar is formed of thistles, alternating with sprigs of rue, and the motto is *Nemo me impune lacessit.*

The "most illustrious" *Order of St. Patrick* was instituted by George III. in 1788, to consist of the sovereign, the lord lieutenant of Ireland as grand master and 15 knights companions, enlarged to 22 in 1833. The king of arms is Ulster King of Arms; Black Rod the usher. The chapel is in St. Patrick's cathedral, Dublin. The collar is formed of alternate roses with red and white leaves, and gold harps linked by gold knots; the badge is suspended from a harp surmounted by an imperial jewelled crown. The motto is *Quis separabit?*

The "most honourable" *Order* of *the Bath* was established by George I. in 1725, to consist of the sovereign, a grand master and 36 knights companions. This was a pretended revival of an order supposed to have been created by Henry IV. at his coronation in 1399. But, as has been shown in the preceding section, no such order existed. Knights of the Bath, although they were allowed precedence before knights bachelors, were merely knights bachelors who were knighted with more elaborate ceremonies than others and on certain great occasions. In 1815 the order was instituted, in three classes, "to commemorate the auspicious termination of the long and arduous contest in which the empire has been engaged"; and in 1847 the civil knights commanders and companions were added. Exclusive of the sovereign, royal princes and distinguished foreigners, the order is limited to 55 military and 27 civil knights grand cross, 145 military and 108 civil knights commanders, and 705 military and 298 civil companions. The officers of the order are the dean (the dean of Westminster), Bath King of Arms, the registrar and the usher of the Scarlet Rod.

The "most distinguished" *Order of St. Michael and St. George* was founded by the prince regent, afterwards George IV., in 1818, in commemoration of the British protectorate of the Ionian islands, "for natives of the Ionian islands and of the island of Malta and its dependencies, and for such other subjects of his majesty as may hold high and confidential situations in the Mediterranean." By statute of 1832 the lord high commissioner of the Ionian islands was to be the grand master. After the repudiation of the British protectorate of the Ionian islands, the order was placed on a new basis, and by letters patent of 1868 and 1877 it was extended and provided for such of "the natural born subjects of the Crown of the United Kingdom as may have held or shall hold high and confidential offices within her majesty's colonial possessions, and in reward for services rendered to the crown in relation to the foreign affairs of the empire." The chapel of the order, in St. Paul's cathedral, was dedicated in 1906. The star of the knights grand cross is a seven-rayed star of silver with a small ray of gold between each, in the centre is a red St. George's cross bearing a medallion of St. Michael encountering Satan, surrounded by a blue fillet with the motto *Auspicium melioris aevi.*

The *Order of St, Michael and St. George ranks* between the "most exalted" *Order* of *the Star of India* and the "most eminent" *Order of the Indian Empire*, of both of which the viceroy of India for the time being is *ex officio* grand master. Of these the first was instituted in 1861 and enlarged in 1876, 1897 and 1903, in three classes, knights grand commanders, knights commanders and companions, and the second was established (for "companions" only) in 1878 and enlarged in 1887, 1892, 1897 and 1903, also in the same three classes, in commemoration of Queen Victoria's assumption of the style and title of empress of India. The collar of the *Star of India* is composed of alternate links of the lotus flower, red and white roses and palm branches enamelled on gold, with an imperial crown in the centre; that of the *Indian Empire* is composed of elephants, peacocks and Indian roses.

The *Royal Victorian Order* was instituted by Queen Victoria on April 25, 1896, for personal services rendered to her majesty and her successors. It consists of the sovereign, chancellor, secretary and five classes—knights grand commanders, knights commanders, commanders and members of the fourth and fifth classes.

To the class of orders without the titular appellation "knight" belongs the *Order of Merit*, founded by King Edward VII. on the occasion of his coronation. The order includes those who have gained distinction in the military and naval services of the empire, and such as have made themselves a great name in the fields of science, art and literature. The number of British members has been fixed at 24, with the addition of such foreign persons as the sovereign shall appoint. A lady, Miss Florence Nightingale, received the order in 1907. The badge is a cross of red and blue enamel surmounted by an imperial crown; the central blue medallion bears the inscription "For Merit" in gold, and is surrounded by a wreath of laurel. The badge of the military and naval members bears two crossed swords in the angles of the cross. The ribbon is garter blue and crimson and is worn round the neck.

The *Distinguished Service Order*, an order of military merit, was founded on Sept. 6, 1886, by Queen Victoria, to recognize the special services of officers in the army and navy. It consists of one class only, who take precedence immediately before the 4th class of the Royal Victorian Order. The badge is a white and gold cross with a red centre bearing the imperial crown surrounded by a laurel wreath. The ribbon is red. edged with blue. The *Imperial Service Order* was likewise instituted on June 26, 1902, and finally revised in 1908, as a recognition of services rendered to the British crown by the members of the civil service in the empire, to consist of companions only. In precedence the order ranks after the Order of the British Empire, 4th class.

In addition to the above, there are two British orders confined to ladies. The *Royal Order of Victoria and Albert* was instituted in 1862 as a purely court distinction. The *Imperial Order of the Crown of India* was conferred for like purposes as the Order of the Indian Empire. Its object was to recognize the services of ladies connected with the court of India.

As was inevitable, the huge number of people engaged in the World War made it necessary that appointments to all the British Orders should be made on a greatly increased scale, while two additional Orders were instituted. A change in the method of wearing the badge of the Third Class (Companion) of some British Orders was made. Where it used to be worn medal-fashion on the left breast, it is now hung round the neck.

The *Order of the British Empire* was instituted in June 1917, to reward War services in all capacities, military and civil. In 1918 a Military Division of the Order was created. The essential features of the latest statute of the Order, published on Dec. 29, 1922, are as follows:—

There are five classes of the Order, which (like the Order of the Bath) is divided into military and civil divisions. Each class can be conferred upon men and women equally.

Highest Class—Knights Grand Cross and Dames Grand Cross (G.B.E.).

Second Class—Knights Commander and Dames Commander (K.B.E. and D.B.E.).

Third Class—Commanders (C.B.E.).

Fourth Class--Officers (O B E.).

Fifth Class—Members (M B.E.).

The two highest classes of the Order wear a star, which is of

silver, of two designs. In the centre is a golden medallion showing a representation of Britannia seated, surrounded by a circlet of crimson enamel bearing the motto of the Order, "For God and the Empire."

The members of the first class wear the larger star on the left breast, and the badge of the Order *(see* below) is also worn on the sash, which, in the case of men, is $3\frac{3}{4}$ in. wide, in the case of women, $2\frac{1}{4}$ in. wide, and crosses the breast from the right shoulder to the left hip, the badge resting on the hip. A collar has been instituted for this class.

The members of the second class wear the smaller star on the left breast, with the badge suspended, in the case of men, by a ribbon $1\frac{3}{4}$ in. wide passing round the neck, and in the case of women, from a bow of ribbon of the same width, placed on the left side, above the star. The third class wear the badge, in the case of men, from a ribbon of the same width as the second class round the neck, and, in the case of women, from a bow on the left side. The fourth and fifth classes wear the badge on the left breast, from a ribbon $1\frac{1}{2}$ in. wide, medal-fashion in the case of men, from a bow in the case of women.

The badge is a cross paty, bearing in the centre the medallion and circlet as in the star. An imperial crown in gold surmounts the cross. For the first three classes the cross is enamelled in pearl grey, bordered with gold, while the circlet is of red enamel with the motto in gold. The commander's badge is smaller than that for the other two classes. The badge of the fourth class is entirely silver gilt, while that of the lowest class is entirely silver. The ribbon of the Order is purple for the civil division, and purple with a narrow red central stripe for the military division.

There are also two medals belonging to the Order: The gallantry medal, which is rare, and is only awarded for conspicuous bravery, where the recipient knew, when he performed the deed of gallantry, that his life was in danger, and the meritorious service medal, given for meritorious service.

The order of *Companions of Honour* was instituted in June 1917, at the same time as the Order of the British Empire. It may be conferred upon either men or women who have rendered conspicuous national service; it confers no title or precedence.

It consists of the Sovereign and 50 members, and there is only one class. This order ranks next after the first class of the Order of the British Empire.

The sovereign's permission by royal warrant is necessary before a British subject can receive a foreign order of knighthood. For other decorations, *see* under NUMISMATICS.

The Golden Fleece (La **Toison d'Or**) ranks historically and in distinction as one of the great knightly orders of Europe. It became divided into two branches, Austria and Spain. It was founded on Jan. 10, 1429–30, by Philip the Good, duke of Burgundy, on the day of his marriage with Isabella of Portugal at Bruges, in her honour and dedicated to the Virgin and St. Andrew. No certain origin can be given for the name. It seems to have been in dispute even in the early history of the order. At its constitution the number of the knights was limited to 24, exclusive of the grand master, the sovereign. The sovereign undertook to consult the knights before embarking on a war, all disputes between the knights were to be settled by the order, at each chapter the deeds of each knights were held in review, and punishments and admonitions were dealt out to offenders; to this the sovereign was expressly subject. Thus we find that the emperor Charles V. accepted humbly the criticism of the knights of the Fleece on his over-centralization of the government and the wasteful personal attention to details. The knights could claim as of right to be tried by their fellows on charges of rebellion, heresy and treason, and Charles V. conferred on the order exclusive jurisdiction over all crimes committed by the knights. It was in defiance of this right that Alva refused the claim of Counts Egmont and Horn to be tried by the knights of the Fleece in 1568. By the marriage of Mary, only daughter of Charles the Bold of Burgundy to Maximilian, archduke of Austria, 1477, the grand mastership of the order came to the house of Habsburg and, with the Netherlands provinces, to Spain in 1504 on the accession of Philip, Maximilian's son, to Castile. On the extinction of the Habsburg dynasty in Spain by the death of Charles II. in 1700 the grand-mastership, which had been filled by the kings of Spain after the loss of the Netherlands, was claimed by the emperor Charles VI., and he instituted the order in Vienna in 1713. Protests were made at various times by Philip V., but the question was never decided by treaty, and the Austrian and Spanish branches continued as independent orders as the principal order of knighthood in the respective States. While the Austrian branch excludes any other than Roman Catholics from the order, the Spanish Fleece may be granted to Protestants. The badges of the two branches vary slightly in detail, more particularly in the attachment of firestones and steels by which the fleece is attached to the ribbon of the collar. The collar is composed of alternate links of furisons and double steels interlaced to form the letter B for Burgundy.

Austria-Hungary.—The following were the principal orders other than that of the Golden Fleece. The *Order of St. Stephen of Hungary*, the royal Hungarian order, founded in 1764 by the empress Maria Theresa. The *Order of Leopold*, for civil and military service, was founded in 1808 by the emperor Francis I. in memory of his father Leopold II. The *Order of the Iron Crown, i.e.,* of Lombardy, was founded by Napoleon as king of Italy in 1809, and refounded as an Austrian order of civil and military merit in 1816 by the emperor Francis I. The *Order of Francis Joseph*, for personal merit of every kind, was founded in 1849 by the emperor Francis Joseph I. The *Order of Maria Theresa* was founded by the empress Maria Theresa in 1757. A purely military order, it was given to officers for personal distinguished conduct in the field. The *Order of Elzzabeth Theresa*, also a military order for officers, was founded in 1750 by the will of Elizabeth Christina, widow of the emperor Charles VI. It was renovated in 1771 by her daughter, the empress Maria Theresa. The *Order of the Starry Cross*, for high-born ladies of the Roman Catholic faith who devoted themselves to good works, was founded in 1668 by the empress Eleanor, mother of Leopold I., to commemorate the recovery of a relic of the true cross from a fire in the palace at Vienna. The relic was supposed to have been peculiarly treasured by the emperor Maximilian I. and the emperor Frederick III. The *Order of Elizabeth*, also for ladies, was founded in 1898.

Belgium.—The *Order of Leopold*, for civil and military merit, was founded in 1832 by Leopold I., with four classes, a fifth being added in 1838. The badge is a white enamelled cross, with gold borders and balls, suspended from a royal crown and resting on a green laurel and oak wreath. In the centre a medallion, surrounded by a red fillet with the motto of the order, *L'union fait la force*, bears a golden Belgian lion on a black field. The ribbon is watered red. The *Order of the Iron Cross*, the badge of which is a black cross with gold borders, with a gold centre bearing a lion, was instituted by Leopold II. in 1867 as an order of civil merit. The military cross was instituted in 1885. There are also the following orders instituted by Leopold II. for service in the Congo State: the *Order of the African Star* (1888), the *Royal Order of the Lion* (1891) and the *Congo Star* (1889).

Bulgaria.—The *Order of SS. Cyril and Methodius* was instituted in 1909 by King Ferdinand to commemorate the elevation of the principality to the position of an independent kingdom. It now takes precedence of the *Order of St. Alexander*, which was founded by Prince Alexander in 1881, and reconstituted by Prince Ferdinand in 1888.

Denmark.—The *Order of the Elephant*, one of the chief European orders of knighthood, was, it is said, founded by Christian I. in 1462; a still earlier origin has been assigned to it, but its regular institution was that of Christian V. in 1693. The order, exclusive of the sovereign and his sons, is limited to 30 knights, who must be of the Protestant religion. The ribbon is light watered blue, the collar of alternate gold elephants with blue housings and towers, the star of silver with a purple medallion bearing a silver or brilliant cross surrounded by a silver laurel wreath. The motto is *Magnanime pretium.* The *Order of the Dannebrog* is, according to Danish tradition, of miraculous origin, and was founded by Valdemar II. in 1219 as a memorial of a victory over the Esthonians, won by the appearance in the sky

of a red banner bearing a white cross. Historically the order dates from the foundation in 1671 by Christian V. at the birth of his son Frederick. The badge of the order is, with variations for the different classes. a white enamelled Danish cross with red and gold borders, bearing in the centre the letter W (V) and on the four arms the inscription *Gud og Kongen* (For God and King). The ribbon is white with red edging.

Egypt.—Since the war, the king of Egypt has founded six new Orders. The chief of them is the *Order of Mohammed Ali* (1915), with three classes: the ribbon is of watered green silk with a white line near to each edge. In 1922 was founded the *Order of Ismail*, the second Egyptian Order; the ribbon dark blue with a stripe of red towards the edges. The *Order of the Nile* (1915) has a ribbon of watered blue silk with a golden-yellow stripe at each edge. For ladies is the *Order of Al Kamal* (1915). The other orders are those of *Agriculture* (1915) and of the *Military Star of King Fuad* (1919).

France.—The Legion of Honour, the only order of France, and one which in its higher grades ranks in estimation with the highest European orders, was instituted by Napoleon Bonaparte on May 19, 1802 (29 Floreal of the year X.), as a general military and civil order of merit. All soldiers on whom "swords of honour" had been already conferred were declared legionaries *ipso facto*, and all citizens after 2j years' service were declared eligible, whatever their birth, rank or religion. On admission all were to swear to co-operate so far as in them lay for the assertion of the principles of liberty and equality. The organization as laid down by Napoleon in 1804 was as follows: Napoleon was grand master; a grand council of seven grand officers administered the order; the order was divided into 1j "cohorts" of seven grand officers, 20 commanders, 30 officers and 350 legionaries, and at the headquarters of the cohorts, for which the territory of France was separated into 15 divisions, were maintained hospitals for the support of the sick and infirm legionaries. Salaries varying in each rank were attached to the order. In 1805 the rank of "Grand Eagle" (now Grand Cross or *Grand Cordon)* was instituted, taking precedence of the grand officers. At the Restoration many changes were made, the old military and religious orders were restored, and the *Legion of Honour*, now *Ordre Royale de la Le'gion d'Honneur*, took the lowest rank. The revolution of July 1830 restored the order to its unique place. The constitution of the order now rests on the decrees of March 16 and Nov. 24, 1852, the law of July 25, 1873, the decree of Dec. 29, 1892, and the laws of April 16. 1895, and Jan. 28, 1897, and a decree of June 26, 1900. The president of the republic is the grand master of the order; the administration is in the hands of a grand chancellor, who has a council of the order nominated by the grand master. The chancellery is housed in the *Palais de la Légion d'Honneur*, which, burnt during the Commune, was rebuilt in 1878. The order consists of the five classes of grand cross (limited to 80), grand officer (200), commander (1,000), officers (4,000), and chevalier or knight, in which the number is unlimited. These limitations in number do not affect the foreign recipients of the order. Salaries are attached to the military and naval recipients of the order when on the active list. The numbers of the recipients of the order *sans traitement* are limited through all classes. In ordinary circumstances 20 years of military, naval or civil service must have been performed before a candidate can be eligible for the rank of chevalier, and promotions can only be made after definite service in the lower rank. Extraordinary service in time of war and extraordinary services in civil life admit to any rank. Women have been decorated, notably Rosa Bonheur, Madame Curie and Madame Bartet. In the present order of the French republic the symbolical head of the republic appears in the centre, and a laurel wreath replaces the imperial crown; the inscription round the medallion is *République française*.

Among the orders swept away at the French Revolution, restored in part at the Restoration, and finally abolished at the revolution of July 1830 were the following: The *Order of St. Michael* was founded by Louis XI. in 1469 for a limited number of knights of noble birth. Later the numbers were so much increased under Charles IX, that it became known as Le *Collier à toutes bêtes*. In 1816 the order was granted for services in art and science. In view of the low esteem into which the *Order of St. Michael* had fallen, Henry III. founded in 1578 the *Order of the Holy Ghost (St. Esprit)*. The badge of the order was a white Maltese cross decorated in gold, with the gold lilies of France at the angles, in the centre a white dove with wings outstretched, the ribbon was sky blue *(cordon bleu)*. The *Order of St. Louis* mas founded by Louis XIV. in 1693 for military merit, and the *Order of Military Merit* by Louis XV. in 1759, originally for Protestant officers.

Germany.—Officially, the old orders of the German empire have now ceased to exist, although the decorations are often worn.

i. *Anhalt.—The Order of Albert the Bear*, a family order or *Hausorden*, was founded, in 1836 by the dukes Henry of Anhalt-Köthen, Leopold Frederick of Anhalt-Dessau and Alexander Charles of Anhalt-Bernburg.

ii. *Baden.—The Order of Fidelity or Loyalty (Hausorden der Treue)* was instituted by William, margrave of Baden-Durlach in 1715, and reconstituted in 1803 by the elector Charles Frederick. There was. in the end, only one class, for princes of the reigning house, foreign sovereigns and eminent men of the State. The military *Order of Charles Frederick* was founded in 1807. The order was conferred for long and meritorious military service. The *Order of the Zähringen Lion* was founded in 1812 in commemoration of the descent of the reigning house of Baden from the dukes of Zahringen. After 1896 the *Order of Berthold I.* was a distinct order; it was founded in 1877 as a higher class of the *Zähringen Lion*.

iii. *Bavaria.—The Order of St. Hubert*, one of the oldest and most distinguished knightly orders, was founded in 1444 by Duke Gerhard V. of Jiilich-Berg in honour of a victory over Count Arnold of Egmont at Ravensberg on St. Hubert's day. The knights wore a collar of golden hunting horns, whence the order was also known as the *Order of the Horn;* the order fell into abeyance at the extinction of the dynasty in 1609. It was revived in 1708, and its constitution was altered at various times, its final form being given in 1808. The *Order of St. George*, said to have been founded in the 12th century as a crusading order and revived by the emperor Maximilian I. in 1494, dated historically from its institution in 1729 by the elector Charles Albert, afterwards the emperor Charles VII. It was confirmed by the rlector Charles Theodore in 1778 and by the elector Maximilian Joseph IV. as the second Bavarian order. Besides the above Bavaria possessed the *Military Order of Maximilian Joseph*, 1806. and the *Civil Orders of Merit of St. Michael*, 1693, and of the *Bavarian Crown*, 1808. There were also the two illustrious orders for ladies, the *Order of Elizabeth*, founded in 1766, and the *Order of Theresa*, in 1827.

iv. *Brunswick.*—The *Order of Henry the Lion*, for military and civil merit, was founded by Duke William in 1834.

v. *Henover.—The Order of St. George* was instituted by King Ernest Augustus I. in 1839 as the family order of the house of Hanover; the *Royal Guelphic Order* by George, prince regent, afterwards George IV. of Great Britain, in 1815; and the *Order of Ernest Augustus* by George V. of Hanover in 1865. These orders have not been conferred since 1866, when Hanover ceased to be a kingdom, and the *Royal Guelphic Order*, which from its institution was more British than Hanoverian, not since the death of William IV. in 1837. The last British grand cross was the late duke of Cambridge.

vi. *Hesse.*—Of the various orders founded by the houses of Hesse-Cassel and Hesse-Darmstadt the following survived in the grand duchy of Hesse. The *Order of Louis*, founded by the grand duke Louis I. of Hesse-Darmstadt in 1807; the *Order of Philip the Magnanimous*, founded by the grand duke Louis II. in 1840. The *Order of the Golden Lion* was founded in 1770 by the landgrave Frederick II. of Hesse-Cassel.

vii. *Mecklenburg.*—The grand duchies of Mecklenburg-Schwerin and Mecklenburg-Strelitz possessed jointly the *Order of the Wendish Crown*, founded in 1864 by the grand dukes Frederick Francis II. of Schwerin and Frederick William of Strelitz. The *Order* of *the Griffin*, founded in 1884 by Frederick Francis III.

of Schwerin, was made common to the duchies in 1904.

viii. *Oldenberg.* — *The Order of Duke Peter Frederick Louis*, a family order and order of merit, was founded by the grand duke Paul Frederick Augustus in 1838.

ix. *Prussia.*—The *Order of the Black Eagle* was founded in 1701 by the elector of Brandenburg, Frederick I., in memory of his coronation as king of Prussia. The order consisted of one class only and the original statutes limited the number, exclusive of the princes of the. royal house and foreign members, to 30, but the number has been exceeded. It was only conferred on those of royal lineage and upon high officers of State. Only those who had received the *Order of the Red Eagle* were eligible. The *Order of the Red Eagle*, the second of the Prussian orders, was founded originally as the *Order of Sincerity* in 170j by George William, hereditary prince of Brandenburg-Bayreuth. The original constitution and insignia were afterwards changed, with the exception of the red eagle which formed the centre of the cross of the badge. The order had almost fallen into oblivion when it was revived in 1734 by the margrave George Frederick Charles as the *Order of the Brandenburg Red Eagle.* On the cession of the principality to Prussia in 1791 the order was transferred and King Frederick William raised it to its high place in Prussian orders.

The *Order for Merit (Ordre pour le Mérite*), one of the most highly prized of European orders of merit, had two divisions, military and for science and art. It was originally founded by the electoral prince Frederick, afterwards Frederick I. of Prussia, in 1667 as the *Order of Generosity;* it was given its later name and granted for civil and military distinction by Frederick the Great, 1740. In 1810 the order was made one for military merit against the enemy in the field exclusively. In 1840 the class for distinction for science and art, or peace class, was founded by Frederick William IV. The number was limited to 30 German and 30 foreign members. The *Academy of Sciences and Arts* on a vacancy nominated three candidates, from which one was selected by the king. It is interesting to note that this was the only distinction which Thomas Carlyle would accept. The *Order of the Crown,* founded by William I. in 1861, ranked with the Red Eagle. Other Prussian orders were the *Order of William,* instituted by William II. in 1896; a Prussian branch of the knights of St. John of Jerusalem, *Johanniter Orden,* in its later form dating from 1893; and the family *Order of the House of Hohenzollern,* founded in 1851 by Frederick William IV. There was also for ladies the *Order of Service,* founded in 1814 by Frederick William III., in one class, but enlarged in 1850 and in 1865. The decoration of merit for ladies (*Verdienst-kreuz*) founded in 1870, was raised to an order in 1907. For the famous military decoration, the *Iron Cross, see* NUMISMATICS.

x. *Saxony.* — *The Order of the Crown of Rue* was founded as a family order by Frederick Augustus I. in 1807. It was of one class only, and the sons and nephews of the sovereign were born knights of the order. It was granted to foreign ruling princes and subjects of high rank. Other Saxon orders were the military *Order of St. Henry;* the *Order of Albert,* for civil and military merit; the *Order of Civil Merit,* 181j. For ladies there were the *Order of Sidonia,* 1870, in memory of the wife of Albert the Bold, the mother of the Albertine line; and the *Maria Anna Order,* 1906.

xi. The duchies of *Saxe Altenburg, Saxe Coburg Gotha* and *Saxe Meiningen* had in common the family *Order of Ernest,* founded in 1833 in memory of Duke Ernest the Pious of Saxe Gotha and as a revival of the *Order of German Integrity* founded in 1690. Saxe Coburg Gotha and Saxe Meiningen had also separate crosses of merit in science and art.

xii. *Saxe Weimar.*—The *Order of the White Falcon* or *of Vigilance* was founded in 1732 and renewed in 1815.

xiii. *Württemberg.*—The *Order of the Crown of Württemberg* was founded in 1818, uniting the former *Order of the Golden Eagle* and an order of civil merit. Besides the military *Order of Merit* founded in 1759, and the silver cross of merit, 1900, Württemberg had also the *Order of Frederick,* 1830, and the *Order of Olga,* 1871, which was granted to ladies as well as men.

Greece.—The *Order of the Redeemer* was founded as such in 1833 by King Otto, being a conversion of a decoration of honour instituted in 1829 by the National Assembly at Argos. There were five classes, the numbers being regulated for each. In 1912 was instituted the *Order of George I.*

Holland. — The *Order of William,* for military merit, was founded in 1815 by William I.; there are four classes; the badge is a white cross resting on a green laurel Burgundian cross, in the centre the Burgundian flint-steel, as in the order of the Golden Fleece. The motto *Voor Moed, Beleid, Trouw* (for Valour, Devotion, Loyalty), appears on the arms of the cross. The cross is surmounted by a jewelled crown; the ribbon is orange with dark blue edging. The *Order of the Netherlands Lion,* for civil merit, was founded in 1818. The family *Order of the Golden Lion of Nassau* passed in 1890 to the grand duchy of Luxembourg *(see* under *Luxemburg*). In 1892 Queen Wilhelmina instituted the *Order of Orange-Nassau.* The *Teutonic Order* (*q.v.*), surviving in the Ballarde (Bailiwick) of Utrecht, was officially established in the Netherlands by the States General in 1580. It was abolished by Napoleon in 1811 and was restored in 1815.

Italy. — The *Order of the Annunziata,* the highest order of knighthood of the Italian kingdom, was instituted in 1362 by Amadeus VI., count of Savoy, as the Order of the Collare or Collar, from the silver collar made up of love-knots and roses, which was its badge, in honour of the 15 joys of the Virgin; hence the number of the knights was restricted to 15, the 15 chaplains recited 15 masses each day, and the clauses of the original statute of the order were 15 (Amadeus VIII added five others in 1434). Charles III. decreed that the order should be called the Annunziata, and made some other alterations in 1518. His son and successor, Emmanuel Philibert, made further modifications in the statute and the costume. The knights of the Annunziata have the title of "cousins of the king," and enjoy precedence over all the other officials of the State. The costume of the order is of white satin embroidered in silk, with a purple velvet cloak adorned with roses and gold embroidery, but it is now never worn; in the collar the motto *Fert* is inserted, on the meaning of which there is great uncertainty, and from it hangs a pendant enclosing a medallion representing the Annunciation. The motto has been taken as the Latin word meaning "he bears" or as representing the initials of the legend *Fortitudo Ejus Rhodum Tenuit,* with an allusion to a defence of the island of Rhodes by an ancient count of Savoy.

The *Order of St. Maurice and St. Lazarus* (SS. Maurizio e Lazzaro), is a combination of two ancient orders. The Order of St. Maurice was originally founded by Amadeus VIII., duke of Savoy, in 1434, when he retired to the hermitage of Ripaille, and consisted of a group of half-a-dozen councillors who were to advise him on such affairs of State as he continued to control. When he became pope as Felix V. the order practically ceased to exist. It was re-established at the instance of Emmanuel Philibert by Pope Pius V. in 1572 as a military and religious order, and the following year it was united to that of St. Lazarus by Gregory XIII. The latter order had been founded as a military and religious community at the time of the Latin kingdom of Jerusalem with the object of assisting lepers, many of whom were among its members. Popes, princes and nobles endowed it with estates and privileges, including that of administering and succeeding to the property of lepers, which eventually led to grave abuses. With the advance of the Saracens the knights of St. Lazarus, when driven from the Holy Land and Egypt, migrated to France (1291) and Naples (1311), where they founded leper hospitals. The order in Naples, which alone was afterwards recognized as the legitimate descendant of the Jerusalem community, was empowered to seize and confine anyone suspected of leprosy, a permission which led to the establishment of a regular inquisitorial system of blackmail. In the 15th and 16th centuries the order declined in credit and wealth, until finally the grand master resigned his position in favour of Emmanuel Philibert, duke of Savoy, in 1571. Two years later the orders of St. Lazarus and St. Maurice were incorporated into one community, the members of which were to devote themselves to the defence of the Holy See and to fight its enemies as well as to continue assisting lepers. The galleys of the order subsequently took part in

various expeditions against the Turks and the Barbary pirates. Leprosy, which had almost disappeared in the 17th century, broke out once more in the 18th, and in 1773 a hospital was established by the order at Aosta. The knighthood of St. Maurice and St. Lazarus is now a dignity conferred by the king of Italy (the grand master) on persons distinguished in the public service, science, art and letters, trade, and above all in charitable works, to which its income is devoted.

The military *Order of Savoy* was founded in **1815** by Victor Emmanuel of Sardinia; badge modified 1855 and 1857. The *Civil Order of Savoy,* founded in **1831** by Charles Albert of Sardinia, is of one class, and is limited to **60** members. The *Order of the Crown of Italy* was founded in **1868** by Victor Emmanuel II. in commemoration of the union of Italy into a kingdom.

Luxemburg. — The *Order of the Golden Lion* was founded as a family order of the house of Nassau by William III. of the Netherlands and Adolphus of Nassau jointly. On the death of William in 1890 it passed to the grand duke of Luxemburg. The *Order of Adolphus of Nassau,* for civil and military merit, was founded in **1858,** and the *Order of the Oak Crown* as a general order of merit in **1841,** modified 1858.

Monaco. — The *Order of St. Charles* was founded in **1858** by Prince Charles III. and remodelled in **1863.** It is a general order of merit.

Montenegro. — The *Order of St. Peter,* founded in **1852,** was a family order, in one class, and only given to members of the princely family; the *Order of Danilo,* or of the *Independence of Montenegro,* was a general order of merit also founded in **1852.**

Norway. — The *Order of St. Olaf* was founded in **1847** by Oscar I. in honour of St. Olaf, the founder of Christianity in Norway, as a general order of merit, military and civil. The *Order of the Norwegian Lion,* founded in 1904 by Oscar II., has only one class; foreigners on whom the order is conferred must be sovereigns or heads of States or members of reigning houses.

Papal. — The arrangement and constitution of the papal orders was remodelled by a brief of Pius X. in 1905. The *Order of Christ,* the supreme pontifical order, is of one class only; for the history of this ancient order see *Portugal (infra).* The *Order of Pius* was founded in **1847** by Pius IX. The *Order of St. Gregory the Great,* founded in **1831,** is in two divisions, civil and military. The *Order of St. Sylvester* was originally founded as the *Order of the Golden Spur* by Paul IV. in 1559 as a military body, though tradition assigns it to Constantine the Great and Pope Sylvester. It was reorganized as an order of merit by Gregory XVI. in 1841. In 1905 the order was divided into three classes, and a separate order, that of the *Golden Spur* or *Golden Legion* (*Militia Aurata*) was established, in one class, with the numbers limited to 100. The cross *Pro Ecclesia et Pontifice* instituted by Leo XIII. in **1888** is a decoration, not an order. There remains the venerable *Order of the Holy Sepulchre,* of which tradition assigns the foundation to Godfrey de Bouillon. It was, however, probably founded as a military order for the protection of the Holy Sepulchre by Alexander VI. in **1496.** The right to nominate to the order was shared with the pope as grand master by the guardian of the *Patres Minores* in Jerusalem, later by the Franciscans, and then by the Latin patriarch in Jerusalem. In 1905 the latter was nominated grand master, but the pope reserves the joint right of nomination. The badge of the order is a red Jerusalem cross with red Latin crosses in the angles.

Poland. — Since the restoration of Polish freedom, the old *Order of the White Eagle* has been set up again. It is given only for exceptional service: the ribbon is light blue. The origin of the *Order of Polonia Restituta* needs no explanation. There are five classes; the badge is a white cross with the eagle of Poland on it; the ribbon consisting of the Polish national colours, red with white edges.

Portugal. — The *Order of Christ* was founded on the abolition of the Templars by Diniz of Portugal in **1318** in conjunction with Pope John XXII., both having the right to nominate to the order. The papal branch survives as a distinct order. In 1522 it was formed as a distinct Portuguese order and the grand mastership vested in the crown of Portugal. In **1789** its original religious aspect was abandoned, and with the exception that its members had to be of the Roman Catholic faith, it was entirely secularized. The *Order of the Tower and Sword* was founded in **1808** in Brazil by the regent, afterwards King John VI. of Portugal, as a revival of the old *Order of the Sword,* said to have been founded by Alfonso V. in 1459. It was remodelled in **1832** under its later name as a general order of military and civil merit. The *Order of St. Benedict of Aviz* (earlier of *Evora*), founded in **1162** as a religious military order, was secularized in **1789** as an order of military merit. The *Order of St. James of the Sword,* or James of Compostella, was a branch of the Spanish order of that name (*see* below under Spain). It also was secularized in **1789,** and in **1862** was constituted an order of merit for science, literature and art. In 1789 these three orders were granted a common badge uniting the three separate crosses in a gold medallion; to the separate crosses was added a red sacred heart and small white cross. There were also the *Order of Our Lady of Villa Viçosa* (1819), for both sexes, and the *Order of St. Isabella,* 1801, for ladies.

Rumania. — The *Order of the Star of Rumania* was founded in **1877,** and the *Order of the Crown of Rumania* in **1881,** for civil and military merit; the ribbon of the first is red with blue borders, of the second light blue with two silver stripes.

Russia. — The *Order of St. Andrew* was founded in **1698** by Peter the Great. It was the chief order of the empire, and admission carried with it according to the statutes of 1720 the orders of *St. Anne, Alexander Nevsky,* and the *White Eagle;* there was only one class. The *Order of St. Catherine,* for ladies, ranked next to the St. Andrew. It was founded under the name of the *Order of Rescue* by Peter the Great in 1714 in honour of the empress Catherine and the part she had taken in rescuing him at the battle of the Pruth in 1711. The *Order of St. Alexander Nevsky* was founded in **1725** by the empress Catherine I. The *Order of the White Eagle* was founded in 1713 by Augustus II. of Poland and was adopted as a Russian order in **1831.** The *Order of St. Anne* was founded by Charles Frederick, duke of Holstein-Gottorp in 1735 in honour of his wife, Anna Petrovna, daughter of Peter the Great. It was adopted as a Russian order in 1797 by their grandson, the emperor Paul. Other orders were those of *St. Vladimir,* founded by Catherine II., 1782, and of *St. Stanislaus,* founded originally as a Polish order by Stanislaus Augustus Poniatowski in 1765, and adopted as a Russian order in **1831.** The military *Order of St. George* was founded by the empress Catherine II. in **1769** for military service on land and sea, with four classes; a fifth class for non-commissioned officers and men, the *St. George's Cross,* was added in **1807.** [These orders were naturally ended by the Soviet revolution which has given rise to the *Order of the Red Flag,* for service to the international revolution, an order which perhaps does not come under this heading.]

Spain. — The branch of the *Order of the Golden Fleece* has been dealt with above. The three most ancient orders of Spain — of *St. James of Compostella,* or *St. James of the Sword,* of *Alcantara* and of *Calatrava* — still exist as orders of merit, the last two as orders of military merit. They were all originally founded as military religious orders, like the crusading Templars, and the Hospitallers, but to fight for the true faith against the Moors in Spain. The present badges of the orders represent the crosses that the knights wore on their mantles. That of St. James of Compostella is the red lily-hilted sword of St. James; the ribbon is also red The other two orders wear the cross *fleury* — *Alcantara* red, *Calatrava* green, with corresponding ribbons. A short history of these orders may be here given. Tradition gives the foundation of the *Order of Knights of St. James of Compostella* to Ramiro II., king of Leon, in the 10th century, to commemorate a victory over the Moors, but, historically the order dates from the confirmation in 1175 by Pope Alexander III. It gained great reputation in the wars against the Moors and became very wealthy. In 1493 the grand-mastership was annexed by Ferdinand the Catholic, and was vested permanently in the crown of Spain by Pope Adrian VI. in **1522.**

The *Order of Knights of Alcantara,* instituted about **1156** by

the brothers Don Suarez and Don Gomez de Barrientos for protection against the Moors. In 1177 they were confirmed as a religious order of knighthood under Benedictine rule by Pope Alexander III. Until about 1213 they were known as the Knights of San Julian del Pereyro; but when the defence of Alcantara, newly wrested from the Moors by Alphonso IX, of Castile, was entrusted to them they took their name from that city. For a considerable time they were in some degree subject to the grand master of the kindred order of Calatrava. Ultimately, however, they asserted their independence by electing a grand master of their own. During the rule of 37 successive grand masters, similarly chosen, the influence and wealth of the order gradually increased until the Knights of Alcantara were almost as powerful as the sovereign. In 1494–95 Juan de Zuñiga was prevailed upon to resign the grand-mastership to Ferdinand, who thereupon vested it in his own person as king; and this arrangement was ratified by a bull of Pope Alexander VI., and was declared permanent by Pope Adrian VI. in 1523. In 1540 Pope Paul III. released the knights from the strictness of Benedictine rule by giving them permission to marry, though second marriage was forbidden. The three vows were henceforth *obedientia, castitas conjugalis* and *conversio morum.* In modern times the history of the order has been somewhat chequered. When Joseph Bonaparte became king of Spain in 1808, he deprived the knights of their revenues, which were only partially recovered on the restoration of Ferdinand VII. in 1814. The order ceased to exist as a spiritual body in 1835.

The *Order of Knights of Calatrava* was founded in 1 1 j8 by Don Sancho III. of Castile, who presented the town of Calatrava, newly wrested from the Moors, to them to guard. In 1164 Pope Alexander III. granted confirmation as a religious military order under Cistercian rule. In 1197 Calatrava fell into the hands of the Moors and the order removed to the castle of Salvatierra, but recovered their town in 1212. In 1489 Ferdinand seized the grand-mastership, and it was finally vested in the crown of Spain in 1523. The order became a military order of merit in 1808 and was reorganized in 1874. The *Royal and Illustrious Order of Charles III.* was founded in 1771 by Charles III.; it was abolished by Joseph Bonaparte in 1809, together with all the Spanish orders except the Golden Fleece, and the *Royal Order of the Knights of Spain* was established. In 1814 Ferdinand VII. revived the order. The *Order of Isabella the Catholic* was founded in 181j under the patronage of St. Isabella, wife of Diniz of Portugal; originally instituted to reward loyalty in defence of the Spanish possessions in America, it is now a general order of merit. Other Spanish orders are the *Maria Louisa,* 1792, for noble ladies; the military and naval orders of merit of *St. Ferdinand,* founded by the Cortes in 1811; of *St. Ermenegild (Hermenegildo),* 1814; of *Military Merit* and *Naval Merit,* 1866, and of *Maria Christina,* 1890; the *Order of Beneficencia* for civil merit, 18j6; that of *Alfonso XII.* for merit in science, literature and art, 1902, and the *Civil Order of Alfonso XII.,* 1902.

Sweden.—The *Order of the Seraphim* (the "Blue Ribbon"). Tradition attributes the foundation of this most illustrious order of knighthood to Magnus I. in 1280; more certainty attaches to the fact that the order was in existence in 1336. In its modern form the order dates from its reconstitution in 1748 by Frederick I. Exclusive of the sovereign and the princes of the blood, the order is limited to 23 Swedish and eight foreign members. The native members must be already members of the *Order of the Sword* or the *Pole Star.* There is a prelate of the order which is administered by a chapter; the chapel of the knights is in the Riddar Holmskyrka at Stockholm. The collar is formed of alternate gold seraphim and blue enamelled patriarchal crosses. The motto is *Iesus Hominum Salvator.* The *Order of the Sword* (the "Yellow Ribbon"), the principal Swedish military order, was founded, it is said, by Gustavus I. Vasa in 1522, and was re-established by Frederick I., with the *Seraphim* and the *Pole Star* in 1748. The *Order of the Pole Star (Polar Star, North Star,* the "Black Ribbon"), was founded in 1748 for civil merit. The *Order of Vasa* (the "Green Ribbon"), was founded by Gustavus III. in 1772 as an order of merit for services rendered to the national industries and manufactures. The *Order of Charles XIII.,* founded in 1811, is granted to Freemasons of high degree. It is thus quite unique.

Turkey.—The *Nischan-i-Imtiaz,* or *Order of Privilege,* was founded by Abdul Hamid II. in 1879 as a general order of merit in one class; the *Nischan-el-Iftikhar,* or *Order of Glory,* also one class, founded 1831 by hfahmoud II ; the *Nischan-i-Mejidi,* the *Mejidieh,* was founded as a civil and military order of merit in 1852 by Abdul-Mejid. The *Nischan-i-Osmanie,* the *Osmanieh,* for civil and military merit, was founded by Abdul Aziz in 1862. The *Nischan-i-Schefakat of Compassion or Benevolence,* was instituted for ladies in 1878 by the sultan in honour of the work done for the non-combatant victims of the Russo-Turkish war of 1877. There was also the family order, for Turkish princes, the *Hanédani-Ali-Osman,* founded in 1893, and the *Ertogroul,* in 1903.

Yugoslavia.—The *Order of the White Eagle,* the principal order, was founded by Milan I. in 1882; the ribbon is blue and red; the *Order of St. Sava,* founded 1883, is an order of merit for science and art; the *Order of the Star of Karageorgevitch,* was founded by Peter I. in 1904. The orders of *Milosch the Great,* founded by Alexander I. in 1898 and of *Takovo,* founded originally by Michael Obrenovitch in 1863, reconstituted in 1883, are since the dynastic revolution of 1903 no longer bestowed. The *Order of St. Lazarus* is not a general order, the cross and collar being only worn by the king.

Estonia has established the *Liberty Cross; Finland* the *White Rose of Finland; Latvia* the *Order of the Three Stars*

Non-European Orders.—Of the various States of Central and South America, Nicaragua has the *American Order of San Juan* or *Grey Town,* founded in 1857; and Venezuela that of the *Bust of Bolivar,* 1854. hfexico has abolished its former orders, the *Mexican Eagle,* 186j, and *Our Lady of Guadalupe,* 1853; as has Brazil those of the *Southern Cross,* 1822, *Dom Pedro I.,* 1826, *the Rose,* 1829, and the Brazilian branches of the Portuguese orders of *Christ, St. Benedict of Aviz* and *St. James.* The republican *Order of Columbus,* founded in 1890, was abolished in 1891.

China.—There were no orders for natives, and such distinctions as were conferred by the different coloured buttons of the mandarins, the grades indicated by the number of peacock's feathers, the gift of the yellow jacket and the like, were rather insignia of rank or personai marks of honour than orders in the European sense. For foreigners, however, the emperor in 1882 established the sole order, that of the *Imperial Double Dragon.* The recipients eligible for the various classes were graded, from the first grade of the first class for reigning sovereigns down to the fifth class for merchants and manufacturers.

Japan.—The Japanese orders were all instituted by the emperor Mutsu Hito. In design and workmanship the insignia of the orders are beautiful examples of the art of the native enamellers. The *Order of tlze Chrysanthemum (Kikkwa Daijasho),* founded in 1877, has only one class. It is but rarely conferred on others than members of the royal house or foreign rulers or princes. The *Order of the Paulownia Sun (Tokwa Daijasho),* founded in 1888, in one class, may be in a sense regarded as the highest class of the *Rising Sun (Kiokujitsasho)* founded in eight classes, in 18; j. The badge of both orders is essentially the same, viz., the red sun with white and gold rays; in the former the lilac flowers of the Paulownia tree, the flower of the Tycoon's arms, take a prominent part. The last two classes of the *Rising Sun* wear a decoration formed of the Paulownia flower and leaves. The *Order of tlze Mirror* or *Happy Sacred Treasure (Zaihosho)* was founded in 1888. There is also an order for ladies, that of the *Crown,* founded in 1888. The military order of Japan is the *Order of tlze Golden Kite,* founded in 1890.

Persia.—The Order of tlze Sun and Lion, founded by Fath 'Ali Shāh in 1808, had five classes. It is understood that the creation by the present Shah of a new set of orders and decorations, is imminent.

Siam.—The *Sacred Order,* or the *Nine Precious Stones,* was founded in 1869, in one class only, for the Buddhist princes of the royal house, The *Order of the White Elephant,* founded in 1861, is the principal general order. The badge is a striking exam-

ple of oriental design adapted to a European conventional form. The circular plaque is formed of a triple circle of lotus leaves in gold, red and green, within a blue circlet with pearls a richly caparisoned white elephant on a gold ground, the whole surmounted by the jewelled gold pagoda crown of Siam; the collar is formed of alternate white elephants, red, blue and white royal monograms and gold pagoda crowns. Other orders are the Siamese Crown (Mongkut Siam), founded 1869; the family Order of Chulah-Chon-Clao, 1873; and the *Maha Charkrkri,* 1884, only for princes and princesses of the reigning family. (C. WE.)

KNIGHT-SERVICE, the dominant and distinctive tenure of land under the feudal system. Its origin may be traced to the mailed horseman, armed with lance and sword, who became the most important factor in battle. This novel system was introduced after the Conquest by the Normans, who relied essentially on their mounted knights, while the English fought on foot. They were already familiar with the principle of knight-service, the knight's fee, as it came to be termed in England, being represented in Normandy by the *fief* du haubert, so termed from the hauberk or coat of mail (*lorica*) which was worn by the knight. The coronation charter of Henry I. (1100) speaks of those holding by knight-service as *milites* qui per loricam terras *suas* deserviunt.

The Conqueror divided the lay lands of England among his followers, to be held by the service of a fixed number of knights in his host, and imposed the same service on most of the great ecclesiastical bodies. No record evidence exists of this action on his part, and the quota of knight-service exacted was not determined by the area or value of the lands granted, but was based upon the unit of the feudal host, the constabularia of ten knights. Of the tenants-in-chief or barons (*i.e.*, those who held directly of the Crown), the chief ones were called on to find one or more of such units, while of the lesser ones some were called on for five knights, *i.e.*, half a constabularia. The same system was adopted in Ireland when that country was conquered under Henry II. The baron who had been enfeoffed by his sovereign on these terms could provide the knights required either by hiring them for pay or, more conveniently when wealth was mainly represented by land, by a process of subenfeoffment, analogous to that by which he himself had been enfeoffed.

The primary obligation incumbent on every knight was service in the field, when called upon, for 40 days a year, with specified armour and arms. There was, however, a standing dispute as to whether he could be called upon to perform this service outside the realm, nor was the question of his expenses free from difficulty. In addition to this primary duty he had, in numerous cases at least, to perform that of "castle ward" at his lord's chief castle for a fixed number of days in the year. On certain baronies also was incumbent the duty of providing knights for the guard of royal castles, such as Windsor, Rockingham and Dover. Under the feudal system the tenant by knight-service had also the same pecuniary obligations to his lord as had his lord to the king. These consisted of (1) "relief," which he paid on succeeding to his lands; (2) "wardship," *i.e.*, the profits from his lands during a minority; (3) "marriage," *i.e.*, the right of giving in marriage, unless bought off, his heiress, his heir (if a minor) and his widow; and also of the three "aids" (*q.v.*). The chief sources of information for the extent and development of knight-service are the returns (cartae) of the barons (*i.e.*, the tenants-in-chief) in 1166, informing the king, at his request, of the names of their tenants by knight-service with the number of fees they held, supplemented by the payments for "scutage" (*q.v.*) recorded on the pipe-rolls, by the later returns printed in the Testa de Nevill, and by the still later ones collected in Feudal Aids. In the returns made in 1166 some of the barons appear as having enfeoffed more and some less than the number of knights they had to find. In the latter case they described the balance as being chargeable on their "demesne," *i.e.*, on the portion of their fief which remained in their own hands. These returns further prove that lands had already been granted for the service of a fraction of a knight, such service being in practice already commuted for a proportionate money payment; and they show that the total number of knights with which land held by military service was charged was not, as was formerly supposed, 60,000, but probably somewhere between 5,000 and 6,000. Similar returns were made for Normandy, and are valuable for the light they throw on its system of knight-service.

The principle of commuting for money the obligation of military service struck at the root of the whole system, and so complete was the change of conception that "tenure by knight-service of a mesne lord becomes, first in fact and then in law, tenure by escuage (*i.e.*, scutage)." By the time cf Henry III., as Bracton states, the test of tenure was scutage; liability, however small, to scutage payment made the tenure military.

The disintegration of the system was carried farther in the latter half of the 13th century as a consequence of changes in warfare, which were increasing the importance of foot soldiers and making the service of a knight for 40 days of less value to the king. The barons, instead of paying scutage, compounded for their service by the payment of lump sums, and, by a process which is still obscure, the nominal quotas of knight-service due from each had, by the time of Edward I., been largely reduced. The knight's fee, however, remained a knight's fee, and the pecuniary incidents of military tenure, especially wardship, marriage and fines on alienation, long continued to be a source of revenue to the Crown. But at the Restoration tenure by knight-service was abolished by 12 Car. II. *c.* 24, and these vexatious exactions disappeared.

BIBLIOGRAPHY.—For the returns of 1166 see the Liber Niger, ed. by Hearne, and the Liber *Rubeus* or Red Book of the Exchequer, ed. by Hall. The later returns are in Testa de *Nevill* (Record Commission, 1807) and in the Record Office volumes of Feudal Aids, arranged under counties. For the financial side see the early pipe-rolls of the Record Commission and the Pipe Roll Society, and abstracts of later ones in The Red Book of the Exchequer; but the editor's view must be received with caution and checked by J. H. Round's Studies on the Red Book of the Exchequer (for private circulation). The Baronia *Anglica* of Madox may also be consulted. The existing theory on knight-service was enunciated by Mr. Round in English Historical Review, vi., vii., and reissued by him in his *Feudal* England (1895). It is accepted by Pollock and Maitland (*Hist.* Eng. Law), who discuss the question at length; by J. F. Baldwin in his Scutage and Knight-service in England (Univ. of Chicago Press, 1897), a valuable monograph with bibl.; and by Petit-Dutaillis, in his Studies supplementary to Stubbs *Constitutional* History (Manchester Univ. Series. 1908). (J. H. R.)

KNIGHTS OF COLUMBUS, THE, a leading Roman Catholic laymen's organization, was founded by the Rev. Michael J. McGivney on March 29. 1882, in New Haven, Conn. Organized as a fraternal benefit society, the Knights maintained from their inception insurance programs for members. Noninsurance members were designated associates.

The primary object of the organization is to associate Catholic men for religious and civic useiulness The Knights established a chair of American history (1904) and an endowment of $500,000 for scholarships (1912) at the Catholic University of America, and during World War I became well-knoan for welfare work. In 1944 they established a trust fund to provide higher education for children of members uho lost their lives during World War II. Under its advertising program, started in 1948, the organization offered to answer inquiries about religion. In 1952 it founded an endowment for the preservation of documents in the Vatican library. The original documents were microfilmed, and a set of the films was deposited at St. Louis university. Thus for the first time many priceless documents were made available to U.S. scholars.

KNIGHTS OF THE GOLDEN CIRCLE, a semi-military secret society in the United States, in the Middle West, 1861–64, the purpose of which was to bring the Civil War to a close and restore the "Union as it was." After the outbreak of the Civil War many of the Democrats of the Middle West, who were opposed to the war policy of the Republicans, organized the Knights of the Golden Circle, pledging themselves to exert their influence to bring about peace. In 1863, owing to the disclosure of some of its secrets, the organization took the name of Order of American Knights, and in 1864 this became the Sons of Liberty. The total membership of this order probably reached 250,000 to 300,000, principally in Ohio, Indiana, Illinois, Iowa, Wisconsin, Kentucky and south-western Pennsylvania. Fernando Wood of New York seems to have been the chief officer and in 1864 Clement L. Vallandigham of Ohio was second in command. The

great importance of the Knights of the Golden Circle and its successors was due to their opposition to the war policy of the Republican administration. The plan was to overthrow the Lincoln government in the elections and give to the Democrats the control of the state and Federal governments, which would then make peace and invite the Southern States to come back into the Union on the old footing. The most effective work done by the order was in encouraging desertion from the Federal armies, preventing enlistments and resisting the draft. Wholesale arrests of leaders and numerous seizures of arms by the United States authorities resulted in a general collapse of the order late in 1864. Three of the leaders were sentenced to death by military commissions, but sentence was suspended until 1866, when they were released under a decision of the United States Supreme Court.

AUTHORITIES.—*An Authentic Exposition of the Knights of the Golden Circle* (Indianapolis, *1863*); E. McPherson, *Political History of the Rebellion* (Washington, 1876); and W. D. Foulke, ***Life*** *of O. P. Morton* (2 vols., 1899); *Treason History of Sons of Liberty*, F. G. Stidger (Chicago, 1903); J. F. Rhodes, *History of the United States from the Compromise of 1850*, vol. v. (1905).

KNIPPERDOLLINCK or **KNIPPERDOLLING, BERNT** (BEREND or BERNHARDT) (*c.* 1490–1536), German divine, was a prosperous cloth-merchant at Münster when in 1524 he joined Melchior Rinck and Melchior Hofmann in a business journey to Stockholm, which developed into an abortive religious errand. Knipperdollinck, a man of fine presence and glib tongue, noted from his youth for eccentricity, had the ear of the Münster populace when in 1527 he helped to break the prison of Tonies Kruse, in the teeth of the bishop and the civic authorities. For this he made his peace with the latter; but, venturing on another business journey, he was arrested, imprisoned for a year, and released on payment of a high fine—in regard of which treatment he began an action before the Imperial Chamber. Though his aims were political rather than religious, he attached himself to the reforming movement of Bernhardt Rothmann, once (1529) chaplain of St. Mauritz, outside Münster, now (1532) pastor of the city church of St. Lamberti. A new bishop directed a mandate (April 17, 1532) against Rothmann, which had the effect of alienating the moderates in Münster from the democrats.

Knipperdollinck was a leader of the democrats in the surprise (Dec. 26, 1532) which made prisoners of the negotiating nobles at Telgte, in the territory of Münster. In the end, Münster was by charter from Philip of Hesse (Feb. 14, 1533) constituted an evangelical city. Knipperdollinck was made a burgomaster in Feb. 1534. Anabaptism had already (Sept. 8, 1533) been proclaimed at Münster by a journeyman smith; and, before this, Heinrich Roll, a refugee, had brought Rothmann (May 1533) to a rejection of infant baptism. From Jan. 1, 1534, Roll preached Anabaptist doctrines in a city pulpit; a few days later, two Dutch emissaries of Jan Matthysz, or Matthyssen, the master-baker and Anabaptist prophet of Haarlem, came on a mission to Münster. They were followed (Jan. 13) by Jan Beukelsz (or Bockelszoon, or Buchholdt), better known as John of Leyden. It was his second visit to Munster; he came now as an apostle of Matthysz. He was 25, with a winning personality, great gifts as an organizer, and plenty of ambition. Knipperdollinck, whose daughter Clara was ultimately enrolled among the wives of John of Leyden, came under his influence. Matthysz himself came to Münster (1534) and lived in Knipperdollinck's house, which became the centre of the new movement to substitute Münster for Strasbourg (Melchior Hofmann's choice) as the New Jerusalem. On the death of Matthysz, in a foolish raid (April 5, 1534), John became supreme.

Knipperdollinck, with one attempt at revolt, when he claimed the kingship for himself, was his subservient henchman, wheedling the Münster democracy into subjection to the fantastic rule of the "king of the earth." He was made second in command, and executioner of the refractory. He fell in with the polygamy innovation, the protest of his wife being visited with a penance. In the military measures for resisting the siege of Münster he took no leading part. On the fall of the city (June 25, 1535) he hid in a dwelling in the city wall, but was betrayed by his landlady. After six months' incarceration, his trial, along with his comrades, took place on Jan. 19, and his execution, with fearful tortures, on Jan. 22, 1536. Knipperdollinck attempted to strangle himself, but was forced to endure the worst. His body, like those of the others, was hung in a cage on the tower of St. Lamberti, where the cages are still to be seen. An alleged portrait, from an engraving of 1607, is reproduced in the appendix to A. Ross's *Pansebeia* (1655).

See L. Keller, *Geschichte der Wiedertäufer und ihres Reichs zu Münster* (1880); C. A. Cornelius, *Historische Arbeiten* (1899); E. Belfort Bax, *Rise and Fall of the Anabaptists* (1903). (A. Go.)

KNITTING. Fabrics consisting of joined loops are formed by knitting or crocheting. Both types of fabric are produced on or with needles by a manual manipulation. In knitting, the two or more needles used are usually made of stiff metal, bone, or ivory, pointed at one or both ends; although a single flexible needle has been evolved, pointed at each end, which can readily be bent into a circle, with which either tubular or selvaged fabrics can be formed, thereby eliminating needles that are loose from the fabric. If the new loops are all drawn through previous loops in one direction, plain fabric results: loops drawn through in the other direction are known as purled loops. If plain and purled loops alternate in the rows, the result is ribbed fabric. If rows or courses of loops are drawn alternately to the fabric face and back, links-and-links fabric will be produced and designs can be formed by so doing in part courses or with selected loops only. Other designs can be produced in knitted fabric by drawing a new loop through more than one loop at a time, thereby forming eyelet or lace fabric. By not drawing a new loop through an old loop for one or a number of courses, the loop, when it is cast off by having a new loop drawn through it and the float threads, forms a tuck stitch. In addition to ribbing, eyeleting, purling, and tucking, there are a great number of other types of loops, so that a great variety of patterns can be produced. Knitted fabrics can readily be widened by casting an additional loop or loops on the needle, or narrowed by bringing two loops together. Crocheted fabrics are also formed of joined loops, but the loops of such fabric are not retained on long needles or wires, the yarn being interlooped in the wale vertically, and not crosswise of the fabric which is the case in knitted fabrics, where chains of loops are formed with a hooked needle. The first wale of a new fabric is merely formed as a chain, with the second and subsequent wales similarly formed, but with the yarn drawn through an adjacent wale. A much greater variety of patterns can be produced by crocheting, than by knitting. (*See* also HOSIERY.) (M. C. Mr.)

KNOBKERRIE, a strong, short stick with a rounded knob or head used by the natives of South Africa in warfare and the chase (from the Taal or South African Dutch, *knopkirie*, derived from Du. *knop*, a knob or button, and *kerrie*, a Bushman or Hottentot word for stick). It is employed at close quarters, or as a missile, and in time of peace serves as a walking-stick. The name has been extended to similar weapons used by the natives of Australia, the Pacific islands, and other places.

KNOLLES, **RICHARD** (*c.* 1550–1610), English scholar, whose *The Generall Historie of the Turkes* (**1603**) was highly praised for its prose style by Samuel Johnson, Henry Hallam, Robert Southey and Byron, but is of little historical value. It was continued to the treaty of Karlowitz (1699) by Sir Paul Rycaut in an edition of 1687–1700. Knolles was born probably at Cold Ashby, Northamptonshire, and graduated from Lincoln college, Oxford, in 1565, being elected fellow in **1571**. He became master of the grammar school at Sandwich, Kent, where he died in 1610. His only other published work was a translation of Jean Bodin, *The Six Bookes of a Commonweale* (1610).

KNOLLES (or **KNOLLYS), SIR ROBERT** (*c.* 1325–1407), English soldier, belonged to a Cheshire family. In **1346** he served in Brittany, and he was one of the English survivors who were taken prisoners by the French after the famous "combat of the thirty" in March 1351. He was soon released and took advantage of the civil war in Brittany to win fame and wealth. In 1356 he transferred his operations to Normandy, when he served under the allied standards of England and of Charles II. of Navarre. He led the "great company" in their work of devastation along the valley of the Loire, winning a terrible reputation by his

ravages. After the treaty of Brétigny in 1360 Knolles returned to Brittany, and took part in the struggle for the possession of the duchy between John of Montfort (Duke John IV) and Charles of Blois, gaining great fame by his conduct in the fight at Auray (Sept. 1364). In 1367 he fought in Spain with the Black Prince and in 1369 in Aquitaine. In 1370 he headed an expedition which invaded France and marched on Paris, but a mutiny broke up the army, and he was forced to take refuge in his Breton castle of Derval. In 1363 Knolles again assisted John of Montfort in Brittany, where he acted as John's representative; later he led a force into Aquitaine, and was one of the leaders of the fleet sent against the Spaniards in 1377. In 1380 he served in France under Thomas of Woodstock, afterward duke of Gloucester, distinguishing himself at the siege of Nantes; and in 1381 he went with Richard II to meet Wat Tyler at Smithfield. He died at Sculthorpe in Norfolk on Aug. 1 j, 1407. Sir Robert built a college and an almshouse at Pontefract; he restored the churches of Sculthorpe and Harpley; and he helped to found an English hospital in Rome. Knolles won an immense reputation by his skill and valour in the field, and ranks as one of the foremost captains of his age. French writers call him Canolles, or Canole.

KNOLLYS (nōlz), name of an English family descended from Sir Thomas Knollys (d. 1435), lord mayor of London. The first distinguished member of the family was Sir Francis Knollys (c. 1514–96), English statesman, son of Robert Knollys, or Knolles (d. 1521), a courtier in the service and favour of Henry VII and Henry VIII. Robert's younger son, Henry, took part in public life during the reign of Elizabeth and died in 1583.

Sir Francis **Knollys.**—Francis Knollys, who entered the service of Henry VIII before 1540, became M.P. in 1542 and was knighted in 1547 while serving with the English army in Scotland. A strong supporter of the reformed doctrines, he retired to Germany after Mary's accession, returning to England to become a privy councillor, vice-chamberlain of the royal household and a member of parliament under Queen Elizabeth, whose cousin Catherine (d. 1569), daughter of William Carey and niece of Anne Boleyn, was his wife. Knollys was sent in 1 j66 to Ireland, his mission being to obtain for the queen confidential reports on the lord-deputy Sir Henry Sidney, of whose conduct of affairs he gave a good report. In 1568 he was sent to Carlisle to take charge of Mary Queen of Scots; he was afterward in charge of the queen at Bolton castle and then at Tutbury castle. He gave up the position of guardian just after his wife's death in Jan. 1569. He was treasurer of the royal household from 1572 until his death on July 19, 1596. His monument may still be seen in the church of Rotherfield Grays, Oxfordshire. Knollys was Elizabeth's commissioner on such important occasions as the trials of hlary Queen of Scots, of Philip Howard earl of Arundel, and of Anthony Babington. Sir Francis's eldest son Henry (d. 1583), and his sons Edward (d. c. 1580), Robert (d. 1625), Richard (d. 1596), Francis (d. c. 1648), and Thomas, were all courtiers and served the queen in parliament or in the field. His daughter Lettice (1540–1634) married Walter Devereux, earl of Essex, and then Robert Dudley, earl of Leicester; she was the mother of Elizabeth's favourite, the 2nd earl of Essex.

Some of Knollys's letters are in T. Wright's *Queen* Elizabeth and her *Times* (1838) and the *Burghley* Papers, ed. S. Haynes (1740); and a few of his manuscripts arc still in existence. A speech which Knollys delivered in parliament against some claims made by the bishops was printed in 1608 and again in W. Stoughton's Assertion for *True* and *Christian Church Policie* (London, 1642).

Sir William **Knollys.**—Sir Francis Knollys's second son William (c. 1547–1632) served as a member of parliament and a soldier during the reign of Queen Elizabeth, being knighted in 1586. William became in 1596 a privy councillor and comptroller of the royal household; in 1602 he was made treasurer of the household. James I created him Baron Knollys in 1603 and Viscount R'allingford in 1616. Through his second wife Elizabeth (1586–1658), daughter of Thomas Howard, earl of Suffolk, Knollys was related to Frances, countess of Somerset, and when this lady was tried for the murder of Sir Thomas Overbury her relatives were regarded with suspicion. Wallingford had to resign his appointments, but he regained the royal favour, and was created earl of Banbury in 1626. He died in London on May 25, 1632.

Sir W. T. **Knollys.**—His descendant, Sir William Thomas Knollys (1797–1883), entered the army and served with the Guards during the Peninsular War. Remaining in the army after the conclusion of the peace of 1815 he rose high in his profession. From 1855 to 1860 he was in charge of the military camp at Aldershot, then in its infancy, and in 1861 he was made president of the council of military education. From 1862 to 1877 he was comptroller of the household of the prince of Wales, afterward King Edward VII. From 1877 until his death on June 23, 1883, he was gentleman usher of the black rod; he was also a privy councillor and colonel of the Scots Guards.

Viscount **Knollys.**—His son Francis (1837–1924), private secretary to Edward VII and George V, was created Baron Knollys in 1902 and received a viscounty in 1911. Another son, Sir Henry Knollys (1840–1930), was private secretary to King Edward's daughter Maud, queen of Norway until 1919.

KNORR, LUDWIG (1859–1921), German chemist, was born on Dec. 2, 1859, at Munich. He studied at Munich, Heidelberg and Erlangen. He was assistant in the chemical laboratories of the University of Munich (1880–82), at the University of Erlangen (1882–85), director of the analytical department of the chemical laboratories at the University of Wiirzburg (1885–88), "professor extraordinarius" of chemistry at Wurzburg (1888–89), and finally professor at the University of Jena. He died at Jena on June 4, 1921. Knorr's researches were in organic chemistry; he isolated and synthesized a number of organic compounds. and did experimental and theoretical work on tautomerism. He isolated, synthesized and gave a proof of the structure of pyrazole; he also isolated the di-keto, keto-enol and di-enol forms of dibenzoylsuccinic esters and of diacetylsuccinic esters. He synthesized pyrazolone, antipyrine and quinoline.

KNOSSOS: see CRETE: Archaeology.

KNOT (Calidris canutus), a limicoline (shore-inhabiting) bird, very abundant at certain seasons on the shores of Great Britain and of many northern countries. There are few shore birds that present greater changes of plumage according to age or season. The knot, about 10 in, long, is rather larger than a snipe, but with a shorter bill and legs. In winter the plumage is ash-gray above (save the rump, which is white) and white beneath. In summer the feathers of the back are black, broadly margined with light orange-red mixed with white; those of the rump, white more or less tinged with red; and the lower parts are of a nearly uniform deep chestnut. The birds that winter in temperate climates seldom attain the brilliancy of colour exhibited by those that arrive from the south. Young birds are ash-gray above, each feather banded with dull black and ocher, while the breast is tinged with warm buff. There are four protectively coloured eggs. European birds (C. c. canutus). breeding on the Taimyr peninsula and Spitsbergen, winter in Africa; northern Asiatic knots (C. c. rogersi), breeding on the New Siberian Islands, migrate to the east coast of Asia and winter in Australia and New Zealand; the American knots (C. c. *rufus*), breeding north of the Arctic circle from Melville peninsula and southeastern Victoria Island north to northern Ellsmere Island and northwestern Greenland, winter in southern South America, south of Peru on the west coast and from Buenos Aires to Tierra del Fuego on the east coast. The name is also applied to an oriental species (C. tenuirostris), probably breeding in northeastern Siberia and wintering from India to Australia and the Malays. Knots are sometimes called robin sandpipers or robin snipe.

(G. F. Ss.)

KNOTS, interlacements of the parts of one or more ropes, cords, threads, etc.; commonly used as devices for binding together various objects. The word is from the O.E. cnotta, from a Teutonic stem *knott;* cf. "knit" and Ger. *knoten.* A description of the more familiar knots is given below. The word is also applied to any hard mass resembling a knot drawn tight as, for example, to that formed in the trunk of a tree at the intersection of a branch. "Knot" or "knob" is an architectural term for a bunch of flowers, leaves or other ornamentation carved on a corbel or on a boss. In heraldry a "knot" is an ornamental figure

formed by intertwining the parts of one or more cords. The word is used on shipboard to denote the distance marks on a log line, and hence as the equivalent of a nautical mile per hour. When a ship travels 20 nautical miles (6,080 ft.) per hour, her speed is 20 knots. The term is also applied figuratively to any intricate problem, hard to disentangle, a use stereotyped in the proverbial expression "cutting the Gordian knot." *(See* GORDIUM.)

KNOTS, BENDS, HITCHES, SPLICES AND SEIZINGS

These are all ways of fastening together the parts of one or more ropes, cords, etc., or of attaching a rope to some such object as a ring or spar. In the narrow sense, a "knot" is a knob on a rope. usually formed by untwisting the strands at an end and weaving them together *(cf.* "wall knot," fig. 2-G), though sometimes by turning the rope on itself through a loop *(cf.* "overhand knot," fig. 1-A). A "bend" and a "hitch" are ways of fastening ropes to one another or to spars. etc. A "splice" is made by untwisting two rope ends and weaving them together. A "seizing" is made by fastening together two spars, two ropes or two parts of the same rope by means of another rope. The use of the various terms is, however, often arbitrary. Generally speaking, the knot and seizing are meant to be permanent and must be unwoven in order to be unfastened, while the bend and hitch can be undone at once by pulling the ropes in the reverse direction from that in which they are meant to hold. The governing principle in the design of these last is that the strain which pulls against them shall draw them together. Many forms of fastening are employed on shipboard and in industry. Some of the more important ones are here described and pictured; for further details, the reader is referred to any book on seamanship In the figures, the knots are drawn very slack and open, in general, so that their structure may be more plainly exhibited.

Knots for Fastening.— Overhand Knot (fig. 1-A). Used to make a knob on a rope, or as the commencement of another knot.

Figure-of-eight Knot (fig. 1-B). Turned in the end of a rope to prevent unreeving. It will not jam as an overhand does.

Square, or *Reef Knot* (fig. 1-C). Two overhand knots turned in opposite nays. Should be carefully distinguished from the *Granny* (fig. 1-D), nhich jams nhen it does not slip. A square knot is unsatisfactory for uniting ropes of different sizes, as the parts will slip unless stopped down. For fastenings of a temporary nature, the second knot is sometimes turned over a bight in the end *a* of one of the ropes (fig. 1-E). By a pull on *a,* the knot can be slipped loose. A *Thief's Knot* (fig. 1-F), though similar in appearance to a square knot, will slip under a strain applied to the two standing parta *b* and *b'*. To make a *Surgeon's Knot* (fig. 1-G), take an additional twist after turning the first overhand, and draw the partially completed knot taut. The parts will be held in place by the friction of the cord while the second overhand is being tied. Used in tying a ligature around a cut artery.

Half Hitch (fig. 1-H). Pass the end of the rope round the standing part *b* and through the bight. *Half Hitch Over a Pin* (fig. 1-I). Should be made so as to continue the lay of the rope about the pin. *Midshipman's Hztch* (fig. 1-J).

Slippery Hitch (fig. 1-K). Pass the end *a* under a belaying pin or cleat and tuck a bight under the standing part *b*. Can be slipped loose by a pull on *a*.

Bowline (fig. 1-L). Forms a loop that cannot slip. A very common and useful knot. Lay the end *a* over the standing part *b;* form with *b* a bight *c* over *a;* take *a* round behind *b* and through the bight *c*. *Running Bowline* (fig. 1-M) is a convenient temporary running noose. Formed by making a bowline over its own standing part. *Bowline on a Bight* (fig. 1-N) is a more comfortable sling for a man than a simple bonline. Double the rope on itself; start as if to make a bowline in the doubled rope, but finish by passing the loop *c* around the loop *b*.

Sheepshank (fig. 1-O). Used for temporarily shortening a rope. A half hitch is taken with the standing parts *a* round the bights b.

Blackwall Hitch (fig. 1-P). Form a bight at the end of the rope and put the hook of the tackle through the bight so that the end of the rope may be jammed between the standing part and the hook. This and the next two are used for hooking tackle on to the end of a rope.

Double Blackwall, or *Stunner Hitch* (fig. 1-Q). Pass the end *a* twice round the hook under the standing part *b* at the last cross.

Cat's-paw (fig. 1-R). Twist up two parts of a lanyard in opposite directions and hook the tackle through the two eyes thus formed.

Sheet, or *Becket Bend,* also called a *Weaver's Knot* (fig. 1-S). Suitable for uniting ropes of different sizes. Pass the end of one rope through a bight of the other, around both parts of the other, and under its own standing part. An ordinary net is a series of sheet bends. Similar in principle is the *Double Sheet Bend* (fig. 1-T).

Carrick Bend (fig. 1-U). Lay the end of one rope over its own part so as to form a bight. Pass the end of the other rope through the bight, etc., as shown in the figure. *Double Carrick Bend* (fig. 1-V). Commonly used for bending hawsers together. If the two parts are of different sizes, each part should be seized back on itself. May be tied in either of two ways shown.

Reeving Line Bend (fig. 1-W). Particularly useful when the lines are to be veered through a small pipe.

English, or *Fishel-man's Knot.* Used for fastening gut ends, etc. The ends are laid alongside pointing in opposite directions and an overhand is made in each around the end of the other.

Two ropes are sometimes united by means of a square knot (fig. 1-C) or by means of two interlinking bowlines, one on each rope.

Clove Hitch, or *Builder's Knot* (fig. 1-X). Pass the end *a* round a spar and cross it over *b*. Pass it round the spar again and put the end *a* through the second bight. *Two Half Hitches:* the half hitch repeated; or a *Round Turn and Two Half Hitches* (fig. 1-I[T]).

Fisherman's Bend. Take two turns round a spar, then a half hitch round the standing part and between the spar and turns. An added half hitch round the standing part gives an *Anchor Bend* (fig. 2-A), used to bend a cable to an anchor; or if, in place of the last half hitch, the end *a* is tucked under one of the round turns. we obtain a *Studding-sail Halyard Bend* (fig. 2-B). A *Magnus Hitch* has two round turns, then a third on the other side of the standing part, nith the end through the bight. *Studding-sail Tack Bend* (fig. 2-C). Will not come adrift by the flapping of the sail.

Timber Hitch (fig. 2-D). Take the end of a rope round a spar, then round the standing part, then several times around its own part against the lay of the rope. *Timber and Half Hitch* (fig. 2-E). Used for towing or dragging a spar.

Rolling Hitch (fig. 2-F). Very handy when one rope is to be fastened to the standing part of another or to a spar, as the rope can be put on and taken off very rapidly. For hauling a spar, two round turns are taken around the spar in the direction in nhich it is to be hauled and a half hitch on the other side of the hauling part.

Knots Worked in the End of a Rope.— Wall Knot (fig. 2-G). Unlay the end of a rope and nith the strand *a* form a bight; take the next strand *b* round the end of *a;* take the last strand *c* round the end of *b* and through the bight made by *a*. Haul the ends taut.

Wall and Crown (fig. 2-H). Form a wall knot and lay one of the ends *a* over the knot. Lay *b* over *a* and *c* over *b* and through the bight of *a*. Haul the ends taut. *Double Wall and Double Crown,* or *Man Rope Knot* (fig. 2-I). Form a wall and crown and let the ends follow their own parts round until all the parts appear double. Put the ends down through the knot.

Single Matthew Walker (fig. 2-J). Unlay the end of a rope and with the strand *a* form a bight; take the next strand *b* round the end of *a* and through the bight made by *a;* take the last strand *c* round the ends of *a* and *b* and through the bight made by *b*. Haul the ends taut. *Double Matthew Walker* (fig. 2-K). Lnlay the ends of a rope. Take the first strand round the rope and through its own bight; the second round the rope, through the bight of the first and through its own bight; the third through all three bights. Haul the ends taut.

Single Diamond Knot (fig. z-L). Unlay the ends of a rope and with the strands form three bights down the sides. Pass strand *a* over *b* and through the bight of *c;* pass strand *b* over *c* and through the bight of a; pass strand *c* over a and through the

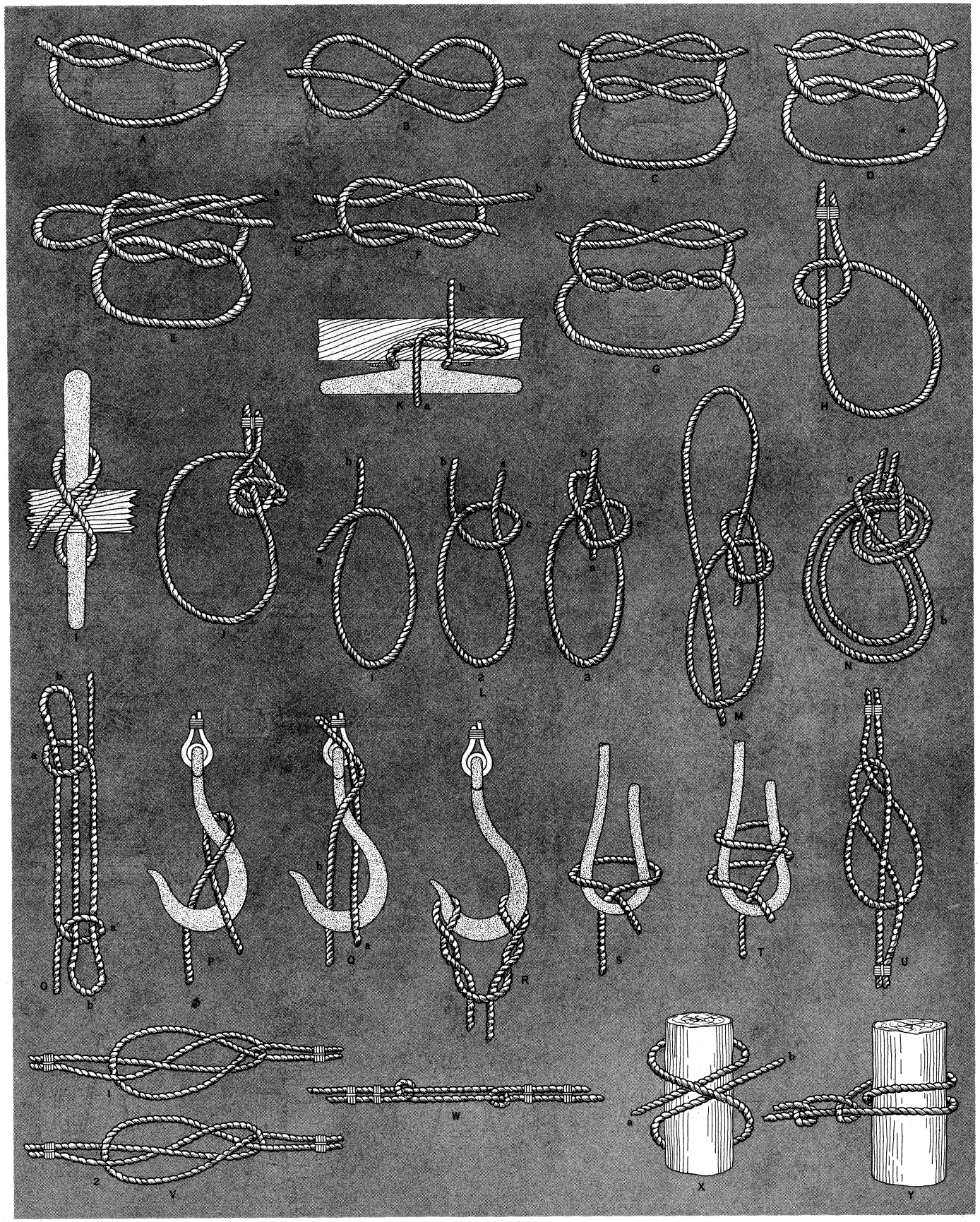


FIG. 1.—DIFFERENT KINDS OF KNOTS

(A) Overhand; (B) figure-of-eight; (C) square, or reef; (D) granny; (E) temporary square; (F) thief's; (G) surgeon's; (H) half hitch; (I) half hitch over a pin; (J) midshipman's hitch; (K) slippery hitch; (L) bowline; (M) running bowline; (N) bowline on a bight; (O) sheepshank; (P) blackwall hitch; (Q) double blackwall, or stunner hitch; (R) cat's-paw; (S) sheet, or becket bend; (T) double sheet bend; (U) carrick bend; (V) double carrick bend; (W) reeving line bend; (X) clove hitch, or builder's knot; (Y) round turn and two half hitches

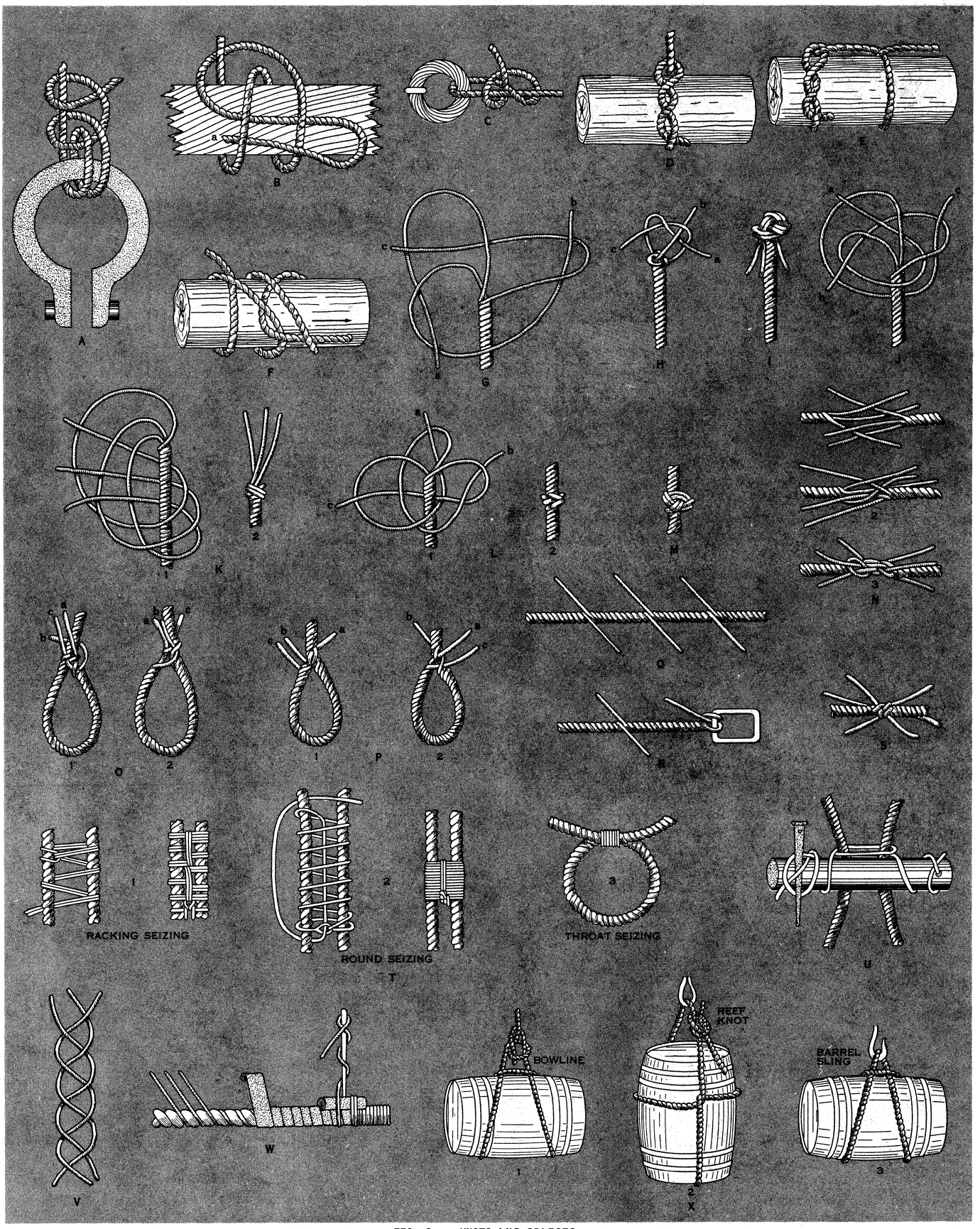


FIG. 2. — KNOTS AND SPLICES

(A) Anchor bend; (B) studding-sail halyard bend; (C) studding-sail tack bend: (D) timber hitch; (E) timber and half hitch; (F) rolling hitch; (G) wall; (H) wall and crown (I) double wall and double crown, or man rope; (J) single Matthew Walker; (K) double Matthew Walker; (L) single diamond; (M) double diamond; (N) short splice; (O) eye splice; (P) sailmaker's eye splice; (Q) long splice; (R) chain splice; (S) shroud knot; (T) seizings; (U) Spanish windlass; (V) sennit; (W) worming a rope; (X) methods of fastening tackle to barrels

bight of b. Haul the ends taut. and lay the rope up again. *Double Diamond Knot* (fig. 2-M). First make a single diamond. Make strands *a* and *b* (fig. 2-L) follow the lead of the single knot through two single bights, so that they come up on top of the knot; make strand *c* pass through two double bights. Haul the ends taut and lap the rope up again.

Splices.—*Short Splice* (fig. 2-N). The strands at the end of each rope are unlaid, married and tucked through the lay of the other rope, over one strand and under the next, two or three times each way. To render the splice neater the strands should be trimmed down to two-thirds their original size before being tucked under for the second time, and to one-third their original size before the last tuck.

Eye splice (fig, 2-0). The strands at the end of a rope are brought back on the body of the rope at such a distance as to give an eye of the size wanted. The unlaid strands are then tucked through the strands of the rope (which are opened out by a spike), in the manner shown in the figure. They are then trimmed and tucked again, trimmed and tucked a third time, passing over one strand and under the next, as in the case of a short splice. *Sailmaker's Eye Splice* (fig. 2-P). Used in the roping of sails. Continues the original lay of the rope around the eye.

Cut Splice and *Horseshoe Splice.* Similar to an eye splice but made out of two pieces of rope; therefore with two splices. In a horseshoe splice the part of one rope between the two splices is much shorter than the corresponding part of the other.

Long Splice (fig. 2-Q). The ropes are unlaid for a considerable distance and their ends brought together with strands interlacing. One strand of each rope is then unlaid for a further distance and the vacant space filled by the adjacent part of the other rope. The splice is thus practically divided into three parts; at each the two strands are halved, knotted and turned in twice. *Chain Splice* (fig. 2-R). For splicing a rope to a chain.

Shroud Knot (fig. 2-Sj. Used when shrouds or stays are broken. A stop is passed at such distance from each end of the broken shroud as to afford strands of sufficient length. The strands are then unlaid, the parts married as if to make a short splice, and a wall knot formed in each, as shown in the figure. After the knot has been well stretched the ends are tapered, laid smoothly between the strands of the shroud, and firmly served over.

Seizings.—These are used to lash together spars, ropes or parts of the same rope. Various types of seizings are illustrated in fig 2-T. With heavy ropes, where power is necessary to heave the parts together, some such device as a *Spanish Windlass* (fig. 2-U) may be employed. The marlinspike, which may act as a lever. is attached to the rope of the windlass by a *Marlinspike Hitch,* as shown in the figure.

Miscellaneous.—There are various ways of securing blocks to ropes. One simple method is to splice an eye of suitable size at one end of the rope. The eye is passed over the end of the block and held in position by a round seizing clapped on cloce under the block. A *single strap* is made by joining the ends of a rope by a short splice. The strap is passed over the end of the block and secured by a seizing. as in the previous case. An iron thimble with a hook is frequently strapped to a block. When this is done the strap is reeved through the eye of the hook and over the groove of the thimble. A seizing is clapped on between the thimble and the block.

Grommet Strap. Made from a single strand of somewhat more than three times the length of the circumference of the strap. Lay one end of the strand over the standing part to form a ring, then with the long end follow the lay of the rope until the ring becomes three-stranded. Split the ends, knot two of the halves together so that the knot will fall in the lay of the rope. cut off the remaining halves, and tuck the knotted halves under the lay of the rope. as in finishing a long splice.

Selvagee Strap. This is a pliable strap used for clapping a tackle on gear, etc. It is made by winding rope yarns around two or more pegs placed at suitable distances from one another, until a strap of the desired stoutness has been obtained. The yarns are then secured together by half hitching with marline.

Sennit (fig. 2-V). Made by plaiting together three rope yarns. It makes a flat lashing, or gasket.

Worming a rope consists in winding spun yarn between the strands, following the lay of the rope (fig. 2-W). This helps to keep out the moisture and renders the surface of the rope smooth for parceling. *Parceling* consists in winding a strip of tarred canvas spirally around the rope, as a further protection from the wet. *Serving* consists in wrapping small stuff snugly over the parceling. Ordinarily a serving mallet is used for hauling each turn taut. Various methods for fastening tackle to barrels, casks, etc., are illustrated in fig. 2-X.

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THE MATHEMATICAL THEORY OF KNOTS

In the sense of analysis situs *(see* TOPOLOGY, GENERAL), a knot is any simple, closed curve in three dimensional space. a curve which never passes more than once through the same point of space and which may be thought of as starting at a point *P* and ultimately returning to P. Two knots are said to be of the same class if there exists a continuous deformation of space carrying one knot into the position initially occupied by the other. If a knot is of the same class as a circle, it is said to be unknotted, for it is convenient to treat an unknotted curve as a special case of a knot, just as it is convenient to treat a straight line as a special case of a curve. No general method has, as yet, been found for telling when two arbitrarily given knots are of the same class, or even for telling whether or not a curve is unknotted.

The structure of a perfectly general mathematical curve can be so complicated that, in most discussions on knots, attention is confined to curves of a reasonable degree of regularity. These last may be thought of, without serious error, as physical threads, arbitrarily twisted and tangled. and closed by having their two ends sealed together. From this physical point of view the problem of classifying knots reduces to the problem of telling under what conditions it is possible, by a process of bending, stretching and shrinking, to deform one of two arbitrarily given threads into a thread of the same shape as the other.

The knot problem seems to have been originally proposed and studied by J. B. Listing in one of the earliest works ever published on the subject of analysis situs. It was again attacked. independently. by P. G. Tait at a time when attempts were being made to interpret material atoms as vortex lines in the ether and to account for the differences in the various chemical elements by ascribing to the atoms of each a characteristic type of knottedness.

In examining a knotted thread the observer notices a certain number of apparent crossing points where, from his point of observation, one branch of the thread is seen to pass in front of another. This number of apparent crossing points may be varied either by deforming the knot or by shifting the point of observation. hut in any particular knot there is a certain minimal number k of crossing points which may be attained by suitably deforming the knot, but below which it is impossible to pass. The number k is a knot invariant, called the number of irreducible crossings of the knot. The simplest possible knot is one of zero crossings: that is to say, one which is unknotted Next in order of simplicity come the trefoil knots with three crossings each. These knots are not of the same class. The problem of effectively determining the number of irreducible crossings of an arbitrarily given knot is still unsolved.

A classification of the more elementary knots according to the number of their irreducible crossings was begun by Tait and later extended by Kirkman. Little and others, so that tables now exist which exhibit all possible kinds of knots of 11 or fewer crossings. These tables are not altogether satisfactory, however. for they were arrived at by essentially empirical methods. It has never actually been proved, for instance, that no two knots listed in the tables as of distinct classes can be transformed into one another.

The first effectively calculable knot invariants were discovered by J. W. Alexander and, later, independently by K. Reidemeister.

With the aid of these invariants, Alexander and Briggs have shown that all knots of eight or less crossings listed as distinct by Tait actually do belong to different classes. However, the new invariants appear to be insufficient to solve the knot problem completely, for they fail to distinguish between certain knots of nine crossings which give every indication of belonging to different classes. It is even doubtful whether they are sufficient to determine whether or not an arbitrary thread is unknotted. A neat classification of braids has been made by Artin.

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KNOT SIGNS. One of the commonest devices to recall to mind something to be done is to tie a knot in a handkerchief. It is probable that the untrained memory would fail to recall the meaning attached to more than a very limited number of knots (see QUIPU). The simplest application of these knots is in keeping a record of a number of days, as is related by Herodotus (iv, 98) of Darius, who, on crossing the Ister in his Scythian expedition, left with the Greeks appointed to guard the bridge a thong with a number of knots equal to the number of days that their watch over the bridge was to be continued. One knot was to be undone each day, and if the king had not returned by the time that all the knots were undone, the Greeks were to break down the bridge and go away.

KNOTWEED or SMARTWEED, the common names! particularly for *Polygonum aviculare,* also called knotgrass, though not a grass, and in general for various plants of the genus *Polygonum* (family Polygonaceaej. All members of the genus, which contains about 27j species, mostly in temperate regions, are herbaceous. Many of them have an acrid or peppery juice. The flowers, mostly with a five-lobed perianth and about eight stamens, are white, greenish or brightly coloured, and consequently visited by insects. In some species, however (*e.g., P. aviculare*), cleistogamous flowers are produced, while in P. *viviparum* many of the lower flowers are replaced by bulbils. In North America upward of 75 species are found, among which are several which have been introduced from the old world, but most of them are native in the western part. About 12 species occur in the British Isles.

The name knotgrass is sometimes used in the southern United States to denote the joint grass, *Paspalum distichum,* which is a true grass (Gramineae) and a good fodder plant.

KNOWLEDGE, THEORY OF, that branch of philosophy which has for its field of operations a range of problems concerned with the nature of knowledge in general. The questions which it investigates are those such as the character of knowledge itself and the relation between it and belief; the validity and reliability of our claims to knowledge of the external world through sense perception; the propriety of claims to knowledge beyond the limits of sense perception; our use of general concepts and of general words; and the presuppositions required for our use of memory arid by our claims to recognize objects or kinds of object as being the same as what we have met with before.

The main divisions of the present article are as follows:

I. General Considerations
II. Theory of Knowledge in Greek Philosophy
  1. Plato
  2. Aristotle
III. Scholastic Epistemology
IV. Cartesian Rationalism
V. Empiricism and the Critical Philosophy
  1. Locke
  2. Berkeley
  3. Hume
  4. Kant
VI. Epistemology in the 20th Century
  1. Perception and Memory
  2. Linguistic Analysis

I. GENERAL CONSIDERATIONS

Theory of knowledge has always been a branch of western philosophy. from the earliest Greek philosophers onward, although it has not' always been explicitly acknowledged as a branch or given a name of its own. Plato, for instance, made early and very substantial contributions to the subject but nowhere marked it off from other branches of philosophy. "Epistemology." the name by which it is now commonly known, was first used in J. F. Ferrier's *Institutes of Metaphysic* (1854). Traditionally, it has been thought to be the business of philosophy to provide us with knowledge of reality; that is, the reality behind the appearances, or reality as contrasted with the appearances by which we are, or may be, deluded. This traditional view, which was natural and acceptable throughout the period before the distinction began to be drawn between philosophy and the sciences (in the 16th and 17th centuries), continued even after the sciences set up on their own; and only in the 20th century was it generally recognized that the position of philosophy is not, after all, that of the supreme authority on the nature of reality.

Throughout the reign of the traditional view it seemed natural to suppose that while one, indeed the main, function of philosophy was to provide knowledge of reality. another necessary function was to answer questions about knowledge itself, to examine the credentials of what men, in the first function, claimed as knowledge. Typical questions would be those mentioned at the beginning of this article; and the task of answering them was the role of epistemology.

Some philosophers, of whom Descartes and Locke would be classic instances, have held that it must be impossible for us to perform the first function of philosophy, namely to acquire knowledge of reality. until we have completed the performance of the second function; *i.e.,* until we have established what are the conditions necessary and sufficient for the acquisition of knowledge and what are the possible extent and limitations of human knowledge. As Locke put it, a sailor needs to know the length of line that he has available before he goes out to sound the depths of the ocean with it.

Although nowadays almost all philosophers, accepting the distinction between philosophy and the sciences, would deny that philosophy has the first function at all (or. at the least, they would regard it as transformed from the task of acquiring new knowledge to that of understanding or analyzing more fully the knowledge that we already have), they would still, for the most part, uphold the second function, that of epistemology. For, even if it is the business of the .sciences rather than of philosophy to pursue and to attain new knowledge. we must still ask what constitutes knowledge; and that will be a question for philosophers. But there is another shift of view also to be recognized: whereas until quite recently philosophy was regarded (and regarded itself) as the queen of the sciences. that is to say, as deciding what scientific claims to knowledge were to be accepted, nowadays a less authoritative role is claimed for it. Physicists and chemists are, in general, the best people to decide whether something in physics or in chemistry is a matter of knowledge or not. It is hardly for philosophers to tell them or to put them in their place. except. say. where they are inconsistent in the demands which they require for knowledge in different contexts. In epistemology the business of philosophers is again that of helping our understanding what is involved in the claim to know that something is the case, what we are committed to in making that claim. etc. Their answers to such questions might incidentally have the effect of querying, or even of rejecting, a piece of what had hitherto been accepted as knowledge; but that would not be very likely, especially in the established sciences, where methods are rigorous enough without a philosopher's interference. In ordinary life, however, many people are careless enough, if they are firmly convinced that something is the case. to suppose that they know that it is the case; and here some understanding, even elementary, of theory of knowledge might have a practical value.

Knowing might seem and has often been taken to be a relationship between two terms: the subject (the knower) and the object (the known). The relationship has been conceived as an act

of awareness or acquaintance, as though knowing was to be regarded as in this respect like seeing. The defects of this view, which has a fairly continuous history right back to Plato, and the errors of the analogy with seeing are generally recognized among philosophers today. The attempt to give an account of knowledge on the lines of that analogy and on the supposition that it is an act or a process and the attempt to find a characteristic of such a process that will guarantee that it is indeed a process of knowing tend to lead to a confusion between epistemology and psychology.

But even if the supposedly simple model of seeing is given up, knowing still seems, in a general way, to require the antithesis of knower and known. And while philosophers as such do not now undertake the task of investigating "the structure of the subjective process called knowing," they still undertake the task of analyzing the nature of knowledge, part of which task will be to ask questions about the objects of knowledge. For example. do we have direct knowledge of the external world? Can we ever really perceive the material objects which we say that we perceive? Are the intellectual difficulties of supposing that we can and that we do so perceive them much greater than we ordinarily recognize? Are we entitled to suppose that what we perceive exists unperceived? Are physical objects really coloured? Do they in themselves possess any of the colours which we sap that we see in them? Such questions about objects are among the traditional questions of epistemology. In the middle of the 20th century the most current modern view would be that such questions are not rightly conceived, or not rightly framed. For they look to be factual questions. to which an answer "Yes" or "No" ought to be attainable, at least with the acquisition of more empirical knowledge. This. it is held, is to misconceive the questions, for philosophical questions are not in this way questions of fact. But this modern view would not rule out epistemology in general, or questions about our knowledge of the external world and about the objects of perception in particular: it would say again that the problem is one, not of discovering new facts (that is the job of science), but of understanding old and, in a way, quite familiar facts.

The difference between the philosophical and the scientific approach can be brought out in detail only by considering the doctrines of various philosophers as summarized below. But the contrast can be sufficiently indicated by taking one example, that of belief, and by considering the differing interests of the psychologist and of the philosopher in it.

The psychologist's interest is that of the scientist. He will look for a causal explanation of. say, Jones's believing that the earth is round. and he will be interested in the emotional associations, if any, of the belief. He will want to generalize, if he can, from examining a number of particular such beliefs, so as to correlate: (1) in the case of Jones. beliefs of a certain kind with circumstances of a certain kind and, (2) more widely, if the evidence allows, beliefs of a certain kind held by a certain group of persons with circumstances of a certain kind and. further, variations in belief with variations in circumstance. The fields of propaganda (whether of politics or of commercial advertising) and of evangelical and revivalist religious movements are interesting to the psychologist. He is concerned, not with the truth or the truthlike value of any of these beliefs, but only with questions about the beliefs as natural phenomena and with their capability of explanation in a causal or a statistical way.

The philosopher asks none of those questions about belief. His questions are broadly of three types. First, he asks about the nature of belief: "What is it?"; "Is to believe to be in a given introspectible mental condition?"; "Or is a behaviouristic account needed?"; "Does believing imply a feeling of doubt, or at least of uncertainty?"; "Or is to say that Jones believes that the earth is round not necessarily to say anything at all about the limitations of Jones's confidence?" Secondly. he asks about the truth or falsity of belief: "What is it for a belief to be true or false?"; and "Is there some special kind of relation between belief and the facts present in the one case. bu: not in the other?" Thirdly, he asks about the justification for the belief: not "What made you believe it?" (*e.g.*, "Did your parents bring you up that way?"), but "What reasons can you offer in defense of the beliei?" Reasons will be good or bad, strong or weak. The philosopher will want, if he can, to characterize the conditions of reasons in general being good or bad. It is not necessary that there should be one general answer to that question, but a number of considerations might be mentioned, which would be more clearly specified in particular cases.

The antithesis between psychology and epistemology might be summarized as follows. The psychologist is interested in causal relations of beliefs, in treating beliefs as part of the subject matter of a natural science. The philosopher is interested in questions about the nature of belief itself and about the validity of beliefs irrespective of their causal associations. The two subjects are distinct, not as one science is from another science. but as something which is a science is from something else which is not a science, or as different aspects of a single subject matter, so that they do have a certain overlap or common ground.

Philosophers have not always kept this distinction in mind. For example. Locke and to a smaller extent, Hume thought it necessary to inquire into the origins of "ideas" in order to settle philosophical questions about the validity and reliability of our supposed knowledge of the external world. Fortunately, although Locke's declared approach to epistemology was what would now he called psychological, his actual approach was much more philosophical, so that his not distinguishing psychology from epistemology did no great harm.

II. THEORY OF KNOWLEDGE IN GREEK PHILOSOPHY

As an attempt to inquire into the nature of knowledge as such is more sophisticated than attempts to gain knowledge, it is natural that epistemology should not have played any very conspicuous part in early Greek philosophy. Although Plato, in the 4th century B C., was not the first to discuss its problems. he was the first to give them any marked prominence. They provided either the central or a major topic for more than half a dozen of his dialogues.

1. Plato.—As Plato had little enough to go on in the way of susiained examination of epistemology by his predecessors, and as his own discussions belong to dialogues ranging over a period of some 30 years, it is hardly surprising that we do not find in him a unitary finished system. He was well aware of the criticisms to nhich some parts of his theory lay open and he remained to the end of his life dissatisfied about the adequacy of his own answers to them. In the circumstances, it is surprising how nearly it is possible to represent him as holding a single coherent doctrine.

The first development of his views. emerging in the *Meno* and in the Phaedo, is fulfilled in the Republic, where it is summarized in the three central books. Plato's procedure is to start from what he takes to be a fact. that knowledge (episteme) is possible, and to ask what is required for it to be so. Knowledge must be of what is real, stable and unchanging, since a claim to know that something is the case is invalidated if later, or even as you make the claim, the thing changes. So-called knonledge cannot be knowledge at all if because of change or of things' being different from what they seem, or seeming different in different circumstances, it has to be abandoned. What will in this way be liable to modification or abandonment will be belief, not knowledge. The next step for Plato is to inquire what will satisfy the conditions of being real, stable and unchanging. The obvious and natural answer, that the field for knowledge nhich he wants is to be found in the external world of material objects and events with which we are all familiar from our sense experience, Plato unhesitatingly rejects. We call this world real only because we have never thought about the problems which it raises. The most marked characteristic of the sensible world is its susceptibility to change. Plato held. following the Heraclitean doctrine, that every thing is in a state of change. all material objects are subject to the constant process of coming-into-being and passing-away. The very multiplicity of material objects seemed to count against their being real (and therefore possible objects of knowledge) for Plato. So also did the fact that they appeared to have contradictory characteristics at the same time: nhat seemed beautiful, or large to one man or in one situation would be ugly, or small, to another man or in another situation. Clearly the world of our sense experience could not satisfy the demands of knowledge.

Further it was plain that at least some of our ideas are such that we could not possibly have gained them from sense experience, notably those of mathematics (more specifically, geometry) and of ethics. We have never actually seen a perfectly straight line, or a perfect circle, and yet the ideas of these are what we use in geometry; we can think about virtue or courage, although we have never met with better than defective instances of them. Again. when we do geometry with the aid of diagrams on the blackboard, it is not the diagrams that we are thinking or talking about. but something else which the diagrams imperfectly represent.

The case of geometry and the inadequacy of the material world as the subject matter for knowledge led Plato to the view that there must be another world, accessible only to the intellect, a world free from the imperfection, inconsistency and mutability of the material world. The intelligible world, as opposed to the familiar sensible world, was not for Plato a piece of imaginative speculation. He saw its necessity as the conclusion of an argument. We do have knowledge; knowledge cannot be of the sensible world; therefore it must be of an intelligible world; therefore there must be an intelligible world.

The intelligible world is the world of forms (see IDEALISM: UNIVERSAL), which are accessible, not to the senses at all, but to the intellect alone. Plato was not entirely happy about the exact status of the forms, for, as is shown by the discussion in the *Parmenides* (a later dialogue than any so far mentioned), he mas well aware of the difficulties, which were presumably much discussed in the Academy; many of them recur in the writings of Aristotle. who was one of Plato's pupils in the Academy. But there are enough points nhich are definite beyond doubt to give a general picture.

The forms are real entities, quite independent of the sensible world, although it is dependent on them. In this sense, it is important always to remember that Plato was a realist: we are not to think of the forms as in any way mind-dependent, or as mental concepts or abstractions; they are substantial entities, which would exist even if there had been no minds to stand in need of them or to apprehend them. For Plato the theory of forms is as much metaphysical as it is epistemological, a point which is clearly emphasized by the discussion in the Republic. The forms are needed. both to confer on sensible objects such degree of reality as they have and to be the objects of knowledge. Thus there is. on the one hand, the intelligible and real world of forms, of which knowledge is attainable; and, on the other hand, there is the sensible, only half-real world of particulars, of which only belief is possible. To every class of particulars of a given kind a single form corresponds: e g , corresponding to the numerous men that exist we have the single form Man; to all tables and beds, the forms Table and Bed; to the acts that are in some degree courageous or just, the forms Courage and Justice.

Because Plato's doctrine was metaphysical as well as epistemological, he does not always speak with a single voice. Thus, while epistemologically he finds it necessary to believe that to every kind of particular a form must correspond (Republic, 596 a), metaphysically he is reluctant to admit forms for what might be called low-degree particulars like mud and hair (*Parmenides*, 130 d). Metaphysically, the forms were regarded as ideals, to which their particulars approximated, but of which they were always in some degree bound, because of their infection with growth and decay. to fall short. This view readily accommodated the concepts of mathematics (the imperfectly straight line almost but not quite achieving the form of straightness) or of morals (an act is never so virtuous that it could not have been more virtuous), with uhich Plato was mainly preoccupied in his earlier Socratic dialogues; about other concepts his views were less clear, as can be seen from the discussion in *Parmenides* (130 d). On the other hand. when epistemological considerations were uppermost, no exceptions could be made. Thus, while metaphysically he tended to treat a form almost as a perfect particular, epistemologically he did not the form there was more like the modern universal. with different levels of forms, suggesting the later genus and the various species subsumed under it.

His general position is summarized in his Simile of the Divided Line and in the Allegory of the Cave which immediately follows it, in the Republic (books vi–vii). Imagining a line divided unequally and then each division again subdivided in the same ratio as before, he assigns to each of the four subdivisions an object and a corresponding cognitive faculty. The lower main division represents the sensible world, the upper main division the intelligible world. In the former, the lower subdivision contains images and reflections as seen in a mirror or in water, and, corresponding to them, the faculty of conjecture; in its upper subdivision come the material objects, of which the reflections below were the reflections, and, corresponding to them, the faculty of perceptual assurance or acceptance. This division as a whole represents belief and its objects, and the objects of the lower subdivision stand to those of the upper in the relation of likeness to original (*e.g.*, in that of the reflection of a tree in the water to the actual tree standing beside the water). This relation is repeated between the lower division as a whole and the upper division as a whole—where the objects, namely the forms, are the originals of which the particulars of the world of belief are in some way copies or reflections.

The upper division as a whole represents two kinds of knowledge: in the lower subdivision, the limited, incomplete and provisional knowledge or understanding (dianoia) of the forms attainable in the mathematical sciences; and in the upper subdivision, the full and complete knowledge (episteme) of the whole hierarchical system of forms, a knowledge of which is only attainable after a long and arduous philosophical training, which culminates in the apprehension of the ultimate form, the Form of the Good, on which the whole system depends.

Thus we have the division of knowledge and belief, with the division of forms and particulars corresponding to it; and the four grades stand at different points on an ascending scale, a scale of increasing reality on the one hand and, corresponding to it, of increasing comprehension and kno ledge on the other. In the Allegory of the Cave, Plato symbolically describes the higher education which is needed to win us away from our earth-bound delusion that it is the material objects of the material world that are real, first to a recognition, via the mathematical disciplines, of the need for and of the existence of the forms (at which stage a fragmentary and conditional knowledge is attained) ; and then, via philosophy, to the final peak where the whole unity of knowledge is revealed.

Not only does Plato find the forms both metaphysically and epistemologically necessary, but also epistemologically they fulfil two different purposes: on the one hand, to account for our ordinary experience, that is, for our ability to recognize similar particulars, to form concepts and to use general words; on the other, to make knouledge possible. knowledge which turns out to be of nothing with a status lower than that of a mathematical system and which in the full sense is attainable only philosophically. The consequences of this view of knowledge are mainly threefold and are clearly related. First, the distinction between knowledge and belief is determined by a difference of objects. Knowledge is of the forms; of material objects not more than belief is possible. Thus, it would not be possible to have first belief and later knowledge of the same thing. Secondly, because he characterizes them in terms of their different objects, Plato seems to be thinking of knowledge and belief as though they were some kind of acquaintance, on the analogy of sight. We may see an object clearly, if we look at it directly, less clearly, if we look at its reflection in a pond. That is. where we ordinarily say that we knew or believed that something was the case, Plato would have to say that we knew or believed an object of a certain kind. Or it may be that he used his word episteme ambiguously, either to mean knowledge of (or acquaintance with) certain objects, namely the forms, or to mean knowledge that certain propositions about the forms were true; in both cases it must be limited to the forms. Thirdly, it may be suggested that Plato has, in effect, given an account, not of knowledge as such, but of a special kind of knowledge; viz., the knowledge attainable of necessary relations within a deductive system such as mathematics. As has been shown above, his argument for the existence of the forms depends in part on his so defining episteme as to preclude from it knowledge of matters of fact (as opposed to matters of necessity). Whether he would also have denied the possibility of empirical knowledge at all is less clear.

W.

His insistence on the changeability of the material world would prevent him from allowing knowledge of general matters of fact. such as the generalizations of an empirical science; but, by the use of tensed verbs. he could (unless the Heraclitean doctrine of flux were carried to the extreme of making thought or communication impossible) have admitted knowledge of singular facts (e g, that Socrates committed suicide by drinking hemlock). A singular statement, recording a particular occurrence, will not be affected by what may happen thereafter, even although a general lanlike statement (*e.g.,* that heated metals expand) may be upset by a later occurrence which is an exception to the law.

In the *Theaetetus,* a dialogue slightly later than the *Republic,* Plato returns to the question "What is knowledge)" and adopts a quite different approach. There he considers in return three suggested answers: (1) that it is sense perception; (2) that it is correct belief; (3) that it is correct belief, with an account given of it. All are rejected, but not on the ground that the objects of belief must be different from the objects of knowledge. The possibility that a man might come to have knowledge of what he had previously only believed is, by implication, admitted; and the forms are nowhere mentioned in the course of the dialogue, so that the difference of status between forms and particulars does not come under discussion.

The first suggestion, that knowledge is identical with sense perception, is coupled in the discussion with the view of Protagoras, that perception is infallible because for any given man things are as he perceives them. To the man to whom the wind feels cold, the wind is cold; and this is not incompatible with the wind's being simultaneously not cold to another man. Plato seems prepared to allow the infallibility of perception, although not to go further and say that in every matter each man is his own judge of what is true. But what permits each man's perception to be infallible, namely that it is of his own private experience, also prevents it from being knowledge, which must be of what is objectively existent. Knowing and perceiving cannot be identical; even if perceiving were a way of knowing, it would not be the only way; and by itself it is not a way of knowing, for knowing involves more than perceiving—in perceiving we do not grasp what really exists. The second proposed answer, that knowledge is the same as true belief. is rejected on two counts. In the first place, belief, even true belief, can be induced by a variety oi methods—for instance, by propaganda or by playing on the emotions—but knowledge can be induced only by instruction. Here Plato is pointing toward an important distinction, which any theory of knowledge requires to recognize, that while you can make a man believe something, you cannot make him know something; belief is a state of mind but knowledge is not, or is not only, a state of mind. Plato's second argument to disprove the alleged identity of knowledge and true belief is to point out that one can in a state of true belief make a correct judgment about a matter, without having knowledge of it. A jury may arrive at a correct verdict in a case where the facts at issue could only have been known by an eyewitness of the crime. Correct weather forecasts, bets on a horse race, or predictions of the results of a general election are all familiar examples of true beliefs which are not knowledge.

The third suggested solution, that knowledge is true belief with the addition of an account of it, is rejected because Plato can find no adequate interpretation of "account." He considers three possibilities. First. if it means simply that the belief is put into words. this is not enough to make it knowledge; for whether a belief is spoken or not is irrelevant to its status as a belief, since an uttered belief is still a belief as much as a silent belief. Secondly, if it means an enumeration of all the factors or elements in a belief, that still will not do; for if a man had a true belief as to what a wagon was and if, in addition, he had been taught to recite a complete catalogue of all the parts of a wagon, the ability to recite the catalogue would not turn his belief into knowledge (to take a modern example, the difference between a man who knows how an electric motor works and another man who has a correct belief about it is not simply that the former can give a list of all the parts involved). Thirdly, if to give an account of a thing is to specify what distinguishes it from other things, not even this will be enough; for ability to spot the distinguishing mark of an object nhich differentiates it from other objects is needed even for true belief about the object and so cannot be the further factor, additional to true belief. which would constitute it knowledge. And it will be no improvement to say that knowledge is true belief *plus* the knowledge that we have specified the correct distinguishing mark; for then the definition would be circular—ue should be using knowledge as one of the terms in its own definition.

On this negative and inconclusive note the *Theaetetus* ends, but it would be difficult to overrate the importance of its contribution to the subject. Plato has come tantalizingly close to a solution of a kind that would now be acceptable. He has not suggested the rigid divorce between knowledge and belief on which he insisted in the *Republic.* Having shown the inadequacy of the attempt to identify knowledge with true belief, he does not then separate them. He tries a modification. that knowledge is true belief *plus* something else: he is still prepared to consider the idea that there is some close relation between belief (where it is true) and knowledge. By the end of the dialogue the relation is not established; but it has not been rejected either.

One further point in Plato's epistemology needs to be mentioned—his treatment of error. or false belief. The question was raised in the *Theaetetus,* but was not answered until the *Sophist,* which purports to be a continuation of the earlier dialogue. The problem was indicated in the *Theaetetus* by the discussion of true belief. For, if there is true belief, then false belief must be possible. But how can it be possible? For it seems that to think what is false is to think what is not; to think what is not is to think nothing; to think nothing is not to think at all; so, the only thought that is possible is of what is true. Either we must accept that to think what is false is to think what is not, or we must deny it. If we accept it. we must conclude that thinking what is false is impossible. If we deny it. me have to give some different account of false judgment. Plato adopts the second alternative and offers his account in the *Sophist,* which turns on the distinction between the existential use and other uses of "to be"; *e.g.,* on the one hand, "There are horses" and. on the other, "Horses are quadrupeds," or "Horses are not cows." To believe that horses are not cows is not to deny the existence of horses, that is to say, it is not to think what is not; it is to have a relational belief, to believe that horses are *different* from cows. The man who falsely believed that horses were cows would not be thinking of nonexistent entities, but would be believing that the relation between horses and cows was one of identity, when in fact the relation is one of difference. Epistemologically, the man who holds a false belief is not performing the logically impossible feat of thinking in nonexistent terms, but is making the mistake of relating his terms in thought differently from the way in which they are actually related.

2. Aristotle.—As a pupil of Plato, Aristotle was for a long time under his influence. He joined the Academy as a student at the age of 18 and spent the next 20 years there as a member of the group that centred round Plato, during which time he wrote a large number of works, all now lost, giving more or less popular expositions of the Platonism with which he was imbued. On his master's death he left Athens for 12 years. On his return, instead of going back to the Academy, he founded the Lyceum as a rival institution. where for the next 12 years he gave lectures and instruction on philosophical and scientific, particularly biological, subjects. It is from this period that his surviving works come, in the form of lecture courses rather than finished philosophical treatises; and at this stage he is most anxious to emphasize his points of disagreement with Plato, a disagreement which in his epistemology, although substantial enough, should not be allowed to obscure the extent to which their views harmonized.

Aristotle agreed with Plato that scientific knowledge must be of what is necessary, as opposed to the merely contingent, but he came to reject Plato's view that this required the existence oi forms transcending the particular objects or situations which manifested them. For Aristotle. while form and matter were intellectually distinguishable they were not separable (*see* FORM). Forms were immanent. not transcendent; they were predicates, not substances. They were neither more nor less real than the particulars which

they characterized, and neither could exist without the other. But forms were more important than the material which they informed: teleologically, for they determined its becoming what it did; and epistemologically. for apprehension of them was necessary to the attainment of any knowledge at all. Aristotle's rejection of the Platonic theory of transcendent forms in favour of his own view of immanence reflects the contrast between Plato's preoccupation with the pure, deductive abstractions of mathematics and Aristotle's greater interest in the natural, empirical sciences. For Aristotle the world around us was reality in a way in which it could never be for Plato. But in respect of the forms of things — the prerequisites of knowledge — both philosophers, although their views differed, were equally realists. In saying that forms were predicates, Aristotle was not for a moment suggesting that they were abstractions, or mind-dependent. They were the real properties of real objects, with which we could have sensible acquaintance. The presence of a given form in one object and its absence from another were actual facts of nature, which could thus be divided up into real kinds, each further subdivisible, according to the cleavages of the forms. It is not implausible to maintain that the prevalence of this rigidly schematic view of forms and real kinds, backed by the authority of Aristotle. did as much as anything else to retard the development of the biological sciences, the progress of which became far more rapid once they emancipated themselves from it.

Aristotle's views on sense perception (aisthesis) as they are to be found in *De* Animu, while in general agreeing with Plato's in being causal in character (*i.e.,* giving an account of perception in terms of the physical interaction of the object perceived, the appropriate sense organ and the intervening medium), differed considerably from Plato's in detail. Aristotle's account, which is largely determined by his general views of form and matter, emphasizes that sense perception is a discriminatory activity, not a mere passive reception of what is given. The soul itself takes on the form of the object which is perceived; it becomes qualified by a real quality of the object, as a lump of wax becomes qualified by a real quality (the shape) of the seal with which it is impressed. More specifically, the sense organ involved becomes assimilated to the object: thus the eye, beholding an object coloured red, itself becomes red; and similarly for the other senses. What was before the perception only potential (both in the case of the sense organ and in the case of the object) becomes in perception actual: thus, for example, a thundering waterfall would not, strictly speaking, be making a noise at all unless there were somebody present hearing it; there can be no actual sound without actual hearing.

Aristotle's account, which is a curious mixture of the philosophical and the physiological, raises many difficulties, widely discussed in the commentaries on him. They can, in the main, be indicated by three questions. Why should it be supposed to be necessary to perception that the sense organ should literally take on the form of the object? How does the supposition that the organ does take the object's form explain perception? When Aristotle says the soul takes the form of the object, is he talking literally or figuratively?

Common to but distinguishable from the five particular senses, each of which has its own peculiar sensibles (as sight has colour, visible shape and size; as hearing has pitch, volume, and so on), there must be a further general sense, without a special sense organ of its own, but with a function superordinate to those of the special senses. Its function is fourfold. First, it perceives the common sensibles, those qualities which are perceivable by more than one sense (i e., size, shape, number, motion and rest): without it we could not recognize that the shape which we saw and the shape which we felt as we looked at a stone in our hands were the same. Its second function is to perceive what Aristotle calls the "incidental sensibles": as the result of previous association we may perceive with one sense what does not belong to it, such as perceiving the sweet by sight. More importantly. in the third place, it accounts for self-consciousness, for our perception of the fact that we are perceiving: it is not by sight that we perceive that we are seeing, nor by hearing that we perceive that we are hearing. Fourthly, it discriminates between the objects of two ditierent senses: we can distinguish white from sweet but we cannot do it by sight alone. taste alone, or both together, for neither is capable of perceiving both objects. The sensus communis, as that faculty of sense common to all the others, while not being a special sense and therefore not having a sense organ of its own, does have its own physiological seat, in the heart, which, rather than the brain, Aristotle held to be the centre to which the impressions received by all the sense organs were transmitted. Finally, sleep and unconsciousness must be due to the inactivity of the sensus *communis;* otherwise there would be no reason not to suppose that some of man's senses might sleep at the same time as others were active (*e.g.,* one might see in one's sleep).

With regard to knowledge, Aristotle made a distinction between matter-of-fact knowledge (*empeiria*) of the contingent and scientific knowledge (episteme) of the necessary, which closely resemble Plato's contrast between belief and knowledge. Scientific knowledge is knowledge not merely that something is so, but also why it is so. To know in this sense is to know the causes of things' being as they are, or the reasons why. And this is achieved within a science when the conclusions are deductively derived from the premisses. So the ideal of knowledge is, as in Plato, that of strict demonstration, the establishment of necessary connection between premiss and conclusion. Scientific knowledge of material objects is an ideal to be desired and is partially attainable to the extent that the form of the objects can be intellectually grasped, but it can never be completely attained, just because the objects are not pure form. They have and must have their matter, which prevents complete generalization or full insight into their essence; *cf.* Plato again. Where Aristotle differs from Plato is: (1) in his view of principles, and (2) in the way in which the principles are to be knonn.

Whereas Plato thought that all knowledge was essentially one, comprising a single deductive system depending on the Form of the Good. Aristotle insisted on the autonomy and independence of individual sciences. While there were some principles or axioms common to all sciences, such as the laws of contradiction and of excluded middle, each science would have in addition its own particular principles, which would consist of definitions of the terms used in the science and of assumptions of the existence of things corresponding to the definitions. The business of a science then would be not merely to verify the empirical characteristics of the objects which were its subject matter, but also to show by argument in conformity with the common axioms that the possession of those characteristics followed from the first principles of the science.

It remained to say how these principles were themselves to be known. They cannot be demonstrated or known by proof, for all proof depends on them. They must therefore be known immediately and not by inference. Aristotle's answer (in Posterior *Analytics*) is that the process must be double, involving both perception (aisthesis) and intelligence (*nous*). We come to learn them by a kind of induction from our sense experience, and yet we know them by an intellectual intuition. The apparent contradiction in this account disappears when we understand what Aristotle was trying to do. He was trying to explain both how we come to think of these principles at all and are inclined to accept them and how we recognize their truth when we are faced with it. The function of perception is to provide us with particular examples or applications of the principles, the repetitions of such examples helping to fix our attention on the principles. But such empirical induction does nothing to prove or to establish the principles. At this point intelligence just sees or intuits the truth of the principle in question.

The role of perception is thus to place the principle in a favourable light for the insight of intelligence. (To this extent, one might compare a child learning by experience that two beads and three beads are equal in sum to five beads, and his coming to "see" that $2 + 3 = 5$.) In short, for Aristotle each science has its own set of ultimate principles which on the one hand are indemonstrable, but on the other hand can be and need to be seen to be self-evident.

Thus, while Aristotle differs from Plato in allowing the mutual

independence of the sciences, he agrees with him both as to the structure of a science, the deduction of conclusions from first principles, and as to the minor role of sense perception, which is no more than to suggest the propositions of the science. The rest is the work of pure intellect. From this it may be seen that emphasis (of which Aristotle himself was fond) on the contrast between the empirical Aristotle, with his insistence on the reality of the particulars of our sensible world, and the abstract rationalist Plato, for whom such particulars had only a second-best quasi-reality, should not be overdone. Aristotle may have been the natural scientist. as opposed to Plato the pure mathematician. but Aristotle's view of a natural science, as given by his theory of knowledge. was far more rationalist and less empirical than his tough-minded treatment of Platonism would sometimes suggest.

III. SCHOLASTIC EPISTEMOLOGY

Between the theories of classical Greece and the resurgence of interest in epistemology in the 17th century A.D. there falls a long period in which, although little attention is paid to it now. philosophy was neither moribund nor dormant. For the mediaeval philosophers. however, epistemology was only a minor interest and centred chiefly round the question of universals or general ideas. The Platonic tradition, according to universals a status independent of the particulars that might instantiate them (*universalia ante rem*), may be seen in the realism of St. Augustine (354–430) and was subjected to the criticisms of Peter Abélard (1079–1142) and of St. Thomas Aquinas (1225?–74), who represented the Aristotelian version of realism, according to which universals mere characteristics common to particulars *(universalia in rebus)* and not independent of them.

In the 14th century new versions of nominalism (universals are general words) and of conceptualism (universals are general concepts, mind dependent, formed by abstraction from particular experiences), advocated by William Ockham, prepared the way for the various empiricist versions of Hobbes, Locke. Berkeley and Hume in the 17th and 18th centuries.

The Platonism of Augustine is directly clear, revealing itself in his insistence on the existence of realities which are not sensible but purely intelligible, of which mathematical ideas are his favourite example. Mathematical truths are there for anyone to grasp, they are apprehended by reason and understanding. they remain necessarily. unchangeably. eternally true. independent of the success or failure of the etiorts of individual men to grasp them. The great problem for Xugustine. as it had been for Plato. was what he was to say of the relation between ideas and the objects of sense. His reply, that as knowledge of ideas was necessary to knowledge of material objects, so the existence of the ideas was necessary to that of the objects. involves making the sensible world causally or formatively dependent on the intelligible: the essence of everything that there is is number, illuminated for the human spirit by the light of God. The idea of there being another and more intelligible world more real than that with which we are sensibly familiar had been absorbed into the Christian tradition.

The intellectual difficulties of such a view, being the same as those recognized by Plato himself in the *Parmenides,* were soon fastened on by men like Boethius (*c.* 480–524), whose commentary on Porphyry, by its exposition of the Aristotelian outlook. inspired subsequent criticisms. Cniversals, which are genera and species, being present as a whole in their individual objects, cannot 'themselves be individual entities and must therefore be features of their objects. The attack on Augustinian realism was carried on by Abélard, who, finding equally objectionable the extreme nominalism that had made its appearance in the 11th century with Roscellinus of Compiegne (*c.* 1050–*c.* 1122), argued for a modified realism, according to which the nature of a universal was its *status,* its being the principle of classification of a group of objects; universal terms are abstract. not concrete. It should be said that Abélard was more successful at criticizing the opposed extremes of transcendent realism and of nominalism than he was at clearly stating his own view, with the result that he has been subjected to considerably differing interpretations. The Thomist view, which was more directly Aristotelian, emphasized the work of active thought *(intellectus agens)* in abstracting the general features of objects perceived in sensation. In the first half of the 14th century William Ockham, rejecting all brands of realism on the principle that *nihil est in rerum natuva extra animam nisi singulare* ("everything that exists outside the mind is particular"), expressed more than one positive view himself: notably. a moderate nominalism, according to which universals are in effect the meanings of general words. signs standing for a class of particular objects or qualities. Later, he came to regard universals as aspects of the mind itself. By insisting that everything that exists is particular and that all generalization is the work of the human mind, Ockham marks the end of scholasticism and the beginning of modern epistemology.

IV. CARTESIAN RATIONALISM

The transition from scholastic to modern philosophy and the revolutionary process by which it was achieved are by general consent accredited to the French thinker Renk Descartes (1596–1650). While he was not the only man responsible and while he was not such a rebel as not to be intellectually a child of his age. it was he who, more than anyone else, liberated subsequent thought from its allegiance to the doctrines of the Catholic Church and who determined that henceforward claims to truth were to be made good before the bar of reason rather than to be reconciled to the dogmatism of faith. Although he professed himself a good Catholic and refrained from publishing his acceptance of the Copernican hypothesis and of the consequences which he derived from it, this profession must be put down to disingenuousness or at least to prudence on his part, to his desire to continue working in peace instead of expending his energy in open conflict with the theologians and thereby risking the fate of Galileo. He marks the beginning of the rationalist movement carried on by Spinoza. Malebranche and Leibnitz (*qq.v.*) and will here be taken as the representative of it, partly because he was its source, partly because through his epistemology can most clearly be exhibited the connection and contrast of the empiricist epistemology, which shortly afterward arose in England to challenge the philosophy of Cartesianism.

What was revolutionary in Descartes' epistemology was: (1) his insistence that nothing was to be accepted as true that did not satisfy the demands or conditions of reason; and (2) his proposal to determine what those conditions would be and to elaborate a method of complying with them before proceeding to attempt to acquire a corpus of knowledge, either in philosophy itself (*i.e.,* metaphysics) or in any of the sciences such as physics. In his first published work, *Discours de la méthode* (1637), he adumbrated the method which he claimed to be both necessary and sufficient; and in the second. *Meditationes de Prima Philosophia* (1641), he gave the results of his application of it to metaphysics. The fundamental problem was to discover a criterion of truth or certain knowledge that could be used to test the claims of any piece of putative knowledge so as to establish their validity or failure. Such a criterion could not be discovered in isolation from knowledge itself: it could be found only by discovering some proposition the certainty of which would resist any attempt to shake it and by seeing what was the distinguishing mark of this proposition; thereafter, any other proposition that revealed the same mark was legitimately acceptable and any proposition that failed to exhibit it must be rejected. Descartes' policy was. therefore, to subject to a systematic doubt, or suspension of belief. all that hitherto he had accepted as knowledge and to continue in this way until he ran into an absolutely indubitable proposition. If he could find such a proposition and if he could evolve a satisfactory method of proceeding positively from it, the previous direction of methodical doubt could be reversed and the beginnings made of the construction of a body of knowledge. At the outset he could not know whether there was such a proposition or whether there was such a constructive method; but unless they were found, the program of methodical doubt must be relentlessly pursued.

That we should. as we naturally do, accept the supposed knowledge of our senses Descartes unhesitatingly rejected, ior two reasons. First, as we all experience, our senses do in fact often

deceive us: objects seen at a distance may look different in colour or shape from what they appear near at hand. Any instance of perceptual illusion is enough to refute the claims of sense to provide us with knowledge of a kind rigorous enough to meet Descartes' demands. Secondly, even if all the information of our senses were, as a matter of fact, correct, by our senses alone we could not know that it was; it is not in any way self-guaranteeing. A dream may seem real enough at the time; and if we subject the whole of our so-called waking life to the Cartesian doubt and suggest that perhaps the whole of that is a dream, our senses can provide no way of removing the doubt or refuting the hypothesis. For practical purposes we might, as we do. treat our sense information as veridical, in default of positive evidence against it. But, philosophically, we are bound to recognize the possibility of its all being an illusion, the hoax of a malignant demon; and therefore we cannot hope to find any indubitable knowledge, or criterion of certainty. there.

It should be said that Descartes' two reasons for rejecting the senses are very different from each other and not strictly compatible with each other. The first, that our senses sometimes deceive us, does not entail that they always do, or even, what his second objection suggests, that, for all we know, they always may. Indeed his first objection requires us sometimes to be able to know that our senses are, on that occasion at least, veridical. I have no ground for saying of one sense experience that it is a delusion or fallacious, unless I can say of another, which contradicts it, that it is not a delusion. Yet his second objection is more sweeping and important, for it amounts to saying that, honever good our empirical evidence map be for any given proposition of sensible experience (e.g., that I see a book in front of me), it will never be good enough, never be so conclusive that reason must accept it. It might be a diabolically ingenious conjuring trick by the malignant demon. And this possibility of error will apply to any empirical proposition at all. however well-attested its truth may appear. A proposition which we are entitled to say that we know to be true must be certified. or self-certifying. in a way stronger than any amount of empirical evidence could ever provide. as long as there is, in some sense, any possibility of my being wrong. the proposition has not got the necessity which knowledge must have.

Descartes' solution to his problem is to be found in the autobiographical section of the Discours, where, reflecting on his general dissatisfaction with the studies that he had pursued during his education at the Jesuit college of La Flèche, he singles out for exception mathematics. as being a discipline with the rigour and method that he is seeking. He was struck with the contrast between the certainty and clarity of mathematical demonstrations and the insecure fumblings of the other sciences. The characteristic of primitive mathematical propositions was that they could be clearly and distinctly perceived to be true, so that "a child, instructed in arithmetic, having made an addition according to the rules can be certain of having found, with regard to the sum he was examining, all that the human mind could find." The method of mathematics is the twin method (1) of intuition, whereby we clearly and distinctly perceive the logical necessity of a mathematical proposition (e.g., $2 + 3 = 5$), and (2) of deduction, which is made up of a sequence of intuitions, whereby we clearly and distinctly perceive that the next step in a mathematical argument is logically necessitated by the previous step. In putting forward the procedure of mathematics as the solution to his search for a criterion of certainty and for a method of proceeding securely from the base of an indubitable proposition, Descartes probably failed to recognize a distinction which was going to cause him trouble throughout the rest of his theory of knowledge: the distinction between the mark of a proposition's being certainly true (viz., its being logically necessary) and the mark of our recognizing, beyond possibility of error, that logical necessity. If there were such a mark as the latter, it would be different from the first, for we can make mistakes about logical necessity as about anything else. That a given proposition is logically necessary does not itself necessitate that we shall recognize that necessity. Descartes had some awareness of this difficulty; for, although he was inclined to give a logical analysis of clear and distinct perception in terms of its objects, "simple natures" and their combinations, he admitted and never succeeded in meeting the point of the question posed by his critics: if we are to accept a proposition as true only when we clearly and distinctly perceive it to be so, how are we to tell when we are clearly and distinctly perceiving such a truth? May we not be deceived into thinking that we have a case of clear and distinct perception, when we have not?

From his examinalion of mathematical procedure Descartes abstracted four practical rules: (1) the rule already mentioned, to accept as true only what he clearly and distinctly perceived to be so; (2) to analyse any problem into its simplest possible elements; (3) to proceed from the simple elements to the more complex whole in due order; and (4) to make the enumeration of elements so complete as to be certain of having left nothing out. But the mathematical method Descartes saw to have one inherent defect and one extrinsic uncertainty, both of which would need to be removed if the method was to be of epistemological use to him. The defect was the use made of memory: in any but the shortest chains of deductive argument the mind could not hold the entire argument before itself at once and therefore had to rely on its memory that the earlier steps of the argument had been satisfactorily traversed. But all the objections which Descartes had raised to relying on the senses he felt equally strongly in the case of memory: often enough memory deceives us, and in no case do we have a guarantee from memory itself that it does not. To the extent that a strictly deductive argument depends on memory, then, even that argument must be treated as doubtful until we can produce independent proof that memory is to be trusted. The extrinsic uncertainty about the mathematical method was whether it would be applicable outside mathematics. Descartes so far was in the position of having, as he supposed, provided himself with the one secure way of attaining knowledge as attested by its success within mathematics. What he could not yet say was whether it could be applied outside mathematics, whether it could be used in answering philosophical questions about what does and what does not exist.

Descartes found his answer in his famous proposition Je pense, donc je suis (or, in its later but better-known Latin form, Cogito, ergo sum—"I think, therefore I am"). Although he might doubt the truth of everything else, even the existence of his own body, he could not doubt the existence of himself, his mind. Thought of any kind (and doubt is a mode of thought) requires a thinker. From the fact. therefore, of his doubting all else Descartes was assured of the necessity of his own existence. The importance of the Cogito for the architecture of Descartes' scheme was not, as is often supposed, that it was for him the first indubitable proposition (any simple proposition of mathematics would have done for that) but that it was the first indubitable existential proposition. His claim was to have found a proposition outside mathematics which had the required certainty as of any proposition within mathematics. It provided him with the sure foundation for erecting, by the process of intuition and deduction (if memory could be validated), a structure of certain knowledge of what exists. More detailed interpretation of Descartes' epistemology becomes at this point very difficult. For instance, while in the *Discours* he had held up a mathematical proposition as the very paradigm of what was indubitable and indeed as the key to the discovery of attaining a certainty wherever it was attainable, in the first Meditatio he appears to allow that even in mathematics we might be deceived. It may be that in the latter he is acknowledging the point, mentioned earlier, that we can make mistakes even over what was logically necessary. But the more probable explanation of his apparent inconsistency is that between the *Discours* and the *Meditationes* his conception of knowledge had altered. In the Meditetiones he insists that knowledge must be of what exists, which would have the queer conclusion that pure mathematics, while exhibiting logical necessity, could not be knowledge: and, at the present stage of his program, applied mathematics, which is concerned with what exists, does not yield knowledge, for the existence of its objects may still be doubted.

From the Cogito and some axioms which he does not scrutinize or subject to doubt Descartes deduces (by arguments so short that

memory is not involved) the existence of God; and from the veracity of God who, having provided us with our senses and memory, will not have done so for the purpose of deceiving us. Descartes infers the reliability of the two faculties which hitherto he had treated with systematic scepticism. Even now it is not because we clearly and distinctly perceive it to be true (for we do not, it having no necessity about it), but because it is guaranteed by the infinite perfection and goodness of God that their information is to be accepted. To complete his scheme, Descartes must now give his account of error. For, having started with the problem how knowledge could be possible and having. as he supposed, solved that by bringing in the truthfulness of God, Descartes now has to explain how we could ever make mistakes. It seems a fact that we often make them, and yet that we should do so appears incompatible with the very properties of God to which Descartes has just appealed to make any systematic knowledge possible. His solution turned on contrasting the human understanding. which is limited in its capacity for clarity of conception and of apprehension, with the human will. which is unlimitedly free. Error is due to will's outrunning understanding, to our committing ourselves in affirmation or in negation to more than we have intellectually grasped. Because our wills are free, there is nothing to stop us judging in a matter as though we understood it more thoroughly than we do; and in such a case we run the risk of error. In particular. we are liable to persist in beliefs because they are familiar and because it has never occurred to us to question them. To pursue certainty of knowledge and to minimize the risk of error, we should scrutinize the credentials of every belief according to the criteria of the method and should not pretend to ourselves that we do clearly and distinctly perceive a truth unless we really do. It may be seen that the whole of Descartes' elaborate scheme continues to be infected by his tendency to assimilate the two quite different concepts of logical necessity and of epistemological certainty; it may indeed be asked how clearly he ever acknowledged the difficulty to himself.

In holding that all thought and conscious experience consisted of having ideas which were private and mind dependent, Descartes recognized that he had the problem of determining the extent to which ideas could be held to represent their objects. Starting by maintaining that all ideas which were not the constructions of the imagination were either adventitious, causally produced in us by experience. or innate. inherent in the mind from birth, Descartes was eventually driven by his metaphysical dualism to conclude that all ideas must be innate (see INNATE IDEAS). It was this side of the Cartesian epistemology that was fastened on for attack by his empiricist successors such as Locke. wishing to maintain that all knowledge must have its origin in experience. The empiricists continued the psychologism of Descartes in regarding ideas as private mental entities or occurrences, a causal explanation of which was required if the possibility and limits of knowledge were to be made intelligible, while they either modified the rigidity of his dualism between mind and matter (*e.g.*, Locke), or abandoned the dualism altogether (*e.g.*, Berkeley and Hume). But the more serious quarrel between empiricist and rationalist than that of the origin of ideas concerns the extent to which knowledge of the world is attainable'by pure reason, The striking failure of Descartes both to apply to metaphysics the method which he professed to be employing (whatever necessity the Cogito may possess. it is not the necessity of a mathematical proposition which it would be self-contradictory to deny) and to assimilate empirical knowledge to the deductive ideal revealed the weakness of thoroughgoing rationalism; it appeared to make headway in the Cartesian philosophy only to the extent that it proceeded with less than the full rigour of its principles.

V. EMPIRICISM AND THE CRITICAL PHILOSOPHY

To empiricists the problem of knowledge appears, with a changed emphasis reminiscent of Aristotle, to consist mainly in determining what is the relation between the human mind and the external world of our sensible experience and what knowledge of reality that relation permits. That is to say, whereas for Plato sense experience was both inferior to and. to a high degree, obstructive of the findings of pure reason and whereas for Descartes the aim was to subordinate sense experience to reason, limiting our knowledge of the external world to what can be made good by reason, for the empiricists sense experience is basic, where we start and what we have to stand on. They do not necessarily maintain that all knowledge is limited to sense experience, nor that that experience is infallible; but sense experience is the best that we have available, and such knowledge as is attainable by reason must conform to it. In fact, Locke, whether knowingly or not, went exploring beyond the Iimits of sense experience and committed himself to propositions which as an empiricist he must be precluded from verifying, while Berkeley (to the extent that he was an empiricist) and Hume more severely restricted themselves to determining what knowledge was possible within the limits prescribed by sense experience. In turn the limitations which Hume's treatment appeared to establish gave rise to the critical philosophy of Kant, who, by contrasting what in human experience is provided by the senses with what is contributed by the faculty of understanding, himself paved the way for more recent versions of empiricism and positivism.

1. Locke.—John Locke (1632–1704), while arriving at conclusions diametrically opposed to those of Descartes, was inspired in the composition of his Essay Concerning *Human Understanding* (1690) by very similar motives; indeed he emphasized his own debt to Descartes. Locke agreed that the first task of philosophy was to devise a method for itself, to "see what objects our understandings mere or were not fitted to deal with." And in his polemic against the then widely held view, derived in part from the Cartesian philosophy, that the human mind possessed innate ideas and principles, Locke was doing what Descartes had done in his revolt against scholasticism: protesting that truth must stand on its own feet. not lean on authority. whether of the church. of the schools, or of Aristotle. That there should be any principles that were to be treated as above scrutiny was as abhorrent to Locke as it had been to Descartes. His Essay soon became a university textbook, and the part which it played in liberalizing British thought may be indicated by the fact that in Locke's century an undergraduate at Oxford could still be fined by the university for disputing Aristotle's doctrines.

It is impossible to state Locke's own epistemological views both briefly and clearly without oversimplifying and misrepresenting them, because in expounding them at great length himself and in spreading the work out over 20 years he involved himself in a number of confusions and inconsistencies. But the general outline may be given. The human mind, being at the time of birth a blank, a *tabula* rasa, gains all the knowledge and all the materials of knowledge that it ever does gain from experience, the twin sources of experience being "sensation" and "reflection"; *i.e.*, sense experience of the external world and introspective experience of the mind's own operations. This was Locke's basic thesis. that all concepts are empirical in their origin and that any concept may be (indeed must be) accounted for by tracing it back to an experience from which it could have originated, or, in the case of more complex concepts, by deriving the different elements in the complex from several different experiences, their unification in a single concept being the work of the mind. Thus, on the one hand) a man acquires his concepts of "red," "sweet," "tables." "trees," etc. by seeing red objects. tasting sweet things, seeing and touching tables and trees. On the other hand, he might imagine a zebra before seeing one. by thinking of an animal as being both like a donkey and striped at the same time (provided that he had already seen donkeys and something that was striped) ; similarly. he might conceive of nonexistent things like unicorns. gingerbread houses and so on, always provided that he had. by his own experience. acquired the concepts of the less complex elements involved. Unfortunately, by choosing to follow the conventional terminology of the day and by expressing his empiricist thesis in terms of "ideas" Locke led himself astray and laid his theory of knowledge open to the criticisms which have been familiar from Berkeley's time onward. Although at the outset of the Essay Locke uses "idea" in the widest and most noncommittal n-ay, so that to say that he had certain ideas in his mind would be to say that he was

having certain thoughts, or thinking of certain things, yet before long he was using the term "idea" in a much more technical way, such that an idea was now a mental entity of some kind which, in the case of sensation, represented the objects, or qualities of objects, of which it was an idea. Thus in his theory of perception Locke found himself a thoroughgoing representationalist, holding that, although there was a real, physical world external to the observer, all that he could know of it was mediated by the ideas which it produced in him. As Berkeley was not slow to point out, anyone holding such a view was, by his holding it, precluded from maintaining that there was a world beyond the ideas at all, let alone going to the lengths that Locke did of specifying which ideas actually resembled the qualities which they represented (ideas of primary qualities) and which did not (ideas of secondary qualities). It is a striking fact that Locke was not prevented by this obvious formal inconsistency in his scheme from talking a great deal of philosophical good sense throughout the rest of his work, which suggests that his robust common sense carried his epistemological dualism and his representationalism very lightly. And it should be emphasized that, in the particular case of perception, some form or other of representationalism has retained a hold on many philosophical minds ever since, the problem for such philosophers continuing to be basically Locke's problem; viz., how to reconcile the view that we do perceive public and independently existing physical objects with the view that the sense impressions or sense data actually received in perception are not or may not be themselves literally parts or qualities of the physical objects themselves.

Locke's classification of the kinds of knowledge humanly attainable does something to anticipate Kant's later treatment — just as Locke's account of the formal concepts of experience, such as substance and cause, hesitating and doubtfully empiricist as it was, points in the direction of Kant's much fuller and more carefully argued proposals. Following his general theory of ideas, Locke maintains that knouledge "is only conversant about them" and defines it as "the perception of the agreement or disagreement of two ideas." There are four kinds of knowledge: (1) of identity or diversity of ideas; (2) of relation, that is, necessary connection, of ideas; (3) of coexistence of ideas, where no necessary connection can be established; and (4) of real existence, that is. of objects and their properties corresponding to our ideas Strictly, only the first and second kinds fit Locke's definition of knouledge, for the other two go beyond ideas, in the same may as his theory of perception went beyond what was permitted by its principles. The first kind is knowledge of analytic propositions, what Locke called "trifling propositions," such as "Red is red," "Red is not blue" and "Whatever is red is coloured." The second kind is knowledge of necessary connections which are not trifling because they do not consist simply of partial or complete identity or difference: for Locke, both mathematical and moral knowledge belonged to this category, and he followed Descartes in distinguishing between intuitive knowledge of self-evident propositions (*e.g.,* that 2 + 1 = 3) and demonstrative knowledge of what was entailed by such self-evident propositions (*e.g.,* that the sum of the interior angles of a Euclidean triangle equals two right angles). Thus the first and second kinds approximately correspond to Kant's later distinction between analytic and synthetic a *priori* propositions. The third kind is knowledge of empirical generalizations, the denial of which might be false but would not be self-contradictory (*e.g.,* that gold is not combustible). The fourth kind is knowledge of actual existence, our knowledge here (as also is knowledge of the third kind) being both limited and uncertain (save in the case of our own existence and of God's, where again Locke followed Descartes), just because we are here not perceiving necessary connections but depending on the matter-of-fact connections which our experience leads us to accept. Locke appreciated that the third and fourth kinds did not fit his requirements for knowledge and that the fourth was not concerned with relations between ideas at all. But he could not abandon them, for he recognized that although they did not fit his scheme, he had marked the important distinction betueen necessary and empirical knowledge, and he rightly insisted that claims to knowledge were not to be invalidated simply on the ground that they were not logically guaranteed In this he performed the important task of preparing the way for much that has followed.

2. Berkeley. — George Berkeley (1685–1753) came from the first under the influence of Locke's *Essay* which, by the time that he entered Trinity college, Dublin, had become one of the standard philosophical textbooks there Although signs may be found in Berkeley's earliest writings of his acceptance of a Lockian position in epistemology, it cannot have been either wholehearted or long-lasting. For Berkeley's own theory. which he developed as a young man (his most important work. *A Treatise Concerning the Principles of Human Knowledge,* was published in 1710, when he was only 25). had its origin in his conviction of the inadequacy of Locke's theory of knowledge. Seeing the difficulties of Locke's dualism between mind-dependent ideas and the independent things which they represented, Berkeley carried the theory of ideas to its extreme and, as he saw it, logical conclusion. Apart from the impossibility in principle, given that dualism, of verifying the existence of material objects beyond the screen of ideas, or any proposition about them, Berkeley thought that he had found insuperable reasons why Locke's account must be unacceptable. In the first place, from ideas alone nothing could be learned about anything else that they might be alleged to represent. because an idea could resemble only another idea: the whole basis for Locke's distinction between primary and secondary qualities was thus destroyed. Secondly, from our own experience we know that ideas are passive and can be produced only by minds; they could not be produced by matter, even if we had independent evidence that there was such a thing. Berkeley therefore proposed the original solution, not of cutting out material objects, but of denying the dualism between ideas and objects. Material objects *were* ideas or collections of ideas: and reality consisted, not of minds, ideas and material objects, but of minds and their ideas. An idea being passive. its existence consisted in its being perceived: *esse est percipi.* A mind or spirit being active, its existence consisted in its perceiving or having ideas: *esse est percipere.* In these two complementary formula's the whole of Berkeley's epistemology is summarized. As he repeatedly insisted, this is in no way to deny the existence of material objects or of the sensible world. Their existence is affirmed, as ideas or collections of ideas belonging to the finite minds of humans and to the infinite mind of God. What is denied is the existence of matter, as an unknowable somewhat lying behind and producing the ideas which me have in perception. Our view of the sensible world as consisting of publicly observable objects may remain as before; what is altered is our account of what it is to be a material object. Thus at one stroke Berkeley claimed to have removed the difficulties of Locke's dualism and to have made empiricism more faithfully empiricist. Distinguishing between the fleeting, fragmentary ideas which a man's imagination produces and the stability, coherence and inescapability of those which he receives from his senses, Berkeley concluded that the latter could be produced only by God: nothing less than a mind of infinite power and purpose could account for the orderliness and design which they displayed. In turn! the problem of continued existence of material objects in the absence of finite observers was solved, for they would never be absent from the mind or will of God. Thus, while it would be for Berkeley self-contradictory to assert the existence of an unperceived object, he was not asking common sense to suppose that, say, a visible object vanished and then reappeared every time a man looking at it closed and reopened his eyes: its continued existence was literal and real, guaranteed by the omnipotence and omniscience of God. There are hints in Berkeley's writings of a quite different; more directly phenomenalist account, in which to say that an object existed unperceived would not be self-contradictory but would be to make a hypothetical statement, to say that certain perceptions would be had, given certain conditions. "The table I write on, I say, exists, that is, I see and feel it; and if I were out of my study I should say it existed, meaning thereby that if I was in my study I might perceive it" (*Principles,* 3). But such a view is nowhere further developed and can hardly he attributed to Berkeley as part of his doctrine. Although Berkeley repeatedly claimed that his theory in no way conflicted

with the beliefs of the plain man or "the vulgar," but only with those of philosophers who had been corrupted by abstract thought, his claim can hardly be upheld. Indeed he seems to have confused the proposition that the plain man is only interested in the existence of material objects at the times at which he (or someone elsej is perceiving them with the proposition that the plain man believes that they exist only at such times. The first proposition, while in general it may be true, is not identical with, and does not logically imply. the second. which on its own account is highly doubtful.

Berkeley himself attached the greatest importance to his attack on Locke's theory of abstract ideas, because he supposed that the theory supported the view of matter which he himself denied. In fact it did not; and the theory of general ideas (that a general idea is a particular idea made general by its function of standing for other ideas of the same class), which Berkeley put in its place and for which he was applauded by Hume, is to be found unambiguously stated by Locke himself. Berkeley. while engaged in the valuable task of working out the implications of what he held to be true in Locke's empirical epistemology, was not always as fair-minded to his predecessor as a more careful study of the Essay would have made him.

3. Hume.—David Hume (1711–1776), in so far as he covers the same ground as his two predecessors, comes somewherein between them. Thus, distinguishing as Locke did between ideas of sensation and ideas of reflection (in Hume's terminology "impressions" and "ideas," the latter being copies of the former in memory and imagination), he veers strongly toward Berkeley's solution of the dualism between impressions and objects, but takes a more agnostic view: he does not so much deny the existence of material objects over and above the impressions which we receive in sense as say that we cannot know it; the existence of such material objects is a hypothesis which, while it involves no contradiction, must remain for us in principle unverifiable. But Hume's importance in the history of epistemology lies in the new ground that he himself broke. for he carried pure empiricism to the logical conclusions of which both Locke and Berkeley had stopped short. His rigorous insistence on analysing any concept at all solely in terms of actual and possible impressions led to original results in at least two major topics: (1) the nature of self and (2) the status of inductive beliefs. both of which, especially the latter, have vexed philosophers ever since. Hume's treatment of the notion of cause, which is involved in the latter topic. so impressed Kant with the challenge which it posed as to change the whole course of his philosophy.

1. Berkeley, while disposing of Locke's notion of material substance (or what he thought was Locke's notion) as an unknowable something underlying the qualities accessible to sense, had retained substance in the case of the self. For him the self was a real persisting particular. which continued the same throughout all its successive experiences. But Hume opposed to that the same challenge as Berkeley had made to Locke in the case of material substance. Denying that a man ever had an impression of himself as an entity over and above the perceptions which comprised his stream of consciousness. Hume posed the question: from what impression (or impressions) can the idea of self be derived? Satisfied that all that could be found were the impressions or perceptions themselves. Hume found himself faced with an uncomfortable dilemma: on the one hand a man has the idea of himself as a unity, as a persisting identity, as the subject of his experiences. an idea which seems inescapably necessary to any continuity of experience at all: on the other hand there is no impression from which such an idea can possibly be derived. In the course of his principal work. The *Treatise* of *Human Nature* (1739), two different solutions are propounded. although it may be doubted whether Hume himself recognized their difference. One solution is to explain away the idea of personal identity as a mistake which we all make because of the action of our imagination: "the identity which we ascribe to the mind of man, is only a fictitious one." The other solution is to explain the idea in terms of those impressions which we do have: "mankind . . . are nothing but a bundle or collection of different perceptions." "When I turn my reflexion on myself. I never can perceive . . . any thing but the perceptions. 'Tis the composition of these, therefore, which forms the self." On this second view, Hume is not explaining away as a mistake the idea of personal identity, but giving an analysis of what it is; denying the substance theory of the self, he is propounding a serial theory, consistent with his program of reducing every concept to a combination of constituent impressions and ideas.

2. Applying the same analytic technique to the concept of cause, Hume found that while it contained as an element the idea of necessary connection between two events, where one may be said to have caused the other, yet such a connection neither is empirically observable as holding between the events; nor is deducible from the concept of either. All that is observable is matter-of-fact conjunction and sequence; *e.g.*, a lump of sugar placed in water just does dissolve. and that is all that can be observed. Nor can there be any logical necessity bet een events: there is nothing self-contradictory about the suggestion that a lump of sugar would not dissolve in water. Hume concluded that the idea of necessary connection involved in our concept of cause was contributed by the imagination and that all that could be asserted of objective nature was what could be empirically observed, namely, matter-of-fact conjunctions and sequences: every event is a discrete particular. But this, in turn, raised a serious problem for inductive belief in general and for prediction in particular. However often a given conjunction of events, such as the putting of a lump of sugar in water and its dissolving, may have been repeated in the past, and however often attempts to produce a different conjunction may have failed, yet, if there is no causal connection between the events beyond their actual concomitance or sequence hitherto, what reason could there be for expecting similar conjunctions in future? How can it be more rational to expect the next lump of sugar placed in water to dissolve than to expect it not to dissolve? More generally, how can it be more rational to accept the past as a guide to the future than not to accept it so—unless one assumes real laws or connections in nature of a kind which a Humian empiricism must deny? Hume professed himself baffled by the problem. He recognized that we do all draw on our experience of the past to help our predictions and plans for the future and that it would be suicidal not to do so; and yet he could see no rational justification for our attitude at all. In presenting the problem thus fearlessly and honestly Hume bequeathed to his successors the task of deciding whether the principle of induction can be caught within the limits of empiricism; that this task has even yet been successfully completed few philosophers would confidently maintain. Although at the time of its publication Hume's *Treatise* caused no stir at all, greatly to its author's disappointment, it has more than any other single work shaped the subsequent course of epistemological thought in the English-speaking world, and its influence more than 200 years later is greater than ever.

See CAUSALITY; INDUCTION.

4. **Kant.**—Immanuel Kant (1724–1804), unlike the leading empiricists in being a professional philosopher, claimed to have staged a revolution in philosophy by the introduction of what he called his critical method. But the philosophical link with his predecessors, particularly with Hume, whom he greatly admired, and perhaps even more with Berkeley. of whom he expressed a very low opinion, is of at least as much importance. For the essence of the critical method was its insistence on inquiring into the limitations imposed on the possibility of knowledge by the nature of the human mind itself (in this there is a faint echo of Locke); his originality and his departure from empiricism lay in the extent to which he held that knowledge depended on the formal contribution of the mind itself. For him experience was not the reception of the given *plus* the formal structure disclosed in the given, it was the interpretation of the given according to the formal organization of it by the experiencing subject. In this he not merely made more explicit what might be held to be implicit in Hume's treatment of the function of the imagination, but also claimed a validity for empirical knowledge based on the nature of the mind's contribution which the empiricists would not have allowed. Rant's epistemology in his chief work on the subject; the *Kritik der reinen Vernunft* (1781: translated as *The Critique of Pure Reason*), shows him to have been impressed with two points and with the

problems raised by them: (1) claiming that there are synthetic a priori judgments, he asks how they are possible; and (2) claiming that empiricist attempts to abstract all concepts from experience fail: he asks how a priori concepts are applicable to experience. Summarily, his solution to both prqblems lies in his thesis that in objective experience and judgment the thinking mind applies to the manifold of sense the a *priori* forms of intuition (space and timej and the appropriate formal categories of experience, of which he claimed to have established that there were 12 and only 12.

Kant's epistemology derives from a number of distinctions with which he begins, as follows:

1. Analytic and Synthetic Judgments. — Accepting as correct and complete the traditional Aristotelian logic of his day, Kant distinguished between an analytic judgment, in which the concept of the predicate is contained in the concept of the subject, and a synthetic judgment, in which the concept of the predicate lies outside the concept of the subject. Thus an analytic judgment, such as "Whatever is red is coloured," is necessary (being coloured is part of what it is to be red), for its denial would be self-contradictory (to assert that something was red but not coloured would be self-contradictory); and it is uninformative, for it serves at most to explicate the meanings of the terms involved. A synthetic judgment, on the other hand, such as "Whatever is red is round," might or might not be true and is not guaranteed as it would be if its denial were self-contradictory (to assert that something was red but not round might be false but would not be self-contradictory); and it is, or might be, informative (even if the information is false), for the concept of the predicate adds something to what is given in the concept of the subject.

2. Synthetic *A* Posteriori and *Synthetic A* Priori Judgments. — Some synthetic judgments assert a merely matter-of-fact connection between subject and predicate. Particular judgments describing sense experience and general judgments which entail such particular judgments will be of this kind, called by Kant synthetic a posteriori judgments, commonly called empirical judgments. They may or may not be true, and even where true they have no necessity. Contrasted with them are synthetic a priori judgments, where the connection between subject and predicate is necessary (although not analytically necessary) and independent of any particular sense experience. This class was crucial for Kant, for such judgments had a necessity which other synthetic judgments did not have, and at the same time mere informative or gave new knowledge, which analytic judgments could not give. The prime examples for Kant were the judgments of arithmetic and geometry. Such judgments were for Kant, as it were. a hybrid of his original synthetic-analytic distinction and had the advantages of each, being both necessary and informative. They were the key to the possibility of certain knowledge, of objective experience; and the problem for Kant was to explain how they could be possible, for their existence could not be established by a purely logical analysis, as in the case of the distinction between analytic and synthetic judgments.

3. *A* Posteriori and *A* Priori Concepts. — Many concepts are derived by abstraction from particular sense experiences; these are a posteriori. But whereas the empiricists held all concepts to be of this kind, Kant maintained that some were a priori, not abstracted from experience, but applicable to it. The problem was how such concepts, if not abstracted from sense experience, could properly be applicable to it. By his answer to this problem, how to make proper application of these concepts in a *priori* principles, Kant claimed to have solved the question of the extent and validity of possible knowledge and to have shown how their improper application engendered the illusions and inconsistencies of metaphysics.

The a priori character of mathematics depends for Kant on the use of the a priori notions — not strictly concepts, he said, for they are not discursive — of time (arithmetic) and space (geometry). The possibility of genuine science, or nonmathematical knowledge, depends on the existence of other nonmathematical a priori concepts and on their application to experience in a priori principles; *i.e.,* synthetic a priori judgments. These concepts, which he called categories or concepts of pure understanding, are to be found from the study of logical forms of judgment. Study of logic, which is the study of the forms of thought, reveals these concepts, but cannot alone validate their application to experience. For example, from the categorical form of judgment Kant derived the category of substance, from the hypothetical judgment the category of cause. Now, if we turn to experience, we find a further distinction: between a purely subjective sequence of sense impressions, which we describe subjectively ("This looks red to me." "This impression comes after that in my stream of consciousness"), and an objective order, which we assert when we say, for instance, "This is red," "This event follows that" or "This event is caused by that event." The difference between the subjective report and the objective judgment lies in the connection between perception and thought which characterizes only the latter. In objective experience and judgment we are applying to what is given in sense the forms of thought, or the categories. Objective experience is only possible and only distinguishable from subjective experience to the extent that we apply to the latter the categorial forms of thought. Objective knowledge is thus only made possible by the ordering which the mind imposes upon the manifold given in pure sense; it presupposes the unity of the perceiving subject, the synthesis of the given by the appropriate a posteriori concepts (the work of imagination and memory) and the application of the appropriate category. Kant claims to have proved that objective experience presupposes the truth of his synthetic a priori principles; *e.g.,* we could not make the distinction which we do between a subjective and an objective temporal order unless the principle that every event must have a cause were true. Thus knowledge is made possible by the mind's formal contribution to experience, without which contribution experience would not be objective.

Kant was careful to insist that his scheme could only be said to apply to experience such as ours. the perception of the phenomena of sense by the combination of sense and thought. It would not apply to nonsensible things-in-themselves or noiimena (that way lay the confusion of metaphysics), nor to any beings that had reason but no senses. For us the objects of our familiar external world are empirically real; here Kant was wrong in thinking that he disagreed with Berkeley. We may not say the same about things-in-themselves: about which strictly we may say nothing; here Kant was right in thinking that he disagreed with Berkeley. Where Kant differs from the pure phenomenalist is in his insistence that objective experience cannot be had or described without the application of categories (*e.g.,* cause and substance); the failure of pure phenomenalism to reduce an empirical judgment to a compendious description of sense underlines the strength of Kant's challenge to empiricism and suggests the need for a priori categories, even if Kant's own list proves inadequate in detail.

The main defect of Kant's system, which has led to subsequent attempts to refine empiricism, lay in his failure to keep the concept of a *noümenon,* or thing-in-itself, a negative concept. It is required both to be a negative concept, about which nothing can be known, and not to be a wholly negative concept, for the system depends on the assumption that things-in-themselves do somehow produce the phenomena of our experience. This basic contradiction in Kant's transcendent idealism, not unlike that in Locke's empiricism, prompted G. W. F. Hegel (*q.v.;* 1770–1831) to attempt an idealism without the assumption of a noiimenal reality beyond the reach of knowledge.

VI. EPISTEMOLOGY IN THE 20TH CENTURY

Developments in epistemology in the 20th century, chiefly in Great Britain and in the United States, have in general stemmed from the empiricist tradition set by Hume and modified by Kant; the absolutist movement deriving from Hegel reached a culmination in Great Britain in the philosophy of F. H. Bradley (1846–1924) but had little following thereafter. Largely because of the rapidly growing influence and authority of the natural sciences, epistemology has mainly concerned itself with questions of the knowability of the external world as accessible to empirical observation for the verification of hypotheses. As a result there can

be seen, at least until recently, a considerable preoccupation with problems of perception; and solutions offered have been in a broad sense realist in character, not necessarily empiricist in the narrowest and sceptical sense, but taking the familiar external world of common sense as base and as what philosophy must come to terms with. Similarly. and again as a reaction against the supposedly sweeping system-building of post-Hegelian idealists, there has been little attempt at synthesis. Philosophers have preferred to attempt piecemeal solutions of relatively isolable cruces within a general realist view, proceeding by one form of analysis or another. the three leading figures being the Cambridge philosophers G. E. Moore (1873–1958), Bertrand Russell (1872–) and Ludwig Wittgenstein (1889–1951).

1. Perception **and** Memory. — In the earlier part of the modern period the cases of perception and of memory may be taken as typical and central examples of the empiricist inheritance.

Perception. — Starting from the common-sense belief that there is an external world, populated by real objects both natural and artificial (*e.g.*, horses, trees, rocks and tables, buildings, machines), the problem was how such objects could be accessible to perceptual knowledge. The simple answer, that perception was a direct relationship between observing subject and the object observed, was generally found unacceptable, under the influence of varying considerations. Take as an example the particular case of sight, the sense most often selected by philosophers for investigation. Quite apart from the alleged difficulty of supposing that the complicated physiological causal process involved in seeing was compatible with claiming that seeing was a direct and unmodified apprehension of external objects as they really were. and apart again from the question how what started as a material relationship (involving, for instance, light rays, retinal images and nervous impulses) could end up as a mental awareness of material objects, there appeared to be a host of other awkward facts to be accommodated. Perceptual illusions are familiar, and perceptual hallucinations occur. The straight stick that looks bent when partly immersed in water still looks bent even although we know (in some sense) that it is not and even although we know the physical explanation of its looking so. What is the relation between the appearance which we cannot help seeing as that of a bent stick and the straight stick which is really there and which we expect to see when we pull it out of the water? What are we seeing when we see what is not there at all (*e.g.*, Macbeth's dagger or the angel of Mons)? To call them images seems insufficient, for they appear to have a projection and a spatial location which the images of daydreaming and of memory do not. If we look squintingly at a single object, for instance a lamppost, and see it double. which, if either, is the real lamppost? What, even if one is the real lamppost, is the other that we are seeing? And what are we seeing, if neither is the lamppost? The same object looks to have different visual shapes from different angles and distances, even although we are in no ordinary sense deluded: two observers looking at a penny lying on the table between them will simultaneously see different visual ellipses; although both will unhesitatingly say that the penny is and looks round. What is to be the relationship between the infinitely various ellipses and the supposedly real round shape of the penny? When we look at a distant star in the night sky, can we be seeing the real star if, as is often the case, it became extinct countless years before the time of our observation? How are we to say what, if any, is the colour of an object, when what colour we see is partly determined by the state of our optical nervous system, by the aids to seeing which we employ, by the condition of the intervening medium and by the distance of the object from our point of observation? Where is the blue of the sky, the rainbow, the mirror image, or the after-image, all of which we say we see? Such questions led philosophers to distinguish between the object perceived and the sense-data by which it was perceived, the latter allegedly being what were immediately given in sense (*e.g.*, the various ellipses of the penny or the differing colours of a woman's dress as seen under different lights). But such a solution, in line with the dualism of Locke's empiricism, engendered new problems of its own about the relation between the sense-data and the objects of which they were sense-data. Were sense-data private or public? If the former, are we any nearer to real knowledge of the objects than Locke was? If the latter, what can be the relation of visual space to physical space? Are some sense-data. but not others, literally parts of the surfaces of their objects? And, if so, how may we decide which are the privileged, authentic ones? Along these lines, it appeared that only statements about sense-data could be certain and that no statement about a material object could possess more than some degree or other of probability. But if statements about sense-data were as personal and as subjective as they appeared, what sure or initial foundation could they provide for any degree of probability at all for the corresponding objective statements about the physical world? To some it seemed that the claim to knoaledge of sense-data was in principle no more secure than a claim to knowledge of material objects. The supposed incorrigibility of a statement about sense-data lay. not in its certainty of being correct, but in the usually complete absence of any means of correcting it: any sense-datum was gone as soon as succeeded by another, and no two persons' sense-data could be directly compared. If. as for some philosophers, sense-data are public entities, existing independently of observers, will not the same questions break out over them as those questions about perception of material objects which they were postulated to solve? And is any visible material object to be thought of as a physical nucleus with an infinite cluster of sense-data somehow surrounding it? Or is, as was maintained by early phenomenalists following Berkeley's lead, a material object simply a collection of all actual and possible sense-data obtainable of it? This nai've phenomenalism seemed the logical conclusion of applying in this field Russell's version of Ockham's principle of economy: "wherever possible, substitute constructions out of known entities for inferences to unknown entities." But, in that case, what could be the status of a "possible sense-datum"? Its claim to be a "known entity" seemed highly dubious. The intractability of these hydra-headed questions suggested a radical defect in all such versions of the sense-datum theory, the defect of treating the technical term "sense-datum" as though it were the name of some special kind of sensed object; philosophers had unwittingly been led astray by their own language.

Memory. — The treatment of memory followed a roughly parallel, although simpler, direction. ending in a similar impasse. Here the question seemed to be primarily temporal: how could an act of remembering. occurring in the present, have as its object an event that had already occurred in the past and was now over? What is there about remembering that entitles us to place any reliance at all on our supposed recollections of the past, including the belief that events happened in the order and at the times when our memories tell us that they did happen? Broadly, two kinds of solution were attempted: the first was the dualist solution, namely to suppose, following Hume, that remembering consisted of having mental images of a certain kind, related as copies to the original events of which they were the images or pictures. But while such a view might be at least partially correct as an account of the phenomenology of remembering, it could answer no questions about the veracity or reliability of memory — as Hume himself had pointed out. No images are self-authenticating: as Russell argued, there was nothing logically absurd about the suggestion that "the world sprang into being five minutes ago, exactly as it then was, with a population that 'remembered' a wholly unreal past." Russell's own theory, that remembering consisted of having images characterized by a feeling of familiarity which would mark off the images of memory from those of imagination, was no improvement on Hume's original version. As an account of the experience of remembering, it seemed unplausible, for a feeling of familiarity appears far more to mark the experience of being unable to remember, of being troubled by the seeming familiarity of a face or a scene while being unable to identify or to locate it in one's past. And Russell's theory, like Hume's, conferred no dependability whatever on supposed memory experiences.

The second line of solution was to suppose, as argued by G. F. Stout (1860–1944), that remembering had as its direct object the event remembered. It was immediate (*i.e.*, noninferential) knowledge of the event remembered. Images occurring in a memory sit-

uation are to be distinguished from the perceptions that occurred in the original situation; and we do not in remembering immediately experience what we are remembering; but present image and "original content" of the perception are only to be distinguished as "successive stages in the history of the same thing." C. D. Broad (1887–), while not accepting this naïvely realistic theory of memory. did not reject it on metaphysical or temporal grounds: he suggested that the event remembered. while not *present* at the time of remembering. might be *presented* then. But such a notion of being presented without being present is not easy to accept, or even to understand. And in any case, as he pointed out, the occurrence of delusive memory situations will not square with such a realist theory of memory, so that it succeeds no more than the dualist theory in solving the epistemological problem which it was intended to answer.

2. Linguistic Analysis.— The general approach to epistemology illustrated by these two examples had been to a great extent inspired by the Russellian idea of making philosophy scientific, of determining how much of our so-called knowledge of the external world could properly be called knowledge; but the process of paring, of refining and of disclosing the details of complexities seemed to lead only to the conclusion that virtually no such knowledge was possible at all. Later, philosophers tended to progress by a different and more hopeful technique, derived from Moore and Wittgenstein. Regarding as misconceived the problems as posed by their predecessors, they shifted from attempting descriptions and theories of the phenomenology of experience to attending more carefully to the uses and implications of language as employed in claims to knowledge. The model hitherto used (unconsciously), due largely to preoccupation with the single sense of sight, had been that of the lens of the eye or the camera recording the scene, producing a picture of it, with the attendant problems how far the picture was a duplication. how far a distortion, of the original. This had appeared even in the act-object interpretation of knowing itself, the assumption that knowing was an act of one kind and that the difference between it and the different act of believing was to be found in the nature of the acts themselves; such psychologizing of epistemology reached back at least as far as Descartes and was largely the result of his influence. But, by attending more critically to the use of the verb "to know" and by ridding themselves of the inertia of the assumption that all active verbs designate acts of one kind or another, philosophers have been able to set their questions in a new light. Instead of trying to treat knowing as a special kind of act of acquaintance or awareness, they took their stand on paradigms of common-sense knowledge and asked under what conditions we would reflectively say that we know what we do know. Again, in the particular case of seeing, instead of starting with an apparently unexceptionable example of visual knowledge. for instance that this is a book in front of me, and working to the paradoxical conclusion that I cannot ever directly see a book or know that it is a book that I see, they ask under what conditions we would reflectively accept a claim to see a book in front of me. The sense-datum terminology is held simply to be an alternative terminology to that of common sense, over which it might have technical advantages for philosophers, enabling them to express themselves more clearly and minutely. It has had the grave disadvantage of laying its users open to the temptation to reify sense-data, thus generating unnecessary puzzles about the epistemological linkage between the sensing of the sense-datum and the perceiving of the material object supposedly achieved thereby. We do better to regard as the only object of a perceptual situation that which actually is perceived, even although, as a result of the observer's inattention or of the difficulties of conditions of perception. it may be misperceived. For instance, what I see as I look at what is in fact a squirrel in the branches of a tree is a squirrel, even although I may, from whatever cause, suppose that I see a cat. There is no need to postulate feline sense-data which I am to be held actually to have sensed, although wrongly to have interpreted. What I saw was a squirrel which, to me at any rate. looked enough like a cat for me to think that what I saw was a cat. A squirrel must look like something; and, even if most often it looks like a squirrel, it is hardly surprising if under some conditions it looks fleetingly like a cat. It is not surprising that pennies lying on the table look elliptical; it would be much more surprising if they did not. But they do not even look elliptical in the way in which the squirrel may look like a cat, for a penny does not look as if it were elliptical, but normally looks as if it were, as in fact it is, roughly circular. We do not see an elliptical sense-datum belonging to a round penny, we see a penny which is round and which looks elliptical only in the way in which it must so look if it is to look as if it really is a round penny. The illusion of the bent stick arrests attention only because of the comparative infrequency of its occurrence: we see a stick which looks as if it were a bent stick only until we know how the trick is done. Thereafter what we see is a straight stick which looks bent only in the way in which the penny looks elliptical, but which does not look as if it is bent any more than the penny looks as if it is elliptical.

The assertion that "he knows that . . ." can be seen not to be reporting a present, occurrent act of a special kind, for it does not report an act at all, let alone a present one. A man knows that many things are the case, even though he may not be thinking of them at the time at which the assertion "He knows that. . . ." is truthfully made of him. He does not cease to know that Adolf Hitler was the leader of Nazi Germany when he thinks about something else or when he falls asleep. A schoolboy answering an examination paper on physics does not on that account or for the period of that examination cease to know that Roger Bannister was the first man to run a four-minute mile, that Gen. Dwight D. Eisenhower was successively a soldier and president of the Cnited States, and that his own name is William Brown. Knowing, in fact, is not an act, still less an act characterized by a feeling of certainty or conviction, for the latter is neither sufficient nor necessary; we are often enough firmly convinced of something but mistaken, and we may know that something is the case, even although we think that we do not. Belief again, like knowledge. is not an act, and for the same reasons: it is a disposition or a tendency to act (including to speak) in certain ways under certain conditions, marked less by a subjective feeling of incomplete certainty or of partial dubiety {although these may often enough be present) than by an inability to establish beyond doubt or to produce conclusive evidence for the belief in question. The temptation to treat knowledge as a special kind of mental condition and consequently to look for a reliable or even infallible criterion of that condition is natural enough, but has now been shown to be delusive. It is natural. for the verb "to know" *prima facie* appears to belong to the class of cognitive "psychological verbs," with others such as "to think." "to wonder," "to imagine," "to believe," etc. But this rough classification is misleading: in the first place, unlike some of the others. "to know" does not designate a mental act, and in this respect it resembles "to believe." Secondly and more importantly. "to know" does not designate wholly a mental condition or state. and in this respect it differs even from "to believe." To say that a man believes something (*e.g.*, that today is Jan. 1) is to say something solely about the man's view on today's date and is not to commit oneseli to agreeing with him: one may report that he believes something, without oneself either agreeing or disagreeing with him. But to say that he knows that today is Jan. 1 is not merely to say something about the man's view about today's date, it is also to commit oneself to agreeing with him: it is to endorse his claim (if he makes it), to say that he is right. Thus the statement that a man knows that something is the case is not, as is so with the other cognitive verbs, a statement entirely about the man's state of mind; and consequently to know is not simply to be in a particular state of mind. In fact, as Plato came so near to saying in the *Theaetetus*, a man knows that something is the case if (1) he can give the correct answer to the question and if (2) he can show that it is the right answer, or produce conclusive evidence for his assertion; what will count as conclusive evidence will depend on the particular circumstances and the context, about which no rules that are both completely precise and completely general can be given in abstraction. The problem about memory will be the problem of determining the conditions under which we could accept a man's claim to remember a certain event: if we

are satisfied that he could have remembered it—or, in other words, that it is an event which occurred within his conscious lifetime, that he was a witness of it or that we can find no evidence that he was not, that he can now give a substantially correct account of it, which we can find no reason to suppose that he could have got, or did get, from another source—then we have no reason for not accepting his claim; if he survives tests of being deceived or of trying to deceive us, we can ask no more.

Thus, by showing that the act-object account of knowledge and belief which runs through philosophy from Plato's *Republic* onward is at times an oversimplification—and, more often, a positive error which, by misframing the questions, has necessarily produced erroneous answers—20th-century philosophers suggested a more fruitful line for epistemology to follow. By paying more attention to linguistic expressions and to the contexts of their use, they laid bare the assumptions—exposing the errors of many of them—from which the subject had so long been proceeding and indicated the lines of a program for its future progress.

See also EMPIRICISM; METAPHYSICS; PSYCHOLOGY, HISTORY OF; QUALITIES; RATIONALISM; SCHOLASTICISM; SCIENCE; SKEPTICISM; and the biographies of philosophers—ARISTOTLE; DESCARTES, RENE; KANT, IMMANUEL; PLATO; etc.

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(A. D. W.)

KNOWLTON, CHARLES (1800–1850), U.S. physician and author of a treatise on birth control which became the subject of celebrated court actions in the United States and England, was born in Templeton, Mass., on May 10, 1800, the son of a farmer. He acquired his early education chiefly through his own efforts, and was graduated from Dartmouth college, Hanover, N.H., with a degree in medicine in 1824. In 1832 Knowlton published anonymously a treatise on birth control entitled *The Fruits of Philosophy: or, The Private Companion of Young Married People,* The following year the second edition appeared, crediting him as the author. Nine American editions eventually were published. The book was first reprinted in England in 1834.

Though the book presented a temperate discussion of the medical, social and economic aspects of birth control, it violated current conventions of taste. Prosecuted in the United States, Knowlton was ordered to pay a fine at Taunton, Mass.. and was imprisoned for three months in Cambridge. An action against him in Greenfield was unsuccessful, however. In England *The Fruits of Philosophy* became the subject of a test case, *The Queen* v. *Charles Bradlaugh and Annie Besant* (2 *Law Reports, Queen's Bench Division,* 569, and the reversed decision in 3 Law *Reports, Queen's Bench Division,* 607), the courts eventually (1877) deciding in favour of the defendants *(see* BESANT, ANNIE; BRADLAUGH, CHARLES). Knowlton died on Feb. 20, 1850.

KNOWLTON, FRANK HALL (1860–1926), U.S. paleobotanist who made his chief contribution to science in his studies on the distribution and structure of fossilized plants, was born at Brandon, Vt., on Sept. 2, 1860, and was graduated at Middlebury college in 1884. He became an aid at the U.S. National museum in Washington, D.C., and in 1887 was made curator of botany and fossil plants at that institution. He resigned in 1889 to take a position as assistant paleontologist with the U.S. geological survey. In 1900 he became paleontologist and, in 1907, geologist of the survey, serving in the latter position until his death at Ballston, Va., on Nov. 22, 1926. His investigations led him on many field trips throughout the western states. He was the founder of *The Plant World* and its editor from 1897 to 1904. The author of more than 200 papers in scientific journals, he also did a considerable amount of popular writing on botanical subjects including *Birds of the World* (1909).

KNOW-NOTHING or AMERICAN PARTY, in United States history, a political party of importance in the decade before 1860. Its principle was political proscription of naturalized citizens and of Roman Catholics. In the years 1830–60 Irish immigration became increasingly preponderant and that of Catholics was even more so. The geographical segregation and the clannishness of foreign voters in the cities gave them a power that Whigs and Democrats alike strove to control, to the great aggravation of naturalization and election frauds. "No one can deny that ignorant foreign suffrage had grown to be an evil of immense proportions" (J. F. Rhodes). In labour disputes, political feuds and social clannishness, the immigrants-especially the Irish and German—displayed their power and at times gave offense by their criticism of American institutions.

In immigration centres like Boston, Philadelphia and New York, the Catholic Church, largely foreign in membership and proclaiming a foreign allegiance of disputed extent, was held by some to be "the symbol and strength of foreign influence" (L. D. Scisco); many regarded it as a transplanted foreign institution, un-American in organization and ideas. Thus it became involved in politics. The decade 1830–40 was marked by anti-Catholic (anti-Irish) riots in various cities and by party organization of nativists in many places in local elections.

The American-Republican (later the Native-American) party arose, its national career began practically in 1845 and it first received a state organization in Louisiana in 1841. New York city in 1844 and Boston in 1845 were carried by the nativists, but their success was due to Whig support, which was not continued, and the national organization was practically extinct by 1847. In the early 1850s nativism was revivified by an unparalleled inflow of immigrants. In 1853–54 there were widespread anti-Catholic propaganda and riots against Catholics in various cities. Meanwhile the Know-Nothing party had sprung from nativist secret societies. Like these, its organization was secret; hence its name—since a member, when interrogated, always answered that he knew nothing about it.

Selecting candidates secretly from among those nominated by the other parties and giving them no public endorsement, the Know-Nothings, as soon as they gained the balance of power, could shatter at will Whig and Democratic calculations. Their power was evident by 1852—from which time, accordingly, Know-Nothingism is most properly dated. Many considered the charges they brought against natusalization abuses as well founded, and those against election frauds not less so. The proposed proscription of the foreign-born knew no exceptions: many wished never to concede all the rights of natives to them, nor to their children, unless educated in the public schools.

As for the Catholics, the real animus of Know-Nothingism was against political Roman Catholic action; therefore, secondarily, against papal allegiance and episcopal church administration (in place of administration by lay trustees, as was earlier common practice in the United States); and, primarily, against public aid to Catholic schools,

and the alleged greed (*i.e.*, the power and success) of the Irish in politics.

The times were propitious for the success of an aggressive third party, but the Know-Nothings lacked aggression. In entering national politics the party abandoned its mysteries, without making compensatory gains. When it was compelled to publish a platform of principles, factions arose in its ranks; moreover, it straddled the slavery question. In 1854, however, Know-Nothing gains were remarkable. In that year "American party" became the official name. Its strength in congress was almost 30-fold that of 1852. It elected governors, legislatures, or both in four New England states, and in Maryland, Kentucky, California; and almost won six southern states. Thereafter the organization spread like wildfire in the south, in which section there were almost no immigrants. Know-Nothing evasion of the slavery question probably helped the south, but neither Republicans nor Democrats would endure the evasion; Stephen Douglas and William Seward, and later (1855–56) their parties, denounced it. In the northwest the Know-Nothings were swept into the antislavery movement in 1854 without retaining their organization. The national platform of 1856 (adopted by a secret grand council), beside including antialien and anti-Catholic planks, offered sops to the north, the south and the doughfaces on the slavery issue. Millard Fillmore was nominated for the presidency. Eight months later the Republican wave swept the Know-Nothings out of the north. Their popular vote in the north was under one-seventh, in the south above three-sevenths, of the total vote cast.

By 1859 the party was confined almost entirely to the border states. The Constitutional Union—the Do-Nothing—party of 1860 was mainly composed of Know-Nothing remnants. The year 1860 practically marked, also, the disappearance of the party as a local power.

Except in city politics nativism had no vitality. Public opinion never accepted its estimate of immigrants nor of Catholic citizens. Some of its antichurch principles, however—as the nonsupport of denominational schools—were generally accepted.

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KNOX, HENRY (1750–1806), U.S. Revolutionary War general, was born in Boston, Mass., of Scottish-Irish parentage, on July 25, 1750. He was prominent in the colonial militia and tried to keep the Boston crowd and the British soldiers from the clash known as the Boston massacre (1770). He joined the American army at the outbreak of the Revolutionary War, and fought at Bunker Hill, planned the defenses of the camps of the army before Boston, and brought from Lake George and border forts much-needed artillery. At Trenton he crossed the river before the main body, and in the attack rendered such good service that he was made brigadier general and chief of artillery in the Continental army. He was present at Princeton; was chiefly responsible for the mistake in attacking the "Chew House" at Germantown; served with efficiency at Monmouth and at Yorktown; and after the surrender of Cornwallis was promoted major general.

His services throughout the war were of great value to the American cause; he was one of Washington's most trusted advisers, and he brought the artillery to a high degree of efficiency. In April 1783 he had drafted a scheme of a society to be formed by the American officers and the French officers who had served in America during the war, and to be called the "Cincinnati"; of this society he was the first secretary-general (1783–99) and in 1805 became vice-president general. Knox was secretary of war in 1785–94, being the first to hold this position after the organization of the federal government in 1789. He urged ineffectually a national militia system, to enroll all citizens over 18 and under 60. For this and for his close friendship with Washington he was bitterly assailed by the Republicans.

Knox died in Thomaston, Me., on Oct. 25, 1806.

KNOX, JOHN (*c.* 1505–1572), Scottish reformer and historian. Of his early life very little is certainly known, in spite of the fact that his *History of the Reformation* and his private letters, especially the latter, are often vividly autobiographical. Even the year of his birth, usually given as 1505, is matter of dispute. Theodore Beza makes it 1515; Sir Peter Young (tutor to James VI of Scotland), writing to Beza from Edinburgh in 1579, says 1513; and a strong case has been made out for holding that the generally accepted date is because of an error in transcription. (*See* Dr. Hay Fleming in the *Bookman*, Sept. 1905.)

Knox was a son of William Knox, who lived in or near Haddington, his mother's name was Sinclair, and his forefathers on both sides had fought under the banner of the Bothwells. William Knox was perhaps a prosperous East Lothian peasant. John went to school and to the university, where he sat "at the feet" of John Major. Major exchanged his "regency" or professorship in Glasgow university for one in that of St. Andrews in 1523. If Knox's college time was later than that date (as it must have been, if he was born near 1515), it was no doubt spent, as Beza narrates, at St. Andrews, and probably exclusively there. But in Major's last Glasgow session a "Joannes Knox" matriculated there; and if this were the future reformer, he may thereafter either have followed his master to St. Andrews or returned from Glasgow straight to Haddington. But there is no trace of him for another 20 years. Then he reappears in his native district as a priest without a university degree (Sir John Knox) and a notary of the diocese of St. Andrews.

In 1543 he signed himself "minister of the sacred altar" under the archbishop of St. Andrews. But in 1546 he was carrying a two-handed sword in defense of the reformer George Wishart, on the day when the latter was arrested by the archbishop's order. Knox would have resisted, though the arrest was by his feudal superior, Lord Bothwell; but Wishart himself commanded his submission, with the words "One is sufficient for a sacrifice," and was handed over for trial at St. Andrews. Next year the archbishop himself had been murdered, and Knox was preaching in St. Andrews a fully developed Protestantism.

Knox gives us no information as to how this startling change in himself had been brought about. After Wishart's execution he fled from place to place, and, hearing that certain gentlemen of Fife had slain the cardinal and were in possession of his castle of St. Andrews, he gladly joined himself to them. In St. Andrews he taught "John's Gospel" and a certain catechism—probably that which Wishart had got from "Helvetia[n]" and translated; but his teaching was supposed to be private and tutorial and for the benefit of his friends' "bairns." The men about him however—among them Sir David Lindsay of the Mount, "Lyon King" and poet—saw his capacity for greater things, and, on his at first refusing "to run where God had not called him," planned a solemn appeal to Knox from the pulpit to accept "the public office and charge of preaching." At the close of it the speaker (in Knox's own narrative) "said to those that were present, 'Was not this your charge to me? And do ye not approve this vocation?' They answered, 'It was, and we approve it.' Whereat the said Johnne, abashed, burst forth in most abundant tears and withdrew himself to his chamber," remaining there in "heaviness" for days, until he came forth resolved and prepared. Knox is probably not wrong in regarding this strange incident as the spring of his own public life.

The St. Andrews invitation was really one to danger and death; John Rough, who spoke it, died a few years after at Smithfield. What to the others was chiefly a promise of personal salvation became for the indomitable will of Knox an assurance also of victory, even in this world, over embattled forces of ancient wrong. It is certain at least that from this date Knox never changed and scarcely even varied his public course. And looking back upon that course afterwards, he records with much complacency how his earliest St. Andrews sermon built up a whole fabric of aggressive Protestantism upon Puritan theory, so that his startled hearers muttered, "Others sned (snipped) the branches; this man strikes at the root."

Meantime the system attacked was safe for another thirteen years. In June 1547 St. Andrews yielded to the French fleet, and the prisoners, including Knox, were thrown into the galleys on the Loire, to remain in irons and under the lash for at least nineteen months. Released at last (apparently through the influence

of the young English king, Edward VI.), Knox was appointed one of the licensed preachers of the new faith for England, and stationed in the great garrison of Berwick, and afterwards at Newcastle. In 1551 he seems to have been made a royal chaplain; in 1552 he was certainly offered an English bishopric, which he declined; and during most of this year he used his influence, as preacher at court and in London, to make the new English settlement more Protestant. To him at least is due the Prayer-book rubric which explains that, when kneeling at the sacrament is ordered, "no adoration is intended or ought to be done." While in Northumberland Knox had been betrothed to Margaret Bowes, one of the fifteen children of Richard Bowes, the captain of Norham Castle. Her mother, Elizabeth, co-heiress of Aske in Torkshire, was the earliest of that little band of women-friends whose correspondence with Knox on religious matters throws an unexpected light on his discriminating tenderness of heart. But now Mary Tudor succeeded her brother, and Knox in March 1554 escaped into five years' exile abroad, leaving Mrs. Bowes a fine treatise on "Affliction," and sending back to England two editions of a more acrid "Faithful Admonition" on the crisis there. He first drifted to Frankfort, where the English congregation was divided, and the party opposed to Knox got rid of him at last by a complaint to the authorities of treason against the emperor Charles V. as well as Philip and Mary. At Geneva he found a more congenial pastorate. Christopher Goodman (*c.* 1520–1603) and he, with other exiles, began there the Puritan tradition, and prepared the earlier English version of the Bible. Here, and afterwards at Dieppe (where he preached in French), Knox kept in touch with the other Reformers, studied Greek and Hebrew in the interest of theology, and having brought his wife and her mother from England in 1555 lived for years a peaceful life.

But even here Knox was preparing for Scotland, and facing the difficulties of the future, theoretical as well as practical. In his first year abroad he consulted Calvin and Bullinger as to the right of the civil "authority" to prescribe religion to his subjects—in particular, whether the godly should obey "a magistrate who enforces idolatry and condemns true religion," and whom should they join "in the case of a religious nobility resisting an idolatrous sovereign." In August 1jjj he visited his native country and found the queen-mother, Mary of Lorraine, acting as regent in place of Mary, queen of Scots, now being brought up at the court of France. Knox was allowed to preach privately for six months throughout the south of Scotland. and was listened to with an enthusiasm which made him break out, "O sweet were the death which should follow such forty days in Edinburgh as here I have had three!" Before leaving he even addressed a letter to the regent, urging her to favour the Evangel. She accepted it jocularly as a "pasquil," and Knox on his departure was condemned and burned in effigy. But he left behind him a "Wholesome Counsel" to Scottish heads of families, reminding them that within their own houses they were "bishop and kings," and recommending the institution of something like the early apostolic worship in private congregations. Knox, though in exile, seems to have been henceforward the chief adviser of the Protestant lords; and before the end of 1557 they, under the name of the "Lords of the Congregation," had entered into the first of the religious "bands" or "co enants" afterwards famous. In 1558 he published his "Appellation" to the nobles, estates and commonalty against the sentence of death recently pronounced upon him, and along with it a stirring appeal "To his beloved brethren, the Commonalty of Scotland," urging that the care of religion fell to them also as being "God's creatures, created and formed in His own image," and having a right to defend their conscience against persecution. About this time, indeed, the regent showed a remarkable degree of toleration, but next year she forbade the reformed preaching in Scotland. A rupture ensued at once, and Knox appeared in Edinburgh on May 2, 1559 "even in the brunt of the battle." He was promptly "blown to the horn" at the Cross there as an outlaw, but escaped to Dundee. and commenced public preaching in the chief towns of central Scotland At Perth and at St. Andrews his sermons were followed by the destruction of the monasteries. But while he notes that in Perth the act was that of "the rascal multitude," he was glad to claim in St. Andrews the support of the civic "authority." Edinburgh was still doubtful, and the queen regent held the castle; but a truce between her and the lords for six months to Jan. 1, 1560 was arranged on the footing that every man there "may have freedom to use his own conscience to the day foresaid"—a freedom interpreted to let Knox and his brethren preach publicly and incessantly.

Scotland, like its capital, was divided. Both parties lapsed from the freedom-of-conscience solution to which each when unsuccessful appealed; both betook themselves to arms; and the immediate future of the little kingdom was to be decided by its external alliances. Knox now took a leading part in the transaction by which the friendship of France was exchanged for that of England. He had one serious difficulty. Before Elizabeth's accession to the English crown, and after the queen mother in Scotland had disappointed his hopes, he had published a treatise against what he called "The Monstrous Regiment (regimen or government) of Women." Elizabeth never forgave him; but Cecil corresponded with the Scottish lords, and their answer in July 1559, in Knox's handwriting, assures England not only of their own constancy, but of "a charge and commandment to our posterity, that the amity and league between you and us, contracted and begun in Christ Jesus, may by them be kept inviolated for ever." The league was promised by England; but the army of France was first in the field, and towards the end of the year drove the forces of the "congregation" from Leith into Edinburgh, and then out of it in a midnight rout to Stirling—"that dark and dolorous night," as Knox long afterwards said, "wherein all ye, my lords, with shame and fear left this town," and from which only a memorable sermon by their great preacher roused the despairing multitude into new hope. Their leaders renounced allegiance to the regent; she died in the castle of Edinburgh; the English troops, after the usual Elizabethan delays and evasions, joined their Scots allies; and the French embarked from Leith. On July 6, 1560, a treaty was at last made, nominally between Elizabeth and the queen of France and Scotland; while Cecil instructed his mistress's plenipotentiaries to agree "that the government of Scotland be granted to the nation of the land." The revolution was in the meantime complete. Knox, who takes credit for having done much to end the enmity with England which was so long thought necessary for Scotland's independence, was destined, beyond all other men, to leave the stamp of a more inward independence upon his country and its history.

At the first meeting of the Estates, in August 1560, the Protestants were invited to present a confession of their faith. Knox and three others drafted it, and were present when it was offered and read to the parliament, by whom it was approved. The Scots confession, Calvinist rather than Lutheran, remained for two centuries the authorized Scottish creed, though in the first instance the faith of only a fragment of the people. Yet its approval became the basis for three acts passed a week later; the first abolishing the pope's authority and jurisdiction in Scotland; the second, rescinding old statutes which had established and enforced that and other Catholic tenets; the third, inflicting heavy penalties, with death on a third conviction, on those who should celebrate mass or even be present at it. The reformer and his friends could no longer be described as, in Knox's words, "requiring nothing but the liberty of conscience, and our religion and fact to be tried by the word of God"

Already "in our towns and places reformed," as the Confession puts it, there were local or "particular kirks," and these grew and spread and were provincially united, till, in the last month of this memorable year, the first General Assembly of their representatives met, and became the "universal kirk," or "the whole church convened." It had before it the plan for church government and maintenance, drafted in August at the same time with the Confession, under the name of The Book *of Discipline,* and by the same framers. Knox was even more clearly in this case the chief author, and he had by this time come to desire a much more rigid Presbyterianism than he had sketched in his "Wholesome Counsel" of 1jjj. In planning it he seems to have used his acquaintance with the "Ordonnances" of the Genevan Church

under Calvin, and with the "Forma" of the German Church in London under John Laski (or A. Lasco). Starting with "truth" contained in Scripture as the church's foundation, and the Word and Sacraments as means of building it up, it provides ministers and elders to be elected by the congregations, with a subordinate class of "readers," and by their means sermons and prayers each "Sunday" in every parish. In large towns these were to be also on other days, with a weekly meeting for conference or "prophesying." The "plantation" of new churches is to go on everywhere under the guidance of higher church officers called superintendents. All are to help their brethren, "for no man may be permitted to live as best pleaseth him within the Church of God." And above all things the young and the ignorant are to be instructed, the former by a regular gradation or ladder of parish or elementary schools, secondary schools and universities. Even the poor were to be fed by the Church's hands; and behind its moral influence, and a *discipline* over both poor and rich, was to be not only the coercive authority of the civil power but its money. Knox had from the first proclaimed that "the *teinds* (tithes of yearly fruits) by God's law do not appertain of necessity to the kirkmen." And this book now demands that out of them "must not only the ministers be sustained, but also the poor and schools." But Knox broadens his plan so as to claim also the property which had been really gifted to the Church by princes and nobles—given by them indeed, as he held, without any moral right and to the injury of the people, yet so as to be Church patrimony. From all such property, whether land or the sheaves and fruits of land, and also from the personal property of burghers in the towns, Knox now held that the state should authorize the kirk to claim the salaries of the ministers, and the salaries of teachers in the schools and universities, but above all, the relief of the poor—not only of the absolutely "indigent" but of "your poor brethren, the labourers and handworkers of the ground." For the danger now was that some gentlemen were already cruel in exactions of their tenants, "requiring of them whatever before they paid to the Church, so that the papistical tyranny shall only be changed into the tyranny of the lords or of the laird."

The danger foreseen alike to the new Church, and to the commonalty and poor, began to be fulfilled a month later, when the lords, some of whom had already acquired, as others were about to acquire, much of the Church property, declined to make any of it over for Knox's magnificent scheme. It was, they said, "a devout imagination." Seven years afterwards, however, when the contest with the Crown was ended, the kirk was expressly acknowledged as the only Church in Scotland, and jurisdiction given it over all who should attempt to be outsiders; while the preaching of the Evangel and the planting of congregations went on in all the accessible parts of Scotland. Gradually too stipends for most Scottish parishes were assigned to the ministers out of the yearly *teinds;* and the Church received—what it retained even down to recent times—the administration both of the public schools and of the Poor Law of Scotland. But the victorious rush of 1560 was already somewhat stayed, and the very next year raised the question whether the transfer of intolerance to the side of the new faith was as wise as it had at first seemed to be successful.

Mary Queen of Scots had been for a short time also queen of France, and in 1561 returned to her native land, a young widow on whom the eyes of Europe were fixed. Knox's objections to the "regiment of women" were theoretical, and in the present case he hoped at first for the best, favouring rather his queen's marriage with the heir of the house of Hamilton. Mary had put herself into the hands of her half-brother, Lord James Stuart afterwards earl of Moray, the only man who could perhaps have pulled her through. A proclamation now continued the "state of religion" begun the previous year; but mass was celebrated in the queen's household, and Lord James himself defended it with his sword against Protestant intrusion. Knox publicly protested: and Moray, who probably understood and liked both parties, brought the preacher to the presence of his queen. There is nothing revealed to us by "the broad clear light of that wonderful book,"[1] *The History* of *the Reformation in Scotland,* more remarkable than the four Dialogues or interviews, which, though recorded only by Knox, bear the strongest stamp of truth, and do almost more justice to his opponent than to himself. Mary took the offensive, and very soon raised the real question. "Ye have taught the people to receive another religion than their princes can allow; and how can that doctrine be of God, seeing that God commands subjects to obey their princes?" The point was made keener by the fact that Knox's own Confession of Faith (like all those of that age, in which an unbalanced monarchical power culminated) had held kings to be appointed "for maintenance of the true religion," and suppression of the false; and the reformer now fell back on his more fundamental principle, that "right religion took neither original nor authority from worldly princes, but from the Eternal God alone." All through this dialogue too, as in another at Lochleven two years afterwards, Knox was driven to axioms, not of religion but of constitutionalism, which Buchanan and he may have learned from their teacher Major, but which were not to be accepted till a later age. "'Think ye,' quoth she, 'that subjects, having power, may resist their princes?' 'If their princes exceed their bounds, Madam, they may be resisted and even deposed,'" Knox replied.

But these dialectics, creditable to both parties, had little effect upon the general situation. Knox had gone too far in intolerance, and Moray and Maitland of Lethington gradually withdrew their support. The court and parliament, guided by them, declined to press the queen or to pass the Book of Discipline; and meantime the negotiations as to the queen's marriage with a Spanish, a French or an Austrian prince revealed the real difficulty and peril of the situation. Her marriage to a great Catholic prince would be ruinous to Scotland, probably also to England, and perhaps to all Protestantism. Knox had already by letter formally broken with the earl of Moray, "committing you to your own wit, and to the conducting of those who better please you"; and now, in one of his greatest sermons before the assembled lords, he drove at the heart of the situation—the risk of a Catholic marriage. The queen sent for him for the last time and burst into passionate tears as she asked, "What have you to do with my marriage? Or what are you within this commonwealth?" "A subject born within the same," was the answer of the son of the East Lothian peasant; and the Scottish nobility, while thinking him overbold, refused to find him guilty of any crime, even when, later on, he had "convocated the lieges" to Edinburgh to meet a crown prosecution. In 1564 a change came. Mary had wearied of her guiding statesmen, Moray and the more pliant Maitland; the Italian secretary David Rizzio, through whom she had corresponded with the pope, now more and more usurped their place; and a weak fancy for her handsome cousin, Henry Darnley, brought about a sudden marriage in 1565 and swept the opposing Protestant lords into exile. Darnley, though a Catholic, thought it well to go to Knox's preaching; but was so unfortunate as to hear a very long sermon, with allusions not only to "babes and women" as rulers, but to Ahab who did not control his strong-minded wife. Mary and the lords still in her council ordered Knox not to preach while she was in Edinburgh, and he was absent or silent during the weeks which preceded the murder of Rizzio. During the rest of the year Knox was hidden in Ayrshire or elsewhere, and throughout 1566 he was forbidden to preach when the court was in Edinburgh. But he was influential at the December Assembly in the capital where a greater tragedy was now preparing, for Mary's infatuation for Bothwell was visible to all. At the Assembly's request, however, Knox undertook a long visit to England, where his two sons by his first wife were being educated, and were afterwards to be fellows of St. John's, Cambridge, the younger becoming a parish clergyman. It was thus during the reformer's absence that the murder of Darnley, the abduction and subsequent marriage of Mary, the flight of Bothwell, and the imprisonment in Lochleven of the queen, unrolled

[1] John Hill Burton (*Hist.* of *Scotland,* iii. 339). Mr. Burton's view (differing from that of Professor Hume Brown) was that the dialogues—the earlier of them at least—must have been spoken in the French tongue, in which Knox had recently preached for a year.

themselves before the eyes of Scotland. Knox returned in time to guide the Assembly which sat on June 25, 1567, in deaiing with this unparalleled crisis, and to wind up the revolution by preaching at Stirling on July g, 1567, after Mary's abdication, at the coronation of the infant king.

His main work was now really done; for the parliament of 1567 made Moray regent, and Rnox was only too glad to have his old friend back in power, though they seem to have differed on the question whether the queen should be allowed to pass into retirement without trial for her husband's death, as they had differed all along on the question of tolerating her private religion. Knox's victory had not come too early, for his physical strength soon began to fail. But Mary's escape in 1j68 resulted only in her defeat at Langside, and in a long imprisonment and death in England. In Scotland the regent's assassination in 1570 opened a miserable civil war, but it made no permanent change. The massacre of St. Bartholomew rather united English and Scottish Protestantism; and Knox in St. Giles' pulpit, challenging the French ambassador to report his words, denounced God's vengeance on the crowned murderer and his posterity. When open war broke out between Edinburgh Castle, held by Mary's friends, and the town, held for her son, both parties agreed that the reformer, who had already had a stroke of paralysis, should remove to St. Andrews. While there he wrote his will, and published his last book, in the preface to which he says, "I heartily take my good-night of the faithful of both realms . . . for as the world is weary of me, so am I of it." And when he now merely signs his name, it is "John Knox, with my dead hand and glad heart." In the autumn of 1572 he returned to Edinburgh to die, probably in the picturesque house in the "throat of the Bow," which for generations has been called by his name. With him were his wife and three young daughters; for though he had lost Margaret Bowes at the close of his year of triumph, 1560, he had four years after married Margaret Stewart, a daughter of his friend Lord Ochiltree. She was a bride of only seventeen and was related to the royal house; yet, as his Catholic biographer put it, "by sorcery and witchcraft he did so allure that poor gentlewoman that she could not live without him." He died on Nov. 24, 1j72, and at his funeral in St. Giles' Churchyard the new Regent Morton, speaking under the hostile guns of the castle, expressed the first surprise of those around that one who had "neither flattered nor feared any flesh" had now "ended his days in peace and honour."

Knox was a rather small man, with a well-knit body; he had a powerful face, with dark blue eyes under a ridge of eyebrow, high cheek-bones, and a long black beard which latterly turned grey. This description, taken from a letter in 1579 by his junior contemporary Sir Peter Young, is very like Beza's fine engraving of him in the Zcones—an engraving probably founded on a portrait which was to be sent by Young to Beza along with the letter. The portrait, which was unfortunately adopted by Carlyle, has neither pedigree nor probability. After his two years in the French galleys, if not before, Knox suffered permanently from gravel and dyspepsia, and he confesses that his nature "was for the most part oppressed with melancholy." Yet he was always a hard worker; as sole minister of Edinburgh studying for two sermons on Sunday and three during the week, besides having innumerable cares of churches at home and abroad. He was undoubtedly sincere in his religious faith, and most disinterested in his devotion to it and to the good of his countrymen. But like too many of them. he was self-conscious, self-willed and dogmatic; and his transformation in middle life, while it immensely enriched his sympathies as well as his energies, left him unable to put himself in the place of those who retained the views which he had himself held. All his training too, university, priestly and in foreign parts, tended to make him logical overmuch. But this was mitigated by a strong sense of humour (not always sarcastic, though sometimes savagely so), and by tenderness. best seen in his epistolary friendships with women; and it was quite overborne by an instinct and passion for great practical affairs. Hence it was that Knox as a statesman so often struck successfully at the centre of the complex motives of his time, leaving it to later critics to reconcile his theories of action. But hence too he more than once took doubtful shortcuts to some of his most important ends; giving the ministry within the new Church more power over laymen than Protestant principles would suggest, and binding the masses outside who were not members of it, equally with their countrymen who were, to join in its worship, submit to its jurisdiction, and contribute to its support. And hence also his style (which contemporaries called anglicized and modern), though it occasionally rises into liturgical beauty, and often flashes into vivid historical portraiture, is generally kept close to the harsh necessities of the few years in which he had to work for the future. That work was indeed chiefly done by the living voice; and in speaking, this "one man," as Elizabeth's very critical ambassador wrote from Edinburgh, was "able in one hour to put more life in us than five hundred trumpets continually blustering in our ears." But even his eloquence was constraining and constructive—a personal call for immediate and universal co-operation; and that personal influence survives to this day in the institutions of his people, and perhaps still more in their character. His countrymen indeed have always believed that to Knox more than to any other man Scotland owes her political and religious individuality. And since his 19th century biography by Dr. Thomas McCrie, or at least since his recognition in the following generation by Thomas Carlyle, the same view has taken its place in literature.

BIBLIOGRAPHY.—Knox's books, pamphlets, public documents and letters are collected into the great edition in six volumes of *Knox's Works*, by David Laing (Edinburgh. 1846–64), with introductions, appendices and. notes. Of his books the chief are the following: 1.—*The History of the Reformation in Scotland,* incorporating the Confession and the Book of Discipline. Begun by Knox as a party manifesto in 1560, it was continued and revised by himself in 1566 so as to form four books, with a fifth book apparently written after his death from materials left by him. It was partly printed in London in 1586 by Vautrollier, but was suppressed by authority and published by David Buchanan, with a *Life,* in 1664. 2.—*On Predestination: an Answer to an Anabaptist* (London, 1591). 3.—*On Prayer* (1554). 4.—On *Affliction* (1556). 5.—*Epistles,* and *Admonition,* both to English Brethren in 1554. 6.—*The First Blast of the Trumpet against the Monstrous Regiment of Women* (1558). 7.—An *Answer to* a *Scottish Jesuit* (1572).

Knox's life is more or less touched upon by all the Scottish histories and Church histories which include his period, as well as in the mass of literature as to Queen Mary. Dr. Laing's edition of the *Works* contains important biographical material. But among the many express biographies two especially should be consulted—those by Thomas McCrie (Edinburgh, 1811; revised and enlarged in 1813, the later editions containing valuable notes by the author); and by P. Hume Brown (Edinburgh, 1895). *John Knox and the Reformation,* by Andrew Lang (1905), is not so much a biography as a collection of materials, bearing upon many parts of the life, but nearly all on the unfavourable side. *See* also J. Glasse, *John Knox,* a *Criticism* and an *Appreciation* (1905); Edwin Muir, *John Knox* (1929). (A.T. I.)

KNOX, PHILANDER CHASE (1853–1921), American lawyer and cabinet officer, was born at Brownsville, Pa., on May 6, 1853. He graduated at hlount Union college, Ohio, in 1872, studied law and was admitted to the bar in 1875. The following year he was appointed assistant U.S. attorney for the western district of Pennsylvania. In 1877 he opened an office in Pittsburgh where he practised law continuously until in 1901 he was appointed attorney-general by President McKinley and was retained by President Roosevelt. While in this office he instituted many important suits, notably those against the "beef trust" and the Northern Securities Company, which marked a new policy on the part of the Government with regard to regulation of business. These prosecutions, together with his reports upon the regulation of trusts, mark him as one of the most capable of those who have held the office. He resigned in 1904, to fill the unexpired term of Matthew S. Quay, as senator for Pennsylvania, and was re-elected to serve in 1905–11.

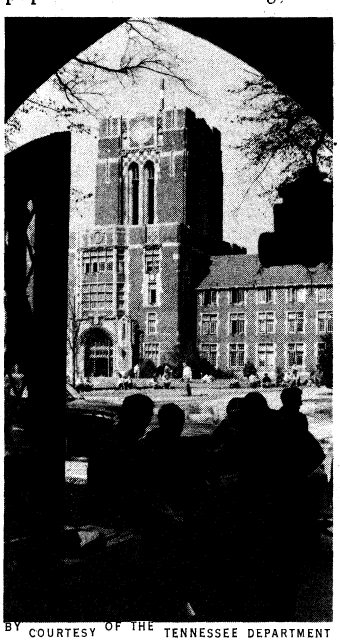
His service in the Senate was interrupted by President Taft summoning him in 1909 to become secretary of State, which position he filled until the end of the Taft Administration in March 1913. Knox's attempt to use the influence of the State Department to encourage and extend American financial and commercial interests, especially in Latin-America, the Near-East and the Far-East, was criticized as "dollar diplomacy." In 1912

he made a tour of Central and South American countries to allay the suspicion aroused in these countries by the financial and industrial policy of the Cnited States and by its Panama canal policy. In 1917 he was again returned to the senate. There he became one of the foremost opponents of the League of Nations. He died in Washington, D.C., Oct. 12, 1921.

KNQX, WILLIAM FRANKLIN (1874–1944), U.S. politician. was born at Boston, Mass.. Jan. 1, 1874. He graduated from Alma college, Alma, Mich.. and after serving briefly with Theodore Roosevelt's Rough Riders became a reporter on the *Grand Rapids Herald,* a paper of which he later became city editor and circulation manager. He published the *Sault Ste. Marie News* (1901–12) and subsequently was publisher of two newspapers in Manchester, N.H., and two in Boston. During World War I he served in the army from Aug. 14, 1917, to Feb. 10, 1919, reaching the rank of lieutenant colonel. He later became a colonel in the field artillery reserve. In 1926 he joined the Hearst press, acting as general manager 1928–31, when he became publisher of the *Chicago Daily News.* In 1936 he was the Republican vice-presidential nominee. He was appointed secretary of the navy July 11. 1940. He died in Washington, D.C., April 28, 1944.

KNOXVILLE, a city in eastern Tennessee, U.S., situated at the confluence of the French Broad and Holston rivers. which form the Tennessee. Pop. (1960) city, 111.827; standard metropolitan statistical area (.Anderson, Blount and Knox counties, and including the cities of Maryville, Alcoa and Oak Ridgej 368,080.

In 1761 the first Anglo-Americans on record visited the region. When a treaty of 178j with the Cherokees opened the region to settlers. Capt. James White established the first permanent home; as headquarters of the Territory South of the Ohio, White's Fort was renamed Knoxville after Henry Knox, the secretary of war in George Washington's cabinet. During the Civil War eastern Tennessee was torn by divided loyalties. Knoxville was occupied by Confederate troops, then Federal; during Nov. 1863 Confederates under Gen. James Longstreet unsuccessfully besieged Gen. Ambrose E. Burnside's Union army in the city's only major engagement. During Reconstruction, Knoxville grew rapidly. With a population of less than 3,000 in 1860 it grew to almost 10.000 by 1870. Two major events marked its history in the 20th century: creation of the Tennessee Valley authority (TVA) during the 1930s and establishment of Oak Ridge (*q.v.*), "the atomic city." 20 mi. W.. during the 1940s. TVA headquarters are at Knoxville and 4 of its 20 dams are within 25 mi.; its electric power helped attract industry and its navigation program increased the city's tran'sportation potential.



BY COURTESY OF THE TENNESSEE DEPARTMENT OF CONSERVATION

AYRES HALL, MAIN LIBERAL ARTS BUILDING AT THE UNIVERSITY OF TENNESSEE. KNOXVILLE

Area employment divides almost equally between industry and agriculture. Marble, tobacco. textiles, food! lumber, metals and chemicals are important to Knoxville's economy.

The University of Tennessee and Knoxville college influence the city's educational and cultural life, as do the Knoxville Symphony orchestra. the community-university Carrousel theatre and the Lawson McGhee library.

Knoxville is the western entrance to the Great Smoky Mountains National park (*q.v.*) and is at the heart of "the Great Lakes of the South," the TVA dam system. The city is well served by highways. railroads and airlines.

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KNUCKLE, the joint of a finger. The knuckle joint of an animal killed for eating is the tarsal or carpal joint of its leg. The word is used also in medical parlance to describe a loop of bowel within a hernial sac. "Knuckling" is used to describe a deformity of the leg of a horse (talipes) caused by a contraction of the posterior tendon of the fetlock. *See* JOINTS AND LIGAMENTS.

(F. L. A.)

KNUCKLEBONES: *see* JACKSTONES.

KNUDSEN, WILLIAM S. (1879–1948), U.S. industrialist, noted for contributions to industrial production in World War II, was born in Copenhagen, Den., March 25, 1879, and christened Signius Wilhelm Paul Knudsen. He emigrated to the U.S. at the age of 20 and became a naturalized citizen in 1914. For several years he worked in various manufacturing plants, where he showed outstanding skill in production management. In 1913 he ment to Detroit to work for the Ford Motor company, then pioneering quantity production of low-priced cars. He later transferred to the Chevrolet Motor company. rose to its presidency and in 1937 became president of General Motors corporation.

When U.S. defense production got under way in the summer of 1940, Pres. Franklin D. Roosevelt appointed Knudsen a member of the advisory committee to the National Defense commission. In 1941 Knudsen became director general of the Office of Production Management. When the War Production board mas created in Jan. 1942, Knudsen's position was abolished, but he was immediately commissioned a lieutenant general and became a roving production expediter for the war department. Resigning in July 1945, he returned to private business and died in Detroit on April 27, 1948. (H. C. T.)

KNUTSFORD, a market town and urban district in the Knutsford parliamentary division of Cheshire. Eng., 2j mi. E.N.E. of Chester by road. Pop. (1951) 6.617. Area 3.9 sq.mi. It stands on a ridge, with the fine domains of Tatton park and Tabley respectively north and west of it. The meres in these domains are especially picturesque.

Among several ancient houses is the Rose and Crown tavern built in 1631. In a churchyard a mile from the town stood the church. which, though partially rebuilt in the time of Henry VIII, fell into ruin in 1741. The parish church of St. John the Baptist (1744) was supplemented (1880) by St. Cross church, in Perpendicular style. The Brook street Unitarian chapel dates from the 17th century. The town has a grammar school, founded in the 15th century but reorganized in 188 j. Lord Egerton built the Egerton schools in 1893. Knutsford was the birthplace of Sir Henry Holland (1788–1873), physician extraordinary to Queen Victoria, and of his son. the second Sir Henry, later Viscount Knutsford. It is also the original Cranford of Mrs. Elizabeth Gaskell (*q.v.*), who is buried in the Unitarian churchyard. There is a tall tower dedicated to her memory.

The name Knutsford (Cunetesford in Domesday Book) is said to signify Cnut's ford, but there is no evidence of a settlement there previous to the Norman conquest. In 1086 Erthebrand held Knutsford immediately of William FitzNigel, baron of Halton, who was himself a mesne lord of Hugh d'Avranches, earl of Chester. In 1292 William de Tabley, lord of both Over and Nether Knutsford, granted free burgage in both Knutsfords. This charter is the only one which gives Knutsford a claim to the title of borough. Various markets and fairs were granted in medieval tirnes. The crowning of the May queen on hfay day attracts large crowds and the streets are then sanded in fancy designs. The industries comprise cotton, worsted and leather manufactures; and there is a paper processing factory and a sawmill and joinery works; but Knutsford is mainly a residential area for Manchester.

KOALA (*Phascolarctos cinereus*), a stoutly built marsupial of the family Phalangeridae, which also contains the phalangers. This animal. which inhabits the eastern parts of the Australian continent. is about 2 ft. in length, and of an ash-gray colour, an excellent climber, residing in loftv eucalyptus trees, the buds and tender shoots of which form its principal food. From its shape the koala is called by the Australians the native bear or

native sloth. This species was formerly killed in great numbers for the skin, from which a cheap and durable fur was made. As a result it was almost exterminated. Stringent laws protected the koalas after **1936.**



BY COURTESY OF THE AUSTRALIAN NEWS & INFORMATION BUREAU

AUSTRALIAN KOALA (PHASCOLARCTOS CINEREUS)

KOBDO, a town and district situated in one of the intermontane basins at the northern foot of the Altai mountains in northwest Mongolia. The immediate vicinity of the town is a stony, arid plain, but it is an important market for cattle-breeding nomads from a wide district around. Its historic role has been that of a trade depot linked commercially with Peking, the exports to China including large numbers of sheep, skins and wool. Pop. of town **(1959** est.) **5.800.** In recent years. however, there has been a marked tendency for Mongolia to be brought within the trade sphere of the Soviet Union. Pop. of district **(1956) 42.300;** area **28.185** sq.mi.

KŌBE, the first port in Japan in terms of value of trade, its sixth largest city and the capital of Hyōgo prefecture, is located at the head of Osaka bay to the east of the city of Osaka. Area **(1940) 32** sq.mi.; **(1958) 190** sq.mi. Pop. **(1940) 967.200;** (1955) **979,305; (1960)** 1,113,977. A long narrow coastal plain seldom more than one and one-quarter miles wide backed by the steep slope of the Rokkō mountains forced the city to spread along the sea. A few winding roads have been built up the front of the mountains to hotels and wealthy homes.

In early days the name Kōbe was applied to a small fishing village separated by the Minato river from the town of Hyōgo, the chief port of the area. Hyōgo, also known as Owada and Muko, was an important port for trade with China and Korea as early as the 8th century. For many centuries it continued to be Japan's chief port for foreign trade and the government maintained patrol boats there to control pirates in the Inland sea. For a brief period during the 12th century Taira Kiyomori made it the capital instead of Kyoto. During the Tokugawa period (1603–1868), Hyōgo served as the outer port of Osaka until in **1867** it was reopened to foreign trade. Soon it was outstripped and absorbed by Kobe, which has a deeper harbour. The combined ports have been called the port of Kōbe since the establishment of the Kōbe customhouse in **1872.** Hyōgo and Kobe were incorporated as the city of Kōbe in **1889.** The many foreigners who settled there in the 19th century gave it an international and cosmopolitan atmosphere. Absorption of adjacent communities continued: Minato in **1896,** Suma in **1920,** Nishigo in 1929, Tarumi in 1941, Arima in 1947, Mikage in 1950, Dōjō in 1951 and Nagao in 1955 During World War II, 60% of the city mas destroyed and the population dropped to 380,000. The city and its harbour facilities were quickly rebuilt after the war.

After Osaka, Kōbe is the most important industrial city of Hanshin industrial belt. The chief products are ships, steel and rubber goods. Other industries produce sake, machinery, electrical equipment and machinery, books and textiles.

(C. A. MR.)

KOBLENZ: see COBLENZ.

KOCH, FREDERICK HENRY (1877–1944), founder of the Carolina Playmakers at the University of North Carolina, is considered the father of American folk drama.

Born in Covington. Kentucky on Sept. 12, **1877.** Koch received his B.A. degree from Ohio Wesleyan university, Delaware, Ohio, in 1900, his M.A. from Harvard in 1909. In 1905 he began teaching at the University of North Dakota, Grand Forks, forming the Dakota Playmakers in 1910. Called to the University of North Carolina, Chapel Hill, in **1918,** he introduced his now famous course in playwriting and created the Playmakers whose theatre became the first state-subsidized playhouse in America. He died Aug. **16,** 1944, at Miami Beach, Fla.

Koch's conviction that the roots of genuine American drama lay in "folk subject matter, with the legends, superstitions, customs, environmental differences and the vernacular of the common people" had far-reaching effect. Not only did his students, among them Thomas Wolfe, Maxwell Anderson and Paul Green testify to his influence, but the development of the little theatre movement, the rise of Negro drama, Mexican and Canadian folk drama and the exploitation of regional sources by playwrights Lynn Riggs, Hatcher Hughes, Lula Vollmer and Eugene O'Neill are generally credited to the persuasiveness of Koch's ideas.

Eleven volumes of folk plays appeared under Koch's editorship.

(E. B. P.)

KOCH, ROBERT (1843–1910), German bacteriologist and Nobel prize winner in medicine (1905), was born at Klausthal, Hanover, on Dec. 11, 1843. He studied medicine at Gottingen, where he came under the influence of Jacob Henle. While he was practising as medical officer at Wollstein he began those bacteriological researches that made his name famous. In **1876** he obtained a pure culture of the bacillus of anthrax, announcing a method of preventive inoculation against that disease seven years later. Cohn. the botanist, hailed the discovery as one of the greatest importance, and printed Koch's account in his *Beitrage.* Koch became a member of the sanitary commission at Berlin and a professor at the School of Medicine in **1880,** and five years later he was appointed to a chair in Berlin university and director of the Institute of Health. By the improved methods of bacteriological investigation he mas able to elaborate, he transformed the science of infection. In **1882** he isolated the bacillus of tuberculosis, and in the following year, having been sent on an official mission to Egypt and India to study the aetiology of Asiatic cholera, he identified the comma bacillus as the specific organism of that malady. In 1890 great hopes were aroused by the announcement that in tuberculin he had prepared an agent which exercised an inimical influence on the growth of the tubercle bacillus, but the expectations that were formed of it as a remedy for consumption were not fulfilled, though it proved useful as a means of diagnosing the existence of tuberculosis in animals intended for food. At the Congress of Tuberculosis held in London in 1901 he maintained that tuberculosis in man and in cattle is not the same disease, the practical inference being that the danger to men of infection from milk and meat is less than from other human subjects suffering from the disease. One of the results of this statement was the appointment of a British royal commission to study the question. Koch also investigated the nature of rinderpest in South Africa in **1896,** and found means of combating the disease. In **1897** he went to Bombay at the head of a commission formed to investigate the bubonic plague. and he subsequently undertook extensive travels in pursuit of his studies on the origin and treatment of malaria. He was summoned to South Africa a second time in 1903 to give expert advice on other cattle diseases, and on his return was elected a member of the Berlin Academy of Sciences. In 1906–07 he spent **18** months in east Africa, investigating sleeping sickness. He died at Baden-Baden of heart disease on May **28,** 1910. Koch was undoubtedly one of the greatest bacteriologists ever known. Apart from the immediate value of his discoveries, he must be recognized as a pioneer in new methods of bacteriological work.

Among his works may be mentioned: *Untersuchungen iiber die A'tiologie der Wundinfektionskrankheit* **(1878);** *Weitere Mitteilungen iiber ein Heilnzittel gegen Tuberkulose* **(1891)** *Heilnzittel gegen die Tuberkulose* (1891); *Über neue Tuberculinpräparate* **(1897);** and *Reiseberichte iiber Rinderpest, Bubonenpest in Indien und Afrika, Tsetse- oder Surra-Krankheit, Texasfieber, tropische Malaria, Schwarzwasserfieber* (1898). His *Samtliche Schrijten* (2 vol. 1912) were edited by Schwalbe. Gaffky and Pfahl. A bibliography of his works is given by W. Becher, *Robert Koch* (1891). From **1886** onward he edited with Karl Flugge, the *Zeitschrift für Hygiene und Infektionskrankheiten* (published at Leipzig). *See* Loeffler, "Robert Koch, zum 60 ten Geburtstage" in *Deut. Medizin. Wochenschr.* (no. 50, 1903).

KOCH, a tribe of northeastern India, which has given its name to the district of Cooch-Behar (*q.v.*). They are probably of Mongoloid stock, akin to the Mech, Kachari, Garo and Tippera tribes, and originally spoke, like these, a language of the Bodo

group. One of their chiefs established a powerful kingdom at Cooch-Behar in the 16th century and they have gradually become Hinduized, and now adopt the name of Rajbansi ("of royal blood").

KOCHER, EMIL THEODOR (1841–1917), Swiss surgeon, a leader in the application of experimental and physiological principles to surgical problems, was born in Berne, Switz., on Aug. 25, 1841. After qualifying at Berne university in 1865 he studied in Berlin, London, Paris and Vienna, where he was a pupil of Theodor Billroth (*q.v.*). In 1872 he became professor of clinical surgery at Berne, remaining at the head of the surgical clinic for 45 years. After attending the International Congress of Medicine in London in 1881 Kocher became the chief advocate of Listerism in Switzerland, but his readiness to accept more advanced methods was outstanding, and he later adopted complete asepsis. His most famous work was that on the physiology, pathology and surgery of the thyroid gland, for which he was awarded the Nobel prize for medicine in 1909. By 1912 he had performed 5,000 operations for goitre, and had converted one of the most difficult surgical procedures into one practically without danger. His other contributions to surgery included his method for the reduction of dislocations of the shoulder, new methods or modifications of older methods for operation on the stomach, the lungs. the gallbladder, the tongue. the cranial nerves and for hernia. He devised many new techniques, instruments and appliances and the forceps and incision that bear his name remain in general use. His *Chirurgische Operationslehre* (1892) was issued in many editions and translations, Kocher died at Berne on July 27. 1917. (W. J. Bp.)

KOCHI, the name of a Japanese prefecture and its capital city. The prefecture in southern Shikoku, was formed from Tosa province after the Restoration of 1868, when feudalism was abolished. Area 2,747 sq.mi. Pop. (1950) 882,683. The population is concentrated on the Tosa plain, which is surrounded by mountains except on the south. Isolated by poor communications, the people have developed strong local pride. The chief products are agricultural machinery and implements, coral, processed sea food, dried bonito, paper and raw silk.

The city of KOCHI, commercial centre and capital of the prefecture, lies at the head of Urado bay. It was formerly the capital of Tosa province and in it was located the castle of the Yamanouchi family, of which the donjon survives. The city is noted for its marine products, especially dried bonito. Area (1940) 19 sq.mi.; (1958) 51 sq.mi. Pop. (1940) 106,000; (1955) 180,146. (C. A. MR.)

KOCK, CHARLES PAUL DE (1793–1871), French novelist and dramatist whose work was long enjoyed at every level of society both in France and abroad, was born at Passy on May 21, 1793, the son of a refugee Dutch banker who died under the guillotine the following March. An avid reader and an inventive storyteller, Paul de Kock took a job as a bank clerk in 1808 but left it after the publication, at his own expense, of his first novel, *L'Enfant de ma femme* (1813). He established his reputation with *Georgette, ou la nièce du tabellion* (1820). *Gustave, ou le mauvais sujet* (1821) and *Mon voisin Raymond* (1823). His numerous novels and plays give a variegated picture of contemporary life. but his licentious works—which he defended as being playful rather than immoral—are no longer much read, though some titles, such as *Le Philosophe en voyage* (1821), *La Laitière de Montfermeil* (1827), *La Femme, le mari et l'amant* (1829; dramatized by Charles Dupeuty, 1830), *La Pucelle de Belleville* (1834), *La Famille Gogo* (1844) and *Cérisette* (1850) are still remembered. His books often gain by translation, which may eliminate faults and flatness of style objectionable in the original. Students of manners can find much curious information in *Le Barbier de Paris* (1826) and *La Grande Ville: nouveau tableau comique, critique et philosophique* (1842). Paul de Kock died in Paris on Aug. 27, 1871. His *Mémoires* were published in 1873. There is a collected edition of his aorks in 299 vol. (1902–05).

See C. Beuchat, *Histoire* du *naturalisme français,* 2 vol. (1949). (R. DL.)

KODALY, ZOLTAN (1882–), Hungarian composer, was born at Kecskemet on Dec. 16, 1882. He studied under Hans Koessler at the Budapest Academy of Music and after an important visit to Paris (1906–07) became professor of composition there from 1907 until 1942. From 1905 he devoted himself enthusiastically to the study of Hungarian folk music and with Bela Bartok built up a collection of more than 3,500 melodies. The influence of this vigorous national music can be seen in his own compositions; his choral works in particular achieve great emotional power by their blend of rich harmonics and traditional material. Most outstanding are the *Psalmus Hungaricus* for tenor solo, chorus and orchestra (1923), a *Te Deum* (1936) and the *Missa Brevis* (1945). His instrumental works, which are strikingly original in treatment, include two string quartets, sonatas for violoncello and piano and for violoncello alone, some pianoforte pieces showing French influence, a suite from his opera, *Hary Janos* (1927), and a concerto for orchestra (1940). He has also published books on folk music and folklore.

KODAMA GENTARŌ, COUNT (1852–1906), Japanese soldier and statesman of the Tokuyama clan, the guiding genius of the Manchurian campaign during the Russo-Japanese War, was born in Suwo province (now part of Yamaguchi prefecture). on March 15, 1852. In 1898 he became governor general of Formosa. In 1900–02 he was minister of the army and in 1903 held concurrently the portfolios of home and education. When the conflict with Russia became imminent in 1903, Kodama gave up his portfolios to become vice-chief of the general staff. and in 1904 was promoted to general. Throughout the Russo-Japanese War (1904–05) he served as chief of staff to Field Marshal Oyama Iwao, commander of the Japanese expeditionary forces in Manchuria. Kodama and Oyama's plans, carefully worked out in advance of each engagement, left a minimum of initiative to local commanders, requiring the attainment of stipulated objectives regardless of cost in lives. But though Kodama was in his element on the battlefield, he was instrumental in bringing the war to a speedy conclusion. Realizing that Japanese resources were near exhaustion, he secretly hastened to Tokyo shortly after the victorious battle of Mukden (March 10, 1905) and urged Japanese leaders to make peace. Following the conflict Kodama became chief of the general staff, but the war had undermined his health and he died in Tokyo on Sept. 24, 1906. Posthumously, he was honoured with the title of count.

See Tatsuji Takeuchi, *War* and *Diplomacy in the Japanese Empire* (1935); Miwa Kai and P. B. Yampolsky (comp.), *Political Chronology of Japan, 1885–1957* (1957). (G A LN)

KOENIG, MARIE PIERRE JOSEPH FRANÇOIS (1898–), French army officer, was born at Caen on Oct. 10, 1898. He saw service first in World War I and later in the Rif campaign. In World War II he fought in Norway, then in France until he was evacuated to England, where he joined the Gaullist forces. In May–June 1942 Koenig achieved renown when, for 15 days, he and his Free French brigade held off Erwin Rommel's panzers at Bir Hacheim in Libya. Subsequently Koenig served as army assistant chief of staff, French delegate to Gen. Dwight D. Eisenhower's headquarters, commander of the French resistance forces, military governor of Paris after its liberation, commander of the French forces in Germany at the armistice, inspector general in north Africa in 1949 and finally as vice-president of the *Conseil Supérieur de la Guerre* in 1950. Retired soon after, he was elected to the national assembly and served briefly in 1954 and again in 1955 as minister of national defense. (M. V.)

KOFFKA, KURT (1886–1941), German-U.S. psychologist, one of the founders of Gestalt psychology, was born on March 18, 1886, in Berlin. He studied at the University of Berlin. receiving his doctor's degree in 1908. After holding assistantships at several universities he taught at Giessen from 1911 until 1924, when he first went to the United States. After teaching at Cornell university, Ithaca. N.Y.. and the University of Wisconsin, Madison, he went to Smith college, Northampton, Mass., in 1927, as the first William Allan Neilson professor of psychology. He died on Nov. 22, 1941, in Northampton.

Koffka, together with Max Wertheimer and Wolfgang Kohler, was responsible for the development of the Gestalt theory, which began as a protest against the elementarism of the day. The move-

ment is best known for its approach to problems of perception. It had an important influence on many aspects of psychology and often was in opposition to stimulus-response behaviourism. Koffka's first important publication was Die Grundlagen der *psy*chischen *Entwicklung* des Kindes, an application of Gestalt principles to child psychology, which was published in English as The Growth of the Mind (1924) and later translated into Spanish, Russian, Japanese and Chinese. His Principles of Gestalt Psychology (1936) is outstanding as an attempt to treat a wide variety of psychological problems from a unified point of view. (Fz. H.)

KOHAT, a municipality, cantonment and district in the Dera Ismail Khan division of West Pakistan. The town is 37 mi. S. of Peshawar by the Kohat pass, along which a military road was opened in 1901. Pop. (1951) 40.841, including 10,122 in the cantonment. It is built on well-drained undulating ground in an amphitheatre of hills at some distance from the site of the old town founded by Bangash in the 14th century. It is noted for *lungis* (cotton loincloths).

KOHAT DISTRICT has an area of 2,693 sq.mi.; pop. (1951) 300,-682. It consists chiefly of a bare and intricate hilly region west of the Indus, deeply scarred with river valleys and ravines, but enclosing a few scattered patches of cultivated lowland. The hills and the valleys run generally east and west. The eastern or Khattak country especially comprises a labyrinth of ranges. The Miranzai valley in the extreme west appears by comparison a rich and fertile tract. and is inhabited by the Bangash branch of the Pathan. The frontier mountains, continuations of the Safed Koh system, attain in places a considerable height, the two principal peaks, Dupa Sir and Mazi Garh, being 8,196 and 8,153 ft. above the sea respectively.

The Waziri hills, on the south, extend like a wedge between the boundaries of Bannu and Kohat, with a general elevation of less than 4,000 ft The salt mines are in the low line of hills crossing the valley of the Teri Toi, and extending along both banks of that river. The salt, pure and grey, occurs in beds of great thickness (in one instance at least 1,000 ft.), overlaid by beds of gypsum followed by nummulitic limestone. It is mined mainly at Bahadur Khel. It sometimes forms hills 200 ft. high. almost entirely composed of solid rock salt, and may be one of the largest veins of its kind in the world. Petroleum springs exude from rock at Panoba, 23 mi E of Kohat The frontier tribes on the Kohat border are the Afridi, Orakzai, Zaimukht and Turi (*qq* v). A railway runs from Jand on the main line (Peshawar to the south) to Kohat and beyond it a narrow-gauge line goes to Thal; the Indus river is bridged at Kushalgarh. The tribal area attached to and administered by Kohat district had a population in 1951 of 133.607.

KOHAT PASS, a mountain pass in the northwest frontier area of West Pakistan. From the north side the defile begins $4\frac{1}{2}$ mi. S.W. of Fort Mackeson, from which it is about 12 or 13 mi. to the Kohat entrance. The pass varies from 400 yd to $1\frac{3}{4}$ mi in width; its summit is about 600 ft above the plain. It is inhabited by Adam Khel Afridis. It is traversed by a metaled road nhich forms Peshawar's main link with Kohat and other districts of the south.

KOH-I-NOR (*i.e.,* "mountain of light"), a famous diamond which became the property of the British crown in 1849 It apparently formed part of the loot of Nadir Shah of Persia when he sacked Delhi in 1739. After his death it fell into the hands of his general Ahmad Shah, founder of the Durrani dynasty of Afghans. His descendant Shah Shuja, when a fugitive in India, was forced to surrender it to Ranjit Singh, the Sikh ruler. On the annexation of the Punjab in 1849 it was acquired by the British and was placed among the crown jewels of Queen Victoria.

Originally it weighed 191 carats, but when it was recut in 1852, at Garrards of London, its weight was reduced to 108 carats.

Its early history is controversial. Some writers have identified it with the diamond given to Baber's son Humayun by the raja of Gwalior after the battle of Panipat in 1526. Others have contended that it came originally from the Kollur mine on the Kistna and was presented to Shah Jahan by Mir Jumla in 1656.

See J. B. Tavernier, ***Travels*** in ***India, ed. by*** W. Crooke (1925); H. Beveridge, "Babar's Diamond: Was It the Koh-i-Nur?" ***Asiatic*** Quarterly ***Review*** (April 1899). (C. C. D.)

KOHISTAN (Persian, Urdu, etc.: "country of the hills," "highlands"), the name of tracts in West Pakistan and Afghanistan.

Northwest Frontier *Kohistan.*—The name Kohistan is specially applied to an area in the Peshawar division of West Pakistan, west of Chilas in Kashmir and the Kagan valley. The eastern part lies in Hazara district and is known as Indus Kohistan after the river that flows through it. The western part is divided between Swat Kohistan (also known as Kalam) and Dir Kohistan, running across the northern areas of those two states. The mountains are snow-bound and rocky wastes down to about 12,000 ft. Below this the hills are covered with forests and grass down to 5,000–6,000 ft., and the valleys, especially near the Indus, are fertile and cultivated.

The inhabitants comprise mainly Kurral, Tanaolees and Dhoonds, all of Turko-Iranian origin and Moslem, who support themselves by agriculture and pasturing. Many are as fair as Italians, with hazel or blue eyes and, frequently, brown hair. Typically they are plump but active, hardy, quiet and honest, but they frequently are obstinate and unforgiving.

Sind Kohistan.—This is a barren hilly tract in the southwest part of the Hyderabad division of West Pakistan. It is composed of the Lakh. Badhra and Bhit ranges, outlying eastern spurs of the Kirthar range. Cattle grazing is the main occupation.

Afghan *Kohistan.*—This important district is north-northeast of Kabul, the capital of Afghanistan, and extends to the Hindu Kush. Part of it is highly cultivated, with flourishing villages.

KOHISTAN is also the name of the detached northeastern sub-Himalayan district of Punjab state, India. Area 709 sq.mi.; pop. (1951) 147,403. Headquarters, Kandaghat (pop. 1,214); largest town, Kasauli (4,007), a military station.

KOHL. The name of the cosmetic used from the earliest times in the east by women to darken the eyelids, in order to increase the lustre of the eyes. It is usually composed of finely powdered antimony, but smoke black obtained from burned almond shells or frankincense is also used. The Arabic word kohl, from ahich has been derived "alcohol." is derived from kahala, "to stain." Kohl or kohlrabi (cole-rape, from Lat. *caulis,* "cabbage") is a kind of cabbage (*q.v.*), with a turnip-shaped top, cultivated chiefly as food for cattle.

KOHLER, KAUFMANN (1843–1926), Jewish theologian and leader in the Reform movement in Judaism, was born into a pious Jewish family at Fuerth, Bavaria. on May 10, 1843. and educated in Talmudical schools and universities of Germany. His quest for reconciliation of traditional faith and modern knowledge is reflected in his doctoral dissertation. Der Segen Jakobs (1867). As its radicalism closed to him the Jewish pulpit in Germany, he emigrated to the United States. As rabbi of congregations in Detroit, Chicago and New York, and as president of the Hebrew Cnion college, Cincinnati (1903–22), Kohler was the foremost exponent of Reform thought for a generation. He convened the Pittsburgh rabbinical conference (188 j), which adopted a platform drafted by him, which set forth the essential principles of Reform in Judaism. He acted as a department editor of the Jewish Encyclopedia (1901–06) and contributed its principal theological articles. Kohler's chief works are *Jewish* Theology, *Systematically* and *Historically* Considered (1918) and The *Origins of* the Synagog ~and *the Church* (1929). (S S. C.)

KOHLER, WOLFGANG (1887–), German-U.S. psychologist, originator of many aspects of Gestalt theory, was born at Reval (now Tallinn), Estonia. Jan. 21, 1887; he became a naturalized U.S. citizen in 1946. Kohler took his doctorate at Berlin in 1909, with an important investigation on hearing. From 1913 to 1920, as director of the Prussian Academy of Sciences Anthropoid Experiment station in the Canary Islands, he performed the famous experiments on problem solving by chimpanzees that led to radical revisions of learning theory, as well as other experiments on perception in apes and hens.

In 1921 he became professor of psychology at Gottingen and a year later, director of the Psychological institute and professor of philosophy at Berlin. He directed there a series of notable investigations that explored many aspects of the comprehensive Gestalt

theory, which Köhler, Max Wertheimer and Kurt Koffka (*qq.v.*) had earlier developed.

Kohler was unique among German scientists in his outspoken criticism of the Nazi regime; as a result he left Berlin in 1935 for Swarthmore college. Swarthmore, Pa. There he made important discoveries about figural aftereffects and about the electrical processes in the brain associated with visual perception. In 1955–56 he was a member of the Institute for Advanced Study at Princeton and in the latter year received the Distinguished Scientific Contribution award of the American Psychological association. Among his important books are *Die Physischcn Gestalten* (1920), *The Mentality of Apes* (1925), *Gestalt Psychology* (1929) and *The Place of Value in a World of Facts* (1938). (D. K. A.)

KOHLHASE, HANS, the hero of Heinrich von Kleist's novel, *Michael Kohlhaas,* was a merchant at Kölln in Brandenburg. Unable to obtain redress in the courts of law for an attack on him by a Saxon nobleman on his way to Leipzig fair, the merchant, in a *Fehdebrief,* challenged not only his aggressor, but the whole of Saxony. The elector of Saxony. John Frederick I, set a price upon his head. Kohlhase then collected a band of criminals which spread terror throughout Saxony. In March 1540 Kohlhase and his principal associate, Georg Nagelschmidt, were seized, and on the 22nd were broken on the wheel in Berlin.

The life and fate of Kohlhase are dealt with in several dramas. *See* Burkhardt, *Der historische Hans Kohlhase und H. von Kleists Michael Kohlhaas (1864).*

KOHLRABI: *see* CABBAGE.

KOHLRAUSCH, FRIEDRICH WILHELM GEORG (1840–1910), German physicist who made contributions in the fields of electricity and magnetism, was born on Oct. 14, 1840, at Rinteln on the Weser, the son of the physicist Rudolph Kohlrausch (1809–58). Kohlrausch studied at Gottingen and Erlangen. He held chairs at Gottingen (1866), at the School of Technology, Frankfurt am Main (1870), at Darmstadt (1871), at Würzburg (1875), at Strasbourg (1888) and at Berlin (1895). He died at Marburg on Jan. 17, 1910.

Kohlrausch devised a method of simultaneously determining the measurement of the horizontal component of the earth's magnetic field and an electric current. He carried out a series of important investigations on electrolytic conductivity, using an alternating current in conjunction with a bridge method, named after him, which reduced the polarization of the electrolyte. He investigated the variation of conductivity with dilution and showed that the ratio of the conductivity to the number of gram-equivalents of the salt per unit volume approached an upper limit for infinite dilution. He obtained a connection between this ratio and the sum of the velocities of the ions; this. with the determination of the ratio of the velocities made by J. W. Hittorf. enabled the absolute velocities of the ions to be found. His *Lcitfaden der Praktischen Physik* (1870; 20th ed., 1954) was widely read.

KOHUT, ALEXANDER AND GEORGE ALEXANDER, father and son. leaders in Jewish scholarship.

ALEXANDER KOHUT (1842–1894), called the "Mighty Hammer" for his Talmudic learning, and dedicated to Hungarian independence, Jewish emancipation and rabbinic scholarship. was born on April 22. 1842, at Felegyhaza. Hung. At 15, he determined to produce a Talmudic lexicon. He chose to revise the *Arukh* of Nathan ben Yehiel (*c.* 1100), a Hebrew and Aramaic dictionary, preparing a critical text and utilizing his knowledge of Persian. His labour of 25 years culminated in the *Arukh Completum.* A fervent supporter of Louis Kossuth (*q.v.*), Kohut excelled in Hungarian language and literature and was in 1867 appointed superintendent of the nation's schools, the first Jew to hold the position. Subsequently, he served in the Hungarian parliament. He emigrated to the United States in 1885 and became a leader of U.S. Judaism. He helped found the Jewish Theological seminary in New York city (1886), a rabbinical school dedicated to the synthesis of Jewish tradition with the values of contemporary culture.

Kohut died in New York city on May 25, 1894. In his will, he requested that his children observe the anniversary of his death with good deeds, fulfilling the biblical teaching: "The memory of the righteous shall be for a blessing." This wish was honoured particularly by his wife, Rebekah, and his eldest son, GEORGE ALEXANDER KOHUT (1874–1933). The younger Kohut, who was born on Feb. 11, 1874, at Stuhlweissenburg, Hung., worked as educator and editor. Taught Judaica by his father. George Kohut studied at the College of the City of New York and at Columbia university. From 1920 he was principal and executive director of Columbia Grammar school. His extensive writings cover bibliography, literature, folklore and Jewish history. He made possible the publication of many fundamental works of modern Jewish research through the Alexander Kohut foundation. He died in New York city on Dec. 31, 1933. (M. Ds.)

KOKAND or KOKAN, a tomn of Asiatic Russia, in the Kokand district of the Uzbek Soviet Socialist Republic. in 40° 28′ N., 70° 40′ E. Pop. (1939) 84,665. Situated at an altitude of 1,375 ft., it has a severe climate, the average temperatures being — year, 56°; January, 22°; July, 65°. Yearly rainfall, 3.6 in. It is the centre of a fertile irrigated oasis. and consists of a citadel, enclosed by a wall nearly 12 mi. in circuit, and of suburbs containing luxuriant gardens. The town is modernized, has an electric plant, broad streets, large squares and a particularly handsome bazaar. The former palace of the khans, which recalls by its architecture the mosques of Samarkand, is the best building in the town. Kokand is one of the most important centres of trade in Turkistan. It is a railway junction, from which one line branches northeast through Namangan, and another southeast to Andijan. Raw cotton and silk are the principai exports, while manufactured goods are imported from Russia. There are cotton cleaning factories and flour mills. A women's co-operative store has been successfully established. with a centre of instruction in health and infant welfare. Coins bearing the inscription "Kokand the Charming," and known as *kokands,* had at one time a wide currency.

The khanate of Kokand was a powerful state which grew up in the 18th century. Its early history is not well known. but the town was founded in 1732 by Abd-ur-Rahim under the name of Iski-kurgan or Kali-i-Rahimbai. This must relate, however. to the fort only, because Arab travelers of the 10th century mention Hovakend or Hokand, the position of which has been identified with that of Kokand. Many other populous and wealthy towns existed in this region at the time of the Arab conquest of Ferghana. In 1758–59 the Chinese conquered Dzungaria and East Turkistan, and the begs or rulers of Ferghana recognized Chinese suzerainty. In 1807 or 1808 Alim. son of Narbuta, brought all the begs of Ferghana under his authority, and conquered Tashkent and Chimkent. His attacks on the Bukharan fortress of Ura-tyube were however unsuccessful, and the country rose against him He was killed in 1817 by the adherents of his brother Omar. Omar was a poet and patron of learning, but continued to enlarge his kingdom, taking the sacred town of Azret (Turkistan), and, to protect Ferghana from the raids of the nomad Kirghiz. built fortresses on the Syr-darya, which became a basis for raids of Kokand people into Kirghiz land. This was the origin of a conflict with Russia.

Several petty wars were undertaken by the Russians after 1847 to destroy the Kokand forts, and to secure possession, first, of the Ili (and so of Dzungaria), and next of the Syr-darya region, the result being that in 1866. after the occupation of Ura-tyube and Jizakh, the khanate of Kokand was separated from Bukhara. During the 45 years after the death of Omar in 1822, the khanate of Kokand was the seat of continuous wars between the settled Sarts and the nomad Kipchaks, the two parties securing the upper hands in turns. Kokand fell under the suzerainty of Bukhara, which supported Khudayar Khan, the representative of the Kipchak party, in 1858–66; while Alim Kul, the representative of the Sarts, put himself at the head of the *gazavat* (holy war) proclaimed in 1860, and fought bravely against the Russians until killed at Tashkent in 1865.

In 1868 Khudayar Khan, having secured independence from Bukhara, concluded a commercial treaty with the Russians. but was compelled to flee in 1875. when a new holy war against Russia was proclaimed. It ended in the capture of the strong fort of Makhram, the occupation of Kokand and Marghelan (1875). and the recognition of Russian superiority by the amir of Bukhara,

who conceded to Russia all the territory north of the Naryn river. War, honever. was renewed in the following year. It ended. in Feb. 1876.nith the capture of Andijan and Kokand and the annexation of the Rokand khanate to Russia. Out of it was made the Russian province of Ferghana. now merged in the Uzbek S.S.R.

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KOKOMO, an industrial city of Indiana, U.S., and county seat of Howard county, is 50 mi. N. of Indianapolis. In 1844 David Foster. a trader among the Miami Indians, laid out the village of Kokomo on part of the reservation once held by Chief Frances La Fontaine. The town was named for a relatively obscure Miami leader referred to in contemporary records as Koh-Koh-Mah. In 1844also, it became the county seat and in 1865it became a city. The modern city dates from 1886 when natural gas was discovered along nearby Wildcat creek. The subsequent ten-year gas boom attracted industries for the production of glass, rubber and tile products. Sudden exhaustion of the natural gas supply nearly halted the city's growth, but pioneer work in the design and manufacture of the "horseless carriage" by two local men, Elwood Haynes and Elmer Apperson, initiated a second industrial era centring around automobile production (the Haynes and Apperson models). A monument east of the city marks the place where one of the first automobiles in the U.S., invented by Haynes and built by Apperson, made its first road test on July 4, 1894. Metallurgical experiments of Haynes paved the way for other industries, including the manufacture of stainless steel and a durable cobalt-chromium-tungsten alloy known as Stellite. By the middle 1920s competitive assembly-line techniques had forced the abandonment of automobile manufacture by Haynes and Apperson. and the city was again faced with severe economic adjustments. Concerted efforts on the part of local citizens attracted new concerns. and by the outbreak of World War II Kokomo was again an important manufacturing centre.

The city has facilities for the production of automotive parts and accessories, steel and tool metals, pottery, plastics, opalescent glass, printed materials and canned goods. Pioneering experiments with the automobile. pneumatic tire, metal alloys and canning processes have led local residents to refer to Kokomo as "the city of firsts."

For comparative population figures *see* table in INDIANA: *Population.* (V. M. B.)

KOKO NOR. The name of a lake of central Asia in northeast Tibet and of an administrative division under the jurisdiction of China. The Koko Nor lake lies at an altitude of 10,513 ft. and has an area of 1.630 sq.mi. It is part of a high-lying basin, much of it very marshy, between the main axis of the Kunlun-Koko Nor mountains on the south and the curving arc of the Nan-shan on the north, the latter separating it from the Tarim basin. The level of the lake varies considerably. The administrative district of Koko Nor or Chinghai was carved out of northeastern Tibet to protect the Kansu-Tarim corridor and is administered by Chinese officials. It includes the Nan-shan ranges as well as the Koko Nor depression. Most of the country is grazing land interspersed with swamps.

The population is thin and scattered. consisting mainly of nomadic Mongols in the north and of Tibetans in the south. In the extreme southeast a wild tribe of Tibetan affinities known as the Golaks live an independent existence

KOKOSCHKA, OSKAR (1886-). German poet and painter, was born at Pochlarn. Aus , on March 1, 1886 An Expressionist, he produced a number of semidramatic works. written in whimsical vein. in nhich the problems of life were treated in a somewhat loose and vague manner. *Mörder, Hoffnung* der *Frauen* (1907), *Der brennende Dornbusch* (1911), *Hiob* (1917) and *Orpheus und Eurydike* (1918) were first published in the *Sturm* and afterward appeared in collected form under the title of *Vier Dramen* (1919). *Der brennende Dornbusch* was produced in Berlin under Kokoschka's direction by the Junge Deutschland, and in his staging of this piece Kokoschka revealed original talent. His verse was, for the most part, complementary to the accompanying pictures. His poetical works include *Die träumenden Knaben* (Vienna, 1908; Leipzig, 1917); *Der weisse Tiertoter* (1920) ; and *Der gefesselte Kolumbus* (1921).

As a painter he became one of the leading representatives of the German Expressionist movement. His paintings "Polperro" and "Cornwall" were presented to the Tate gallery in London in 1941, and "A Woman Bathing" was presented to the National gallery, Edinburgh, in 1942.

See Paul Westheim, *O. Kokoschka* (1919).

KOKSHAROV, NIKOLAI IVANOVICH VON (1818–1893), Russian mineralogist and major general in the Russian army, assisted R. I. Murchison, P. E. P. de Verneuil and Count A. F. M. L. A. von Keyserling in their survey of the Russian empire. He was later director of the institute of mines and of the Imperial Mineralogical society in St. Petersburg (Leningrad). His papers on euclase, zircon) epidote, etc.. were contributed to scientific periodicals. He wrote *Materialen zur Mineralogie Russlands,* 10 vol. (1853–91), and *Vorlesungen über Mineralogie* (1863).

KOKSTAD, a town in Cape province, U. of S.Af., in lat. 30° 30′ S., long. 29° 28′ E.; altitude 4,500 ft.; 136 mi. by rail southwest of Pietermaritzburg. Pop. (1951) 7,533 (including 2,013 Europeans). The town lies at the foot of Mt. Currie, an igneous mass (7,297 ft.). It has a good water supply and the streets are lined with oak trees. There are two good hotels and several public buildings. Kokstad, which is named after its Griqua founder, Adam Kok, dates from 1869, and was granted municipal government in 1893. It is the chief centre of the Griqua people. There is considerable trade in wool, grain and cattle with Basutoland, Pondoland and the neighbouring parts of Natal. The surrounding country is well known for its cheese making.

KOLA, a peninsula of northern Russia lying between the Barents sea on the north and the White sea on the south and having an area of 50,000 sq.mi. It is a plateau 600–700 ft. in height, mainly composed of granite and gneiss and is, geographically, an eastward extension of the mountainous region of Scandinavia. The snow-capped granitic mountain masses of Umptek and Luyavrot reach a height of more than 4,000 ft. West of them lies a lowland gap stretching from Kola gulf in the north to the Kandalaksk gulf of the White sea in the south. Near the middle lies Lake Imandra, 67 mi. from southwest to northeast from which the Niva river flows into Kandalaksk gulf, while to the north are smaller lakes connected by the Kola river. Lakes and rivers are numerous, and the watersheds are often ill-defined morasses, since the area is part of the Finnish moraine region. Toward the north the river valleys are clothed with birch and pine, in contrast to the general tundra nature of the region, but in the south thin birch woods extend over the whole area. Rapids make the rivers useless for navigation, and many are shallow during summer and dooded in spring. Agriculture is impossible, the soil being poor and unproductive tundra, bog and podzol *(see* RUSSIA: *Soils and Their Influence)* and the climate unfavourable. There is a short cool summer (av. July temp. 54.8° F.) and a long winter (av. January temp. 11.8° F.) with an average annual rainfall of 8 in., half of which falls between June and August. The influence of the Atlantic drift is felt for some distance inland from the Murmansk (*q.v.*) coast. The northern limit of cultivation excludes all the peninsula east of the Kola-Kandalaksk depression, but west of it potatoes, turnips and barley are-grown to a small extent; the peninsula depends entirely on imported grain. Cattle and pigs are raised in the grassy valleys. Cloudberries, bilberries and crowberries are abundant in summer. Birds are numerous, especially the ptarmigan. willow grouse, capercailzie, eider duck, goose and puffin. The nomad tribes breed reindeer. Salmon are found in the rivers. and herring and seal are caught off the White sea coasts. The settlements are mainly fishing stations on the Murmansk coast. and the chief town is Murmansk (*q.v.*). The railway constructed in 1917 runs through the main depression northward to Murmansk.

Otherwise communication is extremely difficult. There are a few reindeer sledge tracks in winter: but in summer they become swampy and mosquitoes are so numerous as to interfere with transit, and make it impossible for animals to be used. Mineral wealth consists mainly of silver, lead and zinc ore reported. but not worked, on the Murmansk coast, and silver mines worked on Medvied Island in Kandalaksk gulf. A scientific expedition in 1927 under A. E. Fersman found a marked magnetic anomaly suggestive of more extensive iron deposits than the bog-ore already known to exist. Copper exists in the Ponoi valley near Umba and gold near Kola. Pearls are found in the rivers, especially in the Kola and Tuloma. Apart from the Russian Finns and Norwegians in the fishing settlements of the Murmansk district., the population consists mainly of Lapps. The Lapps are a Finno-Ugrian type, the shortest and most brachycephalic race in Europe. They have high cheekbones, narrow eyes, not Mongolian in type, a good deal of hair on the face and a broad nose. They have been much modified by interbreeding with Russians and Norwegians and their numbers, including half-breeds, are probably about 2,500–3,000. They differ from the Finnish Lapps in dialect and in being entirely illiterate; their language somewhat resembles Mordvinian, but also shows Finnish influence. The Lyavozersk Lapps speak a different dialect from that of the Ponoi Lapps; and the latter have been much more influenced by Russian customs than the former. The Lapps are nomads and breed reindeer in a somewhat casual way. In summer they allow the reindeer to run wild and they occupy themselves with fishing; in winter the herds are kept near the winter villages feeding on the reindeer moss, and this method means that the village becomes bare of lichen and is deserted every few years. Their food is reindeer flesh and dried or salted fish in the winter, and snow chickens, waterfowl and berries in the summer. They trade their reindeer products for knives, gunpowder and small articles with the Russians and Zirians and, before the railway came, did much transport of goods in their boat-shaped reindeer sledges. Administratively the peninsula forms part of the Murmansk district of the Leningrad area. Its total population including the town of Murmansk was 291,188 in 1939.

See *Handbook of Siberia and Arctic Russia, I.D.* 1207 (1920); A. O. Kihlmann and Palmén, *Die Expedition nach der Halbinsel Kola* (1887–92); *A.* O. Kihlmann, *Bericht einer naturwissenschajtlichen Reise durch Russisch-Lappland* (Helsingfors, 1890); and W. Ramsay, *Geologische Beobachtungen* auf *der Halbinsel Kola* (Helsingfors, 1899).

KOLABA, a district in Bombay state, India. Area, 2,715 sq.mi.; pop. (1951) 909.083. The district absorbed in 1948 the former principality of Janjira and parts of the former Bhor state. The headquarters are at Alibag (8,181, mun.), a port 22 mi. S. of Bombay city, though six other municipalities have larger populations. the biggest being Panvel (14,861). Lying between the Western Ghats and the sea! Kolaba district is very hilly. The 20-mi. coast is fringed by a belt of coconut and betel-nut palms. Behind this belt is flat country under rice cultivation. Along the banks of the salt-water creeks there are extensive tracts of salt marshland, and much salt is processed. Tidal inlets, of which the principal are the Nagothna on the north, the Roha or Chaul in the west, and the Bankot creek in the south, run inland for 30 or 40 mi., forming highways for a brisk trade in rice, salt. firewood and dried fish; the fishing is of considerable value. The Western Ghats have two remarkable peaks—Raigarh, where Sivaji built his capital, and Miradongar. There are extensive teak and blackwood forests. The Western railway (Bombay-Poona) crosses part of the district, and communication with Bombay is maintained by a steam ferry. Kolaba district takes its name from a little island off Alibag, which was one of the strongholds of Angria, the Maratha pirate of the 18th century.

KOLA NUT, a synonym for Colanut, the caffeine-containing nut of *Cola acuminata* of tropical west Africa. It is an important article of diet for natives and the dried nuts are exported for use in the manufacture of refreshing drinks. It is cultivated extensively in the Ameri'can tropics.

KOLAR, a town and a district in Mysore state, India. The town is 43 mi. E. of Bangalore. Pop. (1951) 27.176. Industries include blanket weaving and turkey breeding.

KOLAR DISTRICT has an area of 3,188 sq.mi. It occupies the part of the Mysore tableland immediately bordering the Eastern Ghats. The principal watershed lies in the northwest, around the hill of Nandidrug (4,810 ft.), from which rivers radiate in all directions; and the whole country is broken by numerous hill ranges. The chief rivers are the Palar, the South Pinakini or Pennar, the North Pinakini and the Papagani, which are utilized for irrigation. The soil in the valleys consists of a fertile loam; and in the higher levels sand and gravel are found. The hills are covered with scrub, jungle and brushwood. In 1951 the population was 1,129,875. Sugar manufacture and silk and cotton weaving are the principal industries.

KOLAR GOLD FIELDS CITY (30 sq.mi.; pop. [1951] 159.084), 5 mi. W. of Kolar, is administered separately from the district. It is connected by the Kolar Goldfields railway (10 mi.) with the main Southern line. Gold prospecting began there in 1876. The Ooregaum mine (9.400 ft.) is one of the deepest gold mines in the world. The Kolar fields produce about 96% of the Indian output. The British companies working them were nationalized in 1956.

KOLBE, (ADOLF WILHELM) HERMANN (1818–1884), German chemist who accomplished the first generally accepted synthesis of an organic compound from inorganic materials, was born on Sept. 27, 1818, at Elliehausen, near Gottingen, where in 1838 he began to study chemistry under Friedrich Wohler (*q.v.*). In 1842 he became assistant to Robert Wilhelm Bunsen (*q.v.*) at Marburg where he learned to analyze gases. Subsequently he assisted Lyon Playfair at London and from 1847 to 1851 he was engaged at Brunswick in editing Liebig and Wohler's *Handworterbuch der reinen und angewandten Chemie.* He then went to Marburg as Bunsen's successor and in 1865 was called to Leipzig where he died on Nov. 25, 1884.

Kolbe correctly considered organic compounds to be susceptible of derivation from inorganic ones, formed from the latter, directly or indirectly, by simple processes of substitution. The validity of this theory was proved when carbon disulfide prepared from the elements was successfully converted by chlorine into trichloroacetic acid and then into acetic acid by action of hydrogen. He also introduced a modified idea of the structural radicals, contributing in an important degree to the subsequent establishment of the structure theory, and predicted the existence of secondary and tertiary alcohols. He is best known for his work on the electrolysis of salts of fatty and other acids, for his important preparation of salicylic acid from phenol, and for his discovery of nitromethane. Together with Sir Edward Frankland he found that nitriles are converted into the corresponding acids on hydrolysis. From 1869 he edited the *Journal fur praktische Chemie.*

His works include *Lehrbuch der organischen Chemie* (1854) and *Zur Entwickelungsgeschichte der themetischen Chemie* (1881). For biographical details *see* G. Lockemann's essay in G. Bugge, *Buch dcr grossen Chemiker* (1929–30). (R. E. O.; X.)

KOLBERG (KOLOBRZEG; COLBERG), a seaport of Szczecin province, Pol., formerly in the Prussian province of Pomerania, Ger., on the right bank of the Persante, which falls into the Baltic about a mile below the town, and at the junction of the railway lines from Belgard and Gollnow. Pop. (1950) 6,800. Originally a Slavonic fort, Kolberg is one of the oldest places of Pomerania. At an early date it became the seat of a bishop. and although it soon lost this distinction it obtained municipal privileges in 12jj. From 1284 it was a member of the Hanseatic league. It passed by the treaty of Westphalia to the elector of Brandenburg. who strengthened its fortifications, which were, however, razed in 1887. The red-brick church of St. Mary, with five aisles. one of the most remarkable churches in Pomerania, dates from the 14th century. Bathing attracts a number of summer visitors. and it has a harbour at the mouth of the Persante, where there is a lighthouse. Machinery, motor boats, electric motors and spirits are manufactured; there is an extensive salt mine in the neighbouring Zillenberg; the salmon and lamprey fisheries are important; and a fair amount of commercial activity is maintained.

KOLCHAK, ALEXANDER VASILIEVICH (1875–1920), Russian admiral, was born in 1875 and entered the Russian navy in 1888. He served in the Russo-Japanese War of

1904–05 and at the beginning of World War I was in command of a destroyer in the Baltic. In the summer of 1916 Kolchak was appointed commander of the Black sea fleet, with the rank of rear admiral. After the Revolution in 1917 he took an active part in the fighting against the Bolshevists in Siberia. On Nov. 18. 1918, by a decision of the Russian government at Omsk, Admiral Kolchak assumed the title of supreme ruler of Russia. During the first half of 1919 the anti-Bolshevist army under his command met with some success, but in the summer the army disintegrated. there were risings in the rear, and Omsk, the capital of the Siberian government, was captured on Nov. 15, 1919. The government was then transferred to Irkutsk, but after the creation of a new socialist administration at Irkutsk, Kolchak was asked to resign, and on Jan 4, 1920, he signed a ukase transferring his powers to Gen. A. Denikin. Later he fell into the hands of the Bolshevists, and was shot at Irkutsk on Feb. 7, 1920.

KÖLCSEY, FERENCZ (1790–1838), Hungarian poet, critic and orator, was born at Szodemeter, in Transylvania, on Aug. 8, 1790. In his 15th year he made the acquaintance of Kazinczy, and zealously adopted his linguistic reforms From 1821 to 1826 he published many separate poems of great beauty in the *Aurora, Hebe, Aspasia* and other magazines of polite literature. He joined Paul Szemere in a new periodical, *Élet és literatura* (4 vol. 1826–29). From 1832 to 1835 he sat in the Hungarian diet as a liberal. He was an original member of the Hungarian Academy. He died on Aug. 4, 1838.

KOLDING, a town of Denmark in the *amt* (county) of Vejle, on the east coast of Jutland, on the Koldingfjord. an inlet of the Little Belt, north of the German frontier. Pop. (1960) 35,101. The name of Kolding occurs in the 10th century, but its earliest known town rights date from 1321. In 1644 it was the scene of a Danish victory over the Swedes, and on April 22, 1849, of a Danish defeat by the troops of Schleswig-Holstein. It contains the oldest stone church in Denmark, dating from the 13th century. To the northwest lie the ruins of the royal castle, Koldinghus, built in 1248, and partially destroyed by fire in 1808. The large square tower was built by Christian IV (1588–1648). It contains an antiquarian and historical museum (1892). A comprehensive view of the beautiful scenery surrounding the town is obtained from the Skamlingsbank, 8½ mi. S.E. Kolding has good railway connections, and an excellent ice-free harbour, with a depth of more than 20 ft. It has large industrial concerns, and ordinarily exports about 40,000 head of cattle yearly.

KOLGUEV or **KOLGUEFF,** an island in the southeastern part of the Barents sea, 50 mi. off the coast of the Russian Soviet Socialist Republic, U.S.S.R., to which it belongs. It is. roughly. oval in form, has an area of 1.439 sq.mi. and a maximum height of 545 ft. The sea around it is shallow and blocked by ice throughout winter and spring. Tundra and great bogs cover the greater part of the surface; there are several streams and many small lakes. The island is of recent geological formation and consists of sands and clays, which rise in the northwest to cliffs of 60 ft. A few boulders of sandstone and granite occur. Vegetation is sufficient to give pasture for a few herds of reindeer, owned by Samoyeds. There are bears. foxes and many birds.

See **A.** Trevor-Battye, *Ice Bound on Kolguev* (1893), with **full** scientific appendices and history; and **A.** Tolmachev, "Eine Sommerreise nach Kolgujew" *Geog. Annalen,* vol ix **(1927).**

KOLHAPUR, a municipality in Maharashtra state. India, formerly headquarters of the Deccan and Kolhapur states agency (*see* DECCAN) and of Kolhapur state, and now that of Kolhapur district. The town (pop. [1961] 187.306) is 130 mi. S.S.E. of Poona, at the terminal of a 30-mi. branch line running west-southwest from Miraj junction on the main Southern railway. It has a number of handsome modern public buildings, and is the seat of four colleges connected with Poona university.

Originally it appears to have been an important religious centre, and numerous Buddhist remains have been discovered in the neighbourhood. It has a cotton mill, and manufactures pottery, paper, lace, etc.

KOLHAPUR DISTRICT (3,205 sq.mi.) comprises most of the former princely state of the same name, merged with Bombay on March 1. 1949, together with parts of the former Kurundwad and Miraj Senior states and of Belgaum district. The district stretches from the heart of the Western Ghats eastward into the plain of the Deccan. Along the spurs of the main chain of the Ghats lie wild and picturesque hill slopes and valleys, producing little but timber One-tenth of the district is reserved forest. The centre of the district is crossed by several lines of low hills running at right angles from the main range In the east the country opens into a well-cultivated and treeless plain, broken only by an occasional river Among the western hills are the ancient Maratha strongholds of Panhala, Vishalgarh, Bavda and Rungna. The rivers, though navigable during the rains by small vessels, are all fordable during the hot months.

Iron ore exists but is not worked. The principal agricultural products are rice, millets, cotton. wheat and sugar cane, and coarse cloth and pottery are made. There are several ginning factories and a cotton mill. Population of the district (1961) 1,598,400.

The maharajas of Kolhapur trace their descent from Raja Ram, a younger son of Sivaji the Great, the founder of the Maratha power. The prevalence of piracy caused the British government to send expeditions against Kolhapur in 1765 and 1792; and in the early years of the 19th century the misgovernment of the chief compelled the British to resort to military operations, and ultimately to appoint an officer to manage the state. Besides Kolhapur city, the only town of consequence in the district is Ichalkarznji (pop. [1951] 27,423, mun.).

KOLLAR, JAN (1793–1852), Slovak poet who played an important part in the national and literary revival of the Slavs in the early 19th century. Born at Mošovce, Slovakia. on July 29, 1793, of a Protestant family, he was educated at Bratislava and at Jena university, where he fell in love nith the "Mina" of his poems who became his wife, after long separation, in 1835. From 1819 to 1849 he was pastor to the Slovak community in Pest; the last three years of his life nere spent in Vienna as professor of Slavonic archaeology. He died there on Jan. 24, 1852.

Kollar's enthusiasm for the history and destiny of the Slavs was kindled early by the fashionable antiquarian interest in the subject. Decisive, hoaever, were his experiences at Jena, where he came to realize the extent of the German inroads on what had once been Slavonic territory and where he witnessed (notably at the Wartburg festival of 1817) the German endeavours to attain national unity and political freedom. The rest of his life was devoted to the encouragement of cultural unity among the Slavonic peoples, which he regarded as the tribes of a single great nation. These sentiments uere expressed in the lyric-epic poem "Slávy dcera" ("The Daughter of Sláva"), a sonnet cycle preceded by a prologue in elegiacs: it portrays a pilgrimage through partly germanized Slavonic lands and into a pseudo-Dantesque Slavonic hell and heaven In an influential essay of 1837 Kollar advocated literary co-operation among the Slavonic peoples.

See J V. Ormis, *Bibliografia Jána Kollára* (1954). **(R. AY.)**

KÖLLIKER, RUDOLF ALBERT VON (1817–1905), Swiss embryologist and histologist. was one of the most original investigators and teachers of his day. Born at Zurich on July 6, 1817, he studied under Lorenz Oken, Jakob Henle and Johannes Muller; his oun students were later to include Ernst Heinrich Haeckel and Carl Gegenbaur. He became professor of physiology and comparative anatomy at Zurich in 1844; in 1847 he went to Wurzburg as professor of the same subjects, and in 1849 he also took over the chair in anatomy. Through his leadership, together with that of Leydig, Virchow and Gegenbaur. Wiirzburg became one of the finest of German medical institutions.

His investigations covered such diverse subjects as development of cephalopods, structure of smooth muscle, development and differentiation of red blood cells and the significance of the germ layers in development. He interpreted embryogenesis and histological structure in terms of cellular elements. He described the spermatozoa as cellular in origin and nature, and contributed important evidence supporting the neurone doctrine. In addition he wrote two successful textbooks *(Handbuch der Gewebelehre des Menschen,* 1852; *Entwicklungsgeschichte des Menschen und der*

hoheren Tiere, 1861) which set a high standard for textbooks of histology and embryology. He was a co-founder (1848, with Carl von Siebold) and editor of the *Zeitschrift für wissenschaftliche Zoologie.* He died in Würzburg on Nov. 2, 1905.

He considered Darwin's concept of evolution too teleological; he emphasized the significance of sudden as opposed to gradual changes in organisms.

See his *Erinnerungen aus meinem Leben* (1899). (J. M. O.)

KOLLONTAJ (KOLLATAJ), **HUGO** (1750–1812), Polish priest, writer and politician, was born in the district of Sandomierz and was educated first at Pinczow and Cracow and later abroad in Vienna and Rome. Returning home in 1775 he played a leading part in the work of the new educational commission, especially in reforming the ancient university of Cracow, of which he became rector (1782–85). He was given an administrative post but devoted his great abilities to inspiring and guiding the Four Years' *sejm* (1788–91) in its task of reconstructing the social and political institutions of Poland. His knowledge, enthusiasm and tact were mainly responsible for the development of the middle class and for the constitution of May 3, 1791. He was appointed vice-chancellor, but followed the king in joining the reactionary pro-Russian opposition. Disillusioned by the ensuing partition, he retired abroad; but he returned to become one of the chief leaders in Tadeusz Kosciuszko's insurrectionary government (1794). The failure of this last effort to save Poland led to his imprisonment in Austria (1795–1802).

On his release he resumed his educational activities in founding the lyceum of Krzemieniec. He welcomed the reforms associated with the introduction of the Code Napoléon and became the patron of the younger men who formed the radical opposition in the duchy of Warsaw. He stood out among his contemporaries as a man of action who in a conservative community could persuade not only self-seekers and enemies but doctrinaire colleagues to swift action.

Editions of Kollontaj's writings, in Polish, include his political speeches as vice-chancellor, 6 vol. (Warsaw, 1791); his account of the Constitution of May (Leipzig, 1793; Paris, 1868); his correspondence with T. Czacki (1854); and his letters written during emigration, 1792–94 (1872). *See* also Henryk Schmitt, *Poglad na zywot i pisma Ksiedza H. Kollataja* (1860); Wladyslaw Smolenski, *Przewrot Umyslowy w Polsce* (1891); Waclaw Tokarz, *Ostatnie lata Kollataja* (1905); *Cambridge History of Poland,* vol. ii (1941). (A. B. Bo.)

KOLLONTAY, ALEKSANDRA MIKHAILOVNA (1872–1952), Soviet diplomat and the first woman to become an accredited minister to a foreign country, was born in St. Petersburg on April 1, 1872, a daughter of a Russian general. She married an officer of the tsarist army, but was attracted to the Social-Democratic party. She lived abroad from 1908 to March 1917, when she returned to Petrograd and joined the Communist party, becoming soon after the November *coup d'état* commissar for public welfare. During this period an enthusiastic affair with the revolutionary seaman Dybenko might have ended in her execution but for the intervention of Lenin. In 1920 she was prominent for her advocacy of the workers' opposition views. She joined the people's commissariat of foreign affairs in 1922 and served as minister to Norway (1923–25); after a short period as minister to Mexico, she was again appointed to Norway (1927–30); she was minister to Sweden from 1930 to July 1945, with the rank of ambassador from 1943. In 1944 she conducted the Soviet-Finnish armistice negotiations,. She died in Moscow on March 9, 1952.

KOLLWITZ, KATHE (née SCHMIDT) (1867–1945), German print maker and sculptress, an eloquent spokesman for the victims of social injustice, war and inhumanity, was born in Konigsberg, East Prussia, on July 8, 1867, and studied art in Berlin and Munich. In 1891 she married Karl Kollwitz, a physician who chose to practise in a proletarian district of Berlin, and the impact of this milieu largely determined the course of her art. Her first set of prints (1894–98), inspired by Gerhart Hauptmann's provocative drama *The Weavers,* was exhibited in 1898. The following set, "Peasant War" (1902–08), was not equaled in emotional power by any of her later works. After World War I she became the first woman to be elected a member of the Prussian Academy of the Arts, from which she resigned in 1933 as a protest against the Hitler regime. In 1936 she was forbidden to exhibit, After her home in Berlin had been destroyed by bombs in World War II, she moved to the castle of Moritzburg near Dresden as a guest of the former royal Saxon family, and there she died on April 22, 1945. Despite the stormy missionary trend of her art and the limitations it unavoidably imposed, her work derives vitality from a draftsmanship full of strength and character.

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KÖLN: *see* COLOGNE.

KOLOMAN (Hung. KALMAN) (1070--1116), king of Hungary, was the son of King Geza of Hungary by a Greek concubine. King Ladislaus would have made him a monk. but Koloman had no inclination for an ecclesiastical career and escaped to Poland. On the death of Ladislaus (1095), he returned to Hungary and seized the crown. His legitimately born younger brother, Almos, did not submit to this usurpation and in 1108 won over the emperor Henry V, who thereupon invaded Hungary. The Germans were unsuccessful, and Koloman was reconciled with his brother for a time. Five years later Koloman imprisoned Almos and his infant son Béla in a monastery and had them blinded. Nevertheless Koloman was a good king and a wise ruler. In foreign affairs he continued the policy of St. Ladislaus by trying to secure a seaboard for Hungary. In 1097 he overthrew Peter, king of Croatia, and acquired the greater part of Dalmatia, though there he came into collision with the Greek and the German emperors, Venice, the pope and the Norman-Italian dukes, who were all alike interested in the fate of the province. By 1102, however, he was in possession of Zara, Traú, Spalato and all the islands as far as the Cetina. But it was as a legislator and administrator that Koloman was greatest. He was not only one of the most learned, but also one of the most statesmanlike sovereigns of the earlier middle ages. Koloman died on Feb. 3, 1116.

KOLOMNA, a town of Russia, in the *oblast* of Moscow, situated on the railway between Moscow and Ryazan, 72 mi. S.E. of Moscow, at the confluence of the Moskva river with the Kolomenka in 55° 5′ N., 38° 38′ E. Pop. (1956 est.) 94,000. It is an old town mentioned in the annals in 1177, and until the 14th century was the capital of the Ryazan principality. It suffered greatly from the invasions of the Tatars in the 13th century, who destroyed it four times, as well as from the wars of the 17th century; but it always recovered and has never lost its commercial importance.

It has several old churches of great archaeological interest. There are railway workshops where locomotives and wagons are made, and a munition factory.

KOLOMYJA, formerly a Polish town in the province of Stanislawów, 122 mi. S. of Lemberg by rail on the Pruth. Pop. (1931) 33,385. It has an active trade in agricultural products. As the capital of the frontier district of Pokucie, it suffered severely in the 15th and 16th centuries from the Moldavians and the Tartars. It was ceded to the U.S.S.R. in 1945.

KOLS. Hindus use the word *"Kol"* as a generic term for the non-Aryan Munda (Austro-Asiatic) speakers of the Chota Nagpur plateau. "Most of the tribes simply call themselves *'men,'* the same word, with dialectic variations, *Kdl, Kdra, Kūrkū* (merely the plural of *Kūr*), *Hâr, Hārâkô* (another plural), or Hō, being used universally." *(Linguistic Survey of India,* vol. i, p. 38, 1927.)

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KOMÁRNO or KOMÁROM, Nitra region. Czech., at the confluence of the Váh and the Danube, an important harbour. Settlement on its site dates back to Roman times though charter as a town was not obtained until 1265. Commanding important routes north and west, Komárno occupies a strategic position and was once considered the strongest fortress in Europe. It was besieged four times by the Turks between 1543 and 1663, by the Austrians in the 1848–49 revolution, and sheltered the treasure of the Austrian national bank during the Austro-Prussian war of

1866. The surrounding region is noted for cereals and wine, in which with timber, fish and stock a brisk export trade is carried on; river craft are also constructed.

The town was transferred to Czechoslovakia from Hungary by the Treaty of Trianon, 1920, and back to Hungary in 1939. Population (1950) 16,343.

KOMATI, a river of southeastern Africa. It rises at an elevation of about 5,000 ft. in the Ermelo district of the Transvaal, 11 mi. W. of the source of the Vaal, and flowing in a general N. and E. direction reaches the Indian ocean at Delagoa bay. after a course of some 500 miles. The river descends the Drakensberg by a pass 30 mi. S. of Barberton, and at the eastern border of Swaziland is deflected northward, along the western side of the Lebombo mountains. Just W. of 32° E. and in 25° 25′ S. it is joined by one of the many rivers of South Africa named Crocodile. A mile below the junction the united stream, which from this point is also known as the Manhissa, passes to the coastal plain through a cleft 626 ft. high in the Lebombo known as Komati Poort, where are some picturesque falls. At Komati Poort, which marks the frontier between British and Portuguese territory, the river is less than 60 mi. from its mouth in a direct line, but in crossing the plain it makes a wide sweep of 200 mi., first N. and then S., forming lagoon-like expanses and backwaters and receiving from the north several tributaries. In flood time there is a connection northward through the swamps with the basin of the Limpopo. The Komati enters the sea 15 mi. N. of Lourenço Marques. It is navigable from its mouth, where the water is from 12 to 18 ft. deep, to the foot of the Lebombo.

KOMI (Kami) or ZIRIAN, autonomous republic of the Russian S.F.S.R., a district created in 1921, stretching from the region of Archangel on the north and west to the Urals on the east. The Kirov (formerly Vyatka) region lies on the south. Area. 151,473 sq.mi. Komi lies between 59° 30′ N. and 67" N., and 46° E. and 66" E.; thus, a part of the region is north of the Arctic circle. The, Great Land tundra is a swampy district. The vegetation consists mainly of perennial lichens and mosses, with greatly developed root systems, and stunted, matted, cushionlike aerial systems. The leaves may be succulent, or leathery, stiff and needle-shaped, with a waxy or hairy surface. Winter is long and severe, and the temperature may drop to −50° F.; in spring the blocks of ice from the warmer south are piled by the current on the unthawed ice below, and extensive floods are formed. From May to July, the sun never sets below the horizon, and insects, especially mosquitoes, flourish. In rare places of better drainage, where there is no perpetually frozen soil below, oases of brightly coloured blossoms, forget-me-nots, lupins, saxifrage, pedicularis and poppies may occur. During July and August the mid-day temperature may reach 70° F. and crakeberries and cloudberries ripen. Cumulus clouds, heavy showers and driving mist may result from evaporation, the water of the north flowing streams being warmer than the air. By the end of August gales and snowstorms set in and by mid-September, the whole region is snow and ice covered. From November to February the sun does not rise above the horizon and tremendous blizzards, lasting for days, sweep the land. Dwarf willow scrub occurs near the rivers and on sandy soil and provides fuel for the wandering Samoyedes and covert for the nests of the willow grouse, Temming's stint, white fronted goose and red-throated pipit. Ducks and wading birds, stints, ruffs, gray plover and pharalope nest on the quaking treacherous moss bogs in summer: studded with islands of sphagnum — or lichen — covered driftwood brought down by the spring floods. The mammals of the tundra include reindeer, arctic fox and hare, wolf and ermine. The lemming is a vital link in the life cycle of the tundra. Reindeer, both wild and domesticated, are the most important economic animals. The Komi and latterly some Russians, have learned reindeer breeding from the Samoyedes, who are entirely dependent on reindeer for food. clothing and shelter. The splayed hoofs of the reindeer support them on the snow and soft moss, and their broadly spatulate antlers enable them to push the snow aside in search of food. Reindeer breeders are compelled to be nomadic, for their herds are driven northwards in summer by the swarms of mosquitoes and by the need for snow. In 1926–27, the number of reindeer was about 400.000, two-thirds of them bred by Komi and the remaining third by Samoyedes and Russians. In 1925 a veterinary station for reindeer breeders was established at Izhma.

South of this region is the *taiga* forest; two-thirds of Komi area is forest covered, and of this one-half is pine clad. Firs are common, and in the Urals, Siberian cedar, silver fir and larch.

The greater part of the timber products is floated down the Vychegda and Northern Dwina to Archangel and exported, while some is exported via the Perm railway either for local consumption or for the Volga districts. Timber accounts for 75 to 80% of all the exports of the region; the establishment of three electric stations in 1926 is providing power for sawmills and much increasing the output. Tar and pitch preparation and the making of small wooden articles are important *kustar* (home) industries. Linked with the forest is hunting for squirrel, hare, ermine, mink, marten, fox. arctic fox, otter, etc.

Game birds are also a source of income and the wings of the white partridge are exported. Hunting, however, forms a supplementary source of income except in the Izhma-Pechora district, where it is the main occupation. Salmon, Siberian salmon and gang fish are prepared for export in the Pechora region.

Cultivation occupies but a small area in the district. Forest clearings are made by burning; the stumps and roots are cleared away and the charcoal enriches the soil temporarily. Rye, barley, oats, flax, hemp and potatoes are grown; rye and barley occupy 78% of the sown area. Hay and vegetables are raised in a few places.

The meadow lands near the rivers favour cattle breeding which is carried on more intensively than cultivation. Horses are useful in the timber industry, and draught cattle and cows are increasingly bred. Dairying is beginning and several butter factories have been built. Industrial enterprises are non-existent, except for small sawmills, ironsmelting works and a salt preparing factory. But *kustar* or peasant industries and handicrafts have great importance and include the preparation of chamois leather, especially in the Izhma district: the making of harness, carpentry, flour milling, tar and pitch preparation, blacksmith's work, etc. In the Ustkulomsk and Shchugorsk districts whetstone is worked for millstones and grindstones both for the Russian and foreign market. The Komi area, Archangel and Kirov occupy the first place in the U.S.S.R. for the number of peasant artels producing *kustar* products.

Means of communication, except for the rivers, are poor. The Vychegda through its tributary the Keltma is linked by the Catherine canal with the South Keltma, a tributary of the Kama river, and thus with the Volga. The Pechora and its tributaries, linking with the frozen Arctic, play a small rôle. Roads are poor and there is no railway, beyond a few kilometres of the Kirov-Kotlas railway in the southwest. A railway linking Murashi on that line with Syktyvkar (formerly Ust-Sysolsk) on the Sysola river and Ukhtinsk on the Izhma river is planned. The mineral wealth of the Komi area is incompletely surveyed and little worked, but an extensive coal field was discovered in 1924. Iron ore was known in the 18th century in the Vychegda and Sysola districts; salt was worked on the Vyma, a tributary of the Vychegda as early as the 16th century, and grindstone was worked in the Tochil hills near the left bank of the Pechora from the beginning of the 17th century.

The settlements in the district are small, and Syktyvkar (formerly Ust-Sysolsk), pop. (1939) 17,200, the administrative centre, is the largest. The literacy rate is higher than among many nationalities in the U.S.S.R., and two-thirds of the children of school age are provided for; there are schools for the Samoyedes. Medical and sanitary provision is inadequate. The population (1956 est.) was 670,000 (urban, 326,000; rural, 344,000) and the density in 1939 was the smallest in European Russia, except for the Murmansk region. The Komi (Ziriansj number 92.3%, Russians 6.6% and Samoyedes 1.0%. The Zirians (alternative spellings Syryenians, Zyrenians, Sirianians, Zirian-

ians, Zyrians) called themselves Komi or Kami. They are a Finnish race of the Permian branch, with a language closely related to that of the Permyaks and Votyaks. Many Russian words have been adopted, and when the Komi learned reindeer breeding from the Samoyedes, they borrowed Samoyedic words for the art. Castrén published a Komi grammar, but no ancient Komi literature exists. The Finns and Russians were living peacefully together as early as the 9th century in this district, the Finns paying tribute. They have adopted many Russian village customs. They are fair, gray-eyed and of medium stature and readily adapt themselves to commerce. Their log houses (kerkas) have two rooms, with a store shed between and a steam bathhouse, and in summer they take steam baths several times a week and then plunge immediately into the river. The national costume has been replaced by Russian attire. The nomadic Samoyede migrates north in summer and south in winter, following his reindeer, but many have become settled in the Komi villages. Their travelling tent or *chym* is made of about 20 fir poles, sharpened at each end, driven into the ground and lashed together at the top. Over these are tied large pieces of birch bark, secured by stones or lumps of earth to the ground. In winter the birch bark is replaced by reindeer skin, well caulked with moss. A large flat stone serves as a fireplace. Their food is mainly reindeer meat, often in a semidecaying condition. Syphilis, scurvy, smallpox and alcohol have much reduced their numbers and lessened their resistance to the increasing pressure of the Komi and Russians. They are entirely illiterate, but efforts are being made to teach the children and schools where instruction is given in the Samoyede language have been opened.

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KOMURA, JUTARO, MARQUIS (1855–1911), Japanese statesman, was born in Hiuga. He graduated at Harvard in 1877 and entered the foreign office in Tokyo in 1884. He served as chargé d'affaires in Peking, as Japanese minister in Seoul, in Washington, in St. Petersburg (Leningrad) and in Peking (during the Boxer trouble), earning a high reputation for diplomatic ability. In 1901 he received the portfolio of foreign affairs and held it throughout the course of the negotiations with Russia and the subsequent war (1904–05), being finally appointed by his sovereign to meet the Russian plenipotentiaries at Portsmouth, and subsequently the Chinese representatives in Peking, on which occasions the Portsmouth treaty of Sept. 1905 and the Peking treaty of November in the same year were concluded. For these services, and for negotiating the second Anglo-Japanese alliance, he received the Japanese title of count and was made a K.C.B. by King Edward VII. He resigned his portfolio in 1906 and became privy councillor, from which post he was transferred to the embassy in London, but he returned to Tokyo in 1908 and resumed the portfolio of foreign affairs in the second Katsura cabinet until 1911. He was created marquis in 1911. He died at Hayama on Nov. 24, 1911.

KONARAK or KANARAK, a ruined temple in India, in the Puri district of Orissa, for its size "the most richly ornamental building—externally at least—in the whole world," was erected in the middle of the 13th century and dedicated to the sun-god. It consisted of a tower, once more than 180 ft. high, with a porch in front 140 ft. high, sculptured with figures of lions, elephants, horses, etc.

KONDYLES, GEORGE (1880–1936), Greek general and statesman, was educated in Greece. He entered the army as a common soldier but left it in 1905 in favour of *comitadji* warfare against Bulgaria in Macedonia. He fought through both Balkan Wars and World War I, rising from noncommissioned officer to colonel. He resigned his commission in Dec. 1920, on King Constantine's return, and retired to Constantinople, where he became an officer of the "national defense." He afterward commanded a division in Thrace, again resigned his commission, but again took command in Oct. 1923 to crush the threatened revolt against the revolutionary government. In Dec. 1923 he entered parliament as a republican, became minister of war under Alexander Papanastasiou, formed a National Republican party of his own and became minister of the interior under Andreas Michalakopoulos in Oct. 1924. He resigned on June 10, 1925, but was nevertheless arrested by Gen. Theodore Pangalos and banished for a time to Santonia. On Aug. 22, 1926, he made a coup d'état, overthrew Pangalos and became prime minister, pledging himself to retire after holding elections, which he did with great fairness. In the autumn he dissolved his party and withdrew from politics; but resumed active opposition a few months later. He was minister of war again in 1932; and in Oct. 1935, following a monarchist coup d'ktat, he became prime minister but later resigned. As minister of war, he used to take his whip into the assembly and lay it on the table in front of him. He has been called "the Greek Cromwell." while his own soldiers nicknamed him Keraunós (Thunderbolt). He died on Jan. 31, 1936.

KONIA (KONYA). (1) An *il* (province) in Turkey including part of the Taurus range and the greater part of the central steppe. Area 18,994 sq.mi. The population (987,022 in 1960) is for the most part agricultural and pastoral. Industries are carpet weaving and the manufacture of cotton and silk stuffs. Principal exports are salt, minerals, opium, cotton, cereals, wool and livestock; and the imports cloth goods, coffee, rice and petroleum.

(2) Its chief town (anc. *Iconium*), altitude 3,320 ft., is at the southwest edge of the central plain of Asia Minor, amid orchards famous in the middle ages for yellow plums and apricots, and watered by streams from the hills. Pop. (1960) 122,704. After the capture of Nicaea by the crusaders (1097), Konia became the capital of the Seljuk sultans of Rum. (See SELJUKS; TURKS OR TURKIC PEOPLES). It was temporarily occupied by Godfrey. and again by Frederick Barbarossa, but this scarcely affected its prosperity. During the reign of Ala ed-din I. (1219–1236) the city was a centre for artists, poets, historians, jurists and dervishes, driven westwards from Persia and Bokhara by the advance of the Mongols, and there was a brief period of great splendour (see ICONIUM). After the break-up of the empire of Rum, Konia became a secondary city of the amirate of Karamania and in part fell to ruin. In 1472 it was annexed to the Osmanli empire by Mohammed II. In 1832 it was occupied by Ibrahim Pasha who defeated and captured the Turkish general, Reshid Pasha, not far from here.

The walls and the palace of the Seljuk period were still in excellent condition at the beginning of the 19th century but were gradually pulled down for building material. until only vestiges remained. By the 1880s a large part of Konia was deserted, but about 1895 the advent of the Anatolian railway began to restore the city's prosperity. The sacred buildings were patched up and the walls mere nholly removed. The water supply system was improved, and after 1914 water was brought in from Beyshehr lake to irrigate the surrounding land.

Konia is connected by railway with Istanbul and with Baghdad and Basra.

KONIECPOLSKI, STANISLAUS (1591–1646), Polish soldier, was the most illustrious member of an ancient Polish family which rendered great services to the Republic. Educated at the academy of Cracow, he learned the science of war under Jan Chodkiewicz, whom he accompanied on his Muscovite campaigns, and under Stanislaus Zolkiewski, whose daughter Catherine he married. On the death of his first wife he wedded, in 1619, Christina Lubomirska. In 1619 he was captured by the Turks and held prisoner in Constantinople for three years. On his return he was appointed commander of all the forces of the Republic. For his victories against the Tatars at Martynow and elsewhere he received the thanks of the diet and the palatinate of Sandomeria from the king. In 162j he was appointed guardian of the Ukraine against the Tatars, but in 1626 was transferred to Prussia to check the advance of Gustavus Adolphus, against whom he won repeated victories, although the parsimony of his country forced him to confine himself generally to guerilla warfare. In 1632 he was appointed to the long vacant post of *hetman wielki koronny,* or commander in chief of Poland, and in that capacity routed the Tatars and Turks repeatedly and, after years

of conflict, reduced to order the Cossacks, against whom he built the fortress of Kudak. He died in 1646, on the eve of a great expedition against the Turks.

See an unfinished biography in *Tyg. Illus. of Warsaw* (1863).

KONIGGRÄTZ: *see* HRADEC KRALOVE.

KONIGSBERG (Polish Krolewiec), now Kaliningrad, capital of Kaliningrad *oblast*, Russian Soviet Federated Socialist Republic, U.S.S.R., former capital of East Prussia, Ger., which was ceded to the Soviet Union by the Potsdam agreement. Pop. (1959) 202,000. The city is situated on rising ground, on both sides of the Pregel, 4½ mi. from its mouth in the Frische Haff, 80 mi. E.S.E. of Danzig, at the junction of the railway lines to Pillau, Labiau, and Kranz.

The Altstadt of Königsberg grew up around the castle built in 1255 by the Teutonic order. Its first site was near the fishing village of Steindamm, but after its destruction by the Prussians in 1263 it was rebuilt in its present position. It received civic privileges in 1286, the two other parts of the present town—Lobenicht and Kneiphof—receiving them a few years later. but they were not united until 1724. In 1340 Konigsberg entered the Hanseatic league. From 1457 it was the residence of the grand master of the Teutonic order, and from 1525 till 1618 of the dukes of Prussia.

The trade of Konigsberg was much hindered by the constant shifting and silting up of the channels leading to its harbour; and the great northern wars did it immense harm. but before the end of the 17th century it had almost recovered.

The Pregel flows through the town in two branches between which lies the island of Kneiphof. Its greatest breadth within the town is from 80 to 90 yd., and it is usually frozen from November to March. Among the more interesting buildings are the Schloss, a long rectangle begun in 1255 and added to later, with a Gothic tower 277 ft. high and a chapel built in 1592; and the cathedral, begun in 1333 and restored in 1856. a Gothic building with a tower 164 ft. high, adjoining which is the tomb of Kant.

The university (collegium Albertinium) founded in 1544 by Albert I, duke of Prussia, as a "purely Lutheran" place of learning, completed in 1865, was destroyed in World War II. Among its famous professors were Kant (who was born there in 1724 and to whom a monument was erected in 1864), J. G. von Herder, F. W. Bessel, F. Neumann and J. F. Herbart.

Königsberg has been an important naval and military fortress and the protected position of its harbour has made it a very important commercial city. A channel has been made between it and its port, Pillau, 29 mi. distant, on the outer side of the Frische Haff, so as to admit vessels drawing 20 ft. of water right up to the quays of Konigsberg. and this canal has been deepened to 26 ft. Among the industries of the city are shipbuilding, printingworks and manufactures of machinery, locomotives, carriages, chemicals, cork, sugar, beer, tobacco and cigars, pianos and especially amber wares.

The principal exports are cereals and flour, cattle, horses. hemp, flax. timber. sugar, bristles, hides and oil cake. It imports coal, phosphates and steel goods.

KÖNIGSMARK, MARIA AURORA, COUNTESS OF (1662–1728), mistress of Augustus the Strong, elector of Saxony and king of Poland, belonged to a noble Swedish family, and was born on May 8, 1662. Aurora went in 1694 to Dresden to make inquiries about her brother Philipp Christoph, count of Königsmark, who had suddenly and mysteriously disappeared from Hanover. Augustus made her his mistress; and in Oct. 1696 she gave birth to a son Maurice, afterward the famous marshal de Saxe. The elector soon tired of Aurora. who was made coadjutor abbess and lady provost (*Pröpstin*) of Quedlinburg, but lived mainly in Berlin, Dresden and Hamburg. In 1702 she went on an unsuccessful diplomatic errand to Charles XII of Sweden on behalf of Augustus. The countess, described by Voltaire as "the most famous woman of two centuries," died at Quedlinburg on Feb. 16, 1728.

See O. J. B. von Corvin-Wiersbitzki, *Maria Aurora, Grafin Don Königsmark* (Rudolstadt, 1902); P. Burg, *Die schöne Gräfin Königsmark; aus den Briefen, Akten,* etc. (1920).

KÖNIGSMARK, PHILIPP CHRISTOPH, COUNT OF (1665–1694), was a member of a noble Swedish family, born on March 14, 1665, at Stade, and is chiefly known as the lover of Sophia Dorothea, wife of the English king George I, then electoral prince of Hanover. After wandering and fighting in various parts of Europe he entered the service of Ernest Augustus, elector of Hanover. Here he made the acquaintance of Sophia Dorothea, and assisted her in one or two futile attempts to escape from Hanover. Regarded, rightly or wrongly, as the lover of the princess, he was seized, and disappeared from history, probably by assassination, on July 1. 1694.

See A. Kocher, "Die Prinzessin von Ahlden," in the *Historische Zeitschrift* (Munich, 1882); and W. H. Wilkins, *The Love of an Uncrowned Queen* (1900). *See* also the letters between Sophia Dorothea and Königsmark, printed in *Briefwechsel des Grafen Königsmark und der Prinzessin Sophie Dorothea von Celle,* edited by W. F. Palmblad (Leipzig, 1847).

KÖNIGSSEE, or LAKE OF ST. BARTHOLOMEW, a lake in Upper Bavaria. Ger., about 2½ mi. S. of Berchtesgaden. 1,975 ft. above sea level. It has an area of 2 sq.mi., and its greatest depth is 617 ft. Konigssee is the most beautiful lake in the German Alps, pent in by limestone mountains rising to 6,500 ft., which descend precipitously to the green waters below.

KONINCK (KONING, CONINGH), **PHILIPS DE** (1619–1688), Dutch painter most celebrated for his landscapes, was born in Amsterdam. He studied under his elder brother Jacob, a painter about whose work little is known. Philips appears to have lived and worked continuously in Amsterdam, where he died. The influence of Rembrandt is paramount in his art, and it has often been supposed, probably incorrectly, that Rembrandt was his master. However, Koninck was certainly a friend of Rembrandt and was associated with his artistic circle in Amsterdam. His works include portraits, biblical subjects and genre scenes, but his characteristic works depict wide panoramas of level countryside, with villages, trees and waterways, viewed from some slight eminence. Contrasting areas of cloud shadow and sunlit landscape give life and variety to the simple compositions. Though sufficiently similar to Rembrandt in style and handling to have often passed under his name, Koninck's landscapes show generally a blonder and greener colour range.

Examples can be seen in the National gallery, London, the Metropolitan Museum of Art, New York city, and the galleries at Amsterdam, Berlin and Copenhagen, while several remain in private Dutch and British collections. (R. E. W. J.)

KONKAN, a maritime tract mainly within Maharashtra state, India, and extending for about 475 mi. from the former Portuguese territory of Damão (Damauj in the north to the Mysore district of Kanara in the south.

On the east it is bounded by the Western Ghats, on the west by the Arabian sea. From the mountains at its eastern limits (in one place rising to 4,700 ft.), the surface, marked by irregular hilly spurs from the Ghats: slopes to the westward, where the mean elevation of the coast is not more than 100 ft. above sea level.

One of the most striking characteristics of the climate is the violence of the monsoon rains. The coast has a straight general outline, but is much broken into small bays and harbours. This, with the uninterrupted view along the shore: and the breezes which force vessels along the coast always to be within sight of it, made this country a centre of piracy, not finally extinguished until 1812.

KONKOMBA, a people akin to the Gurma and Betshiemba, who inhabit the Oti plain between the Ngkpe or Kulaw river in the Northern Territories of the Gold Coast and the Togo hills. Their dialect is known as Kekpokpam, a language of the Gur or Gurma group of the Voltraic family. They call themselves Bekpokpam and their land Kekpokpam. They are cultivators and cattle raisers and animist in religion. (D. TT.)

KONRAD VON WURZBURG (d. 1287) was one of the most important poets writing in Middle High German in the late 13th century. He was born in Würzburg between 1220 and 1230, and as a professional poet served a succession of patrons, first in Strasbourg, then in Basel, where he eventually made his home and where he died. Aug. 31, 1287. Konrad was a prolific and versatile poet. His works range from full-scale epics, such as *Parto-*

nopier und Meliur and *Der Trojanerkrieg,* to love lyrics and short didactic poems (*Sprüche*). His powers are best displayed in his shorter narrative poems, both the secular romances such as *Englehard, Das Herzmaere* and *Otte mit dem Barte* and the religious legends of *Silvester, Alexius* and *Pantaleon.*

Konrad lived at a time when court life and its chivalric ideals were declining, but before the rising towns had acquired a sufficiently distinct entity to provide creative artists with identifiable means of self-expression. Although himself of humble origin, he sought to preserve the decaying values of courtly life and to invest them with new poetic qualities. His originality is thus of form, not of content, and lies in an ingenuity of poetic diction, an exuberant exploitation of linguistic and narrative skills. He took Gottfried von Strassburg as his model, developing, often to the point of exaggeration, his already stylized techniques of language and versification. If Gottfried may be called the "classical" artist of the 13th century Konrad is the poet of "baroque." The subtlety of his artistry, coupled with the explicitly didactic purpose of both his epic and lyric poetry, earned the esteem of his contemporaries and his subsequent elevation to the ranks of the "12 old masters" honoured by the Meistersingers.

See A. Moret, *Un artiste méconnu, Conrad de Wurzbourg* (1932); G. Ehrismann, *Geschichte der deutschen Literatur bis zum Ausgang des Mittelalters,* 2nd ed. (1935), pp. 35–54, which gives a full bibliography. (Rd. J. T.)

KONTAKION, THE, the name given to the Byzantine metrical sermon. It consists of a number of stanzas (*oikoi*), metrically identical, which end in the same refrain. The stanzas, the first letters of which generally form an acrostic in which the name of the poet is included, are preceded by a prelude (*koukoulion*) in a different metre. The *kontakia* were accompanied by music, none of which has survived, and were probably chanted in a kind of recitative resembling an oratorio, the congregation joining in the refrain.

The metres of the fully developed *kontakia* are extremely elaborate, and are governed by the number of syllables and the position of accents in each line, as well as by regular sense pauses.

In character the *kontakion* is nothing more than a poetical homily, akin to the rhythmical prose sermons of the early Christian church, preached after the lesson. The word *kontakion* appears to be derived from the *kontos,* the staff on which the parchment was rolled, but other terms were also used to designate this kind of poetry, for instance *hymnos, epos, poiema, ode, psalmos* or *ainos.* Certain of the elements of the *kontakion,* such as the acrostic and the refrain, can be found in the Greek literary tradition of the 4th and 5th centuries A.D., but its true character, that of a metrical sermon, and the strophic element are certainly due to the influence of Syrian literature. Syrian elements were blended with the artifices and elaborate adornments of late Hellenistic rhetoric. Unfortunately, it is not possible to follow the early development of the *kontakion,* as nearly all the early examples are lost. It is known mainly from its fully developed form, especially as it appears in the 6th century in the hands of Romanos the Melodos (*see* Romanos, Saint), its greatest master. The Christmas hymn of Romanos and the celebrated *Akathistos,* a hymn of disputed authorship and date, are perhaps the two most famous surviving *kontakia.* The *kontakion* declined in the 9th and the 10th centuries. It gave way to a more elaborate form of religious poetry, the *kanon,* in which music and not the words is perhaps the most important element.

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KOODOO or **KUDU,** a large species of African antelope (*q.v.*), with fine corkscrewlike horns in the male, and the body marked with narrow vertical white lines in both sexes. The female is hornless.

Strepsiceros strepsiceros is the true kudu, which ranges from the Cape to Somaliland; there is a smaller species (*S. imberbis*) in east and northeast Africa.

KOOK (Kuk), **ABRAHAM ISAAC** (1864–1935), rabbi and Talmudic scholar, first chief rabbi of Palestine under the British mandate, was born in Grieva, Latvia, the son of Shlomo Zalman haCohen. He served as rabbi in the towns of Zimel and Boisk, and in 1904 became the rabbi of Jaffa, Israel. In 1914 he was stranded in Europe by the outbreak of World War I and in 1916 accepted the call of congregation Machzike Hadath in London to become their rabbi. In 1919 he returned to Palestine as the rabbi of Jerusalem, and in 1921, when the position was created, he was elected chief rabbi of Palestine, a position he held until his death on Sept. 1, 1935.

Kook's literary activity began with articles in Hebrew periodicals on the inseparability of Jewish nationalism from the Jewish religion. He maintained the essential unity of the halakic and philosophic teachings, which were generally regarded as separate domains, embodying this view in the curriculum of the Yeshiva which he established, first in Jaffa and later in Jerusalem, known as Merkaz Harab. A mystic by nature, Kook viewed Jewish national revival as the process through which the divine plan for strengthening faith against the rising tide of heresy in modern times is carried out. This philosophy, which he preached during his lifetime, he expounded in a stream of cryptic essays, most of which were published posthumously under the title *Oroth Hakodesh.*

Bibliography.—I. L. Maimon, *Azkarah* (1937); Jacob B. Agus, *The Banner of Jerusalem* (1946); S. K. Mirsky, *Bein Shekiah le'Zriha,* pp. 221–233 (1951). (S. K. M.)

KOOTENAY (Kootenai), a river in western North America, once called the Flat Bow and also MacGillivray, has its headwaters in the Rocky mountains to the west of Banff, Alberta. It flows southward in a broad U-shaped valley through scenic Kootenay National park in British Columbia and breaks out of the Rockies at Canal Flat to become a southward-flowing river in the Rocky mountain trench. It swings in a broad U southward into Montana and then northward into Idaho before broadening out into long, narrow Kootenay lake in British Columbia; from the western arm of the lake it flows into the Columbia river. About 130 mi. of the total of 407 mi. of the river are in the United States. There is a wide variation in the seasonal flow of the river as measured at Wardner, B.C. The average late spring runoff of 67,000 cu.ft. per second is more than 100 times the winter minimum of 600 cu.ft. per second.

The Kootenay river falls 365 ft. in the 25 mi. between Kootenay lake and the Columbia river. In this section five dams were constructed, the first two built early in the 20th century. They have a total hydroelectric generating capacity in excess of 300,000 h.p. used chiefly to supply power to the large base-metal smelter and refinery at Trail, B.C. (J. L. R.)

KOOTENAY or Kutenai, an American Indian tribe in the upper drainage of the Columbia river, somewhat more than half the total of 1,000 being in British Columbia, the remainder in Montana and Idaho. An intermountain tribe with culture fundamentally of plateau type, the Kootenay became seasonal buffalo hunters after obtaining horses, and approximated the plains Indians (*q.v.*) in customs. They are noted for birchbark canoes with undershot ends, recalling those of the Amur river in Siberia. Kootenay speech, generally reckoned distinct, shows certain similarities to Algonkin (*see* Algonkian Tribes), which may indicate an original relationship. A. F. Chamberlain, in numerous scattered papers, is the principal authority. (A. L. K.)

KOPER (Capodistria), a town and seaport of the People's Republic of Slovenia, Yugos., lies 24 km. (15 mi.) S.W. of Trst (Trieste). Formerly an island, it was connected to the mainland in 1825 by a causeway half a mile long. Pop. (1961) 7,960. The town of Koper is of Mediterranean character. The most noteworthy buildings are the cathedral and the palace of the local authority in the principal square. There are extensive salt works in the vicinity. Koper is usually identified with the town of Aegida, which in the 6th century A.D. received the name of Justinopolis from Justin II. When Istria fell into the hands of the patriarchs of Aquileia in the 13th century they made Justinopolis the capital of Istria (whence the name Capodistria). It was cap-

turtd by the Venetians in 1278. Under Austria from 1813 to 1918. Koper was then occupied by Italy. In 1954, when the Free Territory of Trieste was partitioned, it became part of Yugoslavia.
(V. DE.)

KOPISCH, AUGUST (1799–1853), German poet, was born at Breslau on May' 26, 1799. He was studying archaeology in Italy (1822–28) when, being an expert swimmer, he, with Ernst Fries, discovered (1826) the blue grotto of Capri. In 1828 he settled at Berlin and was granted a pension by Frederick William IV. He died at Berlin on Feb. 3, 1853. Among his *Gedichte* (1836) are some naïve and humorous little pieces such as Die *Histoire von Noah*, Die *Heinzelmännchen*, Das *grüne* Tier and *Der Schneiderjunge von Krippstedt*, which became widely popular. His collected works were published in five volumes (1856).

KÖPPEN, WLADIMIR PETER (1846–1940), German meteorologist and climatologist, best known for his classification of climates. He was born (of German ancestry) in St. Petersburg. now Leningrad. Russia, on Sept. 25. 1846. After study at Heidelberg and Leipzig, he was employed (1872–73) in the Russian meteorological service. In 1875 he became chief of a new division of the Deutsche Seewarte, Hamburg, charged with the initiation of weather forecasting for northwestern Germany and the adjacent seas. From 1879 he was able to devote himself to fundamental scientific work. His most influential accomplishments were comprehensive studies of the weather and climate of the oceans. investigations of the upper air by means of kites and sounding balloons and a systematic study of climate that culminated in his widely used classification of climates (1918). Besides hundreds of articles and shorter works, his most important writings are *Grundriss* der *Klimakunde* (1931) and, with Alfred Wegener, Die *Klimate* der *geologischen Vorzeit* (1924). In 1927 he undertook. with Rudolf Geiger, the editorship of a five-volume *Handbuch* der *Klimatologie*, which was not completed. but of which a number of parts, three by Koppen himself. appeared between 1930 and 1940. He died in Graz, Aus., on June 22, 1940.

See Else Wegener-Koppen, *Wladimir Koppen, ein Gelehrtenleben* (1955). (J. B. L.)

KOPRULU, MEHMED FUAD (1890–), Turkish scholar, historian and statesman, who made a valuable contribution to the modern study of Turkish literary history. Born in Istanbul in 1890, the descendant of viziers famous in the 17th century, he early abandoned the writing of poetry and literary criticism and under the influence of the Turkish nationalist Ziya Gokalp turned to the study of Turkish literature. He became professor of this subject at Istanbul university (1913) and founded the Institute of Turcology. Turning to politics he became a member of parliament (1936), a founder member of the Democratic party and foreign minister (1950–57). After the publication (1919) of his work on the early Turkish mystics (*Türk Edebiyatinda* ilk *Mutasavviflar*) he studied the beginnings of Ottoman Turkish history and literature. greatly elucidating this little-known period in his publications "Ottoman Turkish Literature" in the Encyclopaedia, of Islam, iv (1931), and Les *Origines* de *l'empire ottoman* (1931). (F. I.)

KORAN (Arabic, *Qur'an*, "recitation"), the name of the sacred scripture of Islam, is regarded by Moslems as the Word of God, and, except in sura I—which is a prayer to God—and some few passages in which Mohammed (vi, 104, 114; xxvii, 93; xlii, 8) or the angels (xix, 6j; xxxvii, 164 *et* seq.) speak in the first person, the speaker throughout is God. The rationale of revelation is explained in the Koran itself as follows: In heaven is the original text (xliii, 3; lv, 77; Ixxxv, 22); by the process of sending down (tanzil), one portion after another (xxv, 34) was communicated to Mohammed, through the intermediation of an angel, who is called sometimes the "Spirit" (xxvi, 193), sometimes the "holy Spirit" (xvi, 104) and, later, "Gabriel" (only in ii, 91, 92; lxvi, 4). A single portion was called either, like the entire collection, *qur'an* (*i.e.*, "recitation"; possibly, the equivalent of the Aramaic *geryana* "lectionary"); or kitab "writing!"; or *sura* "series." The last is the name given to the separate chapters, which are of very unequal length. The contents of the Koran are extremely varied. The theological passages emphasize the Oneness, the Almightiness and the Righteousness of God. Idolatry and the deification of created beings are condemned. The joys of heaven and the pains of hell are depicted in vivid, sensuous imagery, and warnings are given of the approaching advent of the last day and the judgment of the world. Believers receiye general moral instruction, as well as directions for special occasions. Many passages deal with the ordinances of religion, such as prayer, fasting, almsgiving and pilgrimage; or are of the nature of civil or criminal laws, concerning marriage and inheritance, the punishment of adultery, theft, murder, etc.

Prophets. — The warnings which Mohammed addressed to his fellow countrymen were emphasized by stories of how God had punished those who rejected the message of his predecessors, the Prophets of the Old and New Testaments and others. But the deviations from the biblical narratives are very marked, and can in most cases be traced to the legendary anecdotes of the Jewish Haggada and the Apocryphal Gospels. Much has been written concerning the sources from which Mohammed derived this information; there is no evidence that he was able to read, and his dependence on oral communications may explain some of his misconceptions; *e.g.*, the confusion of Haman, the minister of Ahasuerus, with the minister of Pharaoh (xl, 38), and the idehtification of Miriam, the sister of Moses, with Mary (Miryam.), the mother of Jesus (xix, 29). It is certain that in Medina he had opportunities of becoming acquainted with Jews of some culture, and there is linguistic as well as literary evidence for his indebtedness to members of the Nestorian Church. Even in the rare passages where we can trace direct resemblance to the text of the Old Testament (cf. xxi, 105, with Ps. xxxvii, 29; i, 5 with Ps. xxvii, 11) or the New (cf. vii, 48, with Luke xvi, 24; xlvi, 19, with Luke xvi, 25), there is nothing more than might readily have been picked up in conversation with any Jew or Christian. His account of Alexander, introduced as "the two-horned one" (xviii, 82), is derived from the Romance of Alexander, which was current among the Nestorian Christians of the 7th century in a Syriac version. Besides Jewish and Christian histories, there are a few references to early Arabian prophets, such as Salih (vii, 71) and Hud (vii, 63; xi. 52).

Arrangement of Chapters. — It is probable that the whole Koran was written down in Mohammed's lifetime but not brought together as a whole or arranged in order. As it exists now, it consists of 114 chapters, arranged generally (with the exception of the first, the *Fatiha* (lit. "opening"), in order of length, the longest coming first, the shortest (often the earliest in date) coming at the end. At the head of each chapter (sura) is a title, the place of its origin (Mecca or Medina) and the number of its verses (ayat) together with the formula, "In the name of God. the Merciful, the Compassionate" (except in sura ix). For liturgical purposes the whole book is divided into 60 sections (ahzab) or 30 divisions (ajza), each subdivided into a number of prostrations (ruk'a or sajda). Attempts have been made (by Noldeke, Grimme, Hirschfeld, Rodwell, etc.) to arrange the chapters in chronological order. hfohammed's position in Mecca, when he was only the despised preacher of a small congregation, was entirely different from that which he occupied after his migration to Medina (in 622), where he was from the first the leader of a powerful party, and gradually became the autocratic ruler of Arabia; this difference appears in the Koran, and in the majority of cases there is no doubt whatever whether a part first appeared in Mecca or Medina, and the revelations given in Medina frequently take notice of contemporary historical events; still in many cases it is exceedingly difficult to make out any strict chronological sequence.

Abrogation. — Another difficulty presented by the Koran is the fact that Mohammed sometimes revoked whole verses and declared them to be "abrogated" (ii, 100, "Whatever verse We abrogate or cause to be forgotten, We bring a better or its like"; see also xvi, 103, 104). Thus the Koran contains different directions as to the treatment which idolators are to receive at the hands of believers. The number of abrogated verses has been variously estimated by commentators at from 5 to 500.

At the head of 29 of the chapters stand certain initial letters (*e.g.*, ALM, HM, etc.), for which various interpretations have been offered; *e.g.* that they are abbreviations for the names of God, for

the signature of owners of manuscripts, etc., but no explanation has gained general acceptance.

Recensions.—When Mohammed died, separate pieces of the Koran appear to have been already written down by individuals, but many portions had also been committed to memory. The first complete written version is attributed to Zayd ibn Thabit, who was instructed in the reign of Abu Bakr to collect the scattered portions into one volume. This copy passed to Gmar, and at his death to his daughter Hafsa, one of the widows of the Prophet. When in the reign of Uthman quarrels arose in the army as to the true form of the revealed text, Zayd was again appointed by the caliph, together with three members of the tribe of the Quraysh, to prepare an authoritative version. Copies of this were sent to the chief cities of the empire, and all earlier codices, except that of Hafsa, mere ordered to be burned. This recension of Uthman thus became the only standard text for the whole Moslem world.

Commentaries.—The vast exegetical literature of Islam begins with the explanations of individual verses attributed in the Hadith to the Prophet himself and his companions. Much of the work of the early commentators is embodied in the vast Tafsir of Tabari (ob. 922). The Kashshaf of the Mu'tazilite theologian Zamakhshari (ob. 1143) enjoyed a high reputation, in spite of its heretical tendencies, and was made by Baydawi (ob. 1286) the basis of his own work, the most widely read commentary in the Moslem world. Thousands of other commentaries have been written. For the history of Moslem exegesis, in Arabic, *see* I. Goldziher, *Die Richtungen der islamischen Koranauslegung* (1920); in Persian, C. A. Storey, *Persian Literature,* section i, *Qur'anic Literature* (1927).

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KORAT: *see* NAKHON RATCHASIMA.

KÖRBER, ERNST VON (1850–1919), Austrian statesman, was born at Trieste on Nov. 6, 1850. He began his career as an official in the Austrian state service, and became minister of trade under Gautsch in 1897, of the interior under Clary in 1890 and prime minister in 1900. Korber attempted to solve the nationalist question by honest negotiation and compromise, but finally was forced to rule with the help of paragraph 14 of the Austrian constitution (which allowed a government to pass any measure on its joint responsibility, with "provisional validity." should it prove impossible to pass the measure through parliament in the ordinary way). He resigned in Dec. 1904, when the obstruction of the Hungarian party of independence made it impossible to carry through the periodical compromise with Hungary. He returned to politics as common finance minister in Feb. 1915 and became prime minister for the second time in Oct. 1916 after the murder of Count Stiirgkh. He resigned in Dec. 1916 after a fresh dispute concerning the Hungarian compromise and died in Baden on March 5, 1919.

KORCE (Slavonic KORITZA), a town of southern Albania and capital of the *rrethi* of that name. Pop. (1960) 39,400, part Orthodox and part Moslem; there is also a Vllach element in the town and *rrethi.* The town stands about 2,800 ft. above sea level in a fertile plain, which slopes northward down to the former swamp of Maliq, drained after World War II and cultivated. The plain is one of the chief wheat-growing areas of Albania, and sugar-beet cultivation has been added. There are sugar refineries at Korce and Maliq and a brewery at Korce. The town is tree-shaded and has a modern appearance, with largely straight streets. It has no long history, the ruined town of Voskopoje, 9 mi to the west, having been the former commercial centre of the area. Occupied by the Greeks in 1912, Korce was awarded to Albania by the International Boundary commission. The French, from the Salonika front, occupied it during World War I and founded a lycée which had a high reputation. Occupied by the Greeks in the 1940–41 Greek-Italian war, Korce was restored to Albania by the German ,occupation of the Balkans. (D. R. 0.-H.)

KORCULA (CURZOLA), an island in the Adriatic off the Dalmatian coast, forms part of Croatia, Yugos. It lies 3 2 km. (2 mi.) W. of the Pelješac (Sabbioncello) peninsula between Split and Dubrovnik. Pop. (1961) 10,223 (commune). Area 272.6 sq.km. (105 sq.mi.). The island, 48 km. (30 mi.) long and about 8 km. (5 mi.) broad, has a hilly interior rising to 1.863 ft. with prehistoric grave mounds. Phoenicians may have colonized the island and the Greeks did so in the 4th century B.C.; the Greek name Corcyra Melaina may have referred to the dark pines which still grow there. Among the rulers of Korčula were the Romans, Goths, Slavs. Byzantines, Genoese, the kings of Hungary and Croatia and the Bosnian dukes. the city-republic of Dubrovnik, the Russians, French, British and Austrians. It passed to Yugoslavia after World War I. Marco Polo was taken prisoner by the Genoese in a sea fight off the island in 1298.

The people are mainly sailors, fishermen and farmers. Vines and olives are grown, and marble and stone are quarried. There exists a modern shipyard. The capital, Korčula, stands on a rocky foreland near the eastern end. It contains the loggia (council chambers) and palace of the Venetian governors, a fine Gothic cloister in a 15th-century Franciscan friary, walls and towers of the citadel (1420) on the hilltop and a 13th-century Gothic church, formerly a cathedral. In World War II it was occupied by the Italians and in 1943 by the Germans; Yugoslav partisans attacked it several times with heavy losses on both sides. (V. DE.)

KORDOFAN, a region of the eastern Sudan, forming a province of Sudan. It has an area of 146,929 sq.mi. The greater part of Kordofan consists of undulating plains. In the west, isolated peaks rise from 150 to 600 ft. above the plain. To the north is the great massif of Jebel Haraza. Northwest are the mountain groups of Kaja and Katul (2.000 to 3,000 ft.). In the east are Jebel Dair and Jebel Tegale, ragged granitic ranges with precipitous sides. To the south the Nuba Mountains area is well watered. The southwestern part of the province, a vast plain, is known as Dar Messeria.

Though there are no perennial rivers in Kordofan, there are watercourses (khors or wadis) in the rainy season, the chief being the Khor Abu Habl which traverses the central region; in Dar Messeria. the Wadi el Ghalla and the Khor Shalango drain toward the Bahr el Arab. There is only one permanent lake—Keilak, on the border of the Nuba Mountains area and the Dar Messeria.

The chief constituent of the scrub which covers the northern part of the country is the *Acacia verek* (hashab). In the south the red *Acacia seyal* (talh) is abundant. In Dar Hamid, north of the Khor Abu Habl, date, doum and other palms grow. The tebeldi or baobab tree *(Adansonia digitata)* is fairly common. The fauna includes buffalo, giraffe, lion, leopard, cheetah, roan antelope, wart hog, hare, quail, partridge, jungle fowl, bustard and guinea fowl. Ostriches are found on the northern steppes.

History.—Kordofan was originally inhabited by Nubian-speaking members of the Brown race, and the name may be derived from a Nubian word *kurta* meaning "men." Red brick ruins at Abu Sofyan and at Zankor in the northwest suggest that that area was part of the kingdom of Meroë; and after the fall of Meroë c A.D. 350, the royal family may have fled there. A Nubian graffito at Awdun shows that the old name of the Meroïtic kingdom, Cush, was still used in northern Kordofan in the Christian period; and the name of the Kaja of that area still preserves a form of the name Cush. In the 13th century the trade route passing through the north to Egypt was controlled for a time by Kanem; and in 1286 Sultan Kala'un of Egypt sent a messenger to several princelets of the Sudan, including Bara and Anaj, perhaps in northern Kordofan. In the 14th century nomad Arabs from Egypt had spread all over Kordofan, amalgamating with some of the aborigines and driving the remnant into the hills. In the 17th century Tunsam, being defeated in a civil war with Suliman Solong, the founder of the Keira dynasty of Darfur, fled to Kordofan and set up the kingdom of the Musaba'at (*i.e.,* "those who went east") there. In the 18th century both the Fung sultans of Sennar and the sultans of Darfur claimed to control Kordofan, but without perma-

nent effect. Although the Fung army under Abu el-Kaylak defeated the Musaba'at in 1748, the Musaba'ati sultan Hashim had recovered much of Kordofan and re-established himself at El Obeid before el-Kaylak's death (1772). In 1784 war broke out between Hashim and Teirab, sultan of Darfur: after a preliminary victory, Teirab died, and only about the end oi the century was Hashim overthrown. Darfur then controlled Kordofan until 1821, when Mohammed Bey Defterdar defeated the Fur governor Magdum Musallem near Bara and conquered Kordofan for Egypt. The Nuba Mountains area was raided for slaves but never properly administered by the Egyptians. Kordofan remained under Egyptian rule until 1882 when Mohammed Xhmed. the mahdi, raised the country to revolt. It was at Kashgil in Kordofan that Hicks Pasha (Col. William Hicks) and his Egyptian troops, sent to crush the revolt, were annihilated (Nov. 1883). In 1899, a year after the battle of Onidurman. the mahdi's successor met his death and the country passed to the Anglo-Egyptian condominium.

Population. — The population of Kordofan was 1,761,068 in 1956. The inhabitants are roughly divisible into three types—Arabs in the plains, Nuba in the hills and a comparatively small pocket of Dinka Nilotes in the southwest. Many of the more sedentary villagers in the central area are of mixed blood and reflect the intermarriage of Arabs with the Nubian-speaking indigenous population during and after the great Arab invasion of the 14th century. The main language throughout the province is Arabic, but there are many Nuba dialects. The main Arab tribes are the Kababish, the Hawawir and the Kawahla in northern Kordofan; the Messeria and the Hamar in western Kordofan; the Gawamaa in eastern Kordofan; the Hawazma who inhabit the plains in the Nuba Mountains area; and the Bedeiria who live around El Obeid. The nomad Arabs are of two classes, the camel owners or Siad el Ibil and the cattle owners or Baggara (*q.v.*), the former dwelling in the dry northern regions and the latter in the southwestern area. The Nuba (*q.v.*) are split into many clans each under a mek or kinglet.

The capital, El Obeid (52,372 inhabitants at the 1956 census), is centrally situated and stands on the main trade route from Darfur and the western Sudan to the Nile valley and the Red sea; it is connected with Sennar by railway. Other towns are Um Ruwaba, Bara. Nahud, Dilling and Rashad. The commonest form of house built by both Arabs and Nuba is the *tukl*, a round building with thatched conical roof, built of mud. wattle and daub, or straw. In the larger towns the houses are mainly built of stone or of burned or mud bricks and have flat roofs.

Economy. — The shortage of water presents a lasting economic problem. Apart from the more retentive depressions, some of which have been deepened. a supply can generally he got by sinking wells to the solid rock under the sand, though many of the wells are often dry for months. These wells are narrow shafts going down usually 30–50 ft., but some are more than 200 ft. deep: the water is raised laboriously by rope and leather bucket. Even the cattle are trained to go a long time without drinking. and little water is available for irrigation. Entire villages migrate after the grain harvest to the neighbourhood of some plentiful well. In the dry season, moreover. water can be stored in hollowed baobab trees. the soft core of which is not difficult to extract: there is practically no evaporation. and the water remains sn-eet and clear for months. Another common source of water supply is a small type of watermelon which grows wild and is also cultivated.

The main food crop is millet. sown over large areas during the rains: two types are cultivated, *Sorghum vulgare* (durra) and *Pennisetum typhoideum* (dukhn). If they cannot obtain millet the camel-owning nomads subsist largely on milk. The chief wealth of Kordofan is derived from gum arabic (a product of the acacias) and from livestock (cattle. camels and sheep). An American type of rain-grown cotton is cultivated in parts of the Nuba Mountains area, where a number of ginneries have been established. A little gold dust is obtained. hut the gold and other mines in the Tegale country seem to be exhausted. Iron is iound in some districts and is smelted in a fen places. There are large beds of haematite about 60 mi. both N.W. and S.E. oi El Obeid.

(E. J. N. W.; A. J. AL.)

KOREA. Korea is a peninsula extending from Manchuria and the U.S.S.R. southward, 525 mi. long and from 125 to 200 mi. wide. It is bounded on the north by the Yalu and Tumen rivers, on the south by the Straits of Korea, on the west by the Yellow sea and on the east by the Sea of Japan. There are about 3.500 islands along the 5,400-mi. coast line. The area is 85.893 sq.mi.

Geology. — Korea is a mountainous land of diverse geology. The northern interior forms a broad continental base; it is similar geologically to the adjacent areas of Manchuria. The drainage divide of central Korea lies in the eastern part of the peninsula, a high: mountainous terrain composed chiefly of Archeozoic rocks, granite, gneiss. mica schist and other metamorphics. Geosynclinal deposits ranging up to Triassic in age flank these ancient rocks on the west. The southeastern part of the peninsula, of considerably less relief, is composed largely of Cretaceous and Tertiary sedimentary rocks interspersed by late Tertiary granitic intrusions.

The latest major mountain making in Korea appears to have occurred during Jurassic time, all older rocks undergoing the deformation. The latest uplifts have determined the orientation of the peninsula.

Although vulcanism is recorded in the dike rocks and lava flows associated with both the geosynclinal sedimentaries and the later Mesozoic deposits. it has not been pronounced in more recent geologic time. Paektu-san. or Long White mountain. on the northern border, is a volcanic caldera with a crater lake. Some of the higher elevations are capped by lava flows from Paektu-san and other volcanoes. Gllung Island in the Sea of Japan and Cheju (Quelpart) Island off the southwest coast are both volcanic in origin, Halla San on Cheju was last active in A.D. 1007. Korea has no active volcanoes and very rare earthquake shocks, a striking contrast with nearby Japan.

Mineral resources include titaniferous magnetites and hematites of various ages from Archeozoic to Paleozoic. Copper is reported to occur in veins and as contact metamorphic and metasomatic deposits, chiefly in Paleozoic limestones. Gold, in vein quartz and in auriferous sulfides. is widely distributed in Archeozoic rocks. Some Cretaceous coal beds are anthracitic, but the largest coal deposits are of Permian age. (J. H. Bz.; S. McC.)

Physical Geography. — The Tumen and Yalu rivers which originate on the slopes of volcanic Paektu-san form the country's northern border. Located in the heart of the far east, the peninsula is of great strategic importance. The name by which it is best known to its own people is Choson. "Morning Calm," though from time to time it has taken several names. After World War II the Republic of Korea used within Korea the name of Tae Han.

Extending southward from the mountainous northern interior, close to the eastern coast. a major mountain chain throws off spurs to the west and south. Thus, mountains are found in profusion throughout the peninsula; some of the earliest western travelers likened the land to "a sea in a heavy gale." The eastern coast is rugged and has tides that rise only two or three feet. The western coast is a network of estuaries and tidal flats where the tides rise from 20 to 30 ft., making navigation difficult. The main rivers drain to'the west and south. Some of these are navigable in their lower courses for small boats. Notable are the Naktong in the southeast. the Han in the centre. the Taedong in the north and the Talu on the northwestern border. The southwestern coast is a maze of islands and peninsulas. Oifshore from it about 50 mi. is Korea's largest island. volcanic Cheju. Korea has no wide alluvial plain. and only one-fiith of the land is arable. Most of this agricultural land is along the coastal margins and in the river basins. The south has more extensive plains and is favoured by a mild winter, so that two crops may be grown in a year and a dense population supported. Though many of Korea's hills have been denuded of their trees, there are still extensive coniferous and mixed forests, especially in the north and in the more rugged mountain areas. During their possession of Korea, 1910–45, the Japanese used the peninsula as a source of rice and raw materials; they developed numerous mineral resources, particularly coal, iron ore, copper. gold, graphite and tungsten. Taking advantage of the terrain, they built some large-scale hydroelectric plants in northern Korea and, as a consequence, chemical, light metal and other

industries were developed. The capital, Seoul, had some large industrial suburbs producing consumer goods prior to the Korean war that began in 1950. The most important ports, which are also industrial centres for rice milling and the processing of raw materials, are Pusan in the southeast (the major connecting point with Japan); Wonsan, Chongjin, Najin and Unggi along the northeast coast; Mokpo and Kunsan in the southwest; Inchon, which serves the capital; and Chinnampo, the port of the northern metropolis, Pyongyang. Sinuiju, on the Yalu river, acts as an entry point into Manchuria. The post-World War II split of the hitherto unified land by an artificial barrier, the 38th parallel of latitude, accentuated the latent geographic differences between the northern and southern parts of the peninsula. Korea, as its name may be translated, is a land of high mountains and sparkling streams, but it was ravished in the fighting which took place after June 1950.

Climate. — The climate of Korea is humid and continental, similar in many respects to the region between Georgia and Maine in the United States. Korea, however, has a pronounced rainy season in the summer and relatively dry winters. The yearly rainfall varies from about 60 in. along the shores of southern Korea to 25 in. in the northern interior. The summers are hot throughout Korea, with average August temperatures for most of the peninsula above 75° F. The hot, moist summers are well suited for growing rice, the desired crop of the Korean farmer. Winters in the north are dry and cold, with temperatures well below freezing; Pyongyang has an average January temperature of 17.6° F. In the south the winters are relatively mild; average January temperatures along the southern coast are above 32° F. (S. McC.)

Vegetation. — More than 3,400 species and varieties and 880 genera of vascular plants are knoan from Korea. Larch, spruce, fir and birch dominate the northern regions bordering China. Rhododendron *mucronatum* and Pznus *pumila* appear above the timber line. In the Yalu valley and middle Korea the prevailing floristic features are pine (Pznus koraienszs) and deciduous hardwoods such as maple, basswood, birch, poplar, oak, Maackia, Phellodendron, ash, hornbeam, elm, chestnut, hackberry and, infrequently, magnolia (*Magnolia parviflora*) and yew (*Taxus cuspidata*). Wild Manchurian peony (*Peonia albiflora*) and lilies beautify the countryside. The flora of the southern coastal areas and Cheju Island includes many southern forms such as evergreen oak, lauraceous trees (*Cinnamomum, Maclzilus, Actinodaphne*), bamboo and camellia. (W.)

Animal Life. — The native animal life of Korea is in general strikingly similar to that of Europe. Among mammals there are in addition such notable forms as the tiger, snow leopard and musk deer. The ring-necked pheasant is native instead of introduced. The larger mammals include, besides those named, wolf and bear, wild boar, red deer. roe deer and the goral. a goat antelope. The common toad and various frogs are directly related to those of north China and thus to those of Europe as well. The salamanders include the peculiarly Asiatic *Hynobius*. There are a few lizards and several species of snakes, which include two small venomous species, a pit viper and the common viper.

HISTORY

Legends and Early History. — Korean history has a legendary past beginning in 2333 B.C. According to legend, Hwanung, son of the Creator, came to earth, found a beautiful young woman (who had just been transformed from a bear into a human being) and breathed on her; she gave birth to Tangun, who became the first king of Korea. His dynasty is supposed to have ruled until 1122 B.C., when the second dynasty was founded by Kija. a Chinese scholar and colonizer who entered Korea with 5,000 followers and established his capital at Pyongyang. His dynasty, said to have continued until 193 B.C., brought a high civilization to Korea.

The area under the control of the Kija dynasty passed to the control of a Chinese warrior named Wiman in 193 B.C., and in 108 B.C. the Chinese took over the area, broadened it to cover all northern Korea and established four colonies. Lolang, with its capital at Pyongyang, was the most flourishing of the four. In its later years it was virtually an independent state.

Southern Korea, where the three Han peoples lived, stayed outside Chinese control, although it was strongly influenced by Chinese culture. The three Han peoples were the Mahan, Chinhan and Pyonhan. Each of the three was a federation of many clans.

Period of the Three Kingdoms. — The first period in the recorded history of Korea is called the Period of the Three Kingdoms. The year 57 B.C. is generally given as the beginning of the period, since in that year the kingdom of Silla was founded out of the area of Chinhan in southeast Korea. In 37 B.C. Pyonhan became a part of Silla. The kingdom of Koguryo was founded in 37 B.C. in northern Korea in the area formerly under Chinese control. Lolang was the last Chinese colony to be incorporated in Koguryo in about A.D. 300. The third kingdom was Paekche. in southwest Korea, which was established in 18 B.C. out of the area of Mahan. A fourth state, Karak, existed from A.D. 42 to 562 in the southern tip of Korea around the modern city of Pusan. It is believed to have been a Japanese colony, at least for a time, and was finally absorbed by Silla.

The three kingdoms waged war on each other continually over a period of 700 years. Silla was also attacked numerous times in this period by Japan. In A.D. 660 Paekche, and in 668 Koguryo, passed under the control of Silla, which had been given considerable aid by China in its wars against the other two kingdoms.

The unification of the peninsula under Silla lasted until 935. During this period Chinese culture, including Buddhism, was dominant. Literature, art and science made rapid progress. The language of the peninsula became almost completely homogeneous.

Koryo.—One of Silla's generals, Wanggun, revolted and was recognized by the king of Silla in 918 as ruler of an independent state whose capital was established at what is now Kaesong, near Seoul. In 935 the last king of Silla abdicated and Wanggun established the kingdom of Koryo, nhich lasted until 1392. The name "Korea," as applied by westerners, is said to be derived from Koryo. Under the Wang dynasty Koryo was dominated by Buddhism. Koryo generally enjoyed good relations with China, but it was at war many times with the Kitan who controlled Manchuria. In 1231 the Mongols invaded Koryo and occupied the country ruthlessly until 1364, when Mongol forces were defeated by Korean troops led by Gen. Yi Taejo.

Chosen.-General Yi deposed the last Wang ruler in 1392 and established his own dynasty, which was to remain in power until the Japanese annexation of Korea in 1910. The Ming emperor of China recognized the new Yi dynasty and named Korea Chaohsien or Choson, also referred to as Chosun or Chosen. Hanyang, the present city of Seoul, was made capital. Under the Yi dynasty Korea flourished intellectually and culturally. Buddhism was curbed and land held by Buddhist monasteries was distributed among the people. In 1403, about 50 years before Johann Gutenberg, Chinese characters were printed in movable type. In 1420 a royal college of literature was established. In 1443 *onmun*, the phonetic alphabet, was developed. During the first 150 years of the dynasty scholarship mas widespread in medicine, astronomy, geology, history and agriculture.

At the end of the 16th century Korea suffered from the first of tao invasions that took place in a 50-year period. In 1592 Hideyoshi, shogun of Japan, invaded Korea. After seven years of conflict and occupation the Japanese troops were withdrawn. During this period the Koreans, led by Adm. Yi Sumsin, won a famous naval victory over the Japanese in Chinhai bay, aided by an ironclad ship built in the shape of a tortoise.

In 1627 the Manchus, who were threatening the power of the Ming dynasty in China, invaded and occupied Korea and forced the ruler to admit the sovereignty of the Manchus before withdrawing The Manchu Ch'ing dynasty established itself in China in 1644. Korea maintained a tributary status with Manchu China by which China's suzerainty was recognized; in practice, however, this did not interfere with Korea's independence.

Contact With the West. — Korea maintained a policy of isolation until the 1880s. One of the first contacts with the western world occurred in 1653 when a Dutch ship was wrecked on Cheju Island and the 36 survivors were brought to Seoul. Although

forbidden to leave the country, eight of the Dutch sailors escaped after 13 years. The account written by one of them provided the western world with the first eyewitness account of Korea.

From time to time thereafter contacts were made by European vessels. In the 1830s three French priests entered the country, but they were soon killed. Contacts were more numerous after 1865, with ships of many nations attempting to "open up" Korea. At various times French, U.S. and Japanese naval parties came into conflict with the Koreans. In 1876 the Japanese forced ihe Koreans to conclude a treaty which began diplomatic relations between the two countries. In 1882 the U.S. became the first western nation to conclude a treaty with Korea. This was followed by similar treaties with other western countries, and by 1886 diplomatic relations had been established with all nations having interests in northeastern Asia.

Growth of Japanese Influence. — The progressive elements in Korea looked upon Japan as an example of how Korea might also benefit from western civilization. The progressives were opposed by conservative elements, centred about the court, who did not want Korea to adapt itself to the western world. The progressives, aided by the Japanese, led revolts against the court in 1882 and again in 1884. During the first some Japanese were killed, and the Japanese sent troops and demanded an indemnity.

During the 1884 revolt the court appealed to the Chinese government, through the latter's resident minister in Seoul, Yuan Shih-k'ai, for aid, and the Chinese sent troops. The Japanese in Seoul were forced to flee, but returned later, again to secure an indemnity. The Chinese and Japanese governments resolved their difficulties in Korea temporarily under the Tientsin agreement of 1885. China and Japan agreed to withdraw their troops from Korea, the Korean government was to organize its own army without Japanese or Chinese participation, and if because of a serious disturbance it became necessary for either government to send troops into Korea the occupying government would notify the other in writing as to its intentions and withdraw the troops as soon as the matter had been settled.

The Tientsin agreement lasted for nine years. In 1894 the Tonghaks, a religious group opposed to all foreign interference and whose adherents came from the poorer classes, revolted. The Korean government asked the Chinese government for assistance. China informed Japan of its decision to send a small force to Korea. Japan, which had not been asked to send troops, sent a sizable army. Although the Tonghaks were suppressed before foreign troops arrived, the Japanese offered to co-operate with China in the introduction of reforms in the Korean government. The Chinese refused, and the Japanese proceeded to attack the palace in Seoul, seize the king and declare war on China.

The Chino-Japanese War was short-lived. The new Korean government set up by the Japanese asked Japan's help to drive the Chinese from Korea, and in return Japan promised to maintain the independence of Korea. Chinese troops and naval units were easily defeated, and under the treaty of Shimonoseki of April 20, 1895, China recognized Korea's full independence and autonomy.

The Japanese ignored their guarantee of Korea's independence and through their ministry in Korea made many demands on the Korean government, all with the avowed purpose of "reform." The Japanese were opposed, however, by the queen, and they were not able to gain their objectives. The Japanese minister, Viscount Miura, therefore, had the queen and others murdered on Oct. 8, 1895, seized King Yi Taewang and forced upon him a cabinet of Koreans who favoured the Japanese. The Japanese ruled Korea in this way until Feb. 11, 1896, when the king fled with his loyal ministers and his seal of state to the Russian legation. The king then resumed his rule over the country. He dismissed the Japanese officials and replaced some with Russians, including Russian military instructors to train the Korean army.

Japan and Russia attempted to reach an agreement on their positions in Korea. On April 25, 1898, the Kishi-Rosen protocol was signed. By its terms both countries recognized the sovereignty and independence cf Korea and agreed not to interfere directly in the affairs of the country. Russia recognized Japan's interest in the development of the commercial and industrial relationship between Japan and Korea. The agreement meant different things to each party and soon became meaningless. Russia would not consent to Japan's having a free hand in Korea even in return for Russia's being given the same status in Manchuria.

When war beta een Japan and Russia became imminent, the emperor of Korea (in 1897 the king of Korea proclaimed himself emperor to assume the same status as the neighbouring emperors of China, Japan and Russia) proclaimed Korea's neutrality. The Russo-Japanese War began in Feb. 1904, and the Japanese invaded Korea. Within two weeks the Korean emperor was forced to sign a treaty of alliance with Japan. Under the treaty, Japaq "guaranteed" Korea's independence and territorial integrity in return for permission to use Korea as a base of military operations against Russia.

Before the war was over Japan forced the Korean government to accept Japanese advisers on foreign, financial, police, judicial and military matters. Japan took over the Korean postal, telegraph and telephone services.

In the treaty of Portsmouth in Sept. 1905 Russia recognized Japan's paramount position in Korea. The United States and the United Kingdom likewise recognized Japan's rights in Korea.

The Japanese protectorate over Korea was formally established in Nov. 1905. When the Korean emperor first refused to sign the treaty offered by Japan, Japanese soldiers surrounded the palace and the treaty was signed. Under the treaty Japan handled all of Korea's foreign affairs, and Japan had a resident general in Seoul and residents throughout the country. Prince Hirobumi Ito became the first resident general in Feb. 1906.

The Japanese protectorate lasted for five years. In 1907 the emperor was forced to abdicate in favour of his weak son. The Japanese controlled the Korean government by placing a vice-minister in each department. The Korean army was disbanded and the police, judicial systems and prisons were taken over by the Japanese. Annexation was all that was left to effect complete control over Korea.

Period of Japanese Annexation. — On Aug. 22, 1910, the last Korean ruler signed the treaty that annexed Korea to Japan. Korea became a government general in the Japanese empire. The Korean emperor became prince of the Shotoku palace with the title of imperial highness. Annual grants were made to the former emperor and members of the court. Former Korean ministers of state were made peers.

The head of the new regime was the governor general, who was appointed by the Japanese emperor and responsible to him through the Japanese overseas ministry. (In Nov. 1942 Korea became an integral part of Japan, and jurisdiction for its affairs was transferred to the home ministry.) The governor general appointed all officers of the government, issued decrees and imposed fines or prison sentences. Most positions in the government were given to Japanese, even posts of district magistrate and village head. Virtually all higher posts were held by Japanese, while Koreans were appointed to clerical and minor posts. The governor general had an advisory body, the *chusuin* or central council, consisting of 65 native Koreans from the wealthy aristocracy and business class. On the relatively few occasions that the *chusuin* was consulted, the questions on which it was asked to give advice were innocuous. The chief administrative assistant of the governor general was the civil administrator who was appointed by the Japanese prime minister. The civil administrator supervised the government bureaus.

The Japanese controlled Korea solely by force, exercised by the police and the Japanese army. The police operated throughout the country in every community. In 1941 there was one policeman to every 400 persons.

Nationalism. — The Japanese continually faced resistance from the Korean people, first armed resistance and, after World War I, passive resistance. The Japanese ruthlessly attempted to suppress Korean nationalism whenever it appeared, and thousands were killed or imprisoned. In the first three years after annexation there were 70 separate encounters between Korean insurgents and Japanese authorities.

The nationalism of colonial peoples that followed World War I

had its influence in Korea. On March 1, 1919, a proclamation of independence was issued by 33 prominent Koreans. About 500,000 Koreans took part in peaceful demonstrations wherever the proclamation mas read. The movement for independence went on for about two months until it mas suppressed by the Japanese. According to reports of the Japanese government, 553 Koreans were killed, 1,409 wounded and 19,054 imprisoned; 11,831 were still in prisons awaiting trial nearly two years after their arrest. The Japanese recalled Gen. Yoshimichi Hasegawa, governor general, and appointed Adm. Makoto Saito as his successor. Saito promised a number of reforms, including freedom of speech, nondiscrimination between Japanese and Koreans, and decentralization of power, very few of which were actually carried out.

A group of Korean leaders met secretly in Seoul in April 1919 and organized themselves as the National Council of the Korean Provisional Republic, and Syngman Rhee (Yi Sung-man). a former pupil of Woodrow Wilson who was then in the U.S., was appointed its president. Similar groups of Koreans met in Siberia and Manchuria and took the same step. The three groups merged, and the first national assembly was held in Shanghai. Strenuous efforts made by this group to gain recognition at the Paris peace conference. at the Washington disarmament conference and at the League of Nations failed as a result of Japan's influence.

The Korean nationalists continued their activities up to World War II. Many were forced to flee the country, chiefly to the U.S., China, Manchuria and Siberia. They were also active in other countries, including Japan, where in 1933 an unsuccessful attack was made on the life of the Japanese emperor. A permanent Korean commission was established in Washington: D.C., with Rhee at its head.

End of Japanese Rule.—World War II brought an end to Japanese rule of Korea. In Dec. 1943 the Cairo declaration issued by China. the United Kingdom and the U.S. promised Korea its independence in "due course." A provisional Korean government was formed in Chungking in 1944 with Kim Koo as president. Kim Kiusic as vice-president and Gen. Kim Yaksan as war minister. A small Korean force, led by Gen. Li Chungchun, fought under the Chinese against Japan during the war.

At the Potsdam conference in July 1945 the Allies declared that "the terms of the Cairo Declaration shall be carried out." The U.S.S.R. committed itself to support the independence of Korea when it entered the war against Japan on Aug. 8, 1945. Soviet troops entered Korea from the north on Aug. 12 and U.S. troops entered from the south on Sept. 8. For purposes of military operations in carrying out the Japanese surrender, Korea was divided into Soviet and U.S. areas at the 38th parallel.

Postwar Partition.— With the end of Japanese rule a political vacuum existed in both the Soviet and U.S. zones. In South Korea two separate political forces presented themselves to the U.S. occupation authorities. The first, the Korean People's Republic, was proclaimed on Sept. 6, 1945. Communist influenced and in opposition to the U.S. military government, it was headed by Lyuh Woonhyung (Yo Unhung), who had organized a small underground party in Korea during the war. The other was the exiled Korean provisional government, headed by Syngman Rhee and Kim Koo, which returned to Korea from the United States and China after the Japanese surrender. U.S. authorities were neutral and maintained that military government was the only government in South Korea. In Feb. 1946 the U.S. military gqvernment created the Representative Democratic council, an all-Korean body that was to act in an advisory capacity to the commanding general. Syngman Rhee was made chairman. It was replaced in Oct. 1946 by the Korean interim legislative assembly, created to give the Koreans control of their government with the U.S. retaining the power to dissolve the assembly and to appoint half the members.

In the Soviet zone an Executive Committee of the Korean People was organized by the Soviet command in Aug. 1945 to take over some of the Japanese governmental powers. A hierarchy of people's committees was established throughout North Korea. In Feh. 1946 a Provisional People's Committee for North Korea was established to replace the Executive committee. Kim Il Sung, a Korean Communist who had been in the Soviet Union for years, became the head of the North Korean government.

The first effort to unify Korea came at the Moscow conference of Dec. 1945 at which the U.S., the U.K. and the U.S.S.R. (with China adhering) agreed that the U.S. and Soviet commands in Korea were to form a joint commission which, in consultation with Korean democratic parties, was to make recommendations to the four powers regarding the organization of a provisional Korean democratic government. The joint commission met from March to May 1946 but was unable to reach agreement when the Soviet command attempted to prevent certain Korean groups from participating. The joint commission reconvened a year later on the understanding that the Soviet Union would modify its position. The discussions were stalemated, however, when the U.S.S.R. reverted to its original position. Other efforts to secure an agreement between the U.S. and the U.S.S.R. on the unification of Korea failed.

The U.S. referred the question of Korean unification to the United Nations. On Nov. 14. 1947, the general assembly adopted a resolution calling for elections throughout Korea under the observation of the UN Temporary Commission on Korea. The elections mere to select a national assembly to draft a democratic constitution and establish a national government. The Soviet command denied the UN commission permission to enter its zone.

Republic of Korea.—Elections were held in South Korea on May 10, 1948, under the supervision of the UN commission. The national assembly met for the first time on May 31. 1948, and elected Syngman Rhee chairman. A constitution for the Republic of Korea was adopted and promulgated in July 1948. It provided for (1) the election by the legislature of a president and vice-president for four-year terms; (2) a prime minister to be appointed by the president with the legislature's approval; (3) a cabinet to be appointed by the president without legislative approval; (4) a veto by the president over legislation, with the legislature having the power to override vetoes; (5) emergency powers in the hands of the president; (6) a unicameral national assembly, its members to be elected directly by the people for four-year terms; (7) a separate judicial branch composed for the supreme court, with power to determine the constitutionality of laws and regulations, and lower courts; (8) guaranties of civil liberties; (9) the right to equal opportunity for education; and (10) the right of collective bargaining. Syngman Rhee was elected president on July 20. 1948. The Republic of Korea was inaugurated on Aug. 1j, 1948, and on the same day the U.S. military government ended. On Dec. 12 the UN general assembly recognized the new government as the only lawful government in Korea and recommended that the occupying powers withdraw their forces from Korea as early as practicable. The U.S. completed the withdrawal of its military forces from South Korea on June 29, 1949, leaving behind about 500 men who constituted the U.S. military advisory group.

Syngman Rhee was re-elected on Aug. 5, 1952, for a new term beginning Aug. 1j. Before the election there had been a dispute between Rhee and the national assembly, which had the power to elect the president, over whether the constitution should be amended, as suggested by Rhee, to provide for the popular election of the president. President Rhee won this struggle for power and the constitution was changed. The internal political scene was marked by intrigue and shifting coalitions of groups. A few key figures were assassinated, and attempts were made on the lives of others. John Myun Chang, former Korean ambassador to the U.S., was appointed to succeed Lee Bum Suk as prime minister in Nov. 1950, but the premiership was abolished in 1952. Chang appeared on the scene again, running successfully for the vice-presidency on the Democratic party ticket in the elections of May 15, 1956. In these elections, President Rhee, running as the Liberal party candidate, was again re-elected. The Liberal party held a majority in the national assembly; the major opposition party, the Democrats, was a vociferous minority.

Democratic People's Republic of Korea.—The North Korean People's committee adopted a draft constitution on July 10, 1948, and on Aug. 2j elections with single slates were held for members of the supreme people's assembly of Korea. The assembly adopted the constitution on Sept. 8 and proclaimed the

establishment of the Democratic People's Republic of Korea the following day. Kim Il Sung became premier of the North Korean government. On Dec. 25, 1948, the U.S.S.R. announced the complete withdrawal of its occupation forces from North Korea, a claim that the UN commission was not permitted to verify.

Aftermath of the Korean War.—The hostilities that began on June 25, 1950, with the invasion of South Korea by North Korean troops, ended on July 27, 1953, after two years of truce negotiations. (*See* KOREAN WAR.) On the same day the 16 UN members with forces in Korea issued a joint policy declaration which stated that if there should be a renewal of an armed attack they would again be united and be prompt to resist. It also said that in such an eventuality it would in all probability not be possible to confine hostilities within the frontiers of Korea.

The question of attendance at a political conference to negotiate the peaceful unification of Korea, which was recommended in the armistice agreement, received the attention of the United Nations general assembly in Aug. 1953. On Aug. 28 the assembly adopted a resolution recommending arrangements for such a conference. These arrangements would have limited participation in the conference to those members of the UN that had armed forces in the conflict plus the Republic of Korea, the Soviet Union, Communist China and North Korea, excluding neutral nations. Communist China and North Korea objected to excluding neutrals.

The issue of participation in and the date for a conference on Korea was settled by the foreign ministers of the U.S., France, the U.K. and the U.S.S.R. at their meeting in Berlin from Jan. 25 to Feb. 18, 1954. At the Berlin meeting the UN resolution of Aug. 28, 1953, was upheld. A decision was made to exclude neutral nations at a conference to settle the Korean question (as well as the Indochinese question) to begin in Geneva on April 26, 1954.

The Geneva discussions on Korea were fruitless, and on June 15, 1954, the 16 Allied delegations at the conference issued a statement which noted that the Communist delegations had rejected every effort made by the 16 nations to obtain agreement for a peaceful settlement in Korea and concluded that there was no purpose to be served in further discussions until the Communists accepted two basic principles: (1) that the UN had the authority under its charter to take collective action to repel aggression, to restore peace and security and to extend its good offices to seeking a peaceful settlement in Korea; and (2) that genuinely free elections should be held in Korea under UN supervision in order to establish a unified, independent and democratic Korea. The Allies reported the failure of the Korean political conference to the UN, and on Dec. 11, 1954, the UN general assembly approved the report, reaffirmed that the objectives of the UN remained the "achievement by peaceful means of a unified, independent and democratic Korea under a representative form of government and the full restoration of international peace and security in the area," and expressed the hope that progress would soon be made toward these objectives.

It became apparent in 1954 and 1955 that the Communist command was violating the provisions of the Korean armistice agreement. The UN command repeatedly protested these violations. Among the most egregious and ominous were those relating to the illegal Communist build-up of combat forces, particularly the air forces, in North Korea. The UN command demanded that the Communists cease that build-up.

Meanwhile the Republic of Korea protested the continued presence of Polish and Czech members on the Neutral Nations Supervisory commission (NNSC) in its territory on the grounds that the Communists had obstructed NNSC activities in the north and thereby had forfeited their right to have inspections in the south. Beginning in Aug. 1955 mass demonstrations and riots protesting against the presence and activities of the Poles and Czechs took place in many cities in the Republic of Korea. Following agreement between the Communist and UN commands on Aug. 29 the number of members of each of the stationary inspection teams of the NNSC was reduced by one-half and the number of ports of entry and the number of stationary inspection teams for the commission were reduced from ten to six. However, Korean demonstrations against the presence of the Czechs and Poles continued.

On June 6, 1953, prior to the signing of the Korean armistice, Pres. Dwight D. Eisenhower pledged the United States, subject to congressional approval, to enter into a mutual defense treaty with the Republic of Korea and to continue economic assistance. The United States took immediate steps upon the signing of the armistice to implement those pledges. A mutual defense treaty was negotiated in Korea by Secretary of State John Foster Dulles in Aug. 1953. The treaty was signed on Oct. 1, 1953, ratified by the two governments in Jan. and Feb. 1954 and entered into force on Nov. 17, 1954. The treaty pledged the U.S. and the Republic of Korea to consider an armed attack on either as dangerous to the other's peace and safety, with each country to act to "meet the common danger in accordance with its constitutional processes." The U.S. senate's consent to the ratification was subject to the understanding that neither party was obligated to come to the aid of the other except in case of an external armed attack and that the treaty did not require the U.S. to assist the Republic of Korea except in the event of an armed attack against territory recognized by the U.S. as lawfully under the control of the Republic of Korea.

A comprehensive U.S. economic assistance program for the Republic of Korea, the second of President Eisenhower's two pledges, began in Aug. 1953 when congress appropriated $200,000,000 for the rehabilitation and economic support of the Republic of Korea in the fiscal year ending June 30, 1954. In the following fiscal year the U.S. made $300,000,000 available for economic assistance and $400,000,000 for military assistance. In addition, the U.S. agreed to support a strengthened South Korean military establishment, to employ its military power against an aggressor making an unprovoked attack upon the republic and, subject to congressional approval, to press forward with an economic program for Korean rehabilitation. The Republic of Korea agreed to co-operate with the U.S. in its efforts to unify Korea and to take necessary measures to make the economic program for Korea successful. The U.S. assistance program for the Republic of Korea for the fiscal year ending June 30, 1956, totaled more than $600,000,000 for economic and direct military aid and for mutual defense support.

SOCIAL CONDITIONS

Population.—The population of Korea increased from about 19,500,000 in 1925 to an estimated 33,094,117 in 1959–60. About 8,100,000 (1959 est.) persons were in the Korean People's Republic (North), while in the Republic of Korea there were 24,994,117 inhabitants according to the 1960 census. The capital of the Republic of Korea is Seoul, with a population in 1960 of 2,444,883, as compared with an estimated 1,446,019 in 1949. During hostilities Pusan, with a population of 1,162,614 (1960) served as the temporary capital. The capital of the Korean People's Republic (North) is Pyongyang, with a population of 500,000 (1956 est.).

Ethnology.—Neolithic archaeological remains indicate that during the 3rd millennium B.C. the Han people, who were Tungusic or Mongoloid invaders, began to move into Korea from central Asia. They formed the dominant racial stock of the Korean people and were the originators of the Korean language.

Racially the Koreans have the same general background as the Chinese and Japanese, although the Koreans have distinguishing characteristics. The Koreans have dark, straight hair, high cheekbones and a somewhat protruding jaw. They are on the average midway in height between the northern Chinese and the Japanese.

The Korean language belongs to the Ural-Altaic group, which also includes the Mongol, Turkic and Japanese (but not the Chinese) tongues; the Korean spoken tongue and the native vocabulary are dissimilar to the other languages of the group. Although Korean and Japanese have about the same grammatical structure, they are otherwise quite distinct.

Education.—Until the annexation of Korea by Japan in 1910 education was basically a function of the family, with the more literate members of poorer families taking charge of learning in the home. Among the wealthier class a teacher was often hired by a group of families who also provided a schoolroom. Children were taught Chinese ideographs as well as the Korean phonetic script called *onmun* or *hangul*. The goal of many students was to take the examinations for government positions.

Under Japanese rule education in Korea advanced significantly in terms of the number of schools and of students. The content of education, however, was rigorously controlled with a view to assimilating the Korean people. In 1939 there were 1,200,000 Korean students in primary school—one out of every three Korean children—and 93,000 Japanese children—practically every Japanese child. High schools, professional schools, colleges and the Seoul Imperial university had a combined enrollment of 34,000 Japanese and 62,000 Koreans, with the latter figure including a sizable attendance in agricultural training schools. Japanese and Korean students generally attended segregated primary and secondary schools.

Apart from the public-school system there were many private schools run by missionary groups. One-fourth of all the high-school students in Korea attended these private schools, as did 15% of professional-school students and 57% of college students. These schools were of special significance for Korean girls, who were generally not able to go beyond public primary school. The private schools were subject to restrictions by the Japanese authorities in an effort to limit their importance among the Korean population.

With the end of Japanese rule over Korea in 1945, the educational system of South Korea underwent a complete reorganization. Korean

educators were given much responsibility in educational reform. The curriculum of all schools was revised along democratic lines. Textbooks were rewritten in Korean. The C.S. military government distributed 15,000,000 elementary-school textbooks written in the *onmun* alphabet. Special attention was given to scientific and technical training in order to train Koreans to take the place of Japanese technicians who were repatriated to Japan at the end of the war.

Compulsory education on the elementary level was established in the Republic of Korea in June 1950, although the outbreak of the Korean war in the same month prevented its iull implementation. Twelve years of elementary and secondary education were offered, with entrance to secondary education based on competitive examinations. On Dec. 31, 1954, there were 4,043 elementary schools with 2,734,726 ,pupils; 783 middle schools with 407,393 pupils; ,466 high schools with 210.862 students; 213 vocational high schools with 98,281 students; 71 colleges with 98,281 students; 18 normal schools with 13,217 students; and 3.548 civic schools ior adult education with 297,792 students. In 1948 the literacy rate ior the native Korean *onmun* script was reported to be about 70% to 80% as a result of an intensive campaign to eradicate illiteracy; ior Chinese ideographs it was substantially loner.

Religion. — Religion has always reflected the influence of foreigners in Korea. Aside from shamanism (or Sinkyo), Chondokyo (Society of the Heavenly Way) and other native religions, Coniucianism and Buddhism came in with the Chinese influence, Shintoism and various sects of Buddhism with the Japanese and Christianity with missionaries from many western countries.

Shamanism was the earliest indigenous religion of the Korean people and continued to play an important role in the culture of the Koreans, having been part of the mores oi the people since prehistoric times. It is a iorm of animistic nature worship. The practice of shamanism in Korea in modern times is almost identical mith its practice by tribes in central Asia and Siberia and similar to that practised by Eskimo tribes of Alaska and natives of Greenland.

Confucianism ranks next to shamanism in its influence on Korean religious liie. It was introduced from China during the 1st century B.C. and as a state religion vied with Buddhism ior dominance until its final triumph over Buddhism in 1392.

Buddhism entered Korea in the 4th century A.D. It was accepted with much enthusiasm, reaching its high point from the 12th to the 14th centuries. Buddhism continued to exercise an influence, gaining some strength with the Japanese annexation. After 1945 Buddhism had some growth with control centred in liberal Buddhist monasteries.

Korea had its first contact with Christianity at the end of the 16th century as a result of the invasion of Japanese iorces, some of whom were Christians. Foreign Roman Catholic priests, believed to be Chinese, entered Korea in 1686. The first western missionaries to arrive in Korea were three French Roman Catholic priests who entered in the 1830s, only to be killed during anti-Christian persecutions. Such persecutions continued until 1881. Protestant missionaries entered as permanent residents three years later. In 1938 there were reported to be about 500,000 Christians in Korea, more than half of whom were Protestants. With the freeing of Korea. Christianity had a very rapid increase in prestige and in numbers of adherents in South Korea. There were in 1957 an estimated 2,000,000 Korean Christians.

Chondokyo, originally called Tonghak or Eastern Sect, was started in 1859 by a man named Ch'oe. This religion is basically eclectic, adapting various ieatures of shamanism, Coniucianism, Buddhism and Christianity. Estimates of the number of followers of Chondokyo ranged from 2.000.000 in 1930 to about 80,000 in 1938 and 73,000 in South Korea alone in 1947.

Shintoism, introduced by the Japanese, made some converts among the Koreans during the occupation hut virtually disappeared after 1945.

ECONOMIC CONDITIONS

Agriculture, Forestry and Fishing. — Korea has always been a predominantly agricultural country. Agriculture traditionally suffered from relatively low soil iertility, periods of flood and then of drought and an overcrowding of the land. North Korean agriculture, more diversified than that of southern Korea, emphasized grains other than rice to a greater extent. Fruit and vegetable production was also larger in the north.

Cnder Japanese rule, northern Korean chemical plants provided the synthetic fertilizer needed in the country; 70% of the fertilizer output was consumed in Southern Korea. Korea was used by Japan as a source of rice to help make up Japan's food deficits. The Japanese government spent large sums oi money ior irrigation and for clearing of land to increase yields and the area under cultivation. Korea became an exporter of rice for Japan, and at the same time Korea had to import lower grades of rice and other grains to make up its own food deficit.

After the end of World War II, South Korean agriculture suffered from shortages of fertilizer and after 1950 irom the ravages of war. After the truce considerable improvement was made. In 1954 an estimated 13,170,000 persons of the 21,000,000 population of South Korea were members of farming households. Approximately 4,800,000 ac. were under cultivation, 2,850,000 ac. in paddy fields and 1,950,000 ac. in dry fields. The average land area for a farm household was 2.156 ac. (or slightly over two acres). One-third of the farm families iarmed one acre or less.

Rice is South Korea's principal crop, with harley and wheat next in importance. Agricultural production in 1954 included rice 74,403,500 bu.; wheat, harley and rye 32,187,000 bu.; other grains 3,075,000 bu.; soybeans 5,880,000 bu.; other pulses 650,000 bu. In 1954 the Republic of Korea had 763,000 work cattle, 15,800 horses, 937,000 pigs, 27,000 goats, 168,000 rabbits and 5,800,000 poultry.

In 1953 about 15,725,000 ac. in South Korea mere classified as forest land. From 1943 to 1953 timber reserves were reduced by more than 50% through war devastation, indiscriminate cutting and poor management. Estimated 1954 consumption of iorest products included 284,000 cu.m. of lumber, 186,000 metric tons of firewood and 27,000 metric tons of charcoal.

Fish and marine liie is abundant off the Korean coast. The fishing industry involves more than 1,000,000 people, with 613,000 Koreans engaged in actual fishing operations. Sea food rather than meat provides most of the animal protein in the Korean diet. At the end of World War II marine landings decreased to about 200,000 metric tons a year, about half the average of the war years. This decrease was the result largely of the deterioration of the fishing fleet and the withdrawal of large Japanese-owned boats operated under the supervision of Japanese technicians. The beginning of the Korean war in 1950 wiped out the gains in fishing that had been made gradually since 1945. Marine landings in 1954 totaled 248,000 metric tons.

Manufacture and Mining. — During most of the Japanese occupation of Korea, the development oi manufacturing industries was restricted, since the Japanese looked to Korea as a source of raw materials and a market for Japanese manuiactures. Household manuiacturing industries, iood processing and some textile manufacturing on the iactory level represented the major industrial segments of the Korean economy until the 1930s. At that time the Japanese undertook the development of certain industries in Korea, especially heavy industries in northern Korea, in order to complement the Japanese industrial structure. The major industries developed were chemicals, cement, iron and steel. electric power and machinery in northern Korea and textiles and food processing in southern Korea.

With the end of World War II, the industrial capacity of North Korea was damaged by departing Japanese technicians and reduced by some removals of equipment by Soviet iorces. South Korea was cut off irom the more heavily industrialized northern part of the country. The output of South Korea's light industries was inadequate to meet local requirements. About 60% to 70% oi South Korea's electric power was furnished by plants in North Korea until May 1948. when the power supply was cut off by North Korea. The loss of this power was largely restored later by power barges furnished by the United States and by development of South Korean facilities.

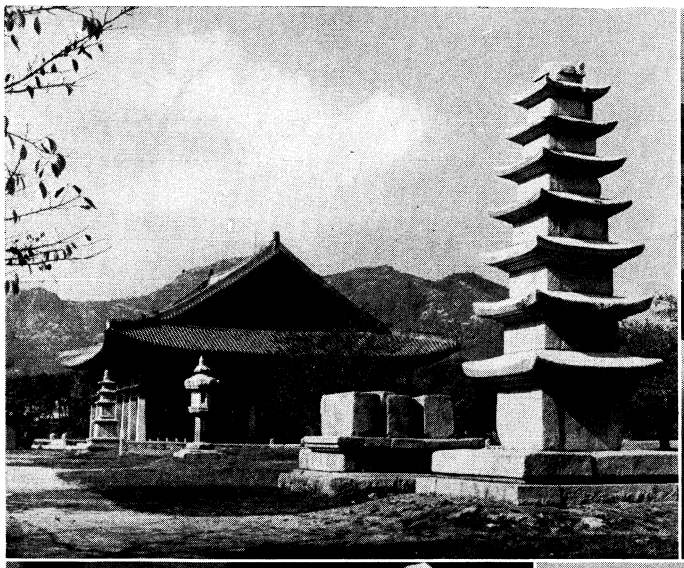
The textile industry was South Korea's most important manufacturing industry in 1955, cotton textiles accounting for about 90% of total textile output. In that year textile production totaled 45,000,000 lb. of cotton yarn; 188,000,000 yd. of cotton cloth; 641,000 lb. of raw silk; and 4,000,000 yd. of woolen cloth.

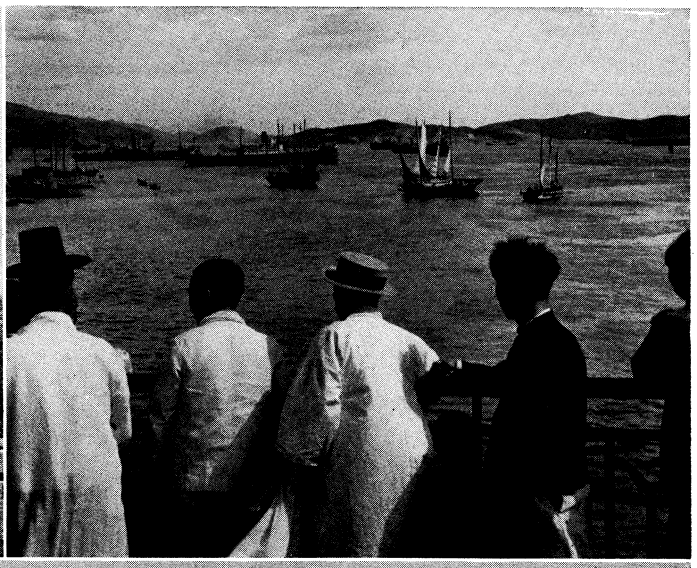
Other manuiacturing output in 1955 included rubber shoes 23,423,000 pairs; bicycle tires 90,000; paper 20.000 metric tons; and cement 56,000 metric tons. Electric power production in 1955 totaled 879,270,000 kw.hr.; a little more than half of this mas irom hydroelectric power plants, about one-fourth from diesel barges and less than a iourth irom thermal power plants.

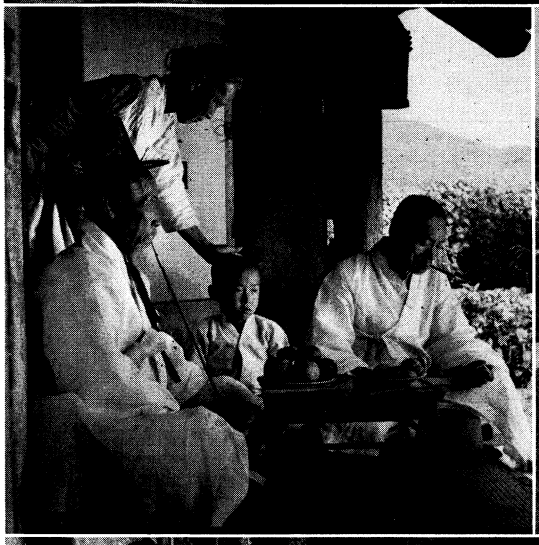
The major mineral resources are found in North Korea. Iron ore, copper, lead. zinc, pyrites, tungsten. graphite, coal and magnesite comprise the important deposits. South Korea has coal, tungsten, copper, lead and amorphous graphite. Mineral production in the Republic of Korea in 1955 included (in metric tons) copper ore 12,705; tungsten concentrate 3,147; amorphous graphite 90,018; kaolin 14,143; iron ore 23,616; lead ore 1,367; and manganese ore 3.482. Though in previous years some peat and lignite coal n-ere mined, in 1955 only anthracite coal was produced. Government-owned mines produced 958,396 metric tons and privately owned mines, 349.108. This domestic production was almost matched by imports of 1,065,241 metric tons of coal. North Korean production was estimated at 2,000,000 tons oi anthracite and 1,300,000 tons oi subbituminous (lignite).

Commerce. — Most of Korea's foreign trade was with Japan during the period of its occupation by that country. In 1939 exports to the Japanese empire represented 97% of the total, and Korea's imports irom the same countries represented 89% of the total. Korea's major export commodities were rice, marine products, minerals and lumber. Its imports were chiefly consumers' goods, coal and machinery. In 1939 Korea's imports were 39% larger than its exports, the deficit being met by gold shipments and bv Japanese capital investments.

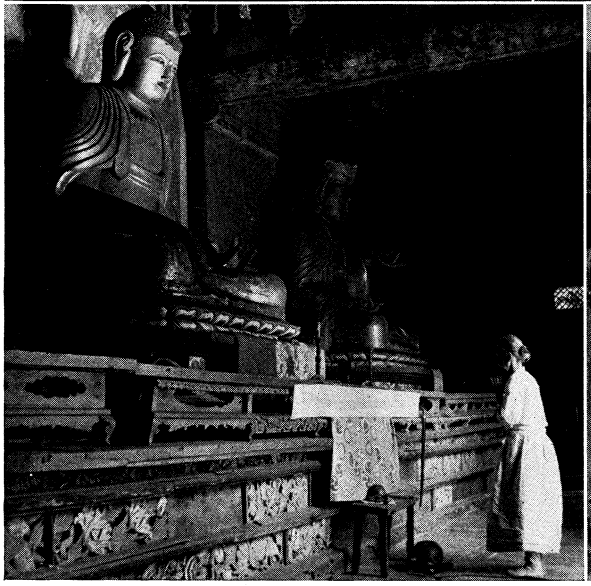
Aiter the end of World War II, North Korea's trade was largely mith Communist China, the U.S.S.R. and Communist countries of eastern Europe. South Korea depended upon U.S.-financed imports irom the U.S. or irom other Asian countries, especially Japan. In 1955, 42% of Korea's exports went to the U.S. and 39% to Japan. Graphite, tungsten, silk and seaweed were among the major exports. The major imports were food products, fertilizer and cloth. In 1955 commercial imports were valued at 48,244,000,000 hwan (officially 180 hwan = U.S. $1) and exports at 9,042,000,000 hwan. In addition, U.S.- and UN-financed economic aid and relief supplies which were received during 1955 were valued at $244,000,000.













PHOTOGRAPHS, (TOP LEFT) FRITZ HENLE, (TOP RIGHT, BOTTOM LEFT, BOTTOM RIGHT) HORACE BRISTOL FROM THREE LIONS, (CENTRE LEFT, CENTRE RIGHT) HORACE BRISTOL FROM PHOTO-REPRESENTATIVES

VIEWS OF THE REPUBLIC OF KOREA

Top ***left:*** A temple near Seoul

Top ***right:*** View of the harbour at Pusan, a principal port of the republic

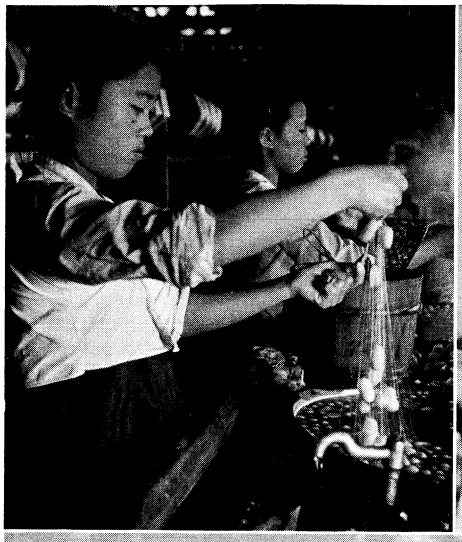
Centre left: A Buddhist family of rural Korea. The grandfather wears the tail black hat and trims his beard in the traditional manner of older Koreans

Centre right: Gravetenders at the United Nations cemetery at Pusan. In the foregraund are the graves of Turkish soldiers who fell in the Korean war

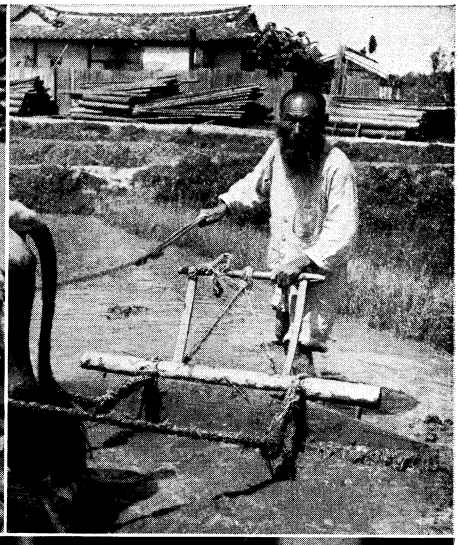
Bottom left: Woman praying at a Buddhist shrine

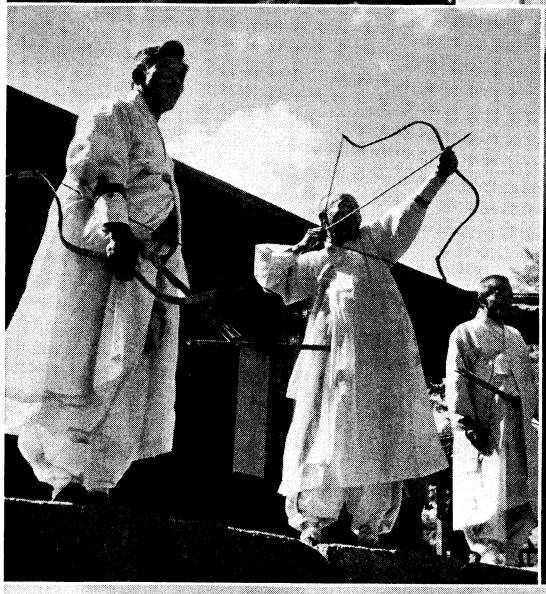
Bottom ***right:*** Aerial view of some of the government buildings of Seoul, capital of the republic

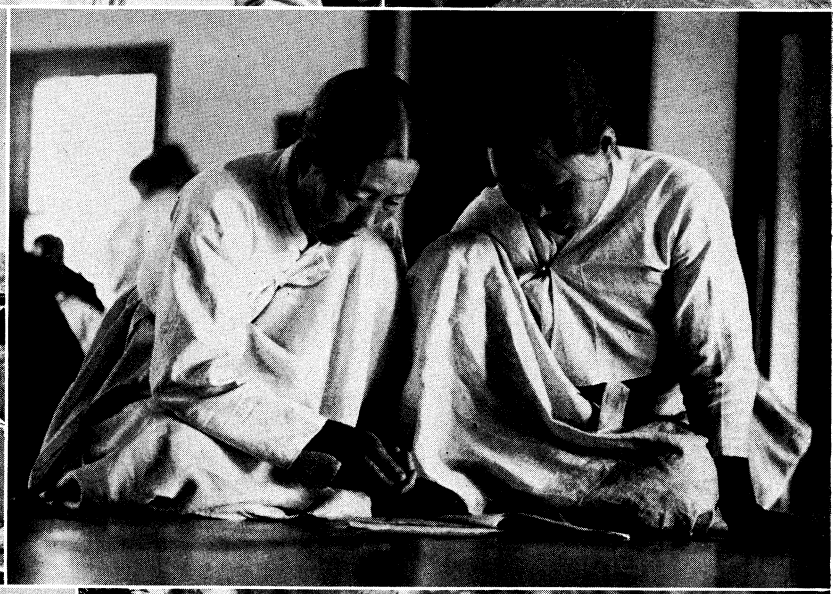
KOREA

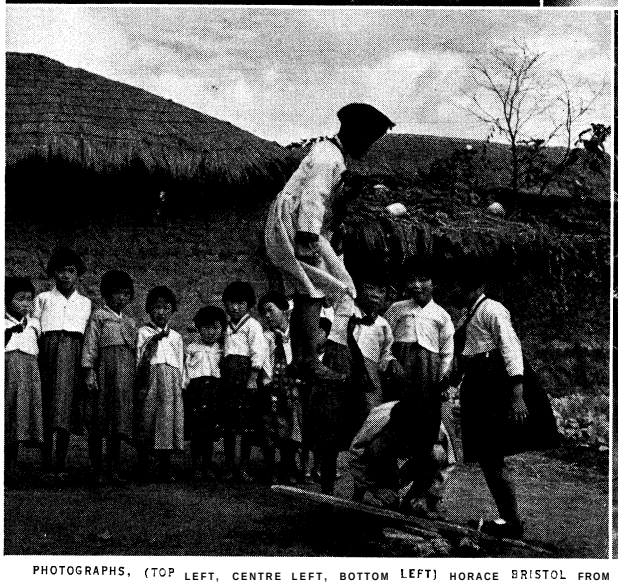














PHOTOGRAPHS, (TOP LEFT, CENTRE LEFT, BOTTOM LEFT) HORACE BRISTOL FROM THREE LIONS, (TOP CENTRE) EVANS FROM THREE LIONS, (TOP RIGHT. CENTRE RIGHT) BOB LAUBACH FROM BLACK STAR, (BOTTOM RIGHT) G BORLAND FROM BLACK STAR

THE PEOPLE OF KOREA

Top left: Reeling thread from silkworm cocoons in a Korean silk manufacturing plant

Top ***centre:*** A Korean farmer, wearing the traditional white cotton work clothes

Top right: Farmer leveling his rice field near Chungju

Centre left: An archery shoot. The sport is popular with Korean men

Centre right: Woman (left) learning to read from a primer. After the Korean war the republic increased its efforts to combat illiteracy and to re-educate those citizens who knew only Japanese script, the language taught during the Japanese occupation. 1910 to World War II

Bottom left: Korean schoolgirls at play. One girl bounces another into the air while a third steadies the jumping board

Bottom right: Korean woman displaying her basket woven of wire scraps

Transportation and Communications. — Railways became the most important means of transportation in Korea. During the period of Japanese annexation the Japanese, ior military and economic reasons, built an extensive rail network. The main line connected Pusan at the southeast tip of Korea with Sinuiju at the Manchurian border. From Seoul a branch line estended to the northeast coast and another line went to the southwest; thus the rail net was in the shape oi an offset X. Numerous branch and connecting lines were later constructed. About 3,500 mi. of railway were built under the Japanese administration, using the standard gauge oi 4 it. 8½ in. The railways were neglected during World War II and efforts were made to rehabilitate them in the postwar period. The Korean war, however, not only stopped the rehabilitation but caused great damage to the existing facilities. In the Republic of Korea most of the system was operated during the Korean war by U S military forces; it was returned to Korean control in June 1955. The mileage in operation at that time was about 1,750 mi. In 1954 the railroads carried 9,269,000 metric tons of freight and 58,180,000 passengers.

At the end of World War II, Korea had an average oi only 0.17 mi. of highways and roads per square mile, as compared with 4.5 in Japan. In 1952 there were about 21,000 mi. of roads, the principal highways paralleled and acted as feeders to the [main] railroad lines. The facilities were almost entirely of dirt and gravel, the only surfaced highway in South Korea being a no-mi. asphalt section from Inchon to Seoul, built in 1946. Streets were paved only in Pusan and Seoul. Few roads were oi all-weather type. The Republic of Korea in 1954 had 7,466 trucks, 2,500 buses, 5,000 passenger cars and 1.860 taxicabs.

The Japanese encouraged air transportation in Korea through subsidies as early as 1929. All air companies that operated in Korea before 1945 n-ere Japanese firms. In 1953 Korean National Airways was the only private commercial airline in South Korea. flying to Tokyo and Hong Kong. Northu-est Airlines and the Civil Air Transportation Company of Free China provided international service to Seoul.

Snipping by water is important in Korean transportation. Contributing factors include the mountainous terrain of the interior, the lack of east-west highways and railways and the growth oi important population centres on the coast. Under Japanese control, practically all Korea's shipping requirements were met by Japanese shipping firms. At the end of World War II these Japanese vessels, except ior a few old ships totaling about 15,000 gross tons, were withdrawn from Korean waters. At the end of 1955, Korea had 28 steamships of more than 1,000 gross tons each and a total fleet of ships (including fishing vessels) numbering 8,096 boats with a total gross tonnage of 265,931; of these 7.860 were less than 100 gross tons.

In June 1955 there u-ere 28,584 telephones in service and 614 post and telegraph offices, all of which were government owned and operated, in the Republic of Korea. The Republic of Korea took over the international communications services of the Radio Corporation of America in Dec. 1949 and was admitted into the International Telecommunication union on Jan. 11, 1952.

Finance. — Despite the industrialization of North Korea, the Korean banking system was much more developed in South Karea, where commerce was centred and where 80% of the total loans and cash holdings in Korea were located. With the end of World War II those branches of the central bank, the Bank of Chosen (which had been under the direct control of the Japanese minister of finance), located in South Korea, operated as the Bank of Chosen until 1950, when it was reorganized as the Bank oi Korea. As of March 1956 the Bank of Korea had assets and liabilities oi 217,598,000,000 hwan. The North Korean branches became the North Korean Central bank.

Inflation remained the basic element in the financial picture of South Korea after the end of World War II. The Korean war, of course, contributed to the inflationary situation. Currency in circulation increased from 66,900,000,000 Korean won (which succeeded the Japanese yen as the monetary unit) in June 1950 to 1.051,100,000,000 won at the end of Jan. 1953. In an effort to check inflation, the Republic of Korea in Feb. 1953 issued a new currency, the hwan, retiring the won at a ratio of 1 hwan ior 100 won. The official foreign exchange rate at the time of conversion was 6,000 won = U.S. $1, a rate that had undergone a number of increases in the preceding years; at the same time the black market rate was about 27,000 won to $1. A new official exchange rate of 180 hwan to $1 was put into effect on Dec. 15, 1953, but it was set at joo hwan to $1 on Aug. 15, 1955.

The budget of the Republic of Korea for the fiscal year 1955 amounted to receipts of 135,981,000,000 hwan and expenditures of the same amount. The 1954 executed regular budget had receipts of 112,225,000,000 hwan and expenditures of 108,741,800,000 hwan. In addition. there were special accounts which had revenues of 146,978,000,000 hwan and expenditures of 187,716,000,000 hwan.

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(S NR, S McC)

KOREAN LITERATURE. A thorough knowledge of Chinese classical literature and mastery of its medium (known to the Koreans as *hanmun)* have traditionally been necessary conditions to social and political preferment in Korea. As a consequence, the great bulk of Korean literature in all branches of learning is written in Chinese. History, biography and belles-lettres form the principal topics, but there are numberless works dealing with every phase of life. The finest products of this literature. which has always been subject to the influence of changing Chlnese fashions. can be compared nithout disadvantage to the works of the great Chinese masters The willing subservience to Chinese civilization. however, has had a repressive effect on the development of the Korean genius. For, side by side with the Chinese tradition, there was a native literature that, with one significant exception. was transmitted only orally until the invention of the Korean phonetic script *(onmun* in Sino-Korean or *hangul* in Korean) in the 15th century.

Chinese was uidely used for documentary purposes by the end of the 4th century A.D. Its literary potentialities were fully realized during the period when the peninsula was unified under Silla rule. Ch'o Chi-won. the greatest scholar of this period, having attained honours at the imperial court of T'ang China for literary proficiency, returned to his native land and produced a famous collection of essays and poems. "Pen-Plouings in a Cassia-Garden." His example of study in China under official auspices was folloued by a considerable number of scholars under the Wang dynasty of the kingdom of Koryo, which succeeded Silla.

The extant historical literature of the period preceding the Yi dynasty (1392–1910), both official and private, is extremely meagre when compared with that of China for the same period. Primary source material for the whole of pre-Koryo history is practically limited to two works of relatively late compilation: the *Samguk sagi* ("Historical Records of the Three Kingdoms"), compiled in the middle of the 12th century by Kim Pu-sik, a fervent Confucian and one of the outstanding literary figures of the kingdom of Koryo; and, more than a century later, the *Samguk yusa* ("Remnants of the Three Kingdoms"). by the Buddhist monk 11-yon. The first dynastic history is the *Koryo-sa* (15th century), which deals, in the manner of the Chinese histories. with the events, institutions and personalities of the Koryo period. The documentation for Yi dynasty history is incomparably more voluminous, as it includes the official annals of the dynasty ***(Yijo sillok***) and various privately compiled descriptions of political and social institutions. Such works, intended for the use of the aristocracy and officialdom, remained until modern times the province of literary Chinese.

Native Korean literature as referred to here means the poetry and prose that was primarily of indigenous inspiration. Being a folk creation, it long antedated writing; but some idea of its origin and early manifestations can be gained from brief notices in the Chinese dynastic histories and from anthropological study of some examples that have been preserved in Korea in Chinese translation. The earliest poetry consisted of incantatory songs associated with the primitive Korean shamanistic religion; the earliest narratives are myths in praise of tribal (in some cases totemistic) ancestors. These were inseparably connected uith the music and dancing that took place at seasonal religious festivals and other special occasions. such as the election of tribal chieftains.

The geographic position of the kingdom of Silla enabled it to remain longer aloof from Chinese civilization than the other two states of the Three Kingdoms, Koguryo and Paekche; hence its indigenous culture developed to a higher degree. and the earliest attempt to represent the Korean language graphically was made in this region. *Idu,* as this script was called, was an adaptation of Chlnese characters to phonetic purposes. and was devised in the latter part of the 7th century A D The 25 poems that are its principal extant monument date from before A.D. 600 to the end of the 10th century. They are best known by the Chlnese term *hyang'ga* ("village song"), which was originally a designation

for Korean, as opposed to Chinese, verse. Composed of four, eight or ten phrases, they express simple emotions and represent a national literature of all social classes which had a long poetic tradition behind it.

The use of the idu script for literary purposes died out early in the Koryo period (935–1392), and no means for the recording of native literature were available until the invention of the hangul script in 1446. The oldest extant collection of poems, the Akchang kasa (16th century), contains a number that date from the Koryo period and are known as chang'ga ("long song"). Being intended to be sung to musical accompaniment, they consist of a varying number of stanzas. each followed by a refrain. They deal primarily with love between the sexes.

The longest-enduring and most universally popular verse form —even to the present day—is the sijo. It became the characteristic form of the period of the Yi dynasty and attained the height of perfection in the 17th and 18th centuries. One of the greatest masters was Yun Son-do (1587–1666). Most *sijo* consist of three lines each of four phrases, with a fixed number of syllables in each phrase: 3. 4, 4. 4(3); 3, 4. 4, 4(3); 3. 5, 4, 4. In subject matter they have much in common with the poetry of T'ang China, uhence many drew inspiration: contemplation of nature, parting of friends, transitoriness of life. Another popular verse form of the Yi period was the long narrative poem called *chapka,* sung by male professional entertainers.

Several works of late Koryo contain many of the elements of the novel, but it was not until the latter half of the Yi period that this form, strongly influenced by novels imported from China, assumed a dominant position in Korean literature. *Hanmun* remained its principal vehicle, though there is, also a considerable body of tales written in *hangul*—much of it anonymous, as a result either of its low social position or of its satirization of Yi institutions.

Korean literature after 1900 was profoundly influenced by western ideas and literary forms. It was inevitable that in the vast intellectua! and social upheavals of modern times the Korean vernacular should replace Chinese as the medium of all aritten communication. This development had a very stimulating effect on the concern of Koreans with their past; in particular, the literature of native inspiration of all periods was studied as a cultural heritage worthy of recovery and perpetuation. A creative fusion of imported and indigenous culture—such as Koreans associate with the Silla ueriod—became the ideal espoused by most modern writers.

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KOREAN WAR. In the Cairo declaration of 1943, Generalissimo Chiang Kai-shek, Prime Minister Winston Churchill and Pres. Franklin D. Roosevelt pledged that in due course Korea would become free and independent. Again in 1945, the Potsdam declaration reaffirmed the principle.

Two days after an atomic bomb was dropped on Hiroshima, Jap., on Aug. 6, 1945, the U.S.S.R. declared war upon Japan and in its declaration officially subscribed to the Potsdam declaration. The surrender of Japanese troops in Korea was accepted by U.S. troops and the forces of the Soviet Union. Japanese forces south of the 38th parallel latitude were directed to surrender to the U.S. commander, those on the north to the Russians. Thus Korea was divided at the 38th parallel purely on a temporary basis to facilitate the surrender of Japanese troops in that country.

Soviet troops who occupied Korea north of the 38th parallel effectively sealed off North Korea from South Korea. The United States laid the matter before the United Nations. which resolved that the people of Korea should elect a national assembly for the whole country, and appointed a nine-nation commission to supervise the election. The first democratic Korean election, held on May 10, 1948. was limited to South Korea because the Soviet authorities refused to allow the people of North Korea to participate. As a result of the election, the government of the Republic of Korea was formed on Aug. 1j, 1948, and the 50,000 U.S. occupation troops started to withdraw. By June 1949 the withdrawal was completed and only the Korean military advisory group of approximately 500 U.S. officers and men remained to continue training Korean security forces.

At the end of Dec. 1948 the U.S.S.R. reported completion of the withdrawal of its occupation forces from Korea, but the United Nations was not permitted to verify the action. Meanwhile, the Democratic People's Republic of Korea had been established under a Communist regime after an election unwitnessed by the U.N. commission. Recognition was accorded this new republic by the U.S.S.R.

From June 1949 to June 1950 there were increasing numbers of raids by increasingly stronger forces crossing the 38th parallel from North to South Korea, attacking smaller security forces of South Koreans. Protests were made to the United Nations, and South Korean forces managed to repel these raids.

On June 25, 1950 (far eastern time), without warning, the North Korean armed forces struck across the 38th parallel into South Korea in strength. Immediately upon notification from Ambassador John J. Muccio that the invasion of South Korea had taken place, the United States asked for a meeting of the United Nations Security council to discuss the matter. The council was convened on the afternoon of June 25 (U.S. time). The Soviet representative was absent from this meeting, at which the Security council adopted a resolution observing that the government of the Republic of Korea was lawfully established and was the only such government in Korea. The resolution noted with grave concern the armed attack by the forces from North Korea and stated that the act constituted a breach of the peace and ended by calling upon all members of the United Nations to refrain from giving assistance to the North Koreans. Two days later, a second Security council resolution recommended that the members of the United Nations furnish such assistance to the Republic of Korea as was deemed necessary to repel the armed attack and restore international peace and security in the area. Earlier that same day, Pres. Harry S. Truman had announced that he had ordered U.S. air and naval forces to give the South Korean troops cover and support.

On June 29 the president authorized Gen. Douglas MacArthur to use certain supporting ground units in Korea and authorized the U.S. air force to conduct missions on specific military targets in North Korea; he also ordered a naval blockade of the entire Korean coast. On July 7 the Security Council requested the United States to designate the commander of the unified forces, and the following day the president appointed MacArthur commander in chief of the U.N. command.

Opposing Forces.—Communists.—In the Communist army, more than 1,000,000 men, largely Chinese. were deployed in Korea by the end of 1952; these men were organized into well-equipped divisions with supporting artillery, tanks and heavy equipment. The Chinese air force consisted of more than 2,000 planes, mostly jets, based on Manchurian fields near the Yalu river. There was no Communist navy in Korean waters.

United Nations Forces.—The United States. the Republic of Korea and 1j other United Nations members had fighting troops in Korea at the end of 1952. Five nations had provided medical assistance to the United Nations command, and 46 nations had offered economic assistance to the United Nations command or to the United Nations Korean Reconstruction agency, or both.

The U.S. 8th army at the end of 1952 was organized into 18 combat divisions. with supporting units, tanks and artillery. The army of the Republic of Korea consisted of ten infantry divisions (including South Korean marines) which at full strength included approximately 10,000 men each. plus supply and labour units and rear area security forces. Korean military forces by the end of 1952 comprised more than 400.000 men.

The following U.S. divisions had taken part in the Korean war: 1st cavalry. 2nd, 3rd, 7th, 24th, 25th, 40th, 45th and 1st marine division. Seven U.S. divisions were in Korea on Oct. 31, 1952.

The 1st commonwealth division consisted of troops from the

United Kingdom, Australia, Canada and New Zealand. This division and smaller units from a number of other U.N. countries made a substantial contribution to the United Nations command army.

Naval units from the United States and ten other United Nations countries participated in a complete blockade of both coasts to deny the use of the sea routes to the Communists and, in coastal bombardment and air strikes from carriers, to destroy enemy supply lines.

U.S. air force, U.S. navy and U.S. marine corps aircraft of all types, as well as aircraft of seven other nations, had participated in the Korean war by the end of 1952. Bombers, fighter bombers, fighters and reconnaissance aircraft, as well as cargo aircraft, participated in the war. The greatest number of sorties flown in one day up to Oct. 31, 1952, was 1,525.

GROUND ACTION

U.N. Defensive, June 27–Sept. 15, 1950.—Complete tactical surprise was effected by the Korean Communist infantry, led by an estimated 100 Soviet-made tanks on June 25, 1950. The Korean Communists' overwhelming superiority in weapons drove the Republic of Korea forces (which lacked tanks and adequate anti-tank weapons) back to Seoul, the R.O.K. capital. On July 1 two reinforced rifle companies of the United States 24th infantry division were flown to Korea from Japan, and on July 5 initial contact was made with the Communists in the vicinity of Osan, south of Seoul.

The South Korean government had by this time moved to Taejon. The North Koreans took Seoul and near-by Kimpo airfield on June 28.

By the middle of July, the U.S. 24th and 25th divisions had closed with the Communists; South Korean forces had stiffened their resistance; the navy was involved in continuous coastal bombardments and naval air strikes; and the air force was engaged in round-the-clock strikes in support of U.N. troops.

By July 15 the Communists had established a bridgehead across the Kum river, and by July 17 they had reached the outskirts of Taejon. On July 20 the U.S. 24th division withdrew its rear guards from Taejon, and two days later Maj. Gen. William F. Dean, its commander, was reported missing.

The Communist 4th and 6th divisions, effecting a strategic envelopment against R.O.K. forces, drove toward western and southern ports, seizing Mokpo, Kwanju, Amwon and Chinan on July 24. After shifting the direction of the attack to the east, the enveloping force drove toward the port of Pusan. By Aug. 4 the withdrawal of the United Nations forces to defensive positions east of the Naktong river had been completed.

In the early part of August, advance elements of the 2nd infantry division, the 5th regimental combat team from Hawaii and the advanced components of the 1st marine division reached Pusan after long sea voyages. Within the perimeter around Taegu and Pusan, Gen. Walton H. Walker, who had succeeded General Dean, directed an army composed of elements of four U.S. divisions, a marine brigade and five R.O.K. divisions. The Communists again massed for a two-prong drive across the Naktong, in an effort to capture Taegu and Pusan. Short, quick counterattacks by the United Nations helped to keep the Communists off balance and prevent penetration. Task Force "Kean," for example, consisting of the 5th regimental combat team, the 35th regimental combat team of the 25th division, the 1st marine brigade and the R.O.K. battalion (with the 24th regimental combat team of the 25th division in reserve) opened a strong U.N. counteroffensive on Aug. 7. By Aug. 11 the task force had secured the left flank of the 8th army.

During August Communist attacks hit nearly every point on the line. The Communists used 1 armoured division and 13 infantry divisions in an effort to drive through to Pusan. At the end of the month, the 27th British Commonwealth brigade joined the 8th army. On Sept. 1 the Communists opened a general offensive against the Naktong river line. Initial penetrations of 6,000 to 8,000 yd. in various sectors of the area were contained after bitter fighting.

U.N. Offensive, Sept. 16–Nov. 2, 1950; Entry of Chinese Into War.—U.N. forces made an amphibious landing at Inchon



OFFENSIVES AND COUNTEROFFENSIVES OF THE KOREAN WAR

on Sept. 15, and at the same time forces in the Pusan perimeter attacked north to join them. They regained a large part of the territory of the Republic of Korea and killed or captured a large part of the original Korean Communist army.

Early on Sept. 15 the United States 10th corps, consisting of the 1st marine division and the 7th division, launched an amphibious landing on the island of Wolmi, commanding the approaches to Inchon. The marines secured the island within two hours. Eleven hours later Inchon was stormed by the 1st marines and four R.O.K. marine battalions. The attack had been preceded by bombing and shelling of the Inchon area by naval ships and aircraft. Within three days after the Inchon landing, U.N. planes were flying in and out of Kimpo airfield again. Seoul had been reinforced by the Communists, but after heavy fighting the 10th corps announced the city had fallen. Though the first link-up of the 10th corps and the 8th army occurred on Sept. 26, it was not until the end of the month that organized Communist resistance collapsed in the 8th army sector. Encircled North Korean forces, more than half the original North Korean invaders, were taken prisoner.

On Oct. 1 the R.O.K. 3rd division pushed across the 38th parallel and drove up the east coast. U.N. forces continued mop-up operations and advanced generally to the 38th parallel against strong resistance. By the last week in October, the Korean Communist army had practically dissolved, and elements that remained had headed for the mountainous borderlands adjacent to Manchuria and Siberia.

The R.O.K. 3rd and capitol divisions captured the North Korean

port of Wonsan. The U.S. 9th corps and the R.O.K. 3rd corps had been kept below the 38th parallel to clear out bands of by-passed North Korean troops. The 1st marine division was advancing toward industrial Hamhung and the Changjin reservoir. By Oct. 20 Pyongyang, capital of North Korea, had fallen. On Oct. 27 Chinese Communist forces were first encountered by the R.O.K. army near the Manchurian border.

Chinese Communist Offensive, Nov. 3, 1950 to Jan, 24, 1951.—By Nov. 10 elements of 11 Chinese communist divisions had been identified in the forward areas. At this time it was not clear whether they were volunteers or whether Communist China had entered the conflict. Initial heavy resistance by the Chinese had quieted by Nov. 10, and the 8th army and 10th corps advanced slowly against moderate resistance. In the last week of Nov. 1950, troops of the 17th infantry regiment of the 7th division reached the Manchurian border at Hyesanjin. R.O.K. troops had reached the bolder at Chosan nearly a month earlier but had been forced to retire.

There were now two distinct major commands in Korea separated by the high Korean mountain chain: General Walker's 8th army in the west consisted of the U.S. 1st cavalry, 2nd, 24th and 25th divisions, the R.O.K. 1st, 6th, 7th and 8th divisions, the British 27th commonwealth brigade, the 29th independent infantry brigade, a Turkish brigade, a battalion of troops from the Philippines and from Thailand; Gen. Edward M. Almond's 10th corps, operating in the east, was composed of the U.S. 7th and 3rd divisions', the 1st marine division, the R.O.K. 3rd and capitol divisions and a commando group of British royal marines.

The United Nations offensive, launched by these two commands on Nov. 24, disclosed a tremendous build-up of Chinese Communist forces. The attack progressed satisfactorily for two days, then strong attacks by Chinese Communists required U.N. forces to resume the defensive. The main effort of the Chinese attack was initially directed at the R.O.K. 2nd corps, and it soon became necessary to utilize the 1st cavalry division, the Turkish brigade, the British 27th commonwealth brigade and the 29th independent infantry brigade to stem the Communist advance. All along the 8th army front, waves of Chinese attacked under cover oi darkness. The U.S. 2nd division, hard hit, drew the task of fighting a rear-guard action. Within a week after the Chinese had begun their counteroffensive, the centre of the U.N. line had withdrawn 50 mi. By the middle of December, the 8th army had formed a defensive perimeter north and east of Seoul after a long withdrawal.

The 10th corps had been hit on Nov. 27 by the second phase of the Chinese offensive. Elements of six Chinese Communist divisions confronted the marine units and the U.S. 7th division near the Changjin reservoir. Elements of the 10th corps were forced to withdraw nearly 60 mi. southward down mountain trails to the coast through large groups of Communist infantry which had cut in behind them. In the withdrawal to the port oi Hungnam, marine elements and the remainder of two battalions of the 7th division encountered from six to eight Chinese Communist divisions.

A U.S. marine battalion and a special task force of the 3rd infantry division were charged with keeping the road to the port open, and with this help, together with maximum assistance from air iorce, marine and naval aircraft, the surrounded forces iought their way to the port. Fighting against great odds in the bitter cold, the marines and the battalions of the 7th division had to march and fight 60 mi. along a narrow and precipitous road.

From Dec. 12 to 24 the 10th corps troops and equipment were embarked, the beachhead contracted, and finally the 3rd division defended the beachhead. Naval guns furnished artillery support for defending troops, and air iorce, naval and marine planes prevented Communist concentrations.

In the evacuation Adm. James H. Doyle's amphibious force of 193 vessels salvaged about 350,000 tons of cargo and 17,500 vehicles and loaded 105,000 troops and approximately 98,000 Korean civilians. The operation was supported by sea and air around-the-clock. About one-fourth of the total sortie capability of the 5th air iorce and the entire 1st marine air wing co-operated to provide air cover for the 10th corps during this period. The 10th corps was moved in behind the 8th army and came again under its control.

On Jan. 1, 1951, a Communist offensive directed toward Seoul in the west and Wonju in the centre achieved penetrations of 10 to 12 mi. in the United Nations lines. By Jan. 4 Seoul was occupied by the Communists, and United Nations forces were organized on a line south of the Han river. Chinese pressure continued, and U.N. forces slowly gave ground until about the middle of January. With the final stabilization of the front line about Jan. 24, the third phase of the Korean war came to a close.

U.N. Counteroffensive, Jan. 25–April 21, 1951.—In a series of limited attacks on the east, U.N. iorces moved northward across the 38th parallel 50 mi. N. of the stabilized January' line on the west. Seoul was retaken by the United Nations forces on March 14, and, on April 3, U.N. units crossed the 38th parallel. The United Nations battle plan consisted of constant movement, keeping the Communists off balance. Gen. Matthew B. Ridgway's (commander of the 8th army after Dec. 23, 1950) efforts and the United Nations attacks were aimed to prevent a build-up for any large-scale Communist offensive action.

Communist resistance u-as strong in more areas and was characterized by a greater use of artillery.

Chinese Spring Offensive, April 22–July 8, 1951.—A series of short-lived Communist offensives from April 22 through May 23, 1951, forced U.N. troops south on all parts of the line. By the end of the period U.N. counteroffensives had not only restored the line but had moved northward across the 38th parallel to a stabilized battle position. Chinese forces, massed along the western half of the front, launched a general offensive on April 22. By April 25, heavy attacks were in progress along the entire iront irom the Hwach-on reservoir west to Munsan-ni. A large-scale offensive effort designed primarily to pinch off Seoul in the west and to sever the east-west road from Seoul to the east coast was begun.

U.N. ground forces, with the assistance of support aircraft, fought a determined defensive battle for the city of Seoul. By the end of April the Communist thrust had been halted. The U.N. line had been pushed hack 10 to 35 mi. on various parts of the front. On May 16, 21 Chinese Communist divisions launched an attack on the centre of the peninsula. United Nations forces withdrew 12 mi., but by May 20 the attack had been contained. The Communists suffered heavy casualties. Powerful counteroffensives were launched by the United Nations forces, however, on May 19 and on May 21. By the end of May, Communist forces were driven 20 mi. to the north, and the front lines again approximated those of Jan. 1, 1951, near the 38th parallel.

In the first two weeks in June, United Nations pressure forced a slow withdrawal of Communist forces. Heavy resistance in the "iron triangle" area (Chorwon, Pyonggang and Kumhwa) caused severe fighting, but by June 12 United Nations iorces had seized the southern portion of that area. On Tune 13 United Nations forces entered Pyonggang, the northern tip of-the iron triangle.

U.N. Summer–Fall Offensive, July 9–Nov. 27, 1951.—A series of limited United Nations attacks pushed the battle line northward an average of five miles along the front. Action from June to November was comparatively light except at particular points. Heartbreak ridge, Little Gibraltar and the Punch Bowl came into the news as United Xations forces iought to acquire observation posts in the mountains. Both sides engaged in vigorous patrol actions, and United Nations forces sent aggressive task iorces behind the Communist lines. In the latter part of the fall, patrol action was continuous, with few engagements larger than company size.

Second Korean Winter, Nov. 28, 1951–April 30, 1952, and Korea Summer–Fall. May 1–Nov. 30,1952.—Communist around action during the second winter campaign was characterized by widely scattered exploratory attacks, usually delivered at night and utilizing units irom squad to battalion in size. During 1952 the Communists continued to increase the amount of their artillery fire. On several occasions as many as 50,000 rounds of mortar and artillery fell on U.N. troops in one day. United Nations command ground actions were limited to combat patrol and probing attacks varying in size from squad to battalion. The Communists were determined to contain U.N. thrusts, and even reconnaissance patrols met immediate resistance accompanied by increasing amounts of mortar and artillery fire.

Ever since the front lines were stabilized in Nov. 1951, a constant battle for observation had occurred. In the second period of 1952, the Korean summer-fall campaign, the battle for the peaks became particularly intense. Opposing front lines were as close together as 50 yd. in some places and as far apart as 10 mi. in others. Battle positions ran along ridge lines offering good observation of the territory. It was for possession of these high mountains that the fighting was most intense.

Mountains were named by the front line troops and by newspapermen. Stubborn fighting and seesaw actions with one side gaining control and then being pushed off caused these important terrain features to change hands many times. In the battle for the hills, the 1st marine division on Bunker hill, the 3rd infantry division (including the Belgian and Greek battalions) on Rig Nori and Kelly hill, the 2nd infantry division (with the French battalion) on Old Baldy and Arrowhead hill, the 9th R.O.K. division on Whitehorse hill, the 7th infantry division on Triangle hill, the 2nd R.O.K. division on Sniper ridge, the R.O.K. capitol division on Finger ridge and Capitol hill, the 25th infantry division (including the Turkish brigade) on Heartbreak ridge and the 8th R.O.K. division in the Punch Bowl area were featured in the news accounts. The accuracy of the U.N. artillery and the close air support of U.N. aircraft helped U.N. troops hold off many times their numbers of Communist infantry attempting to win and hold the contested observation posts. South Korean troops, well led and well trained, fought in some of the most savage actions in their areas.

AIR ACTION

The U.S. air force went into action in support of South Korean troops within three days of the initial North Korean attack of June 25, 1950. By the middle of July the navy was executing continuous naval air strikes and coastal bombardments. Within a short time, the Communist air force had been driven from the skies.

As late as the end of 1952 the Communists had elected not to deploy their air iorces in an offensive role; Communist air attacks on U.N. ground forces were limited to infrequent sorties at night. The Chinese Communist air force, built into one of the most powerful in the Communist world, at the end of 1952 numbered more than 2,500 aircraft, of which 1,300 were jet-propelled craft, chiefly of the MIG-15 type.

From the beginning of the Korean war, United Nations air power played a vital role in the success of the U N. ground forces. In the U N. defensive operations from June 27 to Sept. 15, 1950, aircraft flying from Japan, Korea, Okinawa and from the carriers off the Korean coast primarily gave close air support, bombing and strafing, attacking Communist troops and equipment.

In the U.N. offensive of Sept.-Nov. 1950, heavy bombing by naval aircraft and bombardment by naval ships paved the way lor the success of the Inchon landing. Here again, close support of ground troops played a most important part in the success oi the operations.. On Nov. 1, 1950, an air force plane encountered a communist jet for the first time in the Korean war. On Nov. 9 a Communist jet fighter was destroved by an air iorce F-80 plane. This was the first jet-against-iet engagement in history.

In the third period, that beginning with the Chinese Communist forces' intervention on Nov. 3, 1950, and continuing to Jan. 24, 1951, United Nations aircraft played an important part in enabling C.N. forces to withdraw south of the 38th parallel successfully. In the movement of the 10th corps from the Yalu river and its evacuation at Hungnam, outstanding air support was given to the 1st marine division, elements of the 7th division and the U.S. 3rd division by marine, navy and air force planes. Ground support of troops, bombing of industrial targets, troop-carrier operations and large supply and rescue missions were executed by the United Nations air iorces.

By June 25, 1953, the U.S. air iorce and attached units had flown more than 800,000 sorties, inflicting 181,000 casualties. Troops, tanks and artillery were the primary targets of aircraft in close support. Armed reconnaissance and night intruder missions comprised the bulk of the other flights. North of the battle area, communications centres were continuously attacked. Limited objective attacks and reconnaissance in force by United Nations ground troops iorced Communists into the open, and the U.N. ground support aircraft inflicted heavy casualties on them.

In the U.N. counteroffensive phase, from Jan. 25 to April 21, 1951, both sea forces and air forces concentrated on an interdiction program designed to prevent Communist forces from building up sufficient personnel and matériel for a large-scale attack. In this program, bombardment from the sea and the air intercepted supplies and men on the long trip irom the Manchurian border to the front lines. Rail traffic was bombed and shelled, forcing the Communists to rely upon truck transport which mas then taken under fire by U.N. aircraft.

In July 1951 Operation "Strangle" was proposed and plans developed in collaboration with the army, navy and air force. The primary purpose was to prevent the Communists irom bringing iorward supplies necessary to sustain a major offensive. Though it was acknowledged from the beginning that such an operation could not completely prevent the flow of supplies to the enemy's front, it was believed that his capacity to bring forward those supplies could be cut below the amount required ior another major offensive.

The actual operation began on Aug. 18, 1951, with the objective of disrupting the Communists' rail transport. The success oi this part of the program was shown by the abandonment of many of the rail lines and by the expanded vehicle traffic. It was estimated by officers of the 5th air force and the 8th army that a fleet of at least 6,000 trucks was required to make up ior the loss in rail transportation. By June 25, 1953, about 80,000 vehicles had been destroyed by the U.S. air iorce and attached units.

Stabilization of the battle line lessened the need ior close air support. United Nations aircraft concentrated on the systematic destruction of Communist supply and communications facilities behind the front lines.

Communist air activity rose to greater heights in 1952, and in September, for example, 61 MIG-15s were destroyed, 7 probably destroyed and 57 damaged. Since the first appearance oi the Russian-built MIG-15 in aerial combat, United Nations F-86s had destroyed more than nine MIGs to every F-86 lost in air-to-air engagements. U.N. fighter-bombers conducted daytime raids against rail lines, rolling stock and trucks, preventing the Communists from transporting men and equipment by day. Night intruder operations of U.N. command light bombers and night fighters were directed at motor transport and railway traffic along main supply routes. Medium bombers conducted attacks during the hours of darkness also, principally attacking rail bridges and rail centres, giving close support to U.N. ground forces and distributing leaflets to h'orth Korean municipal areas.

In Oct, 1951 the B-29s of the far east air iorces bomber command had switched largely to nighttime operations. Targets were transportation facilities, storage areas and marshalling yards; close night support missions ior U.N. ground iorces were flown also. The B-29s systematically neutralized airfields in North Korea, making them useless to the Reds.

During the latter part of 1952, as ground action by both sides increased, United Nations close support aircraft were returned to close support of iront line troops. During the lull in ground fighting they had been shifted to missions behind the battle lines.

NAVAL ACTION

Units of the U.S. 7th fleet began operations off the coast of Korea south of the 38th parallel on June 25, 1950, and the first shore bombardment was conducted on June 29. When President Truman ordered a naval blockade of the Korean coast July 1, the U.S. navy immediately took up blockade positions and began air and surface bombardment of military targets. The United Nations navy soon consisted of units from the US. navy and ten other U.N countries.

Complete blockade oi the Korean coasts denied the Communists use of the seas, and coastal bombardment and air strikes from U.N carriers were carried out against troops and supplies as well as against lines of communication and transportation. The first major gunfire bombardment occurred during Sept. 14–24 in support of the 10th corps at the Inchon landing Three cruisers, five destroyers and a battleship participated in the action, during which more than 1,000 tons of projectiles were fired from supporting ships

Other heavy bombardments occurred in support of R O K. troops on the east coast irom the end of August to Dec. 1950, at the Hungnam evacuation in Dec. 1950 and in the seiges of Songjin and Wonson in 1951 and 1952.

By July 1953 the 4 battleships. 8 cruisers and approximately 80 destroyers which had participated in the Korean war had fired more than 4,000,000 rounds of projectiles varying irom 16-in to 3-in at Communist targets. During the war, 16 aircraft carriers were in operation at one time or another in Korean waters: 13 US., 2 British and 1 Australian By the end of June 1953, navy and marine aircraft had flown more than 2j5,000 sorties.

Shore-based marine aircraft gave close support to U.N. ground troops, flew armed reconnaissance and interdiction missions and air spot for gunfire.

Other important naval operations included reconnaissance and patrol operations; greater use of helicopters for varied tasks such as rescue of pilots downed behind Communist lines or at sea; mine-sweeping operations of important harbour entrances and major shipping routes; and operation of ships to transport personnel and supplies on the long sea route to Korea.

ARMISTICE NEGOTIATIONS

As early as July 1950 the United States had asked the U.S.S.R. to use its influence with the North Korean government to withdraw its invading forces immediately. On several other occasions, direct appeals were made to the Communists to halt the fighting, including those made by the Good Offices committee of the general assembly of the U.N.

On June 23, 1951, Jacob Malik, Soviet representative on the U.N. Security council, proposed in a radio address that "discussions should be started between the belligerents for a cease-fire and an armistice providing ior the mutual withdrawal of forces from the 38th parallel." President Truman then instructed General Ridgway, the U.N. commander, to make preliminary arrangements for talks. After a number of messages back and iorth, liaison officers of the two forces met at Kaesong, Korea, on July 8 to discuss arrangements for the first conference on July 10 Prior to the talks, Kaesong had been in a no man's land, but when the Communists .occupied the town its status was no longer neutral. From July 12 to July 15, talks were suspended by the United Nations command until the Communists agreed on detailed provisions regarding the neutrality of the conference zone. Again in August the neutrality of the conference site became an issue after the neutral zone was violated by a company of armed Communists. After a recess of five days, the Communists agreed again to honour the neutrality of the area.

On Aug. 23 the Communists suspended the negotiations because of an alleged bombing and strafing of the conference site by U.N. aircraft. Despite the fact that investigation by United Nations liaison officers proved the charges to be unfounded, the Communists refused to accept the U.N. reply, and negotiations were suspended from Aug. 23 until Oct. 25. After prolonged discussion between liaison officers, the U N. command and the Communists agreed to shift the conference site to Panmunjom.

Military Demarcation Line.—Discussions on the military demarcation line had begun on July 26 The Communists argued that the 38th parallel was the logical demarcation line based upon so-called historical precedent. The U.N. command insisted that the line be based upon military reality, that the agreed line provided each side with defensible positions while an artificial line such as the 38th parallel took no account of natural terrain features or the existing military situation. The line oi contact was considered by the United Nations command as consistent with the U N. objective of repelling aggression. The Communists finally accepted the United Nations position that the demarcation line should be based on the line of contact, and on Nov. 27 final agreement was reached.

Arrangements for Carrying Out Cease-Fire.—The Communists disagreed with the U.N. proposal that all parts of Korea be made accessible to inspection in order to ensure against increases in the military strength during the cease-fire. In the compromise agreed upon, inspection teams were to be stationed at five points of entry on each side, and there would be in addition ten mobile teams to investigate violations. In regard to the rotation of troops, it was agreed that 35,000 men could be rotated monthly on each side.

Initially, the U N. command had proposed that inspection be accomplished by joint teams composed of representatives from both sides, but the compromise which was finally agreed to was an inspection by observers of neutral countries acceptable to both commands. When the Communists proposed the Soviet Union as a neutral nation the U.N. was unable to agree.

Prisoners of War.—When the Communists finally agreed to the exchange of the names of prisoners of war, the United Nations submitted a list containing approximately 132,000 names. With later

investigation, an additional 11,000 persons were also reclassified as civilian internees. The Communist list included approximately 11,500 U.N. and R O.K. prisoners.

After a great deal of negotiation on the subject of forcible or nonforcible repatriation of the North Korean and Chinese prisoners, the U N. negotiators on April 28, 1952, offered the Communists a "package" proposal for resolving the three issues still at variance. The U N. proposed that (1) there should be no forced repatriation of prisoners of war, (2) the United Nations command would not insist on prohibiting reconstruction and rehabilitation of airfields and (3) the United Nations command would agree to accept Poland and Czechoslovakia as members of the neutral nations' supervisory commission if the Communists agreed to Sweden and Switzerland. (G. S. BD.; C. V. C.)

In the early months of 1953 agreement for the exchange of sick and wounded prisoners was reached, and in April the exchange took place. By June, however, the peace conferences were halted by the Communists after Pres. Syngman Rhee of the Republic of Korea objected to the peace terms and ordered the release of anti-Communist North Korean prisoners. The peace talks were resumed July 10, and on July 27 (Korean time) the truce was signed at Panmunjom

Truce Terms.—In addition to the cease-fire order and the establishment of a neutral buffer zone along the line of battle, the provisions noted above regarding neutral nations (India was added as a fifth nation to act as umpire and to provide security forces during the prisoner exchange), rotation of troops, reconstruction of airfields and no forced repatriation were agreed upon. Other articles of the truce included (1) that UN. forces evacuate a group of islands off North Korea, (2) that no blockade of Korea be permitted, (3) that a committee of ten officers, five from either side, settle all truce violations and (4) that military leaders recommend that a political conference between the principal nations be held to arrange for the final withdrawal of troops from Korea. (X.)

KŌRIYAMA, an industrial and communication centre in Fukushima prefecture, Japan, about 140 mi. north and slightly east of Tokyo. Kōriyama is supplied with coal from the nearby Jō coal field and electric power generated from the rivers of the surrounding mountains and from Lake Inawashiro. The power is used in the expanding textile mills and chemical and machine factories. Pop. (1940) 57.400; (1955) 91',119. (C. A. MR.)

KORNBERG, ARTHUR (1918–), U.S. physician and biochemist, co-winner with Severo Ochoa of the 1959 Nobel prize for medicine, was born in Brooklyn, N.Y., on March 3, 1918. He received a B.S. degree from the City College of New York in 1937 and an M.D. degree from the University of Rochester in 1941, and then interned at the Strong Memorial hospital in Rochester. He worked in biochemistry at the National Institutes of Health, Md., from 1942 to 1953, heading the enzyme and metabolic section from 1947 to 1953. In 1953 he became professor and head of the department of microbiology at Washington university, St. Louis, leaving in 1959 to become chairman of the department of biochemistry of the school of medicine, Stanford university, Calif.

Kornberg's scientific work was concerned with the elucidation of the biosynthesis of the nucleotides and of the coenzymes built up from these compounds. In 1956 he and his co-workers discovered the pathway for the biosynthesis of deoxyribonucleic acid (DNA), and for this work Kornberg was given a share of the 1959 Nobel award. The DNA polymers, composed of a varying number of nucleotides, are presumed to be the central constituents of the chromosomes, which carry and transmit the genetic information necessary for the orderly synthesis of specific cell constituents. Kornberg's work clarified the manner by which specific DNA chains are built up in the cell. This discovery is of basic importance to genetics, to the study of viruses, to cell and tissue differentiation and to the understanding of the synthesis of specific proteins. (R. LE.)

KÖRNER, KARL THEODOR (1791–1813), German poet, author of popular patriotic verse, was born at Dresden, Sept. 23, 1791. His father, Christian Gottfried Korner (1756–1831), a distinguished Saxon jurist, was Schiller's most intimate friend. After studying at Freiberg, Leipzig and Berlin, Korner went to Vienna in 1811, where he met Friedrich Schlegel and other writers. He there wrote opera librettos and comedies *(Der grüne Domino, Der Vetter aus Bremen,* etc.) and tragedies *(Rosamunde* and *Zriny),* and was appointed poet to the Hofburg theatre. In the German War of Liberation Korner joined Liitzow's corps of volunteers at Breslau. He mas killed near Gadebusch in Mecklenburg, Aug. 26, 1813. The abiding interest in Korner is patriotic and political rather than literary. His patriotic lyrics were published by his father under the title *Leier und Schwert* in 1814. Among the best known of these war songs are "Liitzow's wilde verwegene Jagd," "Gebet während der Schlacht" (set to music by Carl Maria von Weber) and "Das Schwertlied."

Körner's works were published with a biography in 1834 (ed. by K. Streckfuss), and in 1889–90 in the *Deutsche National-literatur.*

See E. Peschel and E. Wildenow, *Theodor Korner und die Seinen* (1898); K Berger, T. *Korner* (1912). (A Gs.)

KORNGOLD, ERICH WOLFGANG (1897–1957), Austrian-U.S. composer, was born at Brno on May 29. 1897. He studied in Vienna. and his youthful compositions attracted considerable notice. In his maturer work he showed marked dramatic talent and considerable skill in the treatment of voices. The operas *Violanta, Der Ring des Polykrates, Die tote Stadt* and *Das Wunder der Heliane* were played in the principal music centres of Europe. Korngold went to the United States in 1934 and was naturalized in 1943. He composed cinematic music for the Hollywood productions of *Anthony Adverse* (1936) and *The Adventures of Robin Hood* (1938), for which he received academy awards, *King's Row* (1941) and *Escape Me Never* (1946). He also wrote incidental music for *Much Ado About Nothing,* and symphonic overtures. Korngold died on Nov. 29, 1957.

KOROLENKO, VLADIMIR GALAKTIONOVICH (1853–1921), Russian novelist, was born at Zhitomir, Volynia, on July 27, 1853. He studied at Moscow, where he was arrested for addressing a collective petition to the director of the school. He started working in St. Petersburg as a journalist, but was arrested for his advanced social doctrines and spent six years (1879–85) in Siberia. On his return he settled in Nijni-Novgorod, and published *Makar's Dream* (trans., 1916). From 1895 he conducted the review the *Russian Empire.* Korolenko wrote kindly stories of peasant life in the Ukraine and central Russia. A radical and social reformer, he fought for the abolition of capital punishment and of martial law. Korolenko died in Dec. 1921 in Poltava. His best-known works are: *Siberian Tales* (1901); *The Murmuring Forest* (1886; Eng. trans. by M. Fell, 1916); *The Blind Musician* (1886; Eng. trans. by A. Delano, 2nd ed., 1890); *Bad Company* (1886; Eng. trans. by M. Fell, 1916); *The Vagrant and Other Tales* (Eng. trans. by A. Delano, 1887; 2nd ed., 1896); and a delightful autobiographical record, *History of My Contemporary* (1910, 1922).

KORYAKS, also called NYMYLANY in Soviet literature, a Mongoloid people of northeastern Siberia, inhabit the northern part of the Kamchatka peninsula, its isthmus and the adjoining mainland. They are divided into coastal dwellers who fish and breed dogs, and tundra nomads who breed reindeer and hunt.

The Koryaks' religion is animistic and includes the idea of a creator and of a spirit called "Big Raven," the ancestor and protector of Koryaks. (T. E. A.)

KORZYBSKI, ALFRED HABDANK SKARBEK (1879–1950), Polish-U.S scientist and philosopher, founder of general semantics, was born July 3, 1879, in Warsaw of a titled Polish family. He was trained as an engineer at the Polytechnic Institute of Warsaw. During World War I he served in the intelligence department of the Russian army general staff and was wounded in battle. In 1915 he was sent by the Russian government to Canada and the United States to help procure munitions. With the collapse of the tsarist regime in 1917. he remained in the United States to serve as secretary of the French-Polish military mission. A few years later he became a U.S. citizen. Korzybski's first book, *Manhood of Humanity: the Science and Art of Human Engineering* (1921), laid down what he regarded as the basis of his life work, namely, his definition of man as "time-binder."

In one of those rare observations which appear obvious only after they have been made, Korzybski pointed out that human beings are unique among living creatures in that they have the ability, which he called the "time-binding capacity," to transmit information and ideas from generation to generation so that each generation or person can go on from where the last left off. All human culture is the accumulated product of this time-binding capacity, which in turn is the product of man's ability to communicate through the use of symbols, including language. Man-

kind is by nature co-operative; co-operation organized and sustained by linguistic communication is central to all that is characteristically human in human existence.

In the sciences, Korzybski felt that human time-binding capacities were to be seen "at their best"; scientific communication being nonmetaphysical, nondogmatic and efficient, science advances as time goes on. As an instructive contrast, Korzybski undertook also to study human beings "at their worst" by observing, under the guidance of William Alanson White, psychiatric patients at St. Elizabeth's hospital in Washington, D.C., from 1924 to 1926. From this and other study and experiences evolved his best-known (and only other) book, *Science and Sanity: an Introduction to Non-Aristotelian Systems and General Semantics* (1933), on which he worked, mostly in Brooklyn, N.Y., from 1927 to 1933. In this book he presented a critique of traditional assumptions about language and a comparative study of sane and unsane ways of using and reacting to language, which he embodied into a system of linguistic retraining which he called "general semantics."

Training in general semantics, Korzybski stated, would make communications more meaningful, more conducive to co-operative problem solving; it would release men's time-binding capacities—their intellectual potential—now crippled by pathological linguistic habits.

Korzybski taught his system at his Institute of General Semantics, founded in Chicago, Ill., in 1938 and moved in 1946 to Lakeville, Conn. He died at Sharon, Conn., March 1, 1950.

For a fuller description of general semantics, see SEMANTICS, GENERAL. (S. I. H.)

KOS: *see* Cos.

KOSCIUSKO, MOUNT: *see* AUSTRALIAN ALPS.

KOSCIUSZKO, TADEUSZ ANDRZEJ BONAWENTURA (1746–1817), Polish soldier and statesman and American Revolution volunteer, son of Ludwik Kosciuszko, sword-bearer of the palatinate of Brzesc, was born in Mereczowszczyno. On entering the corps of cadets at Warsaw, he attracted the notice of Prince Adam Casimir Czartoryski, by whose influence in 1769 he was sent abroad at the expense of the state to complete his military education. In Germany, Italy and France he studied diligently, completing his course at Brest, where he learnt fortification and naval tactics, returning to Poland in 1774 with the rank of captain of artillery. While engaged in teaching the daughters of the Grand Hetman. Sosnowski of Sosnowica, drawing and mathematics, he fell in love with the youngest of them, Ludwika, with whom he planned to elope, but was wounded and ejected by her father's retainers (1776). His wooing of Tekla Zurowska in 1791 ended little more happily.

In 1776 he entered the army of the United States as a volunteer, and brilliantly distinguished himself! especially at New York and Yorktown. Washington promoted Kosciuszko to the rank of a colonel of artillery and made him his adjutant. His humanity and charm of manner made him moreover one of the most popular of the American officers. In 1783 Kosciuszko was rewarded for his services and his devotion to the cause of American independence with the thanks of Congress, the privilege of American citizenship, a considerable annual pension with landed estates, and the rank of brigadier-general, which he retained in the Polish service.

In the war following upon the proclamation of the constitution of May 3, 1791 *(see* POLAND: *History),* Kosciuszko took a leading part, distinguishing himself as divisional commander at Zielence and Dubienka. When the king acceded to the Targowicians, Kosciuszko with many other Polish generals threw up his commission and retired to Leipzig, which speedily became the centre of the Polish emigration. In Jan. 1793 he visited Paris to attempt to win France for the cause of Poland and the fact that his visit synchronized with the execution of Louis XVI subsequently gave Poland's enemies a plausible pretext for accusing her of Jacobinism, and thus prejudicing Europe against her. On his return to Leipzig, Kosciuszko was invited by the Polish insurgents to take command of the national armies, with dictatorial power. He hesitated at first but when he heard that the insurrection had already broken out, and that the Russian armies were concentrating to crush it, he hastened to Cracow. On March 24, 1794, his arms were consecrated according to ancient custom at the church of the Capuchins, by way of giving the insurrection a religious sanction incompatible with Jacobinism. The same day, amidst a vast concourse of people in the market-place, Kosciuszko took an oath of fidelity to the Polish nation and swore to wage war against the enemies of his country, but protested at the same time that he would fight only for the independence and territorial integrity of Poland.

From March 24–April 1 Kosciuszko remained at Cracow organizing his forces, which were drawn almost entirely from the people and humbler gentry. On April 3 he defeated a superior Russian force at Raclawice, a victory which brought crowds of waverers into his camp. Owing to the poverty and unprepared condition of the country, he had, however, to remain long on the defensive. On June 4 he at last marched against General Denisov, whom he encountered the next day at Szczekociny. Kosciuszko had been at great pains to avoid provoking Austria or Prussia. Nevertheless, Prussian troops had joined the Russian, and Kosciuszko's force of 14,000 was heavily defeated and driven back on Warsaw, with fearful losses. A week later another Polish division was defeated at Kholm; Cracow was taken by the Prussians on the 22nd of June; and the mob at Warsaw broke upon the gaols and murdered the political prisoners. Kosciuszko summarily punished the ringleaders of the massacres and had 10,000 of the rank and file drafted into his camp, which measures had a quieting effect. But now dissensions broke out among the members of the Polish government, and it required all the tact of Kosciuszko to restore order amidst this chaos of suspicions and recriminations. At this very time too he had need of all his ability and resource to meet the external foes of Poland. Superior Russian and Prussian forces invested Warsaw on July 9. Kosciuszko, indeed, conducted the defence of the city with brilliance and success! but elsewhere his generals were outmanoeuvred and defeated in detail by Suvarov. who had advanced to Fersen's support. On Oct. 10 Kosciuszko attacked Fersen at Maciejowice. But the support on which he relied failed to arrive. The Polish army of 7.000 was almost annihilated by the 16,000 Russians; and Kosciuszko, seriously wounded and insensible, was made a prisoner on the field of battle. The long credited story that he cried "Finis Poloniae!" as he fell is a fiction. Kosciuszko was conveyed to Russia, where he remained till the accession of Paul in 1796. On his return on Dec. 19, 1796, he paid a .second visit to the Gnited States. and lived in Philadelphia. Pa.. till May 1798, when he went to Paris. where the First Consul earnestly invited his co-operation against the Allies. But he refused offers even of high command unless Napoleon undertook to give the restoration of Poland a leading place in his plans, and lived in retirement at Berville. near Paris. where the emperor Alexander visited him in 1814. At the congress of Vienna his importunities on behalf of Poland finally wearied Alexander. who preferred to follow the counsels of Czartoryski; and Kosciuszko retired to Solothurn. where he lived with his friend Zeltner. Shortly before his death. on April 2, 1817, he emancipated his serfs, insisting only on the .maintenance of schools on the liberated estates. His remains were carried to Cracow and buried in the cathedral. while the people, reviving an ancient custom, raised a huge mound to his memory near the city.

(R. N. B.; X.)

KOSHER means "fit" or "proper" and is derived from Esth. viii. j. the only biblical instance of the adjective, kosher (Ashkenazic form. with accent shifted colloquially, common in northern Europe) or kasher (Sephardic form. common in southern Europe and the east). Kosher is chiefly used in connection with the dietary laws and implies (1) that the food is not derived from the animals, birds or fish prohibited in Lev. xi or Deut. xiv: (2) that the animals or birds have been slaughtered by cutting the windpipe so as to produce instantaneous loss of consciousness; (3) that the meat has been salted to remove the blood (Deut. xii, 16. 23–2j and elsewhere! after the carcass has been critically examined for physical blemishes, that the ischiatic nerve has been removed (porged) from hindquarters (Gen. xxxii. 32); and (4) that meat and milk have not been cooked together (Exod. xxiii.

19) and that separate utensils have been employed. In consequence of (2) the term *Terefah* (that which has been torn by beasts, Gen. xxxi, 39) is extended to all food violating the law. even, incorrectly. to admixtures of leaven on Passover. though *Kosher la-Pesah*, "fit ior Passover." is fairly correct So-called Kosher wine is prepared under observation to prevent libations to idols and. by Talmudic extension, to avoid handling by non-Jews. This last regulation is presently observed only by the ultra-Orthodox. A relic of Roman days. it once was common to both Judaism and early Christianity. "Kosher" is often used generally of other matters. sometimes as opposed to *Pasul* ("unfit"); *e.g.*, of a scroll of the Law.

In Orthodox Judaism, the dietary laws are considered implications of the Divine command to "be holy" (Lev. xix, 2). but in Reform Judaism their observance has been declared to be unnecessary to the life of piety.

See Jeremiah J. Berman, *Shehitah* (1941); William Elmslie, *Mishnah 'Abodah Zarah* (1911).

KOŠICE (Hungarian KASSA), a city of Czechoslovakia, capital of the region of the same name. lies on the right bank of the Hernád river where it leaves the highlands for the fertile plain. Pop.: (1950) 62,821; (1957 est.) 79.460.

Created a town by King Béla IV of Hungary in 1241, and a royal free tonn by Stephen V in 1290, KoSice became a market place for agricultural produce and a centre of trade between Hungary and Poland Surrounded on three sides by hills covered with forests and vineyards, KoSice consists of an inner town, once walled, and five suburbs, separated from the old town by the site of the dismantled ramparts. The old town is grouped around the Gothic Cathedral of St. Elizabeth (1382–1417). There is also a town hall built in 1756.

, As a second city of Slovakia KoSice was included in Oct. 1918 within the frontier of the new state of Czechoslovakia, and this was recognized by the treaty of Trianon (June 4, 1920). The German-Italian award of Nov. 2, 1938, restored it to Hungary, but after World War II the city became again part of Slovakia. It was captured by the Russian army in Jan. 1945 and on April 3 Pres. Eduard Beneš formed there its first postwar coalition government.

The local industries include manufacture of artificial fertilizers, different kinds of machinery and china. There are also a cloth mill, sawmills and food-processing plants. KoSice lies on an important east-west railway connecting Czechoslovakia with the U.S.S.R. In 1950 a new university and in 1952 a college of engineering were opened there.

KÖSLIN: see KOSZALIN.

KOSSEL, ALBRECHT (1853–1927), German biochemist and Nobel prize winner for physiology and medicine (1910), was born on Sept. 16. 1853, at Rostock. Ger. He was educated at the *Gymnasium* of his native city and at the University of Strasbourg, where he was a pupil of Felix Hcppe-Seyler, one of the pioneers of modern biochemistry. After graduating M.D. in 1878 he worked first under Hoppe-Seyler and then under E. Du Bois Reymond at the Physiological institute in Berlin. In 1895 he became professor of physiology and director of the Physiological institute at Marburg and he held this post until 1901, when he accepted a call to the corresponding chair at Heidelberg. At the time of his death he was emeritus professor of physiology at the University of Heidelberg and director of the Heidelberg Institute for Protein Investigation. For more than 30 years he was editor of the *Zeitschrift für* physiologische Chemie, in which most of his papers appeared. Kossel was one of the first to apply the exact methods of organic chemistry to the elucidation of problems in the chemistry of living tissues. His researches were mainly on the nucleic acids, substances which are concerned in the formation of proteins in the body. In 1910 he was awarded the Nobel prize for physiology and medicine "in recognition of the contributions to the chemistry of the cell made through his work on proteins, including the nucleic substances." He died at Heidelberg on July 5, 1927. (W. J BP.)

KOSSUTH, LAJOS (LOUIS) (1802–1894), Hungarian public official and revolutionary, was born in Monok, Zemplin, on Sept. 19, 1802, of a magyarized Slovak family of the poorer Hungarian nobility. His father was an advocate, and Kossuth, after studying at Sárospatak and Budapest, began his career practising with his father. He moved to Pest, and was appointed by Count Hunyady to be his deputy at the National diet in Pressburg (1825–27, and again in 1832). His letters to his patron (since as deputy he had no vote) were so excellent that they were circulated in manuscript among the Liberal magnates, and soon developed into an organized parliamentary gazette (Orszagyulesi *tudositasok*), of which he was editor. At once his name and influence spread in spite of the efforts of the censorship to prevent circulation of the letters. In 1836 the diet was dissolved. Kossuth continued the agitation by reporting in letter form the debates of the county assemblies. In May 1837, Kossuth with Weszelenyi and several others, were arrested on a charge of high treason. After spending a year in prison at Ofen (Buda), he was tried and condemned to four more years' imprisonment. His arrest had caused great indignation. The diet of 1839 supported the agitation for the release of the prisoners, and refused to pass any government measures; Metternich long remained obdurate, but the danger of war in 1840 obliged him to give way. Immediately after his release Kossuth married Teresa Meszleny, a Roman Catholic. It was the refusal of the Catholic priests to bless their union that first prompted Kossuth to take up the defense of mixed marriages.

He had now become a popular leader, and as soon as his health was restored was appointed (Jan. 1841) editor of the *Pesti Hirlap*, the newly founded organ of the party. which had an unprecedented success. Szechenyi's warning that by his appeal to the passions of the people he was leading the nation to revolution was neglected. Kossuth, indeed, was not content with advocating those reforms—the abolition of entail, the abolition of feudal burdens. taxation of the nobles—which were demanded by all the Liberals. He attacked Austria violently, and fostered Magyar chauvinism by his contemptuous denial of the rights of Hungary's Slavonic inhabitants. At last, in 1844, the government succeeded in breaking his connection with the paper. He then applied for permission to start a paper of his own. In a personal interview Metternich offered to take him into the government service. The offer was refused, and for three years he was without a regular position. He continued the agitation with the object of attaining both the political and commercial independence of Hungary. In the autumn of 1847, supported by the influence of Louis Batthyany, he was elected member for Budapest in the new diet, and at once became chief leader of the Extreme Liberals. The wiser heads distrusted his ambition and egoism, but his impassioned eloquence secured him immense influence.

On March 3, 1848, as soon as the news of the revolution in Paris arrived, in a speech of surpassing power he demanded parliamentary government for Hungary and constitutional government for the rest of Austria. appealing to "our beloved Archduke Francis Joseph," to perpetuate the ancient glory of the dynasty by meeting halfway the aspirations of a free people. He at once became the leader of the European revolution; his speech was read aloud in the streets of Vienna to the crowd by which Metternich was overthrown (March 13). Batthyany, who formed the first responsible ministry, could not refuse to admit Kossuth. but gave him the inoffensive post of ministry of finance. Kossuth, however, was irrepressible. He established a separate Hungarian coinage—as always, using every means to increase the national self-consciousness, and it was characteristic that on the new Hungarian notes which he issued his own name was the most prominent inscription. On July 3 he began to issue his own organ, the Kossuth *Hirlapia*. On July 11, as the danger of intervention from Austria and Croatia increased, Kossuth demanded that the nation arise in self-defense. When Jellačič (*q.v.*) advanced on Budapest, Kossuth went from town to town rousing the people to the defense of the country, and the popular force of the *Honved* was his creation. When Batthyany resigned (Sept. 11) he was appointed with Szemere to carry on the government provisionally, and at the end of September he was made president of the committee of national defense. From this time he was in fact, if not in name, dictator, although his control over the Hungarian forces was imperfect, largely owing to personal friction between Kossuth

and the commanders. His energy and spirit were dauntless, even after the new emperor, Francis Joseph, had revoked his predecessor's concessions and proclaimed Kossuth a traitor. When Windischgratz advanced into Hungary (Dec. 15), Kossuth and the diet retired to Debrecsen. taking with them the holy regalia of St. Stephen.

The spring brought success to the Hungarian arms, and on April 19, 1849. Kossuth issued his famous declaration of independence, declaring that "the house of Habsburg-Lorraine, perjured in the sight of God and man, had forfeited the Hungarian throne." Kossuth himself was now elected dictator; but this extreme step by no means commanded universal assent in Hungary where he was nidely accused of aiming at the throne as well as ruining his country by precipitating the Russian intervention. On Aug. 11 Kossuth abdicated in favour of Gbrgei, on the ground that in the last extremity the general alone could save the nation. Two days later Gbrgei capitulated at Világos.

Kossuth fled to Turkey, which, supported by Great Britain, refused to extradite him, interning him honourably in Vidin, Shumla and Kutahia, Asia Minor. There he was joined by his children, who had been confined at Pressburg; his nife (a price had been set on her head) had joined him earlier, having escaped in disguise. In Sept. 1851 he was liberated and embarked on an American man-of-war. At Marseilles he received an enthusiastic welcome from the people, but the prince-president refused to allow him to cross France. On Oct. 23 he landed at Southampton and spent three weeks in England. where he was the object of extraordinary enthusiasm. In the United States his reception was equally enthusiastic. Other Hungarian exiles protested against his claim to be the one national hero of the revolution, and accused him of arrogance, cowardice and duplicity. He soon returned to England, where he lived for eight years in close connection with Mazzini, by whom with some misgiving, he was persuaded to join the Revolutionary committee.

Quarrels of a kind only too common among exiles followed; the Hungarians were especially offended by his claim still to be called governor. An attempt to organize a Hungarian legion during the Crimean War was stopped; but in 1859, he entered into negotiations with Napoleon, left England for Italy, and began the organization of a Hungarian legion, which was to make a descent on the coast of Dalmatia. The peace of Villafranca made this impossible. From that time he resided in Italy, refusing to reconcile himself with the new regime, or to avail himself of the amnesty. and, though elected to the diet of 1867, never took his seat. In later years, with tardy wisdom, he advocated a federation of Danubian nationalities, thus reversing the policy of savage tolerance which had proved so fatal in 1848. 4 law of 1879, which deprived of citizenship all Hungarians who had voluntarily been absent ten years, was a bitter blow to him. He died in Turin, Italy, on March 20. 1894 and was buried at Pest

Many points in Kossuth's career and character will probably always remain the subject of controversy. His complete uorks uere published in Hungarian at Budapest in 1880–95. The fullest account of the revolution is given in Helfert, *Geschichte Oesterreichs* (Leipzig, 1869, etc), representing the Austrian view, which may be compared with that of C. Gracza, *History of the Hungarian War of Independence, 1848–1849* (in Hungarian) (Budapest, 1894). *See* also Szemere. *Politische Charakterskzzzen: III Kossuth* (Hamburg, 1853); Louis Kossuth, *Memoirs of* My *Exile* (1880), Pulszky, *Meine Zeit, mein Leben* (Pressburg, 1880); *A.* Somogyi, *Ludwig Kossuth* (1894)

KOSTER or COSTER. **LAURENS** (c. 1370–1440), Dutch printer, uhose claims to be considered at least one of the inventors of the art (see TYPOGRAPHY) have been recognized by many investigators. His real name was Laurens Janssoen — Koster (*i.e.,* sacristan) being merely the title which he bore as an official of the great parish church of Haarlem. We find him mentioned several times between 1417 and 1434 as a member of the great council, as an assessor (scabinus), and as the city treasurer. He probably perished in the plague that visited Haarlem in 1439–40; his widow is mentioned in the latter year. His descendants, through his daughter Lucia, can be traced down to 1724.

KOSTROMA, a city and region or obiast of the Russian Soviet Federated Socialist Republic. Formerly a government of tsarist Russia, it was later absorbed into the Yaroslavl oblast and during World War II was ma'de a separate region. Area, 22 703 sqmi. Forests cover much of the area. The soil is mainly sandy and clayey and the climate is severe. Average January temperature is −13.3° F.. July 64.5° F.; frosts of −22° F. are often recorded in January and the rivers are frozen for 150 to 160 days a year.

Agriculture was developed on intensive lines with greater rotation of crops, better fertilizing and the sowing of grasses and lucerne. Crops include rye, oats, barley, potatoes, grass, wheat, flax and vegetables. In the 18th century local flax was worked into linen for export, but the mass production of cheap cotton goods in western Europe in the latter half of the 19th century caused the industry to decline. The villages and towns are small. Peasant industries include textiles and felt, especially for boots, the making of wooden articles, pitch and tar, the preparation of dried vegetables, especially cabbage, and other foodstuffs, the making of household implements and distilling and breu-ing. There is some hunting and fishing.

The railway net is poor and many of the rivers are not navigable for steamers; in years of low water, navigation has been suspended on the Volga during July and August, thus curtailing the already short season. The Volga flows for a short distance through the southwest of the region; its tributary, the Kostroma, lies entirely in the Kostroma region. flowing from north to south near the western boundary. The upper course of the Unzha, another tributary of the Volga. is included near the eastern boundary. Roads are poor, and nonexistent in many parts; during autumn many become impassable bogs.

KOSTROMA, the chief town and capital of Kostroma oblast, stands on the left bank of the Volga, at the mouth of the navigable Kostroma. with suburbs on the opposite side of the Volga, in 57° 45′ N.. 40° 58′ E. Pop. (1956) 156,000. Its glittering gilded cupolas make it a conspicuous feature in the landscape as it climbs up the terraced river bank. It was founded in 11j2. Its fort was often the refuge of the princes of Moscow during war. but the town was plundered more than once by the Tatars. The cathedral, built in 1239 and rebuilt in 1773, is situated in the *kreml,* or citadel. and is a fine monument of old Russian architecture.

In the centre of the town a monument was erected in honour of the peasant Ivan Susanin who saved the life of Tsar Michael Fedeorovich by leading the Poles astray in the forest. On the opposite bank of the Volga, close to the water's edge the monastery of Ipatiyev (founded in 1330) was built. uith a cathedral dating from 1586. both associated with the election of Tsar Michael (1669). Kostroma has been renowned since the 16th century for its linen, which was formerly exported to the Netherlands. It has sawmills and flour mills, and manufactures reels and spools, linen clothing. footwear. makhorka tobacco and wooden wares.

KOSZALIN (German KÖSLIN), a city of Poland, lying 6 mi. from the Baltic, halfway between Szczecin (Stettin) and Gdańsk (Danzig). Pop. (1939) 33,479; (1950) 18,900; (1956 est.) 37,400. Area 24.7 sq.mi.

Koszalin was founded about 1188 in the Slavonic duchy of Pomorze (Pomerania) and was raised to the rank of a city in 1266. It became fortified in 1284. A Gothic Church of Our Lady was built in the 14th century. When in 1648 Pomorze was divided between Saeden and Brandenburg Koszalin fell to the latter. It suffered in several wars and in 1720 was burned down. It was severely damaged in 1945 because it was defended by the Germans as a "hedgehog" position. The Russians captured the city on March 6. It became part of Poland on Aug. 2, 1945, and the remainder of its German population was later transferred west to the Oder-Neisse frontier. On June 1, 1950, it became the chief town of a new Polish province of the same name. By the mid-1950s the rebuilding of the city had made considerable progress and its population was larger than before World War II. Koszalin is linked by rail and road with both Szczecin and Gdansk. A good road links it with Poznan. The local industries include the manufacture of cement, agricultural machinery, and bricks and tiles. There are also food-processing plants.

KOSZEG, a Hungarian town, near the Austrian frontier, in the county of Vas, on the eastern slopes of Irottko (2.897 ft.) near their passage to the plain of the Raab. The hills around are extensively planted on their lower slopes with fruit trees

and vineyards, while sheep are pastured on the higher grounds. A flourishing trade is carried on in fruit and wine, and sawmills, woolen factories and breweries are other activities. The town is noted for its successful resistance to Turkish attacks, checking the advance toward Vienna in 1532.

Pop. (1960) 9,818 (mun.).

KOSZTOLÁNYI, DEZSÖ (1885–1936), the greatest impressionist in Hungarian literature, was born on March 29, 1885, at Szabadka, the son of a headmaster. He studied at the University of Budapest, intending to teach, but became a journalist, joined the circle of the literary magazine *Nyugat* and published his first volume of poetry in 1907. He won general recognition in 1910 with the publication of a cycle of poems, *A szegény kisgycrmek panaszai,* a small boy's subtle and moving impressions of his surroundings. He died in Budapest on Nov. 3, 1936.

Kosztolányi's sensitivity to experience and mastery of expression enabled him to write poetry of great lucidity and deceptive simplicity. A sympathetic observer of human frailty, with a gentle humour and a penchant for the macabre, he was an accomplished short-story writer.

Kosztolányi also wrote several novels: the story of a servant girl, *Édes Anna* (1926?; Eng. trans., *Wonder Maid,* 1947) is perhaps the best. As a translator of poetry he was outstanding. In his later years, he paid much attention to the preservation of the purity of Hungarian. Kosztolányi showed little interest in what others considered the major problems of his time: for him the poet was the "soldier of castles in Spain," the guardian of beauty, civilization and humanity. (Ds. Sr.)

KOTA, one of the indigenous, Dravidian-speaking peoples of the Nilgiri hills in the south of India. They live in seven villages totaling about 1,100 inhabitants at mid-20th century, and interspersed among settlements of the other Nilgiri peoples! Badagas and Todas. A village has two or three streets, each inhabited by the members of a single patrilineal clan. Most adult Kotas also speak Tamil, another Dravidian tongue.

They were traditionally artisans and musicians. Each Kota family was associated with a number of Badaga and Toda families for whom they provided metal tools, wooden implements and pots. They also furnished the music necessary for the ceremonies of their neighbours. From its associated families the Kota family received a share of grain from the Badaga harvest and some dairy products from the Todas. Kotas also co-operated with the jungle-dwelling Kurumbas, who provided jungle products and magical protection.

Because Kotas handled animal carcasses and had other menial occupations, their neighbours considered them to be of inferior rank. But the Kotas were not oppressed by this opinion. If they felt aggrieved in their relations with the others, they would boycott them. Kotas could do without Badaga grain for a time because they had land and farmed it, but the other groups felt the need of Kota tools and music. A compromise usually was effected in such cases, and the normal intergroup relations resumed.

Aboriginal Kota religion entails a family trinity of two brother deities and the goddess-wife of the elder. Each deity has a priest and a diviner in every village. The diviner becomes possessed on appropriate occasions and speaks with the voice of the god.

After 1930 the traditional interdependence among the Nilgiri groups was abandoned and only a few Kota families continue to supply tools and music. Kota livelihood is mainly from the cultivation of grain and potatoes. Their traditional religion, ceremonies and social organization are carried on, but are increasingly changing in the direction of village practices as observed among Tamil and Kanarese-speaking peoples of the nearby plains.

See M. B. Emeneau, Kota *Texts* (1944–46); D. G. Mandelbaum, "The World and the World View of the Kota," *Village India,* ed. by M. Marriott (1955). (D. G. M.)

KOTAH, a town and district of Rajasthan, India. The town is on the right bank of the Chambal, 120 mi. S. of Jaipur and 250 mi. S.S.W. of Delhi. Pop. (1961) 119,845. It is surrounded and also divided into three parts by massive walls, and contains an old and a new palace and a number of fine temples, besides modern schools and hospitals. Muslins are the chief manufacture.

Kotah District has an area of 4,794 sq.mi.; pop. (1961) 847,424. The country slopes gently northward from the high tableland of Malwa, and is drained by the Chambal and its trihutaries, all flowing in a northerly or northeasterly direction. The Mukandwara range. from 1.200 to 1,500 ft. above sea level, runs from southeast to northwest. The Mukandwara pass through these hills, in the neighbourhood of the highest peak (1,502 ft.), was made memorable by the passage of Col. William Monson's army on its disastrous retreat before the Mahratta leader Jaswant Rao Holkar in 1804. The chief articles of export are grains.

Kotah State, to which the present district corresponds, was subject to the Eastern Rajputana States subagency of the Rajputana agency under British paramountcy; it was merged into Rajasthan on March 25, 1948. The state was an offshoot of Bundi state (*q.v.*), having been given about 1625 to a younger son of the Bundi raja by the emperor Shah Jahan in return for services rendered when the latter was in revolt against his father Jahangir. In 1897 much of the area taken in 1838 to form Jhalawar (*q.v.*) was restored to Kotah. The ruling prince of the state was entitled *maharao.*

KÖTHEN, a city of Germany which after partition of the nation following World War II became a regional capital in the *Bezirk* of Halle of the German Democratic Republic, is about 50 km. (31 mi.) N. of Halle and 60 km. (37 mi.) S.S.E. of Magdeburg. Pop. (1959 est.) 37,513. It is a railway junction on the main line between Halle and Magdeburg. There are heavy engineering, boiler and apparatus factories, and the fertile surroundings are a part of the largest sugar beet area in the German Democratic Republic. A chemical training school and a teacher training institute are in Köthen. Kothen was mentioned in the chronicles for the first time in 1115. The well-planned market settlement was granted a municipal charter in 1200.

KOTKA, a seaport of Finland, on an island of the same name, in Kymi *lääni* (county), at the mouth of the Kymmene river. Pop. (1959 est.) 29,634. The chief imports are coal, machinery and iron and the exports timber and wood pulp. There are three harbours, Kotka proper, West and East.

KOTLAS, a town in the Archangel *oblast* of the Russian S.F.S.R., U.S.S.R., on the right bank of the North Dvina, 3 mi. S. of its confluence with the Vychegda. Pop. (1959) 39,200. It grew rapidly after the railway reached it. Kotlas is the head of navigation at low water, and has steamer-building workshops and steam flourmills, wharves. grain elevators, an electric plant and a radio station, Much Siberian grain is unloaded there for water transport:

KOTRI, a municipality and *taluka* in Dadu district, Hyderabad division. West Pakistan. The town (pop. [1951] 15,154) is an important rail centre on the right bank of the Indus. A railway bridge connects it with Hyderabad, former provincial capital, on the opposite bank. Kotri *taluka* had a population in 1951 of 49,109. Area 1,419 sq.mi. In the mid-1950s the Lower Sind or Kotri barrage was being constructed on the Indus 4½ mi. above Kotri. It was designed to irrigate 2,800,000 ac. of land and to generate hydroelectricity. The project involved the formation of a lake 20 mi. long and 45 sq.mi. in area.

KOTZEBUE, AUGUST FRIEDRICH FERDINAND VON (1761–1819), German dramatist, was born on May 3, 1761, at Weimar. In 1780 he completed his legal course at Duisburg, and was admitted an advocate. Through the influence of the Prussian ambassador at the Russian court, he entered the Russian service, and rose to be assessor to the high court of appeal in Reval. He was ennobled in 1785, and became president of the magistracy of the province of Estonia. In Reval he wrote the novels, *Die Leiden der Ortenbergischen Familie* (1785) and *Geschichte meines Vaters* (1788), and the plays *Adelheid von Wulfingen* (1789), *Menschenhass und Reue* (1790) and *Die Indianer in England* (1790). Kotzebue retired from the Russian service, and lived for a time in Paris and Mainz; he then settled in 1795 on his estate near Reval. Within a few years he published six volumes of miscellaneous sketches and stories, *Die jüngsten Kinder meiner Laune* (1793–96), and more than 20 plays, the majority of which were translated into several European languages. He was for a short time dramatist to the court theatre

in Vienna, and then returned to his native town, but as he was not on good terms with Goethe, and had openly attacked the romantic school, his position in Weimar was not a pleasant one, He was returning to St. Petersburg, when he was, for some unknown reason, arrested at the frontier and transported to Siberia. Fortunately he had written a comedy which flattered the vanity of the emperor Paul I.; he was recalled, and presented with an estate from the crown lands of Livonia, and made director of the German theatre in St. Petersburg. He returned to Weimar when the emperor Paul died, but found it as impossible as ever to gain a footing there and turned his steps to Berlin, where in association with Garlieb Merkel (1769–1850) he edited *Der Freimütige* (1803–07) and began his *Almanach dramatischer Spiele* (1803–20). Towards the end of 1806 he was once more in Russia; as councillor of state he was attached in 1816 to the department for foreign affairs in St. Petersburg, and in 1817 went to Germany as a kind of spy in the service of Russia, with a salary of 15,000 roubles. In a weekly journal (*Literarisches Wochenblatt*) which he published in Weimar he scoffed at the pretensions of those Germans who demanded free institutions, and was obliged to move to Mannheim. He was especially detested by the young enthusiasts for liberty, and one of them, Karl Ludwig Sand, a theological student, stabbed him, in Mannheim, on March 23, 1819. Sand was executed, and the government made his crime an excuse for placing the universities under strict supervision.

Besides his plays, Kotzebue wrote several historical works, which, however, are too one-sided and prejudiced to have much value. Of more interest are his autobiographical writings, *Meine Flucht nach Paris im Winter 1790* (1791), *Uber meinen Aufenthalt in Wien* (1799), *Das merkwürdigste Jahr meines Lebens* (1801), *Erinnerungen aus Paris* (1804), and *Erinnerungen von meiner Reise aus Liefland nach Rom und Neapel* (1805). As a dramatist he was extraordinarily prolific, his plays numbering over 200; his popularity, not merely on the German, but on the European stage, was unprecedented. Kotzebue possessed an extraordinary facility in the invention of effective situations, and an unerring instinct for the theatre. Kotzebue is to be seen to best advantage in his comedies, such as *Der Wildfang*, *Die beiden Klingsberg* and *Die deutschen Kleinstädter*, which contain admirable genre pictures of German life. These plays held the stage in Germany long after the once famous *Menschenhass und Reue* (known in England as *The Stranger*), *Graf Benjowsky*, or ambitious exotic tragedies like *Die Sonnenjungfrau* and *Die Spanier in Peru* (which Sheridan adapted as *Pizarro*) were forgotten.

Two collections of Kotzebue's dramas were published during his lifetime: *Schauspiele* (5 vols., 1797); *Neue Schauspiele* (23 vols., 1798–1820). His *Sämtliche dramatische Werke* appeared in 44 vols., in 1827–29, and again, under the title *Theater*, in 40 vols., in 1840–41. A selection of his plays in 10 vols. appeared at Leipzig in 1867–68. *See* also H. Döring, *A. von Kotzebues Leben* (1830); W. von Kotzebue, *A. von Kotzebue* (1881); Ch. Rabany, *Kotzebue, sa vie et son temps* (1893); W. Sellier, *Kotzebue in England* (1901).

KOTZEBUE, OTTO VON (1787–1846), Russian navigator, who commanded two voyages of circumnavigation, was born at Reval (Tallin) on Dec. 30, 1787, the second son of August von Kotzebue (*q.v.*). He accompanied Adam Ivan Krusenstern (*q.v.*) on his voyage of 1803–06. From 1815 to 1818 Kotzebue led an expedition in the brig "Rurik." Entering the Pacific at Cape Horn he visited Easter Island and the Tuomotu archipelago, where a number of islands were discovered, charted a large part of the coast of Alaska and discovered Kotzebue sound; then finding he could not return to the Atlantic through the Arctic, he visited the Marshall Islands on his way back to Europe. He brought home a large collection of previously unknown plants and much new ethnological information. The physicist H. F. E. Lenz accompanied him on his second voyage in 1823–26 and carried out valuable oceanographic researches. His most important discoveries were several islands in the Society and Marshall groups. Kotzebue died at Reval on Feb. 15, 1846.

There are English translations of both Kotzebue's narratives: *A Voyage of Discovery into the South Sea and Bering's Straits for the purpose of exploring a North-East Passage . . . 1815–1818*, 3 vol. (1821), and *A New Voyage Round the World. . . 1823–1826* (1830). (A. M. F.)

KOUMISS: *see* KUMISS.

KOUMOUNDOUROS, ALEXANDROS (1814–1883), Greek statesman, whose name is commonly spelled Coumoundouros, was born in 1814. He took part in the Cretan insurrection of 1841, and was elected to the chamber in 1851, of which he became president in 1854, minister of finance in 1856, and again in 1857 and 1859. He adhered to the moderate wing of the Liberal party until the revolution of 1862 and the dethronement of King Otto, when he was minister of justice in the provincial government. He was twice minister of the interior under Kanaris, in 1864 and in 1865. In March 1865 he became prime minister, and he formed several subsequent administrations in the intervals of the ascendancy of Tricoupis. During the Cretan insurrection of 1866–68 he made warlike preparations against Turkey, but was dismissed by King George, who recognized that Greece could not act without the support of the Powers. He was again premier at the time of the insurrection in Thessaly in Jan. 1878 and, supported by Delyanni as minister of foreign affairs, he sent troops to help the insurgents against Turkey. In Oct. 1880 the fall of the Tricoupis ministry restored him to power, when he resumed his warlike policy, but repeated appeals to the courts of Europe yielded little practical result, and Koumoundouros was obliged to reduce his territorial demands and to accept the limited cessions in Thessaly and Epirus, which were carried out in July 1881. His ministry was overturned in 1882 by the new Thessalian deputies, who were dissatisfied with the administrative arrangements of the new province. He died at Athens on March 9, 1883.

KOUSSEVITZKY (KUSSEVITSKY), **SERGHEY** (SERGEI, SERGE) **ALEXANDROVITCH** (1874–1951), Russian conductor, was born on July 26, 1874, at Vishni Volochek, Tver, Russia. He learned to play the double bass before he was nine, and after studying at the Moscow Philharmonic music school and playing in the Imperial orchestra, gained a European reputation as a solo player. In 1907 he made his debut as a conductor in Berlin, where he had studied for a time with Arthur Nikisch, and in 1910 formed his own orchestra, with which he toured Russia. He had already (1909) founded a music publishing firm with the aim of encouraging young composers. His energy, fire and feeling for rhythm made him an outstanding interpreter of such composers as Scriabin, Stravinsky and Mussorgsky; he also excelled in conveying the grandeur of Beethoven and Sibelius.

After the Revolution, Koussevitzky was appointed director of the Russian State Symphony orchestra and of the Moscow Grand Opera, but in 1921 he moved to Paris, where he again founded his own orchestra. He remained its regular conductor until 1928, although in 1924 he had become conductor of the Boston Symphony orchestra, which, under him, became famous for its vigorous and sympathetic performances of modern music. He retired in 1949 and died in Boston on June 4, 1951.

KOVALEVSKI, ALEKSANDR ONUFRIEVICH (1840–1901), Russian zoologist, founder of comparative embryology and experimental histology, was born on Nov. 19 (new style; Nov. 7, old style), 1840, at Shustyanka, near Dvinsk (now Daugavpils, Latvia). He studied at the University of St. Petersburg, taking the doctor of science degree in 1867. Kovalevski's scientific activities alternated between teaching — as professor of zoology in the universities of St. Petersburg (1867, 1891–93), Kazan (1868–69), Kiev (1869–74) and Odessa (1874–go) — and prolonged expeditions to the Mediterranean coasts and the Red sea. Kovalevski established for the first time the existence of a common pattern in the development of all multicellular animals, thereby providing important evidence of the evolution of living organisms, as shown in his works on the *Development of Amphioxus lanceolatus* (1865) and *Anatomy and Development of Phoronis* (1887). He also demonstrated the homology of their embryonic layers. His most important work on this subject was *Embryological Investigations on Worms and Arthropods* (1871). In a series of investigations on the development of flies (1886–87) Kovalevski demonstrated the role played by phagocytes in the histolysis taking place in the course of their metamorphosis.

Kovalevski's achievements were recognized by his election to the Russian Academy of Sciences (1890). He died on Nov. 22

(S.S.; Nov. 9, O.S.), 1901, in St. Petersburg. The mathematician Sonya Kovalevski (*q.v.*) was his sister-in-law.

See (both in Russian) V. A. Dogiel, "A. O. Kovalevski and His Signiticance in World Science," *Vestnik Akad. Nauk S.S.S.R.*, 11, p. 57 (1956); B. N. Mazurmovich and I. K. Shulga, *Eminent Russian Zoologists* (1955). (C. A. HE.)

KOVALEVSKI, SONYA (SOPHIE) (1850–1891). Russian mathematician and novelist. was born at Moscow on Jan. 15, 1850, the daughter of a general of artillery, Korvina-Krukovsky. In 1868 she married a young paleontologist, Vladimir Kovalevski, and the two went to Germany to continue their studies. In 1869 she went to Heidelberg where she studied under Helmholtz and others; and in the period 1871–74 she read privately with Karl Weierstrass at Berlin. as the public lectures were then not open to women. In 1874 the University of Gottingen granted her a degree *in absentia* for a thesis on partial differential equations, one of her most remarkable works. She returned to Russia. Later, she accepted an invitation to become lecturer at the University of Stockholm. In 1889 she was appointed professor, at the instance of M. G. Mittag-Leffler, also a pupil of Weierstrass. In 1888 she achieved her greatest scientific success by being awarded the Prix Borodin of the French Academy for a paper on the rotation of a solid body round a fixed point. So remarkable was this work that the value of the prize was doubled. She died in Stockholm, Feb. 10, 1891. at the height of her fame, shortly after her election to the St. Petersburg Academy of Science. Madame Kovalevski also gained a considerable reputation as a writer; best known are her novels: *The Sisters Rajevski* and *Vera Vorontzoff*, depicting life in Russia.

BIBLIOGRAPHY.—Her scientific works were published by the Akad. Nauk S.S.S.R. (1948). *See* also *Sonja Kovalevsky, Her Recollections of Childhood*, Eng. trans. by I. F. Hapgood, with a biography by Anna Leffler (1895); G. von Hoyer, *Sonja Kowaleswki, Leben und Liebe einer gelehrten Frau* (1950). (O. OE.)

KOVROV, a town of the Russian Soviet Federated Socialist Republic. U.S.S.R., in the *oblast* of Yladimir, in latitude 56° 24' N., longitude 41° 20' E. It is on the Klyazma river and is a railway junction. Pop. (1959) 100.000. It has railway workshops, iron and copper foundries, timber mills and cotton and woolen mills, and has a civic electricity and water supply. Limestone is quarried in the district.

KOXINGA (CHENG CH'ENG-KUNG) (1624–1662), Chinese general. was born in 1624 in Hirado. Jap., the son of a Chinese father and a Japanese mother. His father, a Fukienese, had gained great wealth from commerce and piracy. In 1645, following the Manchu capture of Nanking, a Ming dynasty pretender, the prince of T'ang, established his court in Fukien. Because of Cheng's support of the pretender. the Ming imperial surname was conferred on him. Popularly. he was called Kuo-hsing-yeh, "Lord of the Imperial Surname," from which the Dutch derived "Koxinga." Cheng continued to profess pro-Ming sympathies throughout his life. although his actions were undoubtedly largely motivated by personal ambition. Holding a portion of Fukien throughout the 1650s, he continuously fought the Manchus, and refused their generous surrender offers. In 1661 Cheng invaded Taiwan (Formosa) and eventually expelled the Dutch. Beset by personal and political difficulties, he died June 23, 1662, apparently a suicide. (JA. B. P.)

KOZHIKODE (formerly CALICUT), headquarters of Kozhikode district in Kerala state. India. lies on the Malabar coast 414 mi. W.S.W. of Madras by rail. Pop. (1951 census) 158.724. Calicut's historic fame for cotton weaving is reflected in the name calico. The place was an early focus of Arab traders. who first settled there in the 7th century. Their descendants together with numerous local converts to Islam constitute the Moplahs. The Portuguese explorer Vasco da Gama reached Kozhikode in 1498. but the first Portuguese attempts to found a trading post were thwarted by the Moplahs and the zamorin, or local chief. In 1511 peace was concluded and a fortified post was built. which the Portueuese abandoned in 1525. An English expedition visited Kozhikode in 1615. but not until 1664 did the East India compsny found a trading establishment there. The French followed suit in 1698 and the Danes in 1752. Haidar Ali captured the town in 1765 and destroyed it. In 1782 his troops were driven out, but it was reconquered in 1788 by his son Tippu, who brutally deported the inhabitants to Beypore, 6 mi. S. In 1790 the British occupied Kozhikode and it passed into British hands by treaty in 1792, when the inhabitants returned and rebuilt the city.

The port has poor facilities and it is practically closed during the monsoon; ships must lie 3 mi. offshore at other seasons. Nevertheless. at the mouth of the Kallayi river, just south of the town, is located one of the largest timber depots in India. Besides coconut products, Kozhikode exports pepper, ginger, coffee, tea and other crops. Its industries include sawmills, tile manufacturing, coffee curing and hosiery works, the last established by the interdenominational Basel Mission society, whose activities there ceased on the outbreak of World War I An important educational centre, Kozhikode has three arts and science colleges (one exclusively for women), a medical and a teacher-training college and a marine biological research institute.

KOZHIKODE DISTRICT, pop. (1961) 2,619,283, area 2,042 sq.mi., was formed in 1956 from the Malabar district of Madras and consists of the *talukas* of Badagara, Ernad, Kozhikode, Quilandy, South Wynad and Tirur. The chief occupations are the cultivation of rice and the processing of coconut and forest products. (G. KN.)

KPELLE, a dark-skinned, well-proportioned patrilineal people of medium stature who practise ornamental scarification, occupying the upper Nuon and upper St. Paul country on the borders of French Guinea and Liberia. They speak Mande-fu, a language related to Toma and Gbandi, and live in federated villages under a paramount chief, with extended family groups having goods in common and administered by the patriarch and elders. There is individual ownership of personal possessions for both men and women No characteristic marriage customs or prohibitions exist. Inheritance of the family property goes to the brother of the deceased, whom failing, to the son or cousin on the father's side. Personal possessions go to the son; a woman's personal possessions sometimes go to her family. There are age classes of political importance regulated by initiation into the secret societies *(Poro [see* PURRAH] for the men, *Sande* for the women) The Kpelle are engaged in cultivation. arboriculture (palm and kola) hunting and fishing

Industry is fairly well developed. Their religion is animist, and there are traces of totemism. The dead are buried in special localities in which members of a family are all grouped together

KRAEPELIN, EMIL (1856–1926). German psychiatrist, considered by many to be the founder of psychiatry. was born at Neustrelitz. Mecklenburg, on Feb 15, 1856. and studied at Würzburg. Munich and Leipzig He held teaching positions in Dorpat and Heidelberg and finally at Munich, where he founded a research institute in 1917 Perhaps his outstanding contribution was his minute attention to the description of psychiatric entities and the course of their development. The successive editions of his *Textbook* of *Psychiatry* (first published in 1883; 8th ed., 1915) really present a history of psychiatry. Kraepelin interested himself in a wide variety of problems: he devised with Oehrn a series of tests by nhich he attempted to separate mental capacities into the four components perception. memory, association and motor functions; comparative psychiatry came under his scrutiny as a result of world travel; his work in criminology formed the basis for many modern conceptions concerning the relation of criminality to mental disease.

Throughout his career Kraepelin investigated manic-depressive insanity. He originally differentiated six states of depression: melancholia simplex. stupor. melancholia gravis, paranoid melancholia, fantastic melancholia and delirious melancholia. In addition he recognized four mixed states: depressed mania, agitated depression, depression with flight of ideas and partial inhibition. He finally concluded that these all belonged to the single entity of manic-depressive insanity. He died Oct. 7. 1926, at Munich. (R. M. D.)

KRAFFT-EBING, RICHARD, BARON VON (1840–1902). German neuropsychiatrist, best known for his work in sexual psychopathology. was born Aug. 14, 1840, at Mannheim and was

educated in Germany and Switzerland. Although he was a student of psychology, the direction of his interests was primarily in the field of medicine and psychiatry. At the age of 32 he was appointed professor of psychiatry at Strasbourg, and subsequently he occupied similar positions at Graz and Vienna (1889). His interests. like those of many other German scientists, were broad: his clinical observations in psychiatry are noteworthy; he was interested in the genetic functions in insanity and in sexual deviation; he investigated epilepsy, paralysis agitans and hemicrania; he established the relationship between syphilis and general paralysis: and he performed experiments in hypnosis.

Krafft-Ebing's books on criminal psychology, psychiatry and forensic psychopathology went through numerous editions, and a number have been translated into English Best-known of his works are *Uber* gesunde und kranke *Nerven* (1903), Psychopathia *Sexualis* (1886) and Lehrbuch der *Psychiatrie* auf *klinischer Grundlage* (1879).

Krafft-Ebing died on Dec. 22. 1902, near Graz. (R. M. D.)

KRAFT (KRAFFT), ADAM (c. 1435–1509), German sculptor of the Nurnberg school. was born about the middle of the 15th century, probably at Nürnberg, and died at Schwabach in 1509. He seems to have emerged as sculptor about 1490, the date of the seven reliefs of scenes from the life of Christ which, like almost every other specimen of his work, are at Nurnberg. The date of his last work, an Entombment, with life-size figures, in the Holzschuher chapel of St. John's cemetery, is 1507. Besides these, Kraft produced the great Schreyer monument (1492) for St. Sebald's at Niirnberg, a skillful though mannered piece of sculpture opposite the Rathaus, with realistic figures in the costume of the time; Christ bearing the Cross, above the altar of the same church; and various works made for public and private buildings, as the relief over the door of the Wagehaus. a St. George and the Dragon, several Madonnas and some purely decorative pieces, as coats of arms. His masterpiece is perhaps the magnificent tabernacle, 62 ft. high, in the church of St. Laurence (1493–1500).

KRAGUJEVAC, the capital of a department of Serbia, Yugos. Pop. (1961) 44,271. It is situated on a tributary of the Morava. On the opposite bank stands the picturesque hamlet of Obilichevo, with a government powder factory and saddlery establishment. Kragujevac is the main arsenal of Serbia and is largely garrisoned. It is a training centre for infantry officers. The town boasts the finest college building and the finest modern cathedral (in Byzantine style) in Serbia, and has also a hospital, a secondary school, a Gymnasium, a girls' school and an excellent library. It is the seat of a prefecture and tribunal. In the first years of Serbia's autonomy under Prince Milosh (1818–39) Kragujevac was the capital and was taken from the Turks in the rebellion of 1835. The whitewashed shed, which served as Serbia's first parliament house, is still to be seen. The town is a road centre and in 1885 it was connected by a branch line with the Belgrade-Nish railway. Afterward its prosperity steadily increased. It has an iron foundry, steam flour mills, a vegetable-preserving factory and several small cloth factories.

KRAIT (Bungarus coeruleus), one of the more dangerous of Indian snakes. There are about 12 species of Bungarus.

KRAKATOA, a small volcanic island in Sunda strait, Indonesia. A large volcano rose in the centre of the tract where the Sunda strait now runs. An explosion blew the mountain away and its base was left as a broken ring of islands. Subsequently small cones were formed within the great crater ring. The most important rose 2,647 ft. above the sea and formed the peak of the volcanic island of Krakatoa.

In 1680 it appears to have been in eruption; great earthquakes took place and quantities of pumice were ejected. But the effects of this disturbance had been so concealed by tropical vegetation that the eruption had been called in question. About 1877, earthquakes began to be frequent in the Sunda strait. In 1883 the manifestations of subterranean commotion became more decided, for, in May, Krakatoa broke out in eruption, discharging pumice and dust, with the usual accompaniment of detonations and earthquakes. On Aug. 26, paroxysms began which lasted till the morning of the 28th. The four most violent took place on the morning of the 27th. The whole northern and lower portion of Krakatoa, within the original crater ring, was blown away; the northern part of the cone of Rakata almost entirely disappeared, leaving a vertical cliff which laid bare the inner structure of that volcano. Instead of the previous volcanic island, which seems to have had an area of 18 sq.mi., and rose from 300 to 1,400 ft. above the sea, there was now left a submarine caviiy, with its bottom more than 1.000 ft. below sea-level. This was the result of explosions of superheated vapour absorbed in the molten magma within the earth's crust. The vigour and repetition of these explosions may have been caused by sudden inrushes of the ocean as the throat of the volcano was cleared and the crater ring was lowered and ruptured. Access of bodies of cold water to the top of the column of molten lava would probably give minor explosions, and then chilling of the lava surface would temporarily lessen or stop volcanic eructations. But until the pent-up water-vapour in the lava found relief, it would gather strength until it burst through the crust and overlying water, and hurled cooled lava, pumice and dust into the air.

The discharge during the two days was enormous. A large cavity replaced the island, and the sea-bottom was covered with a wide and thick sheet of fragmentary materials; while surrounding islands had their forests buried and their area increased by masses of the material ejected; also new islands appeared in the sea. A vast body of the fine dust was carried far and wide by aerial currents, while the floating pumice was transported for many hundreds of miles on the surface of the ocean. At Batavia. 100 mi. from the centre of eruption, the sky was darkened by the quantity of ashes borne across it, and lamps had to be used in the houses at midday. The darkness even reached as far as Bandung, a distance of nearly 150 mi., and 2,300 ft. above sea level. It was computed that the column of stones, dust and ashes projected from the volcano shot up into the air for a height of 17 mi. or more. The finer particles coming into the higher layers of the atmosphere were diffused over a large part of the surface of the earth, and showed their presence by the brilliant sunrise and sunset glow-effects to which they gave rise. Within the tropics they were at first borne along by air-currents at an estimated rate of about 73 m. an hour from east to west, until within a period of six weeks they were diffused over nearly the whole space between the latitudes 30° N. and 45° S. Eventually they spread northwards and southwards and were carried over North and South America, Europe, Asia, South Africa and Australasia. In the Old World they spread from Scandinavia to the Cape of Good Hope.

Another remarkable result of this eruption was the world-wide disturbance of the atmosphere. The culminating paroxysm on the morning of Aug. 27 gave rise to an atmospheric wave or oscillation, which, travelling outwards from the volcano as a centre, became a great circle at 180° from its point of origin, whence it continued travelling onwards and contracting till it reached a node at the antipodes to Krakatoa. It was then reflected or reproduced, travelling backwards again to the volcano, whence it once more returned in its original direction "In this manner its repetition was observed not fewer than seven times at many of the stations, four passages having been those of the wave travelling from Krakatoa, and three those of the wave travelling from its antipodes, subsequently to which its traces were lost" (Sir. R. Strachey).

The actual sounds of the volcanic explosions were heard over a vast area, especially towards the west. They were noticed at Rodriguez, nearly 3,000 English miles away, at Bangkok (1,413 mi.), in the Philippine islands (about 1,450 mi), in Ceylon (2,058 mi.) and in West and South Australia (1,300–2,250 mi.). On no other occasion have sound-waves ever been perceived at the extreme distances to which the detonations of Krakatoa reached. Far more serious were the effects of the successive explosions of the volcano upon the waters of the ocean. A succession of waves was generated which appear to have been of two kinds, long waves with periods of more than an hour, and shorter but higher waves, with irregular and much briefer intervals. The greatest disturbance, probably resulting from a combination of both kinds of waves, reached a height of about 50 ft. The destruction caused by the

rush of such a body of sea-water along the coasts and low islands was enormous. All vessels lying in harbour or near the shore were stranded, the towns, villages and settlements close to the sea were either at once, or by successive inundations. entirely destroyed, and more than 36,000 human beings perished. The sea-waves travelled to vast distances from the centre of propagation. The long wave reached Cape Horn (7,818 geographical miles) and possibly the English channel (11,040 mi.). The shorter waves reached Ceylon, and perhaps Mauritius (2.900 mi.).

The volcano became active again in the latter half of 1927, the various phases of eruption lasting till early 1929. A new eruption point (265 ft.) arose from the sea, Anak Krakatoa ("Child of Krakatoa"), on the rim of the submerged caldera of 1883, between Lang Island (Rakata Ketjil) and Verlaten Island (Sertung), north of Rakata, or Krakatoa proper.

See R. D. M. Verbeek, *Krakatau* (Batavia, 1886); "The Eruption of Krakatoa and Subsequent Phenomena," *Report of the Krakatoa Committee of the Royal Society* (London, 1888); *Krakatau* . . . Part 1, C. E. Stehn, "The Geology and Volcanism of the Krakatau Group," Part 2, Dr. W. M. van Leeuwen, "Krakatau's New Flora," Part 3, Dr K. W. Dammermann, "Krakatau's New Fauna," bibliography, pp 54–55 (Fourth Pacific Science Congress, Batavia-Bandoeng, 1929); Cornelis Andries Backer, *The Problem of Krakatau, as Seen by a Botanist* (Weltevreden, Java, 1929).

KRAKEN, in Norwegian folklore, a sea monster, believed to haunt the coasts of Norway. The description given in 1752 by Norwegian bishop Pontoppidan, with the assertion that it darkened the water around it by an excretion, suggests that the myth was based on the appearance of a gigantic cuttlefish.

KRAMATORSK, a town of Donetsk *oblast* of the Ukrainian Soviet Socialist Republic of the U.S.S.R., stands on the left bank of the Kazenny Torets, a tributary of the Northern Donets, 50 mi. N.N.W. of Donetsk city. Pop. (1959) 115,000. It developed in the late 19th century as a centre of the Donets basin industrial area. Its large metallurgical plant was completely reconstructed after World War II. It is a major producer of heavy machinery for iron and steel plants, as well as making heavy machine tools, mobile excavators and hydraulic presses. There are railway repair shops, ceramics works and coking and cement-making undertakings. Kramatorsk is linked by rail to Slavyansk, Konstantinovka and Artemovsk. (R. A. F.)

KRASNODAR (until 1920 YEKATERINODAR), a town and the administrative centre of Krasnodar Krai in the Russian Soviet Federated Socialist Republic of the U.S.S.R., stands on the right bank of the navigable Kuban, 142 mi. from its mouth. Pop. (1959) 312,000. Founded in 1793 as a Cossack guardpost on the Kuban frontier, it at once developed as a military town. In 1867, after the end of the Caucasian wars, it became a civilian town and centre of the fertile Kuban region, this latter role increasing after the coming of the railways in the 1890s. It was occupied by German troops in 1942–43. Its present industries are largely concerned with processing the agricultural products of the north Caucasus area, especially meat, flour, butter and fats, tobacco, leather (for footwear and saddlery) and wool. There are also considerable engineering industries, producing machine tools, petroleum machinery and spare parts for agricultural equipment. Petroleum is refined there and lubricants produced. Krasnodar is the focus of a network of railways, tapping its region and linking it to Novorossisk, Rostov, Volgograd and Stavropol. Its cultural establishments include four teaching institutes (pedagogic, medical, agricultural and food industry), research institutes for agriculture, tobacco, vegetable fats, canning and the petroleum industry, and several theatres and museums. (R. A. F.)

KRASNODAR KRAI (KRASNODARSKI KRAI), in the Russian Soviet Federated Socialist Republic of the U.S S.K., occupies the western part of the north Caucasus area, along the shores of the Black sea and Sea of Azov, and extends from the crestline of the Caucasus in the south to the Gulf of Taganrog in the north. Its area of 32,317 sq mi. includes the Adygei Autonomous Oblast (*q.v.*). The northern two-thirds of the *krai* forms an extensive plain, crossed by the lower Kuhan and a number of lesser rivers. all flowing into the Sea of Azov. The plain is in steppe vegetation, developed on rich chernozem soils, but the natural grass cover has almost entirely disappeared under the plow. Along the Azov shore are widespread salt marshes and lagoons. The southern part of the *krai* is occupied by the western end of the Caucasus mountains, running parallel to the Black sea coast and dropping in height westward from Mt. Psysh (12,424 ft.), the highest peak. Along the Black sea is a narrow coastal strip. The mountains are covered by deciduous forest on the lower slopes, giving way higher up to conifers and alpine meadows. The climate of the plain is marked by high summer temperatures, averaging about 75° F. in July, and cool winters of about 29°–30° F. The coastal strip has a nearly subtropical climate, with warm winters (43° F. in January at Sochi), and there are many seaside resorts. Rainfall on the plain decreases eastward, Krasnodar town having 26 in. a year and the country further east about 15 in. The seaward side of the mountains has a high rainfall, 55 in. and more.

The *krai* was established in 1937 after a number of administrative changes, and corresponds roughly with the former territory of the Kuban Cossacks. As the name *krai* ("edge") implies, this was a frontier area of Russia in the 19th century, during which most of it was annexed and settled. Its fertile soils now support a relatively dense population of 116 persons per square mile. The 1959 census gave the population as 3,762,499, of whom 1,464,985 (39%) were urban and 2,297,514 rural. The largest of the 20 towns and 26 urban districts are the administrative centre of Krasnodar, Armavir, the resort of Sochi, the port of Novorossisk, the Adygei administrative centre of Maikop, Yeisk and Kropotkin. Apart from the Adygei the population is mostly Russian and Ukrainian, with some Armenians, Belorussians and Tatars.

The *krai* is a major agricultural region. The plain is divided into very large state and collective farms, producing grains, especially winter wheat. Toward the south, winter barley is important. Maize (corn) and spring barley are chiefly grown for fodder. In the lower Kuban area much swamp has been reclaimed and given over to rice growing. Sunflowers, tobacco, sugar beets and flowers for perfume are the main industrial crops. Vegetables, especially melons, tomatoes and potatoes, are widespread, but are of particular importance along the Kuban. The lower foothill slopes of the Caucasus are covered by orchards and vineyards. Large numbers of cattle, pigs and poultry are kept. The processing and canning of agricultural products form the main branch of industry, but petroleum exploitation is important in several areas, notably round Maikop and on the Taman peninsula, and timber working is well developed in the mountains. (R A. F)

KRASNOVODSK, a seaport of the Turkmen Soviet Socialist Republic, U.S.S.R., lies on the east side of the Caspian sea, opposite Baku and on the northen shore of Balkhan or Krasnovodsk bay, 69 ft below sea level. Pop. (1959) 42,000.

Originally a Russian fort built under Peter the Great in 1717, Krasnovodsk became a town in 1869. From 1895 it was the western terminus of the Ashkhabad (formerly Central Asiatic) railway built in 1880. On Sept. 17, 1918, the local Socialist Revolutionary administration arrested 26 Soviet commissars who escaped there from Baku; three days later they were shot near Akhchakuyma, east of Krasnovodsk. On Feb. 6, 1920, the city was occupied by the Red army. Krasnovodsk is the third largest seaport of the Caspian sea (after Baku and Makhachkala). Mainly grain and timber are unloaded, while oil, cotton, silk, minerals and livestock products from Turkmenistan and western Uzbekistan are shipped there. Krasnovodsk is the centre of an oil industry, oil being supplied by pipeline from the petroleum centre at Nebit-Dag. It has a ship-repair yard and a fish-canning plant.

KRASNOYARSK, a town of the U.S.S.R. and the administrative centre of Krasnoyarsk *krai* of the Russian Soviet Federated Socialist Republic, stands on both banks of the Yenisei, where the Trans-Siberian railway crosses the river, at the confluence of the left bank, Kacha, and right bank, Bazaikha. Pop. (1959) 409.000. One of the earliest Russian settlements in Siberia, *It* was founded as the fort of Krasny Yar in 1628 on the left bank. To this point on the great navigable routeway of the Yenisei the Moscow Post road was established in 1735 and the settlement developed iteadily as the chief town of central Siberia. The 19th-century discovery of gold and the opening up of the area

for agriculture accelerated its growth. In 1822 it became the seat of the Yenisei *guberniya* (province) and in the 1890s the Trans-Siberian railway reached the town. Krasnoyarsk then rapidly developed and spread on to the right bank, extending for about 18 mi. along the river. Its industrial growth was considerably stimulated by the evacuation to the town in World War II of many factories from the west. Most of the newer and larger plants are on the right bank. Heavy machinery such as cranes, mining, agricultural and transport equipment and electricity pylons are produced and there are shipbuilding and repair yards, railway repair shops, cementmaking, timber working and food industries. On the Yenisei at Krasnoyarsk one of the largest hydroelectric stations in the world was under construction in the 1960s. (R. A. F.)

KRASNOYARSK KRAI (KRASNOYARSKI KRAI), in the Russian Soviet Federated Socialist Republic of the U.S.S.R., covers an area of 927,258 sq.mi. in central Siberia, extending from the Severnaya Zemlya archipelago in the Arctic ocean to the Sayan mountains in the south. It includes the greater part of the Yenisei basin, the Yenisei itself flowing from south to north along the west of the *krai*. Much of the *krai* is taken up by the central Siberian plateau, covered by extensive basalt flows and cut into by the broad valleys of the Nizhnaya and Podkamennaya Tunguska rivers. The plateau attains its highest elevation in the Putoran mountains of the northwest (Mt. Kamen, 6,683 ft.). North of the plateau is the north Siberian lowland, beyond which are the hills of the Taimyr peninsula. Cape Chelyuskin on the peninsula is the most northerly point of the Eurasian continent. In the far south of the *krai* are the east and west Sayan mountains, enclosing the Minusinsk basin. A narrow strip all along the western bank of the Yenisei belongs to the flat, swampy west Siberian lowland. The vast area of the *krai* covers a wide range of soils and vegetation, from the tundra and thin gley (glei) soils of Taimyr to the steppes and black earths of the Minusinsk basin. The greater part, however, comprises podsol soils and taiga forest, dominated by larch. stone pine, pine and birch, which becomes sparser and more stunted to the north. The whole *krai* has a severely continental climate. January average temperatures are −12° F. at Yeniseisk and −17° at Turukhansk, while respective July averages are 64° and 59". Rainfall, except on the Sayan and Putoran mountains, is low—10–16 in. a year.

The *krai*, which was formed in 1934 from East Siberian territory, has three national areas: the Khakass Autonomous Oblast in the south and the Evenki and Taimyr National Okrugs which cover almost all the plateau and the Taimyr peninsula and adjacent mainland islands. The population (1959) of 2,615,098 is almost uholly concentrated in the south on the steppe lands along the Trans-Siberian railway and in the Minusinsk basin. The Evenki and Taimyr *okrugs* are exceedingly thinly inhabited (0.07 persons per square mile). Half the population (1,320,098) is urban. in 16 towns and 48 urban districts. The largest of these are Krasnoyarsk (the administrative, economic and cultural centre). Kansk. Achinsk, all on the Trans-Siberian railway, the northern mining town of Norilsk and the Yenisei river port of Igarka. The greatest economic importance of the territory lies in its mineral wealth and timber resources. Gold is found in the southwest of the plateau, nickel, cobalt, platinum and copper at Norilsk, iron ore around Abakan. uranium along the middle Yenisei, lignite at Kansk. Achinsk and elsewhere. mica at Kansk, antimony, bauxite and molybdenum elsewhere. Timber working is carried on at most towns along the Trans-Siberian and the Yenisei, notably at Krasnoyarsk and Igarka. Agriculture is limited to the south, where it is dominated by grain crops. chiefly wheat. From Minusinsk the Us highway starts. which crosses the western Sayan mountains into the Tuva Autonomous Soviet Socialist Republic. Apart from the south, the *krai* is almost devoid of all-weather communications. For much of it the only route is the Yenisei, which is navigable for steamers below Minusinsk for five months of the year in the upper and middle courses and for about three months in the lower course. (R. A. F.)

KRASZEWSKI, JOZEF IGNACY (1812–1887), Polish novelist, poet, literary critic, dramatist. historian and journalist, was born in Warsaw on July 28, 1812. He attended Wilno university, was imprisoned in Dec. 1830 on a charge of conspiracy against the Russian government and released in March 1832. He next lived in Volhynia, 1834–59, dividing his time between writing, agriculture and social work. From 1841 he edited and from 1849 also published the review *Ateneum* till 1852. Between 1859 and 1862 he edited the Warsaw daily *Gazeta Polska*. Forced to leave in Jan. 1863 by A. Wielopolski, the head of the civil government whom he had offended in a leading article, Kraszewski settled in Dresden. In 1883 he was arrested on a charge of espionage on behalf of France, in 1884 sentenced to three and a half years' imprisonment. Released on bail in 1885 he went to Switzerland, died in Geneva on March 19, 1887, and was buried in Cracow. Kraszewski's works in book form alone fill 641 volumes. They include nine novels dealing with peasant life in which he approaches the problem of serfdom from an ethical standpoint and prepares the ground for emancipation and endowment with land, seven historical novels set against the background of Poland under the Saxon kings, and a cycle of 29 novels covering Polish history in chronological order, written between 1876 and 1886. (L. R. LR.)

KRAUS, KARL (1874–1936), Austrian critic, essayist and poet, was born on April 28, 1874. at Gitschin (Jicin) in Bohemia, but lived mostly in Vienna, where he died on June 12, 1936. He was the founder, editor and, after a few years. only contributor of the journal *Die Fackel* (1899–1936). This was his chosen weapon for violent attacks. also reflected in his books, against Viennese journalism: particularly against its glorification of the rich bourgeoisie, its moral hypocrisy *(Sittlichkeit und Kriminalitat,* 1908; *Die chinesische Mauer,* 1910) and its corruption of language *(Untergang der Welt durch schwarze Magie,* 1922; *Literatur und Lüge,* 1929). His polemics, because so limited in appeal. seemed dated to later generations of readers. There remained his brilliant satirical style. his technically perfect aphorisms *(Sprüche und Widersprüche,* 1909; *Pro Domo et Mundo,* 1912; *Nnchts,* 1919), his visionary poetic drama of catastrophe *(Die letzten Tuge der Menschheit,* 1918–22) and the fruits of his unending campaign against inaccurate and slovenly use of language *(Die Sprache,* 1937; ed. by H. Fischer, 1954).

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KRAUSE, KARL CHRISTIAN FRIEDRICH (1781–1832), German philosopher, whose panentheism attracted a considerable school of followers not only in Germany but also in Spain, was born at Eisenberg, in eastern Thuringia, on May 6, 1781. Krause taught as *Privatdocent* in various German cities from 1802 onward and died at Munich on Sept. 22, 1832.

For Krause, God. intuitively known by conscience, is not a personality (which implies limitations) but an essence, which contains the universe within itself. This system he called panentheism. because it asserts that God contains the universe without being exhausted in it. Man and the universe form an organic whole made in the image of God; and the form in which the life of the whole develops is right, or the perfect lam. Ideal society results from the widening of the organic operation of this principle from the individual man to small groups of men and finally to mankind as a whole. (Krause developed this concept of a *Menschheitsbund* ["union of mankind"] from his idea of freemasonry.) The differences disappear as the inherent identity of structure predominates in an ever-increasing degree, and in the final unity man is merged in God. Publication of Krause's voluminous literary remains was undertaken at Leipzig. His exclusion of all non-Teutonic words from his later writings made for obscurity.

Krause's principal works are *Entwurf des Systems der Philosophie* (1804); *System der Sittenlehre* (1810); *Das Urbild der Menschheit* (1811; Eng. trans., *The Ideal of Humanity,* 1900); *Abriss des Systems der Philosophie,* 3 vol. (1825–28); *Vorlesungen iiber das System der Philosophie* (1828); and *Vorlesungen iiber die Grundwahrheiten der Wissenschaft* (1829).

See also his *Briefwechsel,* 2 vol. (1902–07); H. C. von Leonhardi, *Rrauses Leben* und *Lehre* (1902).

KREBS, SIR HANS ADOLF (1900–), British biochemist, born in Hildesheim, Ger., on Aug. 25, 1900, won the 1953 Nobel prize for medicine and physiology jointly with Fritz Lipmann (*q.v.*) for his historic contributions to biochemistry and especially for his discovery of the citric-acid cycle in the metabolism of carbohydrates. He obtained the M.D. degree at Hamburg university in 1925.

In 1933 Krebs went to Great Britain as a refugee and was given a Rockefeller grant which enabled him to work as a research student at Cambridge. Two years later he became a lecturer at Sheffield university and in 1945 he was appointed professor of biochemistry, and in 1954 director of the Medical Research council unit for research in cell metabolism. He was elected a fellow of the Royal society in 1947, and became Whitley professor of biochemistry at Oxford university in 1954. In 1932, while he was working at Freiburg, he introduced what is known as the Krebs theory of the cyclic formation of urea, and in 1937 he announced his second major discovery, that of the citric-acid cycle, which is concerned with the oxidation of carbohydrate, fat and protein, and is the chief source of metabolic energy. Apart from these brilliantly conceived researches, he was responsible during World War II for the conduct of experiments on vitamin deficiencies.

Krebs was knighted in 1958. (W. J. Bp.)

KREBS, JOHANN LUDWIG (1713–1780), German organist and composer, born at Buttelstedt, Thuringia, on Oct. 10, 1 3 He studied music first with his father and in 1726 entered the Thomasschule at Leipzig, where he became a pupil of J. S. Bach. He later held posts as organist at Zwickau, Zeitz and at Altenburg, where he died in Jan. 1780. Krebs's organ music is composed in the forms used by Bach and leans heavily on his master's style. It is technically very accomplished and includes some especially fine trio sonatas. He also wrote sonatas for flute and harpsichord and some sacred vocal music. (C. P. Co.)

KREBS CYCLE, also called the "citric acid cycle" or the "tricarboxylic acid cycle," is a series of chemical reactions by which acetic acid is oxidized in living organisms. The biological oxidation (or "combustion") of foodstuffs—proteins, carbohydrates and fats—passes through many stages. The earlier stages represent a partial oxidation and in the case of all three foodstuffs they lead to the formation of acetic acid ($CH_3{\cdot}COOH$). The subsequent oxidation of acetic acid to carbon dioxide and water—through the Krebs cycle—is thus the terminal stage of the chemical processes by which cells burn and obtain energy from foodstuffs. Acetic acid does not appear and react in the free form but is attached to the sulfur atom of coenzyme A.

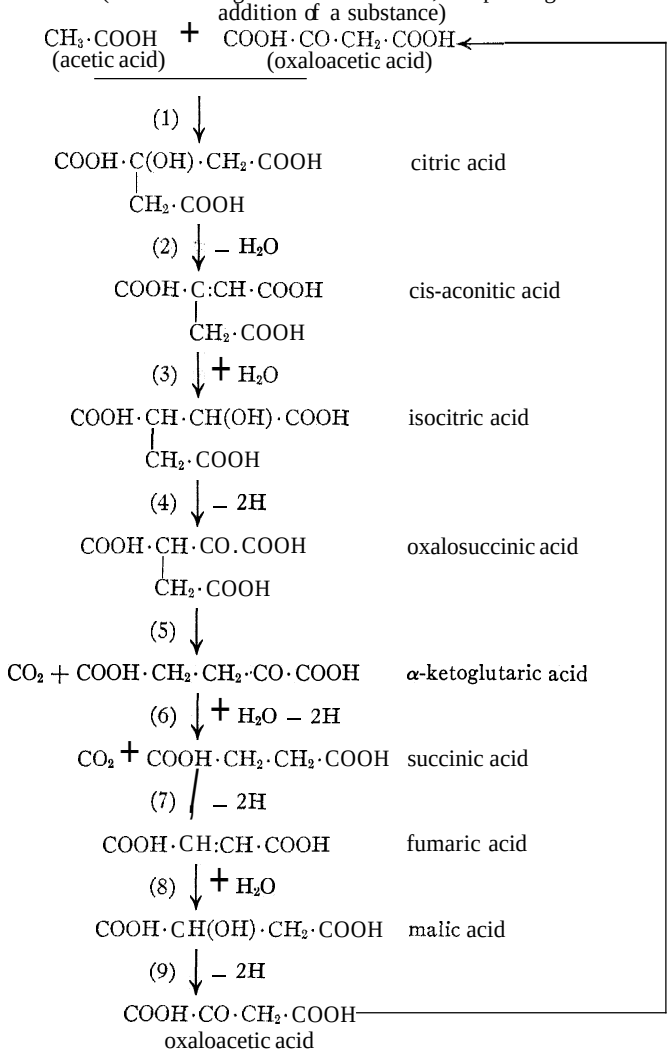
The oxidation of acetic acid is completed in nine main steps, which are shown in the diagram. The first is the condensation of acetate with oxaloacetate, giving citrate. The second and third steps cause a rearrangement of citric acid to isocitric acid, with cis-aconitic acid as an intermediate stage. Isocitric acid gives up two hydrogen atoms in step 4, forming oxalosuccinic acid, which in turn loses carbon dioxide in step 5 and forms α-ketoglutaric acid. Step 6 is the oxidation of the latter to succinic acid, which loses two hydrogen atoms in step 7 to form fumaric acid. This is followed by the hydration (addition of water) of fumaric acid, giving malic acid in step 8. The last step (9) is the loss of two hydrogen atoms by malic acid. This reaction completes the cycle and regenerates oxaloacetic acid to start another turn of the cycle.

Inspection of the diagram shows that the di- and tricarboxylic acids are interconverted through a cyclic pathway. One complete turn of the cycle causes the disappearance of one molecule of acetic acid and the formation of two molecules of CO_2 and of four pairs of hydrogen atoms. These are formed in the steps 4, 6, 7 and 9 and in further processes react with the oxygen of the air to form water. The over-all effect of the cycle is therefore the complete combustion of one molecule of acetic acid. The cycle contributes about two-thirds of the total oxidations in living cells. The remaining third comes from the reactions that convert the foodstuffs to acetic acid. The oxaloacetate required for the initiation of the cycle acts like a catalyst. as it is not used up but regenerated. The relatively small amounts of oxaloacetate that are needed for maintaining the cycle are either formed from aspartic or glutamic acid contained in the proteins of food or are synthesized in various tissues from pyruvate and carbon dioxide.

The cycle was first formulated in 1937 by Sir Hans Adolf Krebs (*q.v.*). Its occurrence has been established in numerous types of cells not only in higher and lower animals but also in plants, bacteria and molds. It is one of the features of the chemistry of cells that is shared by all types of life.

Diagram of the Rrebs Cycle

(The minus sign indicates removal, the plus sign addition of a substance)



The reactions of the cycle, in combination with others, may also serve to synthesize the carbon skeletons of amino acids, in particular of glutamic acid, which is formed from α-ketoglutarate by reductive amination. Glutamic acid in turn is the parent substance of other amino acids in both higher and lower organisms.

Each step of the cycle requires a specific enzyme to catalyze the chemical changes. The set of enzymes for the whole cycle, including further enzymes that are concerned with the proper utilization of the energy liberated, is located in special compartments of the cell—the mitochondria, the "powerhouses" of the cell. They are usually rod-shaped, highly organized structures about 1115,000 in. long in which the enzymes are so arranged that the reaction sequence occurs smoothly and rapidly and the energy can be utilized efficiently.

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KREFELD (Crefeld), a town of Germany which after partition of the nation following World War II was in the *Land* of

North Rhine-Westphalia in the Federal Republic of Germany. It is situated 7 km. (4½ mi.) W. of the Rhine, 25 km. (15½ mi.) N.W. of Diisseldorf by road. Pop. (1959 est.) 207,891. The town stretches in an east-west direction, with Ürdingen, a second city centre lying on the banks of the Rhine The town centre was planned by A. von Vagedes in 1819 and laid out as a rectangle bounded by promenades. the streets, where feasible, conforming to a grid plan Several suburbs were incorporated from 1901 to 1929, and in 1929 also the town of Ürdingen, thus accentuating the east-west development

Early remains include a Roman fortress and cemetery in Gellep (3rd–7th centuries A.D.). Among the historic buildings are the Catholic churches of Fischeln and Hohenbudberg (12th century); St. Peter's church, Ürdingen; the elector of Cologne's castle, Linn (*c* 1200, but most of the surviving work 14th century), which nas made into a museum; the hostelry chapel at Ürdingen (1403); the town hall (1790; extended 19th and 20th centuries); and the old and new town halls in Ürdingen. Other museums are the Kaiser Wilhelm museum, the Museum Haus Lange and the textile museum housing a tapestry collection. There is a monument to Karl Wilhelm, composer of *Dte Wacht am Rhein.* Krefeld is famous for its technical schools, which give instruction in textile manufacture and engineering. Railways run from Krefeld to Düsseldorf, Cologne Mönchengladbach, the Ruhr towns and to the Netherlands. Steel, machinery, textiles, clothing, chemical products, silks, televisors and railway equipment are made, and printing and dyeing are carried on.

The emperor Charles IV granted Krefeld civil rights in 1373 at the instance of Dietrich, count of Mörs. During 1600–1702 it belonged to the house of Orange, and from 1702 it was Prussian. On June 23. 173'8, Ferdinand of Brunswick defeated the French under Clermont at Krefeld during the Seven Years' War. Manufacture of the famous silks and velvets of Krefeld was begun by Mennonite refugees in the 17th–18th centuries. The town became part of Germany in 1871 and after World War I it was occupied by the Allies (1918–26). In World War II it was severely bombed and was captured by the Allies in March 1945. (Gu. R.)

KREHBIEL, HENRY EDWARD (1854–1923), U.S. writer and critic, was born at Ann Arbor, Mich., March 10, 1854. After studying law at Cincinnati. 1872–74, he drifted into journalism, devoting himself more particularly to musical criticism. He was on the staff of the *Cincinnati Gazette,* 1874–80, then editor of the *New York Musical Review,* and finally music critic for the *New York Tribune* till his death, which occurred in New York city, March 20, 1923. One of the most influential music critics of his time, he also lectured and wrote popular books.

Among these are *Studies in Wagnerian Drama* (1891), *How to Listen to Music* (1896), *Music and Manners in the Classical Period* (1898), *The Pianoforte and Its Music* (1911), *Afro-American Folk Songs* (1914), also works explaining grand opera plots, motives and music. He was the American editor of the second edition of Grove's *Dictionary of Music and Musicians* (1904–10), edited Thayer's *Life of Ludwig van Beethoven* (1921), and translated a number of foreign musical works.

KREISLER, FRITZ (1875–1962), Austrian-born violinist known for the beauty of his tone and as a composer of short violin pieces, was born on Feb. 2. 1875, in Vienna. He studied with Joseph Hellmesberger and won the gold medal at the Vienna conservatory at the age of ten, after which he studied with Léo Delibes and Joseph Massart at the Paris Conservatoire. After a successful tour of the United States (1888–89) he returned to Vienna to study medicine, and during the period of his military service was an officer of a Uhlan regiment.

Kreisler reappeared as a violinist in 1898 and became one of the most successful virtuosos of his time. The technical features of his playing mere an intensive vibrato and an economy in bowing. In 1910 he gave the first performance of Elgar's violin concerto. dedicated to him. After 1915 he lived mainly in the U.S., including in his programs his many short pieces, among them his *Caprice viennois* and *Schon Rosmarin.* His *Classical Manuscripts,* published as arrangements of works by Vivaldi, Porpora, Pugnani and others, were admitted in 1935 to be works of his own. He also wrote cadenzas for concertos of Mozart, Beethoven and Brahms and many violin transcriptions. He was naturalized as a U.S. citizen in 1943. He died on Jan. 29, 1962, in New York city.

See L. P. Lochner, *Fritz Kreisler* (1950); Carl Flesch, *Memoirs,* trans. and ed. by H. Keller (1957).

KREMENCHUG, a city, rail and industrial centre in the Poltava *oblast* of the Ukrainian Soviet Socialist Republic, U.S.S.R., and the chief town of the district of the same name, lies on the left bank of the Dnieper. Pop. (1926 est.) 59,000; (1939) 89,553; (1959) 86,000.

Kremenchug was founded as a Russian fortress at the end of the 16th century. Its situation above the falls at the southern limit of navigation on the Dnieper, and on the highway between Moscow and Odessa, gave it importance and by the mid-17th century it was already a wealthy town. From 1765 to 1789 it was the capital of "New Russia."

The construction in 1927–32 of the great dam with power station and canal near Zaporozhe modified the breakage of freight at Kremenchug and its character changed. It became an industrial centre with machine-building, textile, meat-processing and other plants.

The city suffered heavy damage in World War II, especially at the end of 1943. After the war the railway and road bridge connecting the city with its right-bank suburb. Kryukov, was rebuilt. It is more than 1,000 yd. long. Kremenchug is linked by rail with Odessa and Kharkov.

KREMSIER: *see* KROMERIZ.

KRENEK, ERNST (1900–), Austrian-U.S. composer, was born in Vienna on Aug. 23, 1900. He studied composition with Franz Schreker in Vienna and continued his studies in Berlin. The success of the jazz opera *Jonny spielt auf* in 1927 brought Krenek's name to the fore, but that sensational work presented only one aspect of a many-sided personality. He revived the *concerto grosso* for orchestra and wrote symphonies, smaller symphonic works, a *divertimento* for nine solo instruments (Symphonic Music 11), concertos and string quartets. Krenek also composed a number of choral works and songs. He followed up *Jonny* with the one-act pieces: *Der Diktator,* opera in two scenes; *Das geheime Königreich,* fairy opera in two scenes; and *Schwergewicht,* a burlesque. These were produced at Wiesbaden in 1928. His opera *Karl V,* using the 12-tone technique, was performed in Prague, Czech., in 1938.

Krenek then left Europe for the U.S., where he taught at Vassar college, Poughkeepsie, N.Y., 1939–42, and at Hamline university. St. Paul, Minn., 1942–47. He became a U.S. citizen in 1945 and later settled in California.

KRETSCHMER, ERNST (1888–), German psychiatrist, noted for his attempts to correlate body build and constitution with character and mentality, was born on Oct. 8, 1888, in Wüstenrot near Heilbronn, Baden-Württemberg. After studying medicine at the universities of Tübingen and Munich, he became *Privatdocent* (1918) and associate professor (1923) in psychiatry and neurology at the University of Tiibingen and then professor and director of the psychiatric clinic of the University of Marburg (1926). After 1946 he held the chair of psychiatry and neurology at Tubingen.

Kretschmer is perhaps best known for his *Korperbau und Charakter* (1921; 20th ed., 1947), translated as *Physique and Character* (1925), in which he presents his theory of the correlation of body types and mentality. His somatypes are the pyknic, leptosomic (or asthenic) and athletic, which represent the constitutional predestination of mental phenomena, although he makes allowance for the conditioning influence of individual experience. Kretschmer's classifications represented a considerable advance over earlier attempts at the establishment of a constitutional anatomy. He also emphasizes the ancient concept of temperament, or general mood, as being conditioned by individual biochemical factors and as being related to certain physical types.

Kretschmer's other published works, in many editions and translations, range over a large area of psychiatry. They include a *Textbook of Medical Psychology; Der Sensitive Beziehungswahn* (1918), which deals with the problem of paranoia and the psychiatric study of character; *Geniale Menschen* (1929), translated as

The Psychology of Men of Genius (1931); and *Hysterie, Reflex und Instinkt* (1923; 5th ed., 1948), descriptive of his concept of the genesis of hysteria, in which symptom formation is initially conscious and volitional but is later taken over by automatic mechanisms and thus becomes unconscious. *See* also PERSONALITY. (I. V.)

KRETSCHMER, PAUL (1866–1956), German philologist mainly known for a series of monographs on the earliest history and interrelations of the Indo-European languages and the influence upon them of non-Indo-European tongues such as the Etruscan, was born in Berlin on May 2, 1866. At the University of Berlin he studied Indo-European linguistics and classical archaeology, combining these fields in his first two works, written while he was teaching there between 1891 and 1896. His study of the language of the Greek vase inscriptions, *Die griechischen Vaseninschriften ihrer Sprache nach untersucht* (1894), showed how nonliterary materials could be exploited for their linguistic content. His next book was an epoch-making study of pre-Greek elements in ancient Greek, *Einleitung in die Geschichte der griechischen Sprache* (1896). Through detailed comparison of Greek place names with their counterparts in ancient Anatolia, Turk., he concluded that a non-Greek, "Mediterranean" culture had preceded the Greeks there, leaving extensive linguistic traces. The discoveries (begun in 1900) of Sir Arthur Evans at Knossos, Crete, confirmed this view.

After a professorship at Marburg (1897–99), Kretschmer succeeded Friedrich Miiller in the chair of comparative linguistics at Vienna from 1899 to 1936. In 1907 with Franz Skutsch he founded *Glotta,* a periodical devoted to classical linguistics. He also interested himself in modern Greek dialectology and furthered the study of German linguistic geography. Kretschmer died in Vienna on March 9, 1956. (G. M. M.)

KRETZER, MAX (1854–1941), German novelist, born at Posen on June 7, 1854, the son of an innkeeper. Father and son worked for some time in a factory, and Kretzer's realistic descriptions of working-class life in Berlin are based on real knowledge of the milieu. Kretzer made his name with the novels *Die Betrogenen* (1882), *Die Verkommenen* (1883) and *Meister Timpe* (1888).

Kretzer has been called the founder of the realistic school in Germany. but the influence of Paul von Heyse and of Karl F. Gutzkow is evident in his works. With *Das Gesicht Christi* (1896) he went over to the Symbolists. His many later novels approximate more nearly to the ordinary type. Kretzer died Aug. 14, 1941, in Berlin.

See G. Keil, *Max Kretzer: a Study in German Naturalism* (1928).

KREUGER, IVAR (1880–1932), Swedish financier, the "match king," was born at Kalmar on March 2, 1880. Having practised as a civil engineer in the United States and in South Africa he returned to Sweden and in 1913, on the basis of two match firms in his family, founded a match company.

During World War I, the whole of the Swedish match industry. under Kreuger's initiative, was concentrated into a single firm, the Swedish Match company (Svenska Tandsticks AB). with Kreuger himself as managing director. When the war was over, Kreuger, with the backing of capital that was largely American. launched upon a series of highly speculative financial operations. The aim of these was primarily to acquire match factories and to secure a monopoly of the production and marketing of matches in countries outside Sweden. After 1925 the great majority of the transactions took the form of long-term dollar loans by Kreuger to countries short of foreign currency in return for agreements granting such monopoly rights. Since matches are in the nature of necessities and the demand for them is consequently inelastic, these rights, even in quite poor countries, could be extremely valuable. At first, Kreuger's business tactics were very successful: in 1928 the Kreuger concern probably controlled more than half the world production of matches. Expansion continued even after the crisis of 1929: with Germany, for example. Kreuger concluded a monopoly agreement in consideration of a loan of $125,000,000. As the world slump developed, however, the liquidity position of the concern became more and more strained, and by 1931–32 the situation was critical in the extreme.

Kreuger shot himself in Paris on March 12, 1932; afterward it was discovered that both the current assets of the business and the great profits it had previously recorded were largely fictitious. and that accounts had been falsified. The concern. of which the Swedish Match company and the International Xlatch corporation had been components. disintegrated and many of the companies went bankrupt. *See* also FRAUD. (E. F. SD.)

KREUTZER, RODOLPHE (1766–1831). French composer and violinist, one of the founders of the French school of violin playing. Born at Versailles, Nov. 16, 1766. he was a pupil of Anton Stamitz. and in 1789 was appointed professor of the violin at the Paris Conservatoire. In 1796 he toured Europe, rousing great enthusiasm by his playing. In 1798 he mas in Vienna, where he met Beethoven, who dedicated to him his sonata for violin and piano. op. 47. written for the mulatto violinist. George Bridgetower, and known as the Rreutzer sonata. Kreutzer did not appreciate the work and never played it. He wrote about 40 operas. several ballets. 19 violin concertos and many chamber works.

Kreutzer's works for students of his instrument include the *Methode de violon,* written in collaboration with Pierre Baillot, and the *Études ou caprices,* which remain standard exercises for the violin. He died at Geneva, Jan. 6. 1831.

KREUZER, a small copper coin formerly in use in Austria, so called from the cross (kreuz) stamped upon it—100 making a florin or gulden. The kreuzer was also part of the German currency. *See* FLORIN.

KREUZNACH, a town and watering place of Germany. in the *Land* of Rhineland-Palatinate: situated on the Nahe, a tributary of the Rhine, 9 mi. S. of Bingen. Pop. (1959 est.) 34,643.

Kreuznach was evidently a Roman town, as the ruins of a Roman fortification. the Heidenmauer, and various antiquities have been found in the vicinity. In the 9th century it was known as Cruciniacum. and had a palace of the Carolingian kings. In 1065 the emperor Henry IV presented it to the bishopric of Spires; in 1290 it obtained urban privileges and in 1437 it became part of the Palatinate.

The town was ceded to Prussia in 1815. It consists of the old town on the right bank of the river, the new town on the left and the island Badewörth containing the chief spring. The chief industries are marble polishing and the manufacture of optical instruments. chemicals. leather. Celluloid and tobacco.

KRIEGER, ADAM (1634–1666), German-composer who is the most varied and original master of the German baroque song, was born at Driesen in Pomorze (later Drezdenko in west Poland) on Jan. 7, 1634. His musical education seems to have been an informal one in Leipzig; he is known to have visited S. Scheidt at Halle. From 1657 he was court organist to the elector of Saxony. He died at Dresden on June 30, 1666.

His compositions are mostly secular. His *Arien* (1657), often on his own texts, are for one to five voices and *continuo,* with instrumental ritornelli between stanzas. A further set *(Neue Arien,* 1667) was published after his death. (C. P. Co.)

KRIEGER, JOHANN PHILIPP (1649–1725), German composer born at Nürnberg, Feb. 25. 1649. After studying at Nürnberg and Copenhagen he was appointed organist at Bayreuth in 1670. He made a study tour of Italy, working under J. Rosenmüller in Venice and B. Pasquini in Rome. After a brief return to Bayreuth he was appointed *Kapellmeister* to the court of Halle and Weissenfels in 1680. He died at Weissenfels on Feb. 7, 1725.

Krieger was a prolific composer of sacred music, but of the 2,000 or so cantatas he is known to have written only about 80 are extant. He also composed suites of outdoor music for wind instruments and about 200 secular strophic *Arien.* Of Krieger's operas only a few arias remain. (C. P. Co.)

KRIEMHILD (GRÎMHILD): *see* NIBELUNGENLIED.

KRISHNA, the eighth avatar (incarnation) of Vishnu (*q.v.*) and one of the most widely revered and most beloved Hindu gods. His cult is particularly prominent in literature and art. The basic sources of his mythology are the Mahabharata and the Puranas. They relate how the demonic Kamsa usurped the throne of Mathura (in western Uttar Pradesh) and how, in order to over-

power him, the preserver-god Vishnu was born in the Vrishni sept of the Yadava tribe as Krishna (lit. "black," or "dark as a cloud"), son of Vasudeva and Devaki, the sister of Kamsa. Kamsa, hearing a prophecy that he should be destroyed by Devaki's child, attempted to slay her children, but Krishna and his elder brother, Balarama, were smuggled to Gokul where they were brought up by the leader of the coaherds, Nanda, and Yashoda, his wife.

As a child, Krishna performed many miracles and slew demons; he also humbled Indra (*q.v.*), whom the cowherds had ceased to worship at his instance. The cowherd Krishna became widely renowned as a lover and for the ecstatic delight with which the milkmaids, among them his sweetheart, Radha. followed the sound of his flute. At length, however, Krishna and his brother returned to Mathura to slay Kamsa. Afteruard. finding the kingdom unsafe, he led the Yadavas to the western coast of Kathiawar and established his court at Dvaraka. He was revered as the Great Saviour and especially befriended the Pandava brothers; in the war between the Kauravas and the Pandavas he was both crafty counselor and supreme god, who taught the despondent Arjuna a new philosophy later epitomized in the Bhagavad Gita (*q.v.*). Later, at Dvaraka, a brawl broke out one day among the Yadava chiefs in which Krishna's brother and son were slain. As the god sat in the forest lamenting, a huntsman, mistaking him for a deer. shot at and killed him.

Krishna's personality is clearly a syncretic one, but it is not easy to separate and explain the different elements. Vasudeva-Krishna, a Vrishni prince who was presumably also a religious leader, had been elevated to the godhead by the 5th century B.C. His doctrine, later introduced in the Mahabharata as the Bhagavad Gita, emphasized renunciation by action (rather than renunciation of action) and devotion to a personal god. There was probably another Krishna who sponsored a new morality to supersede the ancient ideal of chivalry; a Krishna, son of Devaki, is mentioned in the Chandogya Upanishad as one who has learned to think of man's life as a sacrifice. The cowherd Krishna is obviously the god of a pastoral community which abjured the Indra-dominated Vedic religion; his cult aimed at the sublimation of sensual love. The Krishna who emerged from the blending of these ideologies, though independent in origins and development, was ultimately identified with the All-God. Vishnu-Narayana, and hence considered his avatar. His cult preserved distinctive traits. which were celebrated by some of the later exponents of bhakti, among them Mira Bai. Chaitanya and Vallabhacharya. (R. N. D.)

KRISTIANSTAD, a Swedish port and chief town of the *län* (county) of Kristianstad, on a peninsula in Lake Sjovik. an expansion of the Helge river, 10 mi. from the Baltic. Pop. (1960) 25.763. It was founded and fortified in 1614 by Christian IV of Denmark. who built the church. The town was ceded to Sweden in 1658, retaken by Christian V in 1676. and again acquired by Sweden in 1678. It has engineering works, flour mills. distilleries, weaving mills and sugar factories. Granite and wood pulp are exported. and coal and grain imported. The town is the seat of the court of appeal for the provinces of Skåne and Blekinge.

KRIVOI ROG, a city in the Dnepropetrovsk *oblast* of the Ukrainian Soviet Socialist Republic. U.S.S.R., and the chief town of a rayon of the same name. lies on the Ingulets river. a right-hank tributary of the Dnieper. Pop. (1959) 386,000.

The district is rich in mineral ores obtained from a narrow stretch of crystalline schists underlying the Tertiary deposits. Its iron ore contains on an average 62% to 67% iron, 9% silica and 0.03% to 0.06% phosphorus. In 1913 the output of the Krivoi Rog mines was 6,300,000 metric tons (70% of the Russian total). The mines were unworked in 1919–20 but by 1930 the 1913 output was again reached. In 1940 it was about 24,000,000 tons of iron ore. During World War II the city was occupied by the Germans on Aug. 13, 1941, and liberated on Feb. 22, 1944. It suffered severely from military operations. Before leaving. the Germans flooded the mines and destroved all industrial installations; by 1948. however, the mines were working again, and by 1950 the 1940 level of output was reached. The town has iron foundries, machine-tool plants, chemical works and many other industries. It also has mining colleges. It is linked by rail with the Black sea ports of Nikolayev and Kherson, with the Donets basin and with Poland.

KRK (Lat. CURICUM, It. VEGLIA) is the most northern, largest, most fertile and densely populated of the Yugoslav islands in the Adriatic sea. Area 157 sq.mi. Pop. (1961) 14,497 (commune). The town of Krk, the capital, lies in a sheltered bay on the southern coast. Pop. (1953) 2,839.

The Croats settled in Krk probably in the 7th century. Part of Byzance for centuries, it passed to Venice in 1000. returning to Byzance in 1024. It was governed by the counts Frankopan representing the emperor. In 1118 the local governors became vassals of Venice. Between 1358 and 1480 they also recognized the sovereignty of the crown of Hungary, but afterward the island was under direct Venetian administration. From 1797 to 1809 it was part of Austria. later being included in the French-controlled kingdom of Italy; from 1811, for two years, it mas part of the French "Illyrian provinces." From 1813 to 1918 it was part of the Austrian province of Istria. After two years of Italian occupation Krk became part of Yugoslavia.

Except on the east the island is well wooded and has extensive vineyards and olive groves. It is famous for its red wine.

KRLEŽA, MIROSLAV (1893–), a dominant figure in modern Croatian literature, was born in Zagreb. July 7. 1893. He trained for a military career, but after World War I devoted himself to writing, and founded a left-wing review in 1919. After World War II he was elected vice-president of the Yugoslav Academy of Science and Art and later became director of the Croatian Institute of Lexicography and president of the Yugoslav Writers' union. He is a man of vigorous and powerful intellect and wide learning, who writes with great intensity of expression and has fearlessly criticized political and social injustices. Among his most typical works are the dramatic trilogy. *Glembajevi* ("The Glembaj Family." 1932), an indictment of the decadence of the Croatian bourgeoisie of foreign origin; the psychological novel Povratak *Filipa Latinovicza* (1932; Eng. trans., The *Return of* Philip *Latinovicz,* 1960); and works concerned with the past exploitation and sufferings of the Croatian peasants, *e.g.,* the stories in the collection Hrvatski bog Mars ("The Croatian God Mars," 1922) and the Balade *Petrice Kerempuha* ("Ballads of Petrica Kerempuh," 1936). His collected works were published in 1953–56. (V. J.)

KROCHMAL, NACHMAN (1785–1840), Jewish scholar and philosopher of Jewish religion and history, a pioneer of modern historical and critical research in the origin and development of Judaism, was born at Brody, Galicia. Pol., on Feb. 1;. 178j. Rrochmal's aim was to be the Maimonides (*q.v.*), the guide for the perplexed intelligentsia. of his generation. For this purpose he composed his magnum opus, *More Nebuche* Ha-Seman ("The Guide of the Perplexed of the Age"), which appeared posthumously in an incomplete form in 1851 (critical edition with a large and exhaustive introduction by S. Rawidowicz, 1924). The chief aim of the work is to bring the history of the Jewish people within the frame of world history and to apply the laws of change and development governing all people and cultures to the study and interpretation of the spiritual ideas and movements of Israel. Krochmal divides the history of nations into three periods: youth, maturity, decline. Accordingly, he sees also a succession of such periods in Jewish history, with the exception that in Jewish history there have been several complete cycles, Israel being exempted from the national death that follows the period of decline because of the Absolute Spirit which is the specific national individuality or the religious genius of Israel. The Absolute Spirit is indestructible and its activity manifests itself constantly in Jewish history. The influence of German idealistic philosophy 'on Krochmal's thinking is a matter of controversy. Krochmal is also considered by some to be the father of Jewish cultural nationalism or cultural Zionism.

See Meyer Waxman, *A History of Jewish Literature From the Close of the Bible to Our Own Days,* vol. iii, p. 451 ff. (1930–36); Abraham I. Katsh, "Nachman Krochmal and the German Idealists," *Jewish Social Studies,* vol. viii, p. 75 ff. (1946). (J. M. RL.)

KROEBER, ALFRED LOUIS (1876–1960), one of the most influential and important U.S. anthropologists of the first half of the 20th century, was born in Hoboken, N.J., on June 11, 1876. After receiving an M.A. degree in English in 1897 at Columbia university, he became a student of Franz Boas and received his Ph.D. in 1901, his thesis being on the decorative symbolism of the Arapaho, a Plains Indian tribe of Montana. In 1901 he founded the department of anthropology at the University of California, Berkeley, to which he remained attached until his retirement in 1946. After retirement, he held visiting professorships at Brandeis university, Waltham, Mass., The University of Chicago, and Columbia, Harvard and Yale universities.

His field investigations were concentrated on the Indians of California, but included important studies of Plains Indian tribes and the Zuñi. More than any other American anthropologist his interests and competence ranged over the entire field, and he made important contributions to the archaeology of California, the Valley of Mexico and Peru, as well as to linguistics. folklore, kinship and social structure. His book *Anthropology* (1923) was the first general teaching text on the subject. His main theoretical interest lay in the discovery of patterns or regularities of cultural phenomena on such varied subjects as changes in women's fashion, Mohave epic tales, classificatory systems of relationship, linguistic categories, art styles and sign language.

He was one of the founders of the American Anthropological association, its president (1917), and president of the American Folklore society (1906) and of the Linguistic Society of America (1940). He received the Huxley Memorial medal of the Royal Anthropological institute in 1945, and the Viking medal of the Wenner-Gren Foundation for Anthropological Research in 1946. Honorary degrees in the United States were awarded him by the University of California, The University of Chicago, and Columbia, Harvard and Yale. He died in Paris on Oct. 5, 1960.

Of over 300 articles, monographs and books the following are most significant: *Peoples of the Philippines* (1919, rev. ed., 1928); *Anthropology* (1923, rev. ed., 1948); *Handbook of the Indians of California* (1925); *Cultural and Natural Areas* of *Native North America* (1939); *Stimulus Diffusion* (1940); *Three Centuries of Women's Dress Fashions* (with J. Richardson, 1940); *Peruvian Archeology in 1942* (1944); *Configurations of Culture Growth* (1944); *A Mohave Historical Epic* (1951); *Culture: a Critical Review* (with C. Kluckhohn, 1952); *The Nature of Culture* (1952); *Style and Civilizations* (1957); *Sparkman Grammar of Luiseño* (with G. Grace, 1960). (R. F. HR.)

KROGH, (SCHACK) AUGUST (STEENBERG) (1874–1949), Danish physiologist who performed important experiments showing some of the means by which the smallest blood vessels govern the flow of blood, was born at Grenaa. Den., Nov. 15, 1874, and took his doctor's degree in 1903, with a thesis on the respiration of frogs. In 1916 he became professor of animal physiology at the University of Copenhagen. Krogh made important discoveries in connection with respiration, and in 1906 he was awarded a prize by the Vienna Academy of Science for the investigations which he carried out and described in a treatise, *Mechanism of Gas Exchange in Lungs*.

In 1920 he was awarded the Nobel prize for medicine for his discovery of capillary regulation of the conveyance of blood to the muscles. He discovered that the number of open capillaries is directly related to the activity of the tissue; and that the number of open vessels is significantly less in resting muscle than in active muscle. The difference, Krogh reasoned, was a part of the mechanism of oxygen supply to tissues. He died in Copenhagen on Sept. 13, 1949.

Among his publications are: *The Respiratory Exchange in Animals and Man* (1916) and *The Anatomy and Physiology of Capillaries*, being the Silliman lectures delivered at Yale (1922; rev, enl. ed., 1928); articles in the *Journal of Physiology*.

KROMERIZ (German KREMSIER), a town in the South Moravia region of Czech., on the Morava below its confluence with the Hana. The surrounding area, cultivated in strips, is a sugar-beet and barley region, and the town is a large cattle, cereal and fruit market with industries natural to its area—brewing, flour milling and the manufacture of agricultural machinery. In 1848–49 it was the seat of the Austrian parliament, which met in the palace: later used as a summer residence by the bishop of Olomouc. Pop. (1957 est.) 20,930.

The town passed under German rule in March 1939 and was returned to Czechoslovakia in 1945.

KRONE, the name in several Germanic languages for a crown. Because it has been customary for many centuries to picture the reigning sovereign on coins minted by the state, the word, with its variations, came to be widely employed as a title for currency units in Europe during the 19th century. With the collapse of many European monarchies in the first half of the 20th century, however, its use declined and became confined to Scandinavia. This article traces the history of the krone in the countries where it was used, and of its successor currencies in those countries where it was later superseded.

Austria.— The most important of the krone currencies established in the 19th century was that which was made the monetary unit of Austria-Hungary. Before 1857 Austria's currency had been based on the so-called convention or 20-gulden standard. In that year, a monetary convention was concluded with Prussia and other German states providing for the introduction of a new gulden currency that was slightly lower in value in terms of silver than that which it replaced and was convertible at fixed rates of exchange into the currencies of the other participating countries. In 1866 Austria withdrew from the convention and, in conjunction with Hungary. introduced in 1870 a new double-standard florin, that is, one with a fixed value in terms of both silver and gold. The fall in the world price of silver in relation to gold created complications. however, and in 1892 it was decided to introduce a gold standard currency into Austria-Hungary.

The new gold unit was named the krone, two kronen being equal in value to one florin of the old currency. There were 24.02 krone to the pound sterling and 4.94 to the U.S. dollar. Though linked to gold. the new currency was convertible into this metal only for the purpose of settling transactions with other countries. Internally silver kronen. divisible into 100 heller, were used.

During and after World War I, serious inflation, partly attributable to the economic backwash of the disintegration of Austria-Hungary, resulted in a severe fall in the purchasing power of the krone. Finally, in 1924, the monetary system was reduced to a state of chaos, the rate of exchange to the pound sterling being 340,000 kronen. A new currency unit known as the schilling, divisible into 100 groschen, was then introduced as part of a general reform of the country's financial system. Its gold value established its international worth at 34.58 to the pound sterling and 7.12 to the U.S. dollar. Existing kronen currency was exchanged into schillings at a ratio of 10,000 to 1.

The reform program was successful. Exchange control had to be introduced in 1931 to deal with the adverse effect on Austria's external payments of currency devaluation in other European countries, but the schilling held its ground fairly well through the 1930s. After the *Anschluss* between Germany and Austria in March 1938. however, it was ruled that the German mark should supersede the schilling in Austria and existing Austrian currency was gradually withdrawn. After World War II the Austrian schilling was recreated and arrangements made to convert mark currency into it on a one-for-one basis. Initially, the external value of the new currency was fixed at 10 to the U.S. dollar and 40 to the pound sterling. But inflationary pressures quickly reduced its purchasing power. A new schilling currency was introduced to replace the existing one on a one-for-three basis in 1947 but the external rate was not altered. Between 1949 and 1953, however, there were three cuts in the foreign exchange worth of the schilling, bringing the rate against sterling up to 73 and that against the U.S. dollar to 26. Thereafter the schilling became a fairly strong currency.

Hungary.— The Austro-Hungarian krone currency, which Hungary had shared with Austria up to the end of World War I. suffered a serious fall in real value in Hungary as in Austria after 1918. The exchange. rate against the pound having weakened to 346,000 to the pound. a new monetary unit—the korona—was

introduced on the basis of exchange rates of 24.02 to the pound and 4.94 to the U.S. dollar. But the new currency, which was divisible into 100 fillér, had no fixed gold value and subsequently depreciated. So in 1927 the pengö, also divisible into 100 fillér, took the place of the korona as Hungary's basic currency unit. The new currency was given a fixed gold value, while exchange rates against sterling and the U S. dollar were stabilized at 27 82 and 5.72 respectively. In the 1930s, however, the gold link was severed and exchange rates fluctuated. During and after World War II, the pengö depreciated rapidly in response to inflationary pressures and finally became worthless. Hungary having become part of the Soviet bloc, a new currency, the forint, linked to the Russian rouble, was introduced in 1946. Nominally, the forint was given a gold value that established its exchange rate against sterling at 32.87 and against the U.S. dollar at 11.74.

Czechoslovakia. — As part of the old Austro-Hungarian empire Czechoslovakia had a krone currency up to the end of World War I. Political separation having been achieved in Nov. 1918, currency separation followed in Feb. 1919. A new unit knoan as the koruna, divisible into 100 heller. was then introduced and arrangements made for the conversion of existing Austrian krone currency on a one-for-one basis. The koruna suffered a fall in purchasing poaer in subsequent years but then it was possible for the government to announce stabilization of the exchange rate in 1923 on the basis of a rate of 33.75 to the U.S. dollar. A formal gold link was established in 1929, but in the 1930s the gold standard was suspended and the koruna devalued. By 1939, however, it had recovered to about 29 to the dollar and was held at about 25 to the dollar during most of World War II. After liberation in May 1945, the prewar parity was restored. but inflation reduced the real worth of the koruna and in November there was a devaluation to 50 to the dollar and 202 to the pound sterling. No new adjustments were made in the monetary system for several years after a Communist coup brought Czechoslovakia within the Soviet bloc in 1948, but in 1953 the koruna was revalued and linked with the Russian rouble at a level that established nominal dollar and sterling parities of 7.20 and 20.16 respectively.

Denmark. — Before 1873 the currency unit was the rigsdaler of 96 skilling, a silver coin. In that year Sweden and Denmark formed the Scandinavian Monetary convention and adopted as their common currency unit the krone, a gold coin divisible into 100 ore. Existing silver coinage was convertible into the new unit on a one-for-two basis. The Danish krone was also convertible into the units of the other convention members (Norway joined in 1875) at par and was quoted at 18.159 to the pound sterling and 3.73 to the U.S. dollar. The gold standard was suspended at the beginning of World War I and subsequently internal inflation reduced the purchasing power of the Danish krone and thereby brought about a weakening of exchange rates. Because the depreciation of the different currencies of the monetary union was not even. the convention was dissolved in 1924. The Scandinavian krone then ceased to exist. By pursuing a deflationary policy, Denmark raised the value of its own krone to the prewar level against the pound and the U S dollar by 1927 and then returned to the gold bullion standard. the krone being made convertible into gold at prewar rates for external payments purposes but not internally. When Great Britain left the gold standard in 1931, however, Denmark followed suit and from that time until the beginning of World War II its krone fluctuated in line with the pound sterling. With the German occupation in 1940 exchange rates became entirely nominal. After liberation in 1945, the'krone was maintained at the level of 4.80 to the U.S. dollar and 19.36 to the pound sterling to which it had been adjusted during the occupation. In 1949 it was devalued in line with the pound sterling. with the result that the parity rate against the U.S. dollar moved out to 6.91. Denmark experienced difficulty in the external payments field in the mid-1950s but, by enforcing stringent monetary policies, maintained the krone's value.

Norway. — The country's currency unit prior to joining the Scandinavian convention in 1875 was the speciedaler, a silver coin divisible into 120 skilling. On Norway's entering the convention. these coins were made exchangeable into the new Scandinavian krone on a one-for-four basis. Ncrway's currency suffered some loss of purchasing power during World War I but deflationary measures in the postwar period cleared the way for a return in 1928 to the gold bullion standard on the basis of exchange rates before the war. After leaving the gold standard in 1931 as a sequel to the British decision to devalue the pound, the Norwegian krone fluctuated in line with sterling. During the German occupation from 1940 to 1945, the krone was made convertible into the reichsmark at Rm. o 60 per krone. Serious inflation caused a severe fall in its real value during this period, but after liberation the krone was fixed at 20 to the pound and 4.96 to the U.S. dollar, only slightly below the prewar level. However, Norway devalued in line with the pound sterling in 1949, thereby causing the parity rate against the U.S. dollar to move to 7.14. Subsequently, Norway's external economic affairs developed in a satisfactory way and the krone was firm.

Sweden. — The Swedish krona was linked with the kronen of the other Scandinavian convention countries until 1914. On the outbreak of World War I the gold standard was suspended but the Swedish krona suffered less from inflation during the following years than other Scandinavian currencies and was therefore able to return to a full gold standard for external and internal purposes as early as 1924 on the basis of prewar parities. The gold standard was suspended in 1931 and subsequently the Swedish krona fluctuated in line with the pound sterling on the basis of a rate of approximately 19.40 kronor to the pound. As in the case of other Scandinavian countries, there was no monetary agreement with the United Kingdom establishing such a link, but because of the extensive use of sterling for financing Swedish foreign trade it was considered best to follow this course. During most of World War II the krona was pegged at a level of 16.95 to the pound. The currency having maintained its real value better than many others during the war years, it was decided to raise its value by 14% in 1946, bringing the rate against sterling to 14.50 and that against the dollar to 3.60. Subsequently, the Swedish payments position weakened and when the pound was devalued in 1949 it was thought advisable to make a similar cut in the krona, with the result that the dollar parity moved to 5.17. Afterward, Sweden's external economic position developed favourably and the value of the currency was well maintained. (C. G. T.)

KRQNECKER, LEOPOLD (1823–1891), German mathematician whose primary contributions were in higher algebra, was born at Liegnitz, Dec. 12, 1823, and died at Berlin, Dec. 29, 1891. At the Liegnitz ***Gymnasium,*** Kronecker had as his instructor in mathematics Ernst Kummer, from whom he acquired a passion for the theory of numbers. In 1845 he took his doctor's degree at the University of Berlin, with a dissertation on those special complex units which appear in cyclotomy. Kronecker managed the family mercantile and land business until the age of 30, when he was financially able to retire. While in business he pursued mathematics as a recreation. From 1861 to 1883 he lectured at the University of Berlin and in 1883 succeeded Kummer as professor.

Kronecker was primarily an arithmetician and algebraist. His major contributions were in elliptic functions, the theory of algebraic equations and the theory of algebraic numbers. In the last he created an alternative to the theory of J. Dedekind. His theory of algebraic magnitudes (1882) presents a part of this. Kronecker's philosophy of mathematics, however, seems destined to outlast his more technical contributions. He was the first to doubt the significance of nonconstructive existence proofs, and for many years carried on a polemic against the analytical school of K. Weierstrass on this and other points of classical analysis. He sought to reduce all mathematics to the positive whole numbers and showed how all but these could be eliminated. In some of his strictures on classical analysis, Kronecker was justified by 20th-century research on the foundations of mathematics.

His works were edited by K. Hensel in 5 vol. (1895–1930) and his lectures, ***Vorlesungen uber Mathematik,*** were edited ***by*** E. Nette and K Hensel, **3** vol. (1894–1903).

See. G. Frobenius, *Gedächtnisrede* **(1893).** **(E. T.** B.)

KRONSTADT (KRONSHTADT), a naval port of the Russian S.F.S.R., the Soviet Union, on the island of Kotlin (Finnish

Retusari or Rat Island) in the narrow bay in which the Gulf of Finland terminates, in 59° 59' N., 29° 49' E. Pop. (1939) 50,000. The waters to the north of the island are not navigable for large ships. To the south a sand bank stretches along the coast of Oranienbaum, so that the channel for large ships is close to the island and forms the only way to Leningrad, which can be easily reached from Kronstadt. Fortifications are erected on the Oranienbaum coast, also, so that ships enter between fortifications to the north and south.

It is one of the chief naval bases of the Soviet Union; admission to the war harbour, docks and forts is prohibited, while the number of inhabitants of the island is strictly limited. The strategic value of Kotlin was recognized by Peter the Great, who captured Kotlin from the Swedes in 1703 and constructed a fort and docks on the island. It was renamed Kronstadt in 1823. It was at first an important commercial harbour, since ships could not reach St. Petersburg (Leningrad) owing to the shallowness of the channel, and cargoes were here transferred to smaller vessels. In 1875–85, a canal, 23 ft. deep was constructed through the channel and the island lost its trading importance. New batteries and a new fort were constructed in 1856–71, and the fortifications have been frequently strengthened and increased since that date. The sailors and special troops of Kronstadt always formed the most revolutionary element of the Russian army and navy; a Kronstadt officer led the mutiny of the Dekabrists in 1825. A Kronstadt sailor, Sukhanov, was the leader of the military organisation of the revolutionary Narodnaya Volya group and was shot in 1882. Mutinies broke out among the troops in 1905 and 1906, but were ferociously suppressed.

After the February 1917 revolution, the Kronstadt Soviet opposed the provisional government and declared a "Kronstadt Republic" and took part in the July 1917 mutiny. During the October 1917 revolution, the Baltic fleet cruiser "Aurora" bombarded the Winter Palace and thus helped in the Bolshevist victory. In 1919, during the first attack of General Yudenich against Leningrad, Kronstadt was bombarded from the air by White Army troops, then established on the coast to the south of the island, and an English warship penetrated the harbour and torpedoed a cruiser. In the autumn of 1919 Kronstadt aided in the repulse of Yudenich's second attack. In accordance with their revolutionary reputation, the Kronstadt navy in March, 1921 mutinied against the Soviet government, and took possession of the fortress and two ironclads. After a bombardment lasting many days, the Soviet troops made a night attack across the ice and the revolt was crushed with much severity. Kronstadt's fortifications, during World War II, aided greatly in resisting the 1941–44 siege of Leningrad and helped in maintaining the Lomonosov bridgehead. The port is icebound for 140 to 160 days each year, from about the beginning of December until April.

KROONSTAD, a town on the Valsch river in the Orange Free State, U. of S.Af., alt. 4,491 ft., the state's second largest industrial and agricultural centre, 127 mi. N.E. of Bloemfontein, 406 mi. N.W. of Durban, by rail. Pop. (1951) 26,612 (10,047 Europeans).

The district produces wheat, maize, meat and wool. It is an important rail and road junction and a holiday resort. Its rapid development in the 1950s was largely attributable to its proximity to the Free State gold fields.

KROPOTKIN, PETER ALEXEIVICH, PRINCE (1842–1921), Russian geographer, author and revolutionary, was born at Moscow on Dec. g, 1842, the son of Prince Alexei Petrovich Kropotkin. At the age of fifteen he entered the Corps of Pages at St. Petersburg (1857), which combined the character of a military school endowed with special rights and of a court institution attached to the imperial household. Kropotkin had early developed an interest in the condition of the Russian peasantry, and this interest increased as he grew older. During his last years as a student Kropotkin came under the influence of the new Liberal-revolutionary literature, which largely expressed his own aspirations. In 1862 he was gazetted to a Siberian Cossack regiment in the recently annexed Amur district. For some time he was aide-de-camp to the governor of Transbaikalia at Chita, and subsequently attaché for Cossack affairs to the governor-general of East Siberia at Irkutsk. In 1864 Kropotkin took charge of a geographical survey expedition, crossing North Manchuria from Transbaikalia to the Amur, and shortly afterwards was attached to another expedition which proceeded up the Sungari river into the heart of Manchuria. Both these expeditions had valuable geographical results.

In 1867 Kropotkin quitted the army and returned to St. Petersburg, where he entered the university, becoming at the same time secretary to the physical geography section of the Russian Geographical Society. In 1873 he published a map and paper in which he proved that the existing maps of Asia entirely misrepresented the physical formation of the country, the main structural lines being in fact from south-west to north-east, not from north to south, or from east to west as had been previously supposed. In 1871 he explored the glacial deposits of Finland and Sweden for the Russian Geographical Society, and while engaged in this work was offered the secretaryship of that society. But by this time he had decided not to work at fresh discoveries but to aid in diffusing existing knowledge among the public, and he accordingly refused the offer, and returned to St. Petersburg, where he joined the revolutionary party.

In 1872 he visited Switzerland, and became a member of the International Workingmen's Association at Geneva. He found this body too conservative, and after studying the programme of the more advanced Jura Federation at Neuchbtel and spending some time in the company of the leading members, he definitely adopted the creed of anarchism (*q.v.*) and, on returning to Russia, took an active part in spreading the nihilist propaganda. In 1874 he was arrested and imprisoned, but escaped in 1876 and went to England, and then to Switzerland, where he joined the Jura Federation. In 1877 he went to Paris, where he worked in the socialist movement, returning to Switzerland in 1878, where he edited for the Jura Federation a revolutionary newspaper, Le *Révolté,* also publishing various revolutionary pamphlets. Shortly after the assassination of the tsar Alexander II. (1881) Kropotkin was expelled from Switzerland by the Swiss government, and after a short stay at Thonon (Savoy) went to London, where he remained for nearly a year, returning to Thonon towards the end of 1882. Shortly afterwards he was arrested by the French government, and, after a trial at Lyons, sentenced by a police-court magistrate (under a special law passed on the fall of the Commune) to five years' imprisonment, on the ground that he had belonged to the International Workingmen's Association (1883).

In 1886, however, as the result of repeated agitation on his behalf in the French Chamber, Kropotkin was released, and settled near London. He now devoted himself to literary work, and to the development of his doctrine of "mutual aid." He was an authority on agriculture as well as on geographical subjects, and put forward many practical suggestions for its development. Kropotkin had a singularly gentle and attractive personality, and was much loved and respected in England. He desired the minimum of government, and the development of a system of human co-operation which should render government from above superfluous. When the Russian revolution broke out he decided to return to Russia. He arrived in June 1917, and settled near Moscow, taking no part in politics. He died on Feb. 8, 1921.

His works include: *Paroles d'un rdvoltd* (1884); *La conquête du pain* (1888); *L'Anarchie: sa philosophie, son idéal* (1896); *The State, its Part in History* (1898); *Fields, Factories and Workshops* (1899, new ed. 1919); *Memoirs of a Revolutionist* (1900); *Unsuspected Radiations* (1901); *Mutual Aid, a Factor of Evolution* (1902, later ed. 1915); *Modern Science and Anarchism* (1903); *The Desiccation of Asia* (1904); *The Orography of Asia* (1904); *Russian Literature* (1905, 2nd ed. 1916); *Modern Science and Anarchism* (1912); *Ethics, Origin and Development* (1924).

KRÜDENER, BARBARA JULIANA, BARONESS VON (1764–1824), Russian mystic, was born at Riga on Nov. 11, 1764, daughter of Otto von Vietinghoff and his wife, née von Münnich. At 18 she married Baron von Krudener, a widower of 34, a distinguished Russian diplomatist. There were two children of the marriage, Paul and Juliette. In 1789 the baroness, who was a nervous, highly strung woman, formed a passionate attachment for a young French officer, Charles Louis de Frégeville. Her hus-

band declined to divorce her, and in 1798 she joined him again for a short time at Berlin where he was ambassador. His death (June 14, 1802), released her. In the meantime the baroness had been enjoying literary society at Coppet and in Paris, and, under the influence of Chateaubriand, had written her sentimental and largely autobiographical romance of *Valérie*. In Jan. 1804 she returned to Riga, where she underwent "conversion" under the ministrations of a Moravian shoemaker.

From the date of her conversion began her extraordinary career in the execution of her "mission" in Europe. At Konigsberg she met Queen Louise of Prussia and a peasant named Adam Muller, who revealed to her that a man would be raised up "from the north . . . from the rising of the sun" (Isa. xli., 25) to destroy Antichrist (Napoleon) and that the millennium would then begin. The baroness spent 11 years wandering over Europe before she was able to reveal to the tsar Alexander that he was the predestined man "from the rising of the sun." Wherever she went she gathered a crowd of followers and great excitement prevailed. She was expelled from one Swiss Canton after another for seeking to persuade the peasants to flee from the wrath to come.

Madame de Krudener achieved her famous interview with Alexander I. on June 4, 1815. She came upon him as he was brooding over an open Bible; she preached to him for three hours, at the end of which he "found peace." "Chiliasm," as the new cult was called, established itself in the most powerful court in Europe, and Madame de Krudener, who followed Alexander to Heidelberg and Paris, found herself a political force and one of the moving spirits in the conception of the Holy Alliance (*q.v.*). The proclamation which was to herald the reign of peace was issued on Sept. 26, signed by the sovereigns of Russia, Austria and Prussia. Madame de Kriidener claimed, though the tsar reproved her indiscretion, that the idea was hers. She expected to travel back to Russia by way of Switzerland in the tsar's company. But he had by this time recovered from his infatuation and left her behind in Switzerland.

She was not able to return to St. Petersburg until 1820, when she urged the tsar to take up arms for the Greeks in their war of independence. Alexander's reply was a letter asking her to leave St. Petersburg. She went to the Crimea, where Princess Galitzin had established a pietistic colony. There, at Karasu Bazar, she died on Dec. 25, 1824. The misery of the colony of peasants who had "fled from the wrath to come" seems to have opened her eyes. She said: "The good I have done will endure; the evil I have done the mercy of God will blot out."

The most authoritative study on Madame de Kriidener is E. Muhlenbeck, *Étude sur les origines de la Sainte-Alliance* (Paris, 1909), with numerous references to original authorities. *See* also C. Ford, *Life and Letters of Mme. Krudener* (contains bibliog.) (1893), and *Lives* by P. J. G. Eynard (2 vols., Paris, 1849), Lacroix (Paris, 1880), and Turquan (Paris, 1900).

KRUEGER, WALTER (1881-), U.S. army officer, commander of the 6th army during World War II, was born in Flatow, West Prussia, Jan. 28, 1881, and went to the U.S. in 1889. He volunteered for duty as an enlisted man in 1898 during the Spanish-American War, and became a second lieutenant of infantry in the regular army in 1901. In World War I he was chief of the tank corps, American expeditionary force. then attended many military schools, served with the war department general staff and was in charge of the southern defense command from May 1941 to Jan. 1943. He gained a wide reputation as a skilled tactician and trainer of troops. Early in 1943 General Krueger took command of the newly activated U.S. 6th army in Australia and New Guinea. In December his forces invaded New Britain and in April 1944 occupied Hollandia, capital of Dutch New Guinea. Krueger led the 6th army through the Philippine Islands campaign and into the occupation of Japan and retired as full general in Jan. 1946. His memoirs were published under the title *From Down Under to Nippon* (1953). (R. R. SH.)

KRUGER, STEPHANUS JOHANNES PAULUS (1825–1904), president of the Transvaal republic, was born in Colesberg, Cape Colony, on Oct. 10, 1825. His father was Caspar Jan Hendrick Kruger, who was born in 1796, and whose wife bore the name of Steyn. In his ancestry on both sides occur Huguenot names.

At the age of ten Paul Kruger—as he afterwards came to be known—accompanied his parents in the migration, known as the Great Trek, from the Cape Colony to the territories north of the Orange in the years 1835–40. Brought up on the borderland between civilization and barbarism, constantly trekking, fighting and hunting, he had little education. His literature was almost confined to the Bible, and the Old Testament was preferred to the New. Kruger, like Piet Retief and others of the early Boer leaders, believed himself the object of special Divine guidance. At about the age of 25 he is said to have disappeared into the veldt, where he remained alone for several days, under the influence of deep religious fervour. He belonged to the narrow and puritanical Dopper sect, the members of which were always unswerving in their support, and at all critical times in the internal quarrels of the state rallied round him.

When the lad, who had already taken part in fights with the Matabele and the Zulus, was 14 his family settled north of the Vaal and were among the founders of the Transvaal state. At the age of 17 Paul found himself an assistant field cornet, at 20 he was field cornet, and at 27 held a command in an expedition against the Bechuana chief Sechele—the expedition in which David Livingstone's mission-house was destroyed. In 1853 he took part in another expedition against Montsioa. When not fighting natives in those early days Kruger was engaged in distant hunting excursions which took him as far north as the Zambezi. In 1852 the Transvaal secured the recognition of its independence from Great Britain in the Sand River convention. In 1856–57 Kruger joined M. W. Pretorius in his attempt to abolish the district governments in the Transvaal and to overthrow the Orange Free State government and compel a federation between the two countries. The raid into the Free State failed.

In 1864, when the faction fighting ended and Pretorius was president, Kruger was elected commandant-general of the forces of the Transvaal. In 1870 a boundary dispute arose with the British government, which was settled by the Keate award (1871). The decision caused so much discontent in the Transvaal that it brought about the downfall of President Pretorius and his party; and Thomas François Burgers, an educated Dutch minister, resident in Cape Colony, was elected to succeed him. 'During the term of Burgers' presidency Kruger did everything in his power to undermine his authority, going so far as to urge the Boers to pay no taxes while Burgers was in office. The *impasse* in the government of the country drew bitter protest from Burgers, and terminated in the annexation by the British in April 1877. Kruger and his party were determined to secure the downfall of Burgers, and they did not foresee the results of his fall. The Transvaal was annexed and Kruger accepted office under the British government.

He continued, however, to agitate for the retrocession of the country, being a member of two deputations which went to England endeavouring to get the annexation annulled, and in 1878 Sir Theophilus Shepstone, the British administrator, dismissed him from the service. In 1880 the Boer rebellion occurred, and Kruger was one of the famous triumvirate, of which General Piet Joubert and Pretorius were the other members, who, after Majuba, negotiated the terms of peace on which the Pretoria convention of Aug. 1881 was drafted. In 1883 he was elected president of the Transvaal, receiving 3,431 votes to 1,171 recorded for Joubert.

In Nov. 1883 President Kruger again visited England, and secured the London convention, granted by Lord Derby in 1884 on behalf of the British government. In 1888 he was elected president for a second term of office. In 1889 Dr. Leyds, a young Dutchman, was appointed state secretary, and a system of state monopolies around which much corruption grew up was begun. President Kruger now turned his attention to securing Boer political monopoly in face of the increase in the Uitlander population. In 1890, 1891, 1892 and 1894 the franchise laws (which at the time of the convention were on a liberal basis) were so modified that Uitlanders were practically excluded. In 1893 Kruger had to face a third presidential election, in which his majority fell to about 700. His opponent, Joubert, accused the government of

tampering with the returns, and appealed to the *volksraad*. The appeal, however, was fruitless, and Kruger retained office.

Kruger's external policy had been to try to enlarge the frontiers of the Transvaal at the expense of Great Britain. In successive disputes he usually gained something, but in 1895 he was definitely defeated in his endeavours to reach the sea at Delagoa bay. His internal policy was narrow and bigoted. It is said that in replying to a deputation of Uitlanders who desired to obtain legal status for the English language in the Transvaal he stated "This is my country; these are my laws. Those who do not like to obey my laws can leave my country." The Jameson raid strengthened him in his resistance to reform of the franchise or any concession to the Uitlanders. It also strengthened his hold on his own people.

In 1898 Kruger was again elected president of the Transvaal, this time with an overwhelming majority. A conference was arranged at Bloemfontein between Sir Alfred (afterward Lord) Milner, the high commissioner, and President Kruger on the franchise and other questions. No agreement was reached. In Oct. 1899, after a long and fruitless correspondence with the British government, war with Great Britain was ushered in by an ultimatum from the Transvaal. *(See* SOUTH AFRICAN WAR.) In 1900, Bloemfontein and Pretoria having been occupied by British troops, Kruger, too old to go on commando, with the consent of his executive proceeded to Europe, where he endeavoured in vain to induce the European powers to intervene on his behalf.

He took up his residence at Utrecht, where he dictated a record of his career, published in 1902 under the title of *The Memoirs of Paul Kruger*. He died on July 14, 1904, at Clarens, near Vevey, on the shores of Lake Geneva. He was buried at Pretoria on the following Dec. 16, Dingaan's day, the anniversary of the day in 1838 when the Boers crushed the Zulu king Dingaan — a fight in which Kruger, then a lad of 13, had taken part.

See J. F. van Oordt, P. *Kruger en de opkomst d. Zuid-Afrikaansche Republiek* (Amsterdam, 1898); the *Memoirs* already mentioned; F. R. Statham, *Paul Kruger and his Times* (1898); and, among works with a wider scope, G. M. Theal, *History of South Africa* (for events down to 1872 only); Sir J. P. Fitzpatrick, *The Transvaal From Within* (1899); *The Times History of the War in South Africa* (1900–09); A. P. Hillier, *South African Studies* (1900); Philip R. Botha, *Die Staatkundige ontwikkeling van die Zuid-Afrikaanse Republiek onder Kruger en Leyds*, etc. (1926); H. Hallman, *Krugerdepesche und Flotterfrage*, etc. (1927); J. P. La G. Lombard, *Paul Kruger, die Volksman* (1925).

KRUGERSDORP, a town, mining and industrial centre in the Transvaal, S.Af., on the Witwatersrand, 20 mi. W.N.W. of Johannesburg, at an altitude of 5.709 ft. Pop. (1951) 75,738. including 26,901 Europeans, 46,406 natives. 1,734 Coloureds and 697 Asiatics; (1960) 89,493, including 30,241 Europeans The town dates from 1887, shortly after gold was discovered on the Witwatersrand, and is named after Pres. Paul Kruger. Manganese and asbestos deposits are also worked and a number of plants for the extraction of uranium have been established. The railway from Johannesburg to Mafeking and the Rhodesias meets the line from the Cape, via Fourteen Streams at Krugersdorp. The famous Sterkfontein caves. where the prehistoric Sterkfontein man was discovered in 1936 by R. Broom, attract many visitors.

KRUMBACHER, CARL (1856–1909), German Byzantine scholar, was born at Kurnach in Bavaria, and was professor of medieval and modern Greek at Munich (1897–1909). He also founded the *Byzantinische Archiv* (1898) and the *Byzantinische Zeitschrift* (1892). His chief work is *Geschichte* der *byzantinischen Literatur* (from Justinian to the fall of the eastern empire, 1453).

KRUMEN, properly KRU, a tribe inhabiting the Liberian coast between the Cess and Cavally rivers. Krumen are of the short, stocky bush Negro physique and of very dark complexion. Since the 18th century they have furnished crews for European vessels and, being very hard working, have always been popular; a settlement of Kru seamen and their families is established in Freetown. Sierra Leone. Traditionally the Kru polity was founded on the federation of exogamous patrilineal. clans into village groups lacking any centralized authority. The extended family owned property in common and individual ownership was restricted. Other features included age classes, oracles and the use of the ordeal, though there was much variation from place to place. Female circumcision was never practised and women had a higher status than in surrounding tribes.

Despite their European contacts the Kru preserved a sense of tribal solidarity to a remarkable degree, but some of the traditional customs are losing their force. They have often been in conflict with the Liberian government and in the mid-1950s continued to be administered through government-appointed paramount chiefs acting with a council of elders.

See H. S. Mekeel, "Social Administration of the Kru," *Africa*, vol. x (1937) and vol. xii (1939); B. Holas, *Mission dans l'est libérien* (1952).
(M. P. BN.)

KRUPP, the surname of a German family owning one of the biggest concerns for steel and armaments products in Europe, whose development was closely connected with the political ups and downs of Germany.

FRIEDRICH KRUPP (b. Essen, July 17, 1787–d. Essen, Oct. 8, 1826) succeeded in manufacturing cast steel. His son ALFRED (b. Essen, April 26, 1812–d. Essen, July 14, 1887) known as the "Cannon King," produced in 1847 a three-pounder muzzle-loading gun of cast steel. At the Great exhibition of London in 1851 a solid flawless ingot of cast steel weighing two tons caused a sensation in the industrial world. After producing axles and weldless steel tires for railways, Krupp turned to making field guns and howitzers. In the 1860s his works employed about 10,000 people. Social welfare on a large scale, including housing, co-operative stores, schools, etc., were one of the best-known features of the Krupp concern. To secure the supply of raw materials, Krupp acquired iron and coal mines.

Under the direction of FRIEDRICH ALFRED (b. Essen, Feb. 17, 1854–d. Essen, Nov. 22, 1902), the business underwent an enormous expansion resulting from the rising of the German navy and the demand for armour plates. Krupp acquired the Germania shipbuilding yards at Kiel in 1902. By that time the firm employed more than 40,000 people. Friedrich Alfred was succeeded by his elder daughter BERTHA KRUPP (1886–1957); she married on Oct. 15, 1906, GUSTAV VON BOHLEN UND HALBACH (b. The Hague, Aug. 7, 1870–d. Salzburg, Austria, Jan. 16, 1950) and he was allowed to add the name Krupp to his own.

During World War I the firm secured special international significance by the manufacture of heavy guns like the 42-cm. howitzer "Big Bertha" and the long-range gun which in the spring of 1918 bombarded Paris over a distance of 76 mi. After the war. the manufacture of arms was forbidden and parts of the works had to be dismantled. The labour force of the firm was reduced by half from its pre-1914 number and put to turning out locomotives, agricultural implements and other nonmilitary products. A new special hard steel *(Widia)* was developed. Controlling interests in several coal, iron and steel firms in Germany were acquired.

During the French occupation of the Ruhr in 1923 Krupp Von Bohlen was arrested and sentenced to 15 years' imprisonment by a military court.

Hitler's policy of military conquest switched back the Krupp combine to armament products. In World War II Krupp's constructed a heavy howitzer, the "Big Gustav," firing 80-cm. shells; it was used against Sevastopol in 1941.

The Krupp works were severely damaged in air raids. After the war parts of the remaining works were dismantled. The modern steel plant of Borbeck, built at a cost of RM. 120,000,000, was shipped as reparation to the U.S.S.R.

On April 11, 1945, ALFRIED FELIX ALWYN, the eldest son of Krupp von Bohlen (born 1907), was arrested and later indicted before the Nürnberg International Military tribunal in the place of his sick father. In July 1948 he was sentenced to 12 years' imprisonment and his property confiscated; in Jan. 1951 he was released and his property restored. But under the Allied Deconcentration law no. 27 the Krupp combine was split up. Under an agreement embodied in the Allied decree of March 4, 1953, Alfried Krupp von Bohlen, as the single owner, had to sell through trustees within a period of five years all his coal and steel assets (valued at DM. 260,000,000 and employing 45,000 people on

Jan. 1, 1953); he had also to sign a solemn undertaking not to acquire or own in future any securities or interests or leading position in any enterprise engaged directly or indirectly in these industries; and he had to assume responsibility for payment of pensions to about 16,000 people. Alfried retained the ownership of all remaining units of the firm Friedrich Krupp; namely, the Essen engineering plants, a locomotive building works, a civil engineering plant, a motor-vehicle factory and other units, employing in Oct. 1953 more than 25,000 people. According to an Allied estimate, Alfried Krupp von Bohlen had to dispose by sale of 75% of the value of the concern.

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KRUPSKAYA, NADEZHDA KONSTANTINOVNA (1869–1939), Russian educationalist and wife of Lenin (*q.v.*), was born on Feb. 26, 1869, in St. Petersburg (Leningrad), where she was educated at the Woman's college. She aided Lenin in his revolutionary activity, became his wife in 1898 and shared his years of work and exile in Europe. When Lenin came to power in Russia, she became a member of the commissariat of education and developed the party's plan for popular education. Mme. Krupskaya was also vice-commissar of education and a member of the central committee of the Communist party and the presidium of the U.S.S.R. She remained influential after Lenin's death, particularly in education. She died in Moscow, in the Kremlin. on Feb. 27, 1939.

KRUSENSTERN, ADAM NAN (1770–1846), Russian navigator and admiral, was born at Haggud, Estonia, on Nov. 19, 1770. After service in the British fleet (1793–99), he commanded in 1803–06 the first Russian expedition to explore the South Pacific and circumnavigate the world, visiting the Marquesas Islands, Kamchatka and Sakhalin. He died at Reval (Tallin) on Aug. 24, 1846.

Krusenstern's *Voyage Round the World* . . . was published in Russian in 1809–13 (3 vol. and atlas), and in German in 1810–14 (3 vol. and atlas). An English edition (2 vol.) was published in 1813. Krusenstern also published *Atlas de l'Océan Pacifique* (1824–27), with *Recueil de mémoires hydrographiques* (1824–35). (H. M. Ws.)

KRUSEVAC, a town in central Serbia, Yugoslavia, situated 10 mi. S.W. from the point where Zapadna Morava joins the Morava river. Pop. (1953) 16,638. The town is built round a central square, from which the streets radiate in the form of a cross. It was from Krusevac that the last Serbian tsar Lazar marched against the Turks and lost his empire at Kosovo in 1389. A fragment of the white tower survived, to which, according to legend, crows brought the tidings of defeat to his queen Militsa, and a church, dating from the reign of Stephen Dushan (1336–56) with beautiful rose windows. The town was taken by the Serbs in the Austro-Turkish war of 1788–90, but by the treaty of Svishtov was restored to Turkey. For a brief period under Prince Michael (1839–42), Krusevac was the capital of Serbia.

KRYLOV, IVAN ANDREEVICH (1768–1844), great national fabulist of Russia, was born on Feb. 14, 1768, at Moscow, the son of an army officer. When he was nine he worked as an office boy, but after his father's death in 1779 his mother moved to St. Petersburg (Leningrad); and until she died in 1788 Krylov held a post in the civil service there. In 1783 he was already writing, but his early work showed no distinction: *Kofrenitsa* ("The Coffeestall Keeper"), an opera, written in 1784, was not published until 1868; of two tragedies, *Cleopatra* (1785) and *Philomela* (1786), the former is not even preserved. From 1789 to 1790 Krylov, assisted by Radistchev, edited a monthly satirical journal. *Pochta Dukhov* ("The Ghosts' Mail"); in 1792 he bought a printing press with which he printed another satirical journal. *Zritel* ("The Observer"), which in 1793 became the St. *Petersburg Mercury*. Nothing is known of Krylov's movements from 1794 till 1797 when he turned up in Moscow as a tutor and secretary in the family of Prince Golitzyn, whom he accompanied when the latter was made governor general of Riga. In 1801 he wrote a comedy, *Pirog* ("The Pie"), which was performed in St. Petersburg in 1802. From 1803, when he resigned his post, to 1805 he appears to have wandered from place to place, gratifying a passion for playing cards and visiting country fairs, which had always attracted him from his early childhood. It was not until 1805, when he was 37, that he produced any of the work for which he is famous. In that year he showed his translations of two of La Fontaine's fables to Dmitriev, from whom he received great encouragement. In 1808 he printed 17 fables, most of them original, and in 1809 he published the first edition of his *Fables* (23 in number) in which he satirized, especially, the slavish imitation of things French by the Russian intelligentsia.

Meanwhile he had obtained the patronage of the imperial family, and was appointed to a post in the mint in 1808, and in 1810 to an assistant librarianship in the imperial public library. His unfinished comedy, *The Sluggard*, had a great success in Moscow in 1807. In 1811 he became a member of the Russian academy, and won its gold medal in 1823, besides receiving many other honours. He died on Nov. 9, 1844 (O.S.). Krylov's fables are written for the most part in the colloquial language of the peasants, satirizing in homely anecdotes the slothfulness, greed, untidiness, etc., in everyday life.

BIBLIOGRAPHY.—A collected edition of Krylov's works appeared at St. Petersburg in 1844; the best semicontemporary edition is that by I. A. Pletnev, with drawings by K. A. Trutovsky (1864). W. R. S. Ralston prefixed an excellent sketch to his English prose version of the *Fables* (1868; 2nd ed., 1871). Another translation, by Sir Bernard Pares, appeared in 1926.

KRYPTON, an inert and rare gaseous element belonging to the helium family or the zero group of the periodic system. It finds some application in the field of gaseous tube lighting and in negative glow lamps for Christmas tree ornaments, etc. Krypton is contained in a type of lamp which produces a flash of light of extremely small duration and is useful for high-speed photography. Krypton and xenon used in place of argon to fill hot-filament incandescent lamps would increase the efficiency and life of the lamp but would add to the cost.

Krypton has an atomic number of 36, an atomic weight of 83.80 and is represented by the symbol Kr. The stable isotopes of the element, listed in the order of decreasing abundance, have the following mass numbers: 84, 86, 82, 83, 80, 78. Radioactive isotopes produced by the fission of uranium and by other nuclear reactions are also known. In its normal state the atom contains 2 electrons in the K shell, 8 in the L shell, 18 in the M shell and 8 ($4s^2$, $4p^6$) in the N shell. This structure is considered responsible for the chemically inert nature of the element.

Krypton is present in dry air, where it was discovered in 1898 by Sir William Ramsay and M. W. Travers, to an extent of only 0.00011% by volume or 1 part in 910,000. Although it also occurs in traces in natural gases and in gases from hot springs and volcanoes, no source for the element superior to the atmosphere (*q.v.*) is known. The element is produced on a small commercial scale by the fractional distillation of air (*see* NEON).

A critically chosen list of the physical constants of krypton follows: density of the gas at 0° C. and 1 atm. pressure 3.743 g. per litre; density of the liquid at its boiling point 2.6 g. per ml.; melting point −157.0° C.; normal boiling point −153.23° C.; critical temperature −63.77° C.; critical pressure 54.18 atm.; heat of vaporization at the normal boiling point 25.78 cal. per gram; ionization potential for the first electron 14.02 v.; solubility, when at 1 atm. pressure in water at 0.5° C. 0.12 ml. (measured at 0° C. and 1 atm.) per millilitre of water; solubility at 20° C. 0.06 ml. per millilitre of water. The ratio of the specific heat of the gas at constant pressure to that at constant volume has a value, 1.689, which indicates that the molecules are single atoms. Krypton crystals have a face-centred cubic structure corresponding to the closest possible packing of spheres. One edge of the unit cell at 88° K has a length of 5.69×10^{-8} cm. This corresponds to a radius of the atom of 2.01×10^{-8} cm.

Although krypton is highly inert from a chemical point of view, it forms a few compounds of low stability in which the bonds between krypton and its neighbouring atoms are of the weak intermolecular type known as van der Waal's forces. Prominent among

the compounds which have been reported are three solids: a hydrate, $Kr.nH_2O$ (n is thought to be about 5 or 6); a compound with phenol, $Kr.mC_6H_5OH$; and a material having a composition $3C_6H_4(OH)_2$, 74Kr formed by crystallizing hydroquinone from water saturated with krypton under high pressure. The first of these exists up to a maximum temperature of about 12.5° C. when under a pressure of 47.5 atm. The second has a dissociation pressure of about six to ten atmospheres at 0° C.

Krypton is detected qualitatively by observing its characteristic lines in the spectrum. It is determined quantitatively by: (1) isolating the gas by chemical and physical means and then measuring its volume; (2) concentrating the gas and estimating its percentage in the concentrate from the intensity of its lines in the spectrum; (3) by use of a mass spectrometer.

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(G. H. C)

KSHATTRIYA (Kshaht're-yah), the second of the four Indian castes, earlier also called Rajanya. The word is from the Sanskrit Kshatra, "rule" or "power." The term included the old Aryan nobility, aboriginal families who had maintained princely status In the later Vedic literature the Kshattriya is distinct from the Brahmana, "priest," and markedly above the Vaisya, the "subject people" and the Sudra, "serfs." Though closely connected with the Brahman the Kshattriya was his rival and even in religion was independent, having a literature of his own in the Upanishads. and contributing largely to Buddhism, Jainism and to the modern sect of the Sikhs A legend declares that the Kshattriyas were exterminated by a Brahman, Parasu-Rama, meaning probably that Brahmanism regained and strengthened its prestige

The Kshattriyas ceased to exercise power under their old title. but their status was assumed by the Rajputs The modern Kshatri inherited the name but not the functions of the Kshattripa, who was a warrior, feudal chief and administrator. See also CASTE (INDIAN).

KUALA LUMPUR, the capital of Malaya, lies in the state of Selangor astride the confluence of the Klang and Gombak rivers in hilly country west of the central mountain range and about 25 mi. east of the swampy coast of the Strait of Malacca. Municipal pop. (1957) 316,230 (mun.), of whom 62% were Chinese and only 15% Malays.

The town was founded in 1857 by 87 Chinese miners who started a tin mine at Ampang, now a suburb. Situated in a highly malarious jungle area, the town nevertheless flourished as a tin mining centre Chinese settlers were under the control of a "Capitan China," formerly the title for a Chinese headman in the Malay States In 1880 Kuala Lumpur superseded Klang as the Selangor capital, and its rapid growth thereafter was largely due to Sir Frank Swettenham who became resident of Selangor in 1882 He caused the whole town to be rebuilt in bricks and tiles. as a precaution against fire and as an aid to better health, and he connected the town by rail with Klang. Its population increased from 5,000 to 25,000 and it was chosen as the capital of the Federated Malay States in 1895. It has more than doubled its size since World War II as a result of the great shifts of population during the long guerilla war against the Communists in Malayan jungles, and in 1958–59 new industries set up with some capital from Singapore

Kuala Lumpur is a mixture of ultramodern architecture and traditional Chinese shophouses. The centre, along the Klang river, is congested, but the municipal area and the suburbs are well planned. and after 1954 six new satellite villages were created in the district. Notable buildings are the government offices and the railway station and offices, all somewhat Moorish in design; the Institute for Medical Research (the best-equipped in Asia); the Rubber Research institute; the Chinwoo building on top of a hill with an auditorium and swimming pool; insurance buildings; banks; hotels. The seat of government and the palace of the federation's Supreme Head are in Kuala Lumpur. The town is a nodal point for rail, road and air communications within the Federation of Malaya. It is connected by road and rail to its port, Port Swettenham; and at its airport, about 3 mi. S., large international airliners call. It has become the junction of passenger and freight services by road to Penang, Singapore and eastern Malaya. Kuala Lumpur's prosperity depends on tin and rubber from the surrounding lowland region (see SELANGOR), light industries and distributing trades; together with its status as capital since 1957 of an independent country. (C. J. S.; E. H. G. D.)

KUANG-CHOU WAN (KWANGCHOW BAY), a stragetic bay leased to France for a naval base from 1898 to 1946 on the east coast of the Luichow peninsula of Kwangtung province in south China. A roadstead 18 mi. long and 6 mi. wide between two islands leads to the harbour at the Ma-ch'ih river estuary where Chanchiang (including former Fort Bayard and Tche Kam) is situated. In the late 1950s the Chinese Communists reported the building of a large deep-water port there, connected by a newly built railroad with Li-t'ang in Kwangsi on the line between Lui-chou and Nanning.

The new port appeared destined to be a major competitor with Hongkong and Canton for the south China hinterland markets. Its exports were chiefly food grains, hemp and other local-products, while imports included timber, crude oil, cement and salt. Rail connections with the large-scale shale-oil industry at Mou-ming (Kao-chou) add significance to the status of Kuang-chou Wan. Chan-chiang, which has highway connections with the interior, is also the entrepbt for adjacent Hainan Island. Fisheries are significant in the bay. (H. J. Ws.)

KUAN YÜ (d. A.D. 219). Chinese military leader, legendary hero and deity, arose from obscurity in an age of chaos. He became intimate with Liu Pei, founder of the Shu kingdom, in whose service he gave his life. His brotherly loyalty to Liu and to the leader Chang Fei, sworn in the "oath of the peach garden," was recounted by public storytellers as early as the 9th century and in the Romance of *the* Three Kingdoms about 1500. Officially proclaimed a divinity in 1594, he was worshiped in numerous shrines as patron of wealth, literature and several provinces, as well as of war. (E. A. KE.)

KUBAN, a river of southern European U.S.S.R., rising in the western glaciers of Elbrus. Kiukurtli glacier and Ullukam glacier, lower termination 9,744 ft., are the sources of the western Kuban. Its important tributary, the Teberda, flows from a glacier west of the Klukhor pass. Kuban is a Tatar name; the river is called Kuman by the Nogai, Kubin by the Abkhasians and Psishche (old nater) by the Cherkess. It is the Hypanis of Herodotus and Strabo, and the Vardanes of Ptolemy. Its length is 563 mi. and its drainage area 23,552 sq.mi. Its left bank tributaries, the Teberda, Great and Little Zelenchuk, Urup, Great and Little Laba, Bielaya. Pshchekha, Aphins, Adagum, Pshishch and Psekups rise as mountain torrents rushing through the narrow forested gorges of the Caucasus, and later water the wide, treeless plains, from 1,000 to 2,000 ft. high, south of the main river. Its right hand tributaries are short and unimportant. Upon entering the steppe region south of Stavropol the river turns northwest and then west and enters the Kyzyl-tash gulf of the Kerch district of the Black sea.

In its lower course the Kuban forms a wide, low, rush-grown delta, a swampy malarial area, where the wild boar is found. Although the river lies farther south than the river Po in Italy, it is frozen from December to February. It is subject to floods three times in the year, in spring and midsummer from the melting of the mountain snows, and in autumn from the rains; Krasnodar and the Taman region suffer severely at these times, when the river may increase to half a mile in width instead of the normal 700 ft. It is navigable for steamers from the delta to its confluence with the Laba. There are naphtha beds south of the river near the delta.

KUBELIK, JAN (1880–1940), Czech violinist and composer who was one of the leading virtuosos of his time. Born at Michle, near Prague, July 5, 1880, he was a pupil of O. Sevčik. Between 1898 and 1938 he made several world tours, but his best period was between 1900 and 1910 when his left-hand pizzicatos

and brilliant runs recalled the style of Paganini. His compositions include an American Symphony (1937) and six violin concertos. F. Drdla's Serenade was written for him. He died at Prague, Dec. 5, 1940. His son (Jeronym) Rafael Kubelik (b. Býchory, near Kolin, June 29, 1914) was conductor of the Czech Philharmonic orchestra (1936–39) and the Chicago Symphony orchestra (1950–53), and was music director at Covent Garden from 1955 to 1958. He wrote four operas, two symphonies, violin and cello concertos and chamber music.

KUBERA (KUVERA), in post-Vedic Hindu mythology, god of the north and of wealth, typified in sculpture by his plumpness. Half brother to the demon Ravana, who drove him from Ceylon, his original home, he then dwelt on Mt. Kailasa, and his pleasance, the world's treasure house, is Chaitraratha on Mt. Mandara. In later times Lakshmi (*q.v.*) is his spouse.

KUBLAI KHAN (1215–1294), the greatest of the successors of Genghis Khan and founder of the Mongol (or Yüan) dynasty in China (see CHINA: History). was the fourth son of Tolui or Tulē (d. 1232), youngest of the four sons of Genghis by his favourite wife. Genghis was succeeded in the khanship by his third son Ogdai (1229–1241) whose widow Töregene reigned after his death until 1246 when Güyük, his eldest son, was elected khan. From 1248 to 1252 Giiyiik's widow Oghul Khaimish was regent of the empire. The election of Mangu, Tulē's eldest son, brought the khanship back to Tulē's line (1251), not without bitter opposition from Ogdai's descendants, who believed they had better claims to Genghis Khan's empire. (See JENGHIZ KHAN.)

Under Mangu's reign, his brother Kublai was entrusted with full civil and military powers over the eastern parts of the empire (1252). In 1253 he received the district of Ch'ang-an in the Wei river valley (Shensi province) as a personal fief where he established a permanent territorial administration on the advice of Chinese literati whom he had invited to his court. Kublai played a prominent role in the campaigns against the empire of the Chinese Sung dynasty, reigning at the great city of Lin-an, later known as Hang-chou. Kublai's first operations were, however, not directed against the metropolitan provinces of Sung but against the western province of Ssu-ch'uan where he took the provincial capital Ch'eng-tu in 1252. From there his armies proceeded south and conquered the Tai kingdom of Nan-chao in present-day Yünnan (1253–56). After the capture of the Tai capital, Kublai returned north and left the uar to his general Uriyangqadai whose forces penetrated into Tonkin and compelled the Annamite king to recognize Mongol suzerainty.

In 1257 the khan Mangu himself entered on a new campaign in west China and died there during the siege of Ho-chou in Ssu-ch'uan (Aug. 1259). Operations ceased immediately, and in 1260 Kublai was elected by the Mongol nobles as Mangu's successor, but his younger brother Ariq Boge disputed the election and proclaimed himself khan at Qara Qorum in the Gobi desert. Kublai fought against his brother and defeated him (1264). Another pretender, this time from Ogdai's line, continued to challenge Kublai's rule and retained his independence in parts of Turkistan until his death in 1301. These internal struggles retarded Kublai's operations against southern China, and it was not until 1267 that a new campaign against the Sung was launched with full force. The twin cities of Hsiang-yang and Fan-ch'eng on opposite sides of the Han river were finally brought to surrender in 1273 after five years of siege. After this, Bayan, Kublai's most gifted general, took command. He entered the Sung capital Lin-an early in 1276; the young emperor of Sung. with his mother, was sent as a prisoner to Kublai's court but was treated with courtesy. Two young princes of Sung had been dispatched to southern China before the fall of the capital, and were successively proclaimed emperor by loyal adherents of the Sung dynasty. Attempts to maintain their cause were made first in Fukien and afterward near Hong Kong but in 1279 these efforts were finally extinguished. Kublai was at last undisputed sovereign of all China. His conquest was a consequence of the superior strategy of his armies but equally of the frequent voluntary surrender of Sung commanders. Kublai's rule as Great Khan of the Mongol empire was acknowledged by his brother Hulagu in Persia and the Mongol dominion in southern Russia (Golden Horde) whereas Qaidu in central Asia remained hostile. Even so, Kublai had become the sovereign of an empire which stretched from Korea to the Arabian desert and eastern Poland.

In conformity with Chinese tradition, Kublai demanded allegiance and tributary gifts from China's neighbours. Some of these, like Annam and Korea, had already submitted. To others, Kublai sent envoys asking for submission and launched campaigns if his demands were ignored. Although these foreign expeditions were prepared on a great scale and at huge costs, almost all of them ended in failure. Twice between 1274 and 1281 Kublai's armies tried to invade Japan but his forces were either destroyed by storms or annihilated by the Japanese. Attempts to subdue the Malay kingdom of Champa in Cochin China (1283–87) by joint land and sea attacks failed, and Kublai secured only nominal allegiance from the Champa kingdom. Repeated expeditions against Burma (1277, 1283, 1287) brought the Mongol forces to the Irrawaddy delta and the ancient capital Pagan, but here again Kublai had to be content with the acknowledgment of a formal suzerainty. The Khmer kingdom of Kambuja, perhaps impressed by these campaigns, declared formal submission in 1294. During the last years of Kublai's reign an attack was launched against the Javanese kingdom Majapahit (1293). After some initial successes the expeditionary forces were compelled to re-embark after considerable losses. Kublai also sent envoys to southern India but no force was used because Chinese relations with these parts had always been purely commercial.

In addition to his military gifts, Kublai was an able administrator. He felt himself to be as much a legitimate emperor of the Chinese as he was a descendant of Genghis Khan. He was the first to make what is today Peking the capital of all China when he established his court at Yen-ching, as it was until then called, under the name of T'ai-tu ("great capital"). In central Asia and in the west this residence was known under the name of Cambaluc (from Turkish Khan Baliq "town of the Khan"). T'ai-tu was the minter residence; the summer residence was Shang-tu (the "upper capital") in southern Mongolia near Dolon-nor. The first Mongol rulers in northern China had had no administrative apparatus but relied on force and extortion. Kublai, on the other hand, tried from the beginning to establish a permanent bureaucracy on Chinese lines. He was also the first Mongol ruler to adopt Chinese reign titles (1260) and in 1271 gave his own dynasty the Chinese name of Ta Yüan "Great Origin." His rule in China is characterized by a synthesis of traditional Chinese features and Mongol elements. The social and economic structure of China was left basically unchanged. The rule of the Mongol minority was cemented by discriminatory legislation: rhe whole population of the Chinese khanate (in 1290 about 58,000,000) was divided into four classes: Mongols; Asian confederates (Uighurs, Persians, Turks, etc.) ; northern Chinese, Koreans and Juchen; and southern Chinese. The first two classes enjoyed considerable administrative. economic and judicial privileges; the third class held an intermediate position whereas the fourth — numerically by far the largest group — was practically excluded from state offices with the exception of literary and ritual functions. In trade and commerce, and also in science and medicine, Uighurs, Persians, Jews and Syrians played a great role. State revenues were, as under previous Chinese dynasties, based on taxes paid in kind and in currency, forced labour and numerous monopolies. The official currency was paper money.

In the religious field, Kublai favoured Lamaist Buddhism to which he himself became a convert. A Tibetan lama, Phags-pa, was appointed head of the Buddhist church. This cleric also devised a new alphabet for the Mongol language (1269) based on the Tibetan script but written vertically like Chinese. The use of this artificial and cumbrous alphabet was declared obligatory but it could not supersede the Uighur script for Mongol. In spite of his sympathies for Buddhism and some anti-Taoist legislation Kublai retained a benevolent attitude toward other religions, and servants of every recognized religious community continued to enjoy exemption from taxes and labour service.

Although Kublai spoke little if any Chinese and could certainly

not write Chinese (he probably could read Mongol in the Uighur script), he patronized Chinese literature and culture and ordered the translation of some Chinese works on history and statecraft and excerpts from the classics into Mongol. An account of the splendour of his court and entertainments, of his palaces and hunting expeditions and of his postal services is given by Marco Polo (*q.v.*) through whom Europe received for the first time reliable information on the far east. Polo's China is Kublai's China, a rich, industrious and civilized country, open to commerce with and influence from the near east and Europe. Chinese sources record that European travelers (fa-lang "Franks"), perhaps the first who ever reached China in the middle ages, were granted an audience with Kublai in 1261.

Kublai must be regarded as one of the great rulers in history. He showed natural magnanimity and was able to rise above the nomad mentality of his ancestors and to govern a huge state with an ancient civilization. He was not unpopular among the Chinese and was held in esteem even by Chinese orthodox historians. The first non-Chinese to rule over the whole of China, Kublai became famous in east and west alike as the Great Khan whose greatness was equally recognized by his Chinese, Islamic and European contemporaries.

His favourite son, Jingim, who had received instruction from Chinese scholars and been appointed as heir-apparent in 1273, died at the age of 42 (1286).

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KUBU, a small seminomadic group of people found primarily in swampy areas near watercourses in southeast Sumatra, Indonesia. They appear to be a mixture of an early Veddoid stock (see MALAY ARCHIPELAGO) and Negrito. Some are quite Negroid while others have long narrow heads and are lighter in colour than the pygmies. Hair ranges from closely curled to wavy.

Contact of the Kubu with their neighbours has been primarily through "silent trade"; *i.e.,* goods for barter are put where traders can look them over. They, in turn, place n'earby what they are willing to give in exchange and retire to a distance. If the deal is satisfactory, the Kubu take what is offered and vanish into the bush. Shortly before World War II the Dutch forced part of these people into villages near the Malays and started them in agriculture, but these settlements were often deserted. Nevertheless the contacts thus made, as well as those brought about by oil exploration in their territory, have resulted in breaking down their isolation.

Settlements normally consist of 20 to 30 persons living in frail houses made of bamboo and leaves. An older person serves as headman but he has little authority. Rules with regard to sex relations are said to be lax and divorce is common. Jungle produce and small game provide most of the food, for in such a group there are no domestic animals other than an occasional dog or chicken. Dress consists of a bark loincloth and a headband to hold back the tangled hair. The Kubu seldom bathe and are subject to skin diseases. Children go naked.

Little is known about their beliefs beyond the fact that they have mediums, or shamans, and that they make offerings to the spirits.

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KUCHAN (QUCHAN), a fertile and populous district of the province of Khurasan in Iran, bounded on the north by Turkmen S.S.R. The population is 'principally composed of the descendants of a tribe of Zafaranlu Kurds which was established there, with a hereditary Khan at its head, by Shah Abbas I in the 17th century, and had a population in 1956 of 214,007. A large proportion are nomads and live in tents. The district produces much grain and there are extensive vineyards.

The two chief towns are Quchan (pop. [1956] 21.286) and Shirvan. The former suffered severely from earthquakes in 1852, 1871, 1893 and 1895. In that of 1893, it is said, 12,000 perished and only 10,000 were left. The present town was rebuilt after the last earthquake on a site 8 mi. E. of the ruined town. The geographical position of the old town, now consisting of about 200 wooden huts, is 37° 8′ N., 58° 25′ E., at an elevation of 4,280 feet. The new town was regularly laid out with broad streets and spacious bazaars, and situated as it is on a cart road about midway between Ashkhabad on the trans-Caspian railway and Meshed, is a place of considerable trade.

On the hill now called Nadir-Tepe, which is nearby, Nadir Shah was killed in A.D. 1747. (P. Z. C.)

KUEI-LIN (KWEI-LIN), city of Kwangsi Chuang Autonomous Region, China, situated in the northeastern part of the region on the Li river which flows southeast as the Kuei-shui to join the Hsi Chiang (West river) at Wuchow. Historically the city was an important administrative centre mainly because of its location on a productive valley floor which is also the easiest route south from Hunan. In 1939 the Hunan-Kwangsi railway was extended through Kuei-lin to Liu-chou via this corridor. The city lies amid striking vertical, forested limestone peaks, many of them containing large water-solution caves, the inspiration of Chinese artists for centuries.

Kuei-lin is the location of the Kwangsi Agricultural institute and Provincial museum. During World War II tlfe caves sheltered refugees, small industries, and supplies for the U.S. and Chinese air forces until the Japanese captured Kuei-lin, 1944. Pop. (1953) 145,100. (TE. H.)

KUEI-YANG (KWEIYANG), the capital and route centre of Kweichow province, southwest China, stands on a small plain over 3,400 ft. above sea level at the approximate r'adial drainage apex of the province and at the head of the Ch'ien Chiang which flows into Szechwan. Since the Ch'ing dynasty (1644–1912) the city has been a Chinese regional administrative centre for tribal peoples. During World War II it grew as a vital road centre between K'unming, Chungking and Liu-chou, and as a military and medical headquarters of the Chinese army, later augmented by U.S. forces. Kuei-yang was opened by rail from Kwangsi in 1959, with other lines approaching from Szechwan and Yiinnan. In the same year the city opened its first steel plant and a textile mill. One of China's eight institutes for national minorities was established there, since the province has large numbers of at least eight different non-Han people. Pop. (1957 est.) 504,000. (TE. H.)

KUEN-LUN MOUNTAINS: see KUNLUN MOUNTAINS.

KUFA, a decayed city of Iraq, on the Hindiya branch of the Euphrates, about 7 mi. E. by N. of Najaf. Founded as a garrison town by the Arabs in A.D. 638, it became the capital of the caliph 'Ali (see CALIPHATE) and the headquarters of Shi'ite opposition to the orthodox caliphs of Damascus and Baghdad. It remained a centre of Arab learning and culture until the 10th century, when it began to fall into decay before the rise of Hillah and later, of Najaf.

KUHLMANN, RICHARD VON (1873–1948), German diplomatist, was born on March 17, 1873, at Constantinople. From 1908 to 1914 he was counselor of the German embassy in London, and was very active in the study of all phases of contemporary political and social life in Great Britain and in Ireland. During World War I he was successively counselor of embassy at Constantinople, minister at The Hague, and from Sept. 1916 to Aug. 1917, ambassador at Constantinople. He was then appointed foreign secretary and represented Germany in the Brest-Litovsk negotiations, which on March 3, 1918, led to the treaty of peace with Russia. Kuhlmann also negotiated the peace of Bucharest (May 7, 1918) with Rumania.

In July 1918 he delivered in the Reichstag a speech in which he declared that the war could not be ended by arms alone, but must be a "peace of understanding." Kuhlmann was practically thrown over by the chancellor, Count Hertling, in a speech intended to explain away his statement and, after an interview with the emperor at the front, he tendered his resignation (July 9, 1918).

Kuhlmann died on Feb. 16, 1948.

KUHN, FRANZ FELIX ADALBERT (1812–1881), German philologist and folklorist, was born at Konigsberg. Neumark, on Nov. 19, 1812. From 1841 he was connected with the

Kollnisches gymnasium at Berlin, of which he was appointed director in 1870. He died at Berlin on May 5, 1881. Kuhn was the founder of a new school of comparative mythology, based upon comparative philology. He first devoted himself to German stories and legends, but his reputation is founded on his researches into the language and history of the Indo-Germanic peoples as a whole. In his *Zur altesten Geschichte der Indogermanischen Volker* (1845), he gave an account of the earliest civilization of the Indo-Germanic peoples before their separation into different families, by comparing and analyzing the original meaning of the words and stems common to the different languages.

KUHN, RICHARD (1900–), German biochemist, was awarded the 1938 Nobel prize in chemistry for work on carotinoids and the vitamins, but was forbidden by the German government to accept. He was born Dec. 3, 1900, in Vienna. After receiving his doctor's degree at Munich, he became an assistant to Richard Willstatter. Following the years 1926–29, spent at the Technische Hochschule in Zurich. he became the director of the Max Planck Institute for Medical Research at Heidelberg. professor at the University of Heidelberg and associated with the Max Planck Society for the Advancement of Science at Gottingen. He investigated the structure of long-chain compounds containing conjugate double bonds—the polyenes and diphenylpolyenes connected with the chemical nature of carotinoids. These are the fat-soluble yellow colouring materials which are widely spread through nature and whose role is evidently vital. Kuhn discovered at least eight carotinoids, prepared them in pure form and by analysis determined their constitution. He ascertained one to be requisite for the fertilization of certain algae. Simultaneously with Paul Karrer, Kuhn announced the constitution of riboflavin, vitamin B_2, which is associated with the oxidation of sugar in the body cells. Kuhn was the first to isolate one gram of riboflavin, obtained from 53,000 l. of skimmed milk. With three co-workers, he isolated the important antidermatitic vitamin B_6. The studies of these complex organic compounds are of great significance for biological and medical problems. From 1948 Kuhn was editor of Liebig's *Annales der Chemie*. He received the Pasteur, Paterno and Goethe prizes. (V. Bw.; X.)

KÜHNE, WILHELM (1837–1900), German physiologist who made important findings on the chemistry of digestion and the physiology of muscles and nerves, was born at Hamburg on March 28, 1837. He studied at Lüneburg, at Gottingen, at Berlin under Emil Du Bois-Reymond, at Paris under Claude Bernard and at Vienna under K. F. W. Ludwig and E. W. Brucke. In 1863 he received an appointment in the pathological laboratory at Berlin; in 1868 he was made professor of physiology at Amsterdam: and in 1871 succeeded H. von Helmholtz in the same capacity at Heidelberg, where he died on June 10, 1900.

KUIBYSHEV, R.S.F.S.R.: *see* SAMARA.

KUKA or KUKAWA, a town of Bornu province, in the Northern Region of the Federation of Nigeria, situated in latitude 12° 5j' N. and longitude 13° 34' E., about 25 mi. from the western shores of Lake Chad, in the midst of extensive plains. Pop. (1953) 3,526 (African pop.).

The modern town of Kuka was founded about 1810 by the *shehu* Lamino (Sheikh Mohammadu al-Amin al-Kanemi), the deliverer of Bornu from the Fulani invaders. In 1840 the town was laid waste by Mohammed Sherif, the sultan of Nadai; and when the *shehu* Umar restored it he built two towns more than half a mile apart, each surrounded by walls of white clay. Kuka became wealthy and populous (containing about 60,000 inhabitants), being a centre for caravans to Tripoli and a stopping place of pilgrims from the Hausa countries to Mecca. The chief building was the great palace of the *shehu*. Between 1823 and 1872 Kuka was visited by several English and German travellers. In 1893, however, Bornu was seized by Rabah Zobeir (*q.v.*), who chose a new capital, Dikwa; and Kuka fell into complete decay. It was found in ruins in 1902, on the inception of the British administration. Attempts to revive it as the capital of the *shehu* of Bornu and to make'it the headquarters of the provincial administration failed. In 1904 the resident moved to Maifoni, later to be known as Maiduguri; and In 1907 the *shehu* moved and founded his new capital near the same place, to be called Yerwa. Kukawa now remains a much reduced town as the headquarters of Kanembu district. (*See* BORNU.)

For an account of Kuka before its destruction by Rabah, *see* Heinrich Barth, *Travels and Discoveries in North and Central Africa,* new ed. (London, 1890); and G. Nachtigal, *Sahara und Sudan,* vol. 1 (Berlin, 1879). (T. E. LH.)

KUKI, a name given to a group of tribes inhabiting both sides of the mountains dividing Assam and Bengal from Burma, south of the Namtaleik river. These tribes appear to have come down the Chindwin valley from the north, sending offshoots into the hills to the west which fused with the Naga tribes, leaving more or less evident traces on their culture. The main body having reached the sea turned north again up the hills. In the course of migration, and by the practice of slave hunting, alien blood was incorporated and the earliest Kuki immigrants, known in Manipur and Cachar as "Old Kukis," are so mixed with Naga stock that some tribes seem as much Naga as Kuki. In the case of the Thado Kuki who followed them. the Lushei, who drove the Thado north from the district called Lushai hills, the Lakher, and the various tribes of the Chin hills in Burma—Haka, Siyin, Sokte, etc.—there is, in spite of divergences, so strong a similarity in general type and culture that they can be fairly treated as forming a single group, ruled by chiefs on a quasi-feudal system, exogamous, patrilineal, attaching great importance to genealogy and descent. Heirlooms and antiques are valued inordinately. They are wasteful cultivators but good artificers: they are actually migratory or but later settled. Clans claim descent from a common ancestor, polygyny is allowed and the levirate practised, marriage is by purchase and subject to involved posr-mortem claims against the woman's descendants for the benefits conferred by her bearing of children into her husband's clan. Chiefs wield wide authority; their subjects are bound to them by service tenures, and a man accepting a chief's protection assumes a vassalage which he cannot put off at will. Communal houses for bachelors are found sporadically. All disease is ascribed to spirits and can be driven off by appropriate disinfectants or ceremonies, but a beneficent Creator is believed in. to whose abode souls go after death. having to pass a malignant demon on the way. The dead are frequently buried, but by some tribes exposed on platforms and cremation has been known. Heads of enemies and of animals are sought to put on the graves of relatives, that the souls of the former may accompany the latter to the next world. The heads of important persons used to be disposed of separately in ledges of cliffs. Ordeals are undergone by plunging under water. As weapons, guns have superseded the simple bow and arrows, sametimes poisoned, and the shield. The spear seems never to have been popular. The Kuki is generally an indefatigable hunter and snarer of game, warlike, bloodthirsty and destructive. His languages belong to the Tibeto-Burman family and his folklore savours of the Arabian Nights.

See Carp and Tuck, *Chin Hills Gazetteer* (1896); J. Shakespear, *Lushei-Kuki Clans* (1912). (J. H. H.)

KU KLUX KLAN, a secret, masked organization which after the American Civil War became the chief instrument of the white underground resistance movement in the south against northern and Negro domination. It has had many imitators of the same name since. After World War I a new organization assuming the K.K.K. name grew from southern beginnings to considerable, though brief, national political power. The process of imitation has also been one of degeneration into race-baiting at its most disreputable level. After World War II its few mob bands were sternly repressed even in the south of its origin.

The original organization was formed as a purely social club by six young Confederate veterans in Pulaski, Tenn., on Christmas Eve 1865. 'They apparently derived the name from the Greek word Kyklos from which comes the English "circle." "Klan" was added for the sake of alliteration and Ku Klux Klan emerged. Even the long, ghostly robes they wore were at first adopted in an almost Halloween spirit. On their rides, so garbed, the young men were amused when they frightened superstitious freedmen. From

the realization of the effectiveness of such fears, however, the Klan spontaneously spread. It became the organization and instrument for regulating the activities of ex-slaves and opposing the Negro and carpetbagger (*q.v.*) governments set up under the reconstruction measures (1867–76) of the U.S. congress.

The formidable Ku Klux Klan of history mas formally organized at Nashville, Tenn., in 1867. Set up as the "Invisible Empire of the South," it was divided into state Realms, county Provinces and individual Dens. Over the whole "invisible empire" presided a Grand Wizard and under him the hierarchy descended in Grand Dragons, Grand Titans and Grand Cyclopses. There were also giants, genii, hydras, furies, goblins and nighthawks. In robes designed to frighten the Negroes and prevent identification by federal troops, the Klansmen's asserted purpose was to protect the white people from obstreperous Negroes and to reassert the political and social superiority of the whites.

Klansmen whipped and sometimes killed in the dark and also were surreptitious members of juries in the courthouses. They posted placards warning those whose behaviour they did not approve to mend their ways or leave the community. And when congressional committees or other authorities questioned klansmen, they "lied like gentlemen," as one of their leaders put it after his interrogation by a congressional committee. A similar purpose moved the Klans in all parts of the south but the organization was never effectively disciplined from the top. There was wide variety in the regalia worn by different dens, ranging from ghostly white to flaming scarlet. Great differences, too, marked the character of various Klan groups. Indeed, not all those who carried out the Klan purposes in the Klan guise were members of the organization. In the same period similar societies such as the Knights of the White Camelia, the White league, the Invisible Circle and the Pale Faces spread throughout the former Confederacy.

Not all devoted southerners approved the secrecy or the methods of the Klan. Even the Grand Wizard of the "invisible empire," a former Confederate officer, Gen. Nathan Bedford Forrest, ordered it disbanded in 1869 because of increasing violence involving murder and kidnapping, at the hands of some overzealous or unscrupulous members. There were some ready to serve private grudges as well as a region's cause. Inevitably the Klan's activities in intimidation of Negroes, carpetbaggers and their southern white sympathizers (called scalawags) created great indignation in the north. Congress enacted laws to suppress the organization.

To many southerners, however, the Klan seemed the only answer to the activities of the Loyal leagues, which also were secret and ritualistic. The Loyal leagues were organized by the carpetbaggers to control the Negro vote by means sometimes similar to those of the Klan. There was widespread southern sympathy for the hundreds of suspected Klansmen who were arrested by federal authorities, and particularly for those who were sent to the state penitentiary at Albany, N.Y. When the last of these were freed in 1873. they came home as heroes.

No vestige of heroism attended the Ku Klux Klan of the 20th century. While taking its name from the old southern order, its inspiration can be more directly traced to the intolerance from which the nativist Know-Nothing party (*q.v.*) grew in the 1850s. Clearly also one prime purpose in the organization of the new Klan and particularly of its promoters was profit from membership, sale of regalia, publications, etc.

The new K.K.K. was organized on Stone mountain, near Atlanta, Ga., in 1915 by Col. William J. Simmons, a preacher and promoter of fraternal orders. He proclaimed it as a "high-class, mystic, social, patriotic" society devoted to the protection of womanhood and the supremacy of white Protestants. To the hostility toward the Negroes and the ritual and regalia of the first Klan, the new one added bias against Catholics, Jews, foreigners and, finally, organized labour.

The organization remained small and weak until Edward Y. Clarke and Mrs. Elizabeth Tyler brought to it their talents as publicity agents and money raisers. Membership rose to between 4,000,000 and 5,000,000. Millions of dollars poured into the Atlanta offices for memberships, rituals and Klan costumes. Fiery crosses, a symbol of the new organization, burned in all parts of the country. The Klan controlled politicians in both parties. Justice Hugo L. Black of the U.S. supreme court, who admitted in 1937 that he had been a Klan member when elected to the senate from Alabama in 1926, mas only one of many.

But Klan power bred Klan corruption. Clarke and Mrs. Tyler were involved in a personal scandal. In a struggle for power within the organization, Hiram W. Evans, a dentist from Texas, pushed Colonel Simmons out with a cash settlement of $90,000. Numerous acts of violence by its members or under the spreading shadow of its name created increased public sentiment against it. In Indiana the Grand Dragon was sent to prison for murder.

The nomination of a Catholic, Alfred E. Smith, for the presidency by the Democrats in 1928 gave the organization a last spurt of growth under the slogan. "Keep the Pope out of the White House." The Klan energetically participated in the prejudices stirred in that campaign but got little profit from its efforts. At the beginning of the depression in 1930, its membership was down to 30,000. In 1939 the remnant Klan's association with the fascist German-American Bund was disclosed. And in 1944 just enough of the order remained to disband hastily when the government tried to collect $685,000 in unpaid back taxes from it.

There has been no real national Klan since, though efforts were made to revive the organization after World War II. In some southern areas Klansmen resorted to whippings, cross burnings, night rides and the like in an effort to set themselves up as the extra-legal protectors of their prejudices. They met public impatience and legal prosecution. Klansmen were sent to prison. The U.S. department of justice put the Klan on its list of subversive organizations. In North Carolina a Klan meeting, called to impose ideas of racial purity on a small Indian group, was put to ignominious flight by the Indians, who also took the law into their onn hands. In the 1950s the new racist groups, such as the southern citizens councils, which set themselves up in opposition to the C.S. supreme court's school integration decision, insistently disassociated themselves from the discredited Klan. Except among the most backward groups, even those who shared the Klan's intolerance regarded it with contempt. Indeed. by the 1960s it was regarded as more disreputable than menacing.

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RUKU: *see* BARI.

KUKU KHOTO: *see* HUHEHOT.

KULJA (Chinese ILI-HO), a region of the Sinkiang Uigur Autonomous Region, China. It is bounded on the west by the Kazakh Soviet Socialist Republic, U.S.S.R., and consists of a depression which cuts deeply for some distance eastward into the great plateau of central Asia. The snow-clad Borokhoro mountains, a northwestern extension of the Iren-khabirga, form its northern boundary and rise to a height of 11.922 ft.. with passes at 7,000 to 7,415 ft.; their slopes between 6.000 and 9,000 ft. are covered with coniferous forest. Along the south, beginning with the glacier-topped Khan Tengri peak (22,949 ft.) in the west, stretches a mountain barrier, part of the Tien-shan system including the Narat ranges. The Narat forms a diagonal east-northeast to west-southwest link between the northern and southern ranges enclosing the valley; it is crossed by the Jambi Dawan (11.415 ft.) and other passes. Upon the slopes of this range grow deciduous forests (wild apple, apricot, birch and poplar), with pines above. The Ketmen range extends into Kulja and has a height of 11.936 ft. near the western boundary of the region but lower in the east. The Tekes or Upper Ili makes its way through a gap in this range, which continues in a southwesterly direction as far as the Karat. The region is drained by the Ili, which rises in the Kazakh S.S.R. south of the Ketmen range and east of Lake Issyk-kul, and flows

northeastward into Chinese Turkistan, receiving many tributaries, the longest of which is the Kok-su. It then turns north through a gap in the mountains, after which it receives the Kunghez on its right bank and flows westward to the north of the Ketmen range, receiving the Kash on the right and, after a westerly course of 120 mi, recrosses the frontier into Kazakh S.S.R., where it flows into Lake Balkash. During the summer months it has a good volume of water and is navigable for shallow-draught steamboats near the Russian frontier. The valley of the Kunghez is about 120 mi. long; the river flows first in a gorge and then amid thickets of rushes; little of its valley is available for cultivation. The valley of the Tekes or Upper Ili is at first a series of wild gorges, then broadens out and, in this section, there are evidences of irrigation in earlier times. After the junction with the Kunghez, the river flows through a fertile valley, 50 mi. wide at Horgos-Koljat, once known as the granary of western China. with black earth soil and loam and cultivated in dependence on irrigation from the river The climate is extremely dry: frosts of −22° F. and summer heat of 110° F. have been recorded. Apricots, peaches, pears and vine are grown, and cotton near the town of Kulja. while barley can be grown up to an altitude of 6,500 ft. Gold, silver, copper. galena and coal are found. the last within a few miles of the town of Kulja, but they are little worked; the copper and silver mines were at one time extensively exploited. Agriculture, however, is insufficient to supply the needs of the population and grain is imported from the U.S.S.R. Nomad herdsmen pasture their flocks in the valleys in winter and on the high alpine meadows in summer. The eastern end of the valley has a sandy soil with gypsum, marl and clay and a scanty flora.

This valley, like the Dzungarian gate to the north, has been a highway of the nations, and was invaded in early times by Scythians and Persians. The Uzuns, a blue-eyed, fair-haired people who are recorded as living in the region in the 2nd and 1st centuries B.C., mere driven out by the Huns and some took refuge near Lake Issyk-kul (*q.v.*). Later the region became a dependency of Dzungaria. The Uighurs and the Kara-Khitai successively occupied it. Jenghiz Khan and his armies swept through it in the 13th century, after which it became a Mongolian khanate. The Oirats *(see* OIRAT AUTONOMOUS AREA) occupied it from the end of the 16th or the beginning of the 17th century until 1775, when the Chinese annexed and practically depopulated it. Chinese cultivators from Kashgaria, military colonists and criminals were then settled in the region. Other tribes, attracted by its fertility, came into the region and in 1771 the Kalmucks from the Volga *(see* KALMUCK) reached it after a 3,000-mi. journey through hostile country.

Unsettled conditions prevailed, but no serious outbreak occurred until after the Mohammedan rebellion of 1862 which began in the adjacent provinces of Kansu and Shensi and soon spread to the Ili valley. where many thousands of Chinese were massacred and towns and settlements were laid waste. Among these was New Kulja. Manchu Kulja or Ili, lower down the valley on the same side of the river as old Kulja. It was previously the seat of the Chinese government. with a large penal establishment and a garrison, but its 70.000 inhabitants were massacred by the Dungans in 1868 and it is in ruins. The Dungans and Taranchis formed a Taranchi sultanate, but from 1871 the Russians occupied the region for ten years, during which they built a large Russian suburb near the town of Kulja. By the treaty of St. Petersburg, 1881, the territory was restored to China, together with the command of the Tian Shan passes, though the Chinese had to pay indemnity to cover cost of the Russian occupation.

After the Chinese revolution, 1911, the governor of Sinkiang, resident at Urumchi, remained practically independent. White Russian refugees fled to the region after the Russian revolution. causing an increase in the Russian element of the population. But after 1932, when a Mohammedan revolt was suppressed with Soviet Russian assistance, Soviet Russian control over the province became strong until Russia withdrew its troops in 1942.

KULJA (old Kulja) is the chief city. It is situated in 43° 54′ N., 81° 19′ E. on the Ili river. Pop. (1953 est.) 108,200. The town is surrounded by broad walls 30 ft. in height and the houses are mainly clay built and flat roofed; its Taranchi and Dungan mosques show Chinese influence. Wheat, barley and lucerne are cultivated.

KÜLPE, OSWALD (1862–1915), German psychologist and philosopher, who did important research on mental state of preparation for action, was born on Aug. 3, 1862, in Latvia. He studied with Wilhelm Wundt and was professor at Wiirzburg, Bonn and Munich. His study of the qualitative difference between a memory and the object it represents was important. Best known are the studies of the effects of attitudes and tasks upon perception and the course of recall and thought, which Kiilpe and his pupils conducted at Wiirzburg. He showed that if an individual is comparing two tones as to intensity and a little later is asked which is the higher pitch, he will be uncertain in his response, although he is accurate as to intensity. Similarly, what is recalled by a word depends upon the task that has been set. If a person is shown a word when the task is to name the class to which it belongs, the class is recalled; if he seeks an instance, that is remembered (dog-animal for one, dog-terrior for the other). The principle was extended to cover all thought processes. Kiilpe died at Munich on Dec. 30, 1915.

Kiilpe's *Grundriss der Psychologie* was translated as *An Outline of Psychology*. A three-volume, partly posthumous work, *Die Realisierung*, was an important contribution to epistemology.

(W. B. PY.; X.)

KULTEPE (Turkish for "ash hill"), a mound hiding the remains of the Bronze Age city of Kanesh, is situated in the *il* of Kayseri in central Turkey, about 12 mi. N.E. of the town of Kayseri (the ancient Caesarea Mazaca in Cappadocia, chief centre of the region since antiquity). Its bulk, covered with vegetation, comprises an expanse of stratified debris of about 1,900 by 1.500 ft., rising to a height of almost 70 ft. Although partly wrecked by earth removal and careless digging, it is an imposing landmark next to the village of Karahiiyiik off the main highway from Kayseri to Sivas.

Kultepe was known to archaeologists during the 19th century, but began to attract particular attention as the reputed source of so-called "Cappadocian tablets" in Old Assyrian cuneiform writing and language, which found their way from the open antiquities market to various public and private collections from 1880 onward. Unsuccessful attempts were made by E. Chantre in 1893 and by H. Winckler and H. Grothe in 1906 to locate the precise spot where these tablets were being uncovered. At length, in 1925, B. Hrozny found the source of the tablets in a field some 100 yd. from the base of the mound, in the buried remains of what proved to be an Old Assyrian merchant colony attached to the Xnatolian city proper and known as Karum Kanesh. Hrozny's excavations added many new tablets. Within the walls of the city he discovered a spacious central building, presumably a palace or temple.

The excavations at Kiiltepe were resumed in.1948 and continued annually by the Turkish Historical society under the direction of T. and N. Özgüc. Their painstaking and methodical excavations not only added thousands of new tablet finds? including the first such discoveries in the city mound itself, but also contributed a proper archaeological mapping of the site. The work. moreover, inevitably shed new light on the tablets themselves, which constitute the earliest historical documents of Anatolian provenance.

Texts of this Old Assyrian type have been discovered also at Alishar Hüyük, and in addition to earlier examples approximately 50 were discovered in 1956 at Bogazkoy, the site of the Hittite capital. They belong to what is known as the "colony period" in central Anatolia around the turn of the 2nd millennium B.C. and more particularly to the 20th and 19th centuries. At that time Indo-European Hittites had already settled in the region. and the process of their assimilation to the indigenous Anatolian population is reflected in the local proper names recorded in the Kiiltepe tablets. Names of earliest Hittite history like Hattusa and Anitta are also attested. Amid such a society there existed for many generations flourishing Assyrian *karums*, of which Kanesh was doubtless the most important, though numerous others are mentioned on the tablets. These *karums* served as end stations for

the caravan shipments by donkeys from and to Assyria and as distribution centres for the imports, notably lead and a wide variety of woven goods. Copper was the most important Anatolian export article, while silver served for currency transactions, unless a simple barter prevailed. A highly developed commercial system with features like "letters of credit" and "risk insurance" emerges from these business letters on baked clay, enclosed in clay envelopes and impressed nith cylinder or stamp seals

Reference to datable events and personalities in Assyria is of particular importance. The protracted peaceful periods of the *karum* were invariably interrupted by violent destruction by fire and attendant sudden abandonment by the inhabitants; as a result the everyday surroundings of the Assyrian merchants are still largely discernible in their original layout. The houses were of traditional Anatolian type, with stone foundations and superstructures of brick and beams enclosing an open court Two stories are frequent, of which the upper generally served as living quarters, while the ground floor was used for business purposes. The hearths, pottery and general furnishings are thoroughly Anatolian; one is led to assume considerable adaptability on the colonists' part and frequent intermarriage nith the indigenous people. This may explain the good relations that prevailed with the local population and authority, with the latter imposing only routine control and levies on the Assyrian imports.

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KUMAMOTO, large and populous Japanese prefecture (Ken) of central western Kyushu. Area 2.846 sq.mi. Pop. (1960) 1,856,192. Predominantly agricultural, it produces large rice surpluses for shipment to northern Kyushu industrial cities and some silk, tobacco and other cash crops. Forestry is important in the mountainous interior, and fishing is the economic mainstay along the coast and in the Amakusa Islands. Industry consists mainly of food processing, cotton textiles. chemicals. pulp and paper and ceramics.

The capitai, Kumamoto, is the largest and most influential city. followed by industrial Yatsushiro. Tourists visit the enormous crater of Mt. Aso in the northeastern interior.

(J. D. EE.)

KUMAMOTO, largest city and capital of Kumamoto prefecture, Japan, is located on the lower reaches of the Shira river. Pop. (1960) 373,922. Kumamoto has long been the dominant city of central Kyushu. Its modern growth dates from the erection of a powerful castle at the end of the 16th century: this fortification played a central role in the Satsuma rebellion of 1877. Kumamoto serves as the main collection centre for the prefecture's thriving agricultural areas, has many regional offices of federal government agencies and is a military centre. Small-scale factories that process foodstuffs and cotton textiles employ about 20% of the city's labour force. (J. D. EE.)

KUMASI, a town in Ghana and capital of Ashanti (*q.v.*), lies 125 mi, N.W. of Accra among hills-rising to 1,000 ft. Carved out of one of Africa's densest forest belts. it has a humid climate and a heavy rainfall. Pop. (1960 mun.) 220,922 (mostly Ashantis); (1948) 59,420.

The town is zoned into commercial, industrial and residential areas. Population is most dense where the civic activities are concentrated in the central and oldest part of the town within a two mile radius of the fort built by the British in 1897. which houses the museum of the Ghana regiment. The oldest buildings, put up by European commercial firms at about the same date, are along Harper road close to the fort. Nearby was the palace of the kings of Ashanti (1816), destroyed by Sir Garnet Wolseley's troops when they burned Kumasi in 1874. The old town of thatched mud houses surrounded by swamps and bush has since 1897 been modernized with paved streets, public parks and gardens. Among modern buildings are churches, including an inter-denominational Christian chapel, a mosque, law courts (government departments, police headquarters and. dominating the town, the Kumasi Central hospital. The Prempeh Assembly hall is used for public meetings and social gatherings. Besides schools and teachers' training colleges there are the Kumasi College of Technology (1952) with courses up to degree standard, and the Kwadaso Agricultural station which conducts research into soil and agricultural problems and is the training centre for Ghana's agricultural officers. The Ashanti Cultural centre supports a museum and a zoological garden and has a regional library. A sports stadium was opened in 1959 by Prince Philip, duke of Edinburgh, to commemorate Ghana's independence. There is also a race track belonging to the Ashanti Turf club.

Kumasi lies at the junction of the main north-south and eastnest roads, and from its Central Lorry park trucks carry passengers and goods daily to all parts of Ghana. The town is connected to Accra and Sekondi-Takoradi by rail. and daily air services operate to these towns and to Tamale. The wealth of Kumasi is principally derived from cocoa farming in the hinterland. The central market, one of the town's attractions. is believed to be the largest in West Africa. Minor crafts such as weaving the traditional "Kente" cloth. carpentry. gold and silver nork. sandal-making and printing are next in importance to trade. The city exports cocoa, timber and foodstuffsto other parts of the country, and imports clothes hardware and printed cotton.

About 1663, Nana Obiri Yeboa. one of the early kings of the Ashanti dynasty, bought a piece of land from an old lady, Xdonaa Nkrawiri. The negotiations took place under a Kum tree. which gave the name to the town he founded there, at first called Kwaman. The settlers came from Asantemanso. 23 mi S. Kumasi is historically the seat of the kings of Ashanti. It nas here that the Golden Stool. symbol of the king's authority and the unity of the people, is alleged to have descended from the heavens. on a certain Friday in 1700 at Dwabirem. the precincts of the king's palace (near the fort). In the Central hospital's grounds a sword hilt protruding from the earth marks the spot where all the regalia of Ashanti chiefs made before the descent of the Golden Stool were buried so that they should not have pre-eminence over the Golden Stool. Four mausoleums contain the mortal remains of the Ashanti kings.

Following the Yaa Asantewaa rising in 1900, the British government took over the control of Kumasi which was administered by a resident commissioner with the help of a council of Kumasi chiefs. In 1925 the administration was entrusted to the Kumasi public health board which in 1943 was succeeded by the Kumasi town council; in 1954 the Kumasi municipal council mas established.

(A. A. Y. K.)

KUMBAKONAM (formerly COMBACONUM), a town in the Tanjore district of the state of Madras. India. stands on the delta of the Cauvery river (*q.v.*), 194 mi. from Madras city on the Southern railway. Pop. (1951) 91.643; municipal estimate (1959) 112,253. The Government college has more than 1.000 undergraduates, and Kumbakonam is the home of some of south India's most celebrated lawyers. It is also an industrial centre noted for silk weaving and the manufacture of brass vessels. It was a subsidiary capital of the Chola dynasty (see CHOLA) and possesses a famous monastery, the Kashi *matha*, founded by the Hindu philosopher Sankara Xcharya. There are several temples including the Nagesvara, which dates from Chola times, and the great Vishnu temple. built in the Vijayanagar (*q.v.*) period. whose gopuras or monumental gateways are richly decorated.

The nearby Mahamakam tank is believed to have direct subterranean connection with the Ganges, especially so during the Mahamakam festival celebrated once in 12 years.

(G. KN.)

KUMISS (KOUMISS), also called milk wine or milk brandy. is a fermented alcoholic beverage prepared from milk. It is of ancient origin. and according to Herodotus was known to the Scythians. The name'is said to be derived from an ancient Asiatic tribe. the Kumans or Komans. It is one of the staple articles of diet of the Siberian and Caucasian races, but has also been manufactured in western Europe for its medicinal properties. It is generally made from mares' or camels' milk by a process of fermentation set up by the addition to the fresh milk of a small quantity of the finished article. This fermentation. which appears

to be of a symbiotic nature, being dependent on the action of two distinct types of organisms, the one a fission fungus. the other a true yeast. eventuates in the conversion of a part of the milk sugar into lactic acid and alcohol. Kumiss generally contains 1% to 2% of alcohol, 0.5% to 1.5% of lactic acid, 2% to 4% of milk sugar and 1% to 2% of fat

The beverage named kefir is similar to kumiss, but is usually prepared from cows' milk, and the fermentation is brought about by the so-called kefir grains, derived from a plant.

KÜMMEL is a liqueur flavoured with caraway, or the more delicate cumin, seed, both of which are excellent digestives growing extensively near Riga, Latvia, and in the Netherlands, where they have been cultivated since the middle ages. The liqueur made from them is usually sweet and is on the average 39% alcohol by volume. The first recorded example was made in 1575 by Lucas Bols in Amsterdam. The original Allasch kiimmel (that became popular at Queen Victoria's court) was made from cumin by the Mentzendorffs at Allasch, their estate near Riga, and commercialized in 1823. After World War I, when the Mentzendorffs had fled, their former agent Blankenhagen produced a new Allasch kummel at a distillery at Stettin (Szczezcin). The Wolfschmidt distillery at Riga was established in 1847. but Wolfschmidt kümmel is today produced in Copenhagen. Other fine kiimmels are made in the Netherlands. (C. C. H. F.)

KUMMER, ERNST EDUARD (1810–1893), German mathematician, noted for his work in higher arithmetic and geometry, was born at Sorau on Jan. 29. 1810, and died at Berlin on May 14, 1893. In 1828 he entered the University of Halle, to study for the church, but quickly changed to mathematics, in which he took his doctorate in 1831. He taught at Sorau for a year and at the Gymnasium at Liegnitz, for ten years, meanwhile corresponding with the leading mathematicians of Germany. In 1842 he was appointed professor of mathematics at Breslau, where he remained until 1855, when he succeeded Peter G. L. Dirichlet at Berlin and was also appointed professor at the Berlin War college.

Kummer's outstanding achievement, comparable in mathematical and philosophical importance with the creation of non-Euclidean geometry. was the restoration of the fundamental theorem of arithmetic to those algebraic numbers fields which arise in connection with Pierre de Fermat's last theorem. The restoration was effected by Kummer's creation of what he called ideal numbers. (See FERMAT'S LAST THEOREM.) For this he was awarded the grand prize of the Paris Academy of Sciences in 1857, although he had not competed.

In geometry. his researches on systems of rays led him to the surface named after him, the quartic which is the singular surface of the quadratic line complex. This surface is the wave surface in space of four dimensions (see LINE GEOMETRY).

He also made basic contributions to the theory of hypergeometric functions. All of Kummer's work is characterized by great power and penetrating originality. (E. T. B.; X.)

KUMQUAT, the group name of several shrubs of the genus *Fortunella,* closely allied to the orange and lemon and formerly placed under Citrus *japonica.* Natives of eastern Asia, these small trees are widely cultivated throughout the subtropics; they grow 8 to 12 ft. high, the branches are mainly thornless and have dark-green, glossy leaves and pure-white, orangelike flowers standing singly or clustered in the leaf axils. The bright orange-yellow fruit is round or ellipsoidal, about one inch in diameter. with mildly acid, juicy pulp and a sweet, edible. more or less pulpy skin. The kumquat long was cultivated in China and Japan and was introduced into Europe in 1846 by Robert Fortune, collector for the London Horticultural society, and shortly after into North America. It is much hardier than most plants of the orange tribe and succeeds well when grafted on the trifoliate orange Poncirus *trifoliata.* It is largely used by the Chinese as a candied fruit.

The oval or Nagami kumquat (F. margarita) is the commonest species; the fruits are elliptic, reddish when ripe and about one and a half inches to two inches long. The round or Mammi kumquat is F. *japonica.*

The Meiwa kumquat, in which both the pulp and the rind of the fruit are sweet, is considered an intrageneric hybrid and is widely grown in China.

KUN, BÉLA (1886–1937), Hungarian politician, was born at Szilagycseh (Csehul Silvaniei), Transylvania, of lower middle-class Jewish stock. He entered the University of Cluj in Transylvania. where his father was then employed, but broke off his studies in favour of politics. He took an active part in organizing the Social Democratic party in Transylvania. but having involved himself in irregularities in the management of the funds of a workmen's benefit society, of which he was treasurer, he moved to Budapest, uhere he obtained a minor post on the Social Democratic newspaper. the *Népszava.*

He was taken prisoner on the Russian front early in World War I. After the Russian Revolution he attracted the attention of Vladimir Lenin, who put him through a special course in revolutionary tactics and in Dec. 1918 sent him back to Hungary on a false passport and equipped with large funds. With these Kun started a Communist newspaper, the *Vörös Ujság,* in which he agitated violently against the government of Michael Károlyi. He was imprisoned, but given every privilege and facility to continue his propaganda, which combined social agitation with promises that if put into power he would secure Russian help against the Rumanian forces then standing on Hungarian soil. On March 20, 1919 he was released by Károlyi and took over the power at the head of a Communist-Social Democratic coalition from which the moderate elements were, in practice, soon eliminated. while Kun himself, although nominally only commissary for foreign affairs, became dictator of Hungary, under Lenin, whom he regularly consulted by wireless.

The history of Kun's regime is that of Hungary for the period. Kun himself displayed an energy which was undoubtedly inspired by genuine fanaticism and considerable shrewdness. He was, however, rigid and doctrinaire in the extreme, and apparently entirely blind to the unpopularity of his measures, his colleagues and himself. The discontent evoked by his arbitrary rule, combined with the failure of Communist Russia to send the promised help, led to his fall. After he had undertaken an unsuccessful offensive against the Rumanians his regime fell on Aug. 1, 1919, and he fled to Vienna. After a term of internment, he was allowed to proceed to Russia. He reappeared in Vienna in 1928, engaged in another attempt to promote revolution in Hungary. He was arrested and imprisoned, but again allowed to return to Russia. When Stalin turned actively against "Trotskyism" Kun fell into disfavour. He was liquidated in the purges of 1936–37. Kun was a simple fanatic prepared to use terror when necessary. He possessed energy, some capacity for organization and mental alertness, but his mind was unconstructive and inelastic. (C. A. M.)

KUNAR, a river and valley of Afghanistan and northwest Pakistan. The Kunar valley (Khoaspes in the classics) is the southern section of that great river system which reaches from the Hindu Kush to the Kabul river near Jalalabad and which, under the names of Yarkhun, Chitral. Kashkar, etc., is more extensive than the Kabul basin itself. The lower reaches of the Kunar are wide and comparatively shallow, the river meandering in a multitude of channels through a broad and fairly open valley, well cultivated and fertile, with large, flourishing villages and a mixed population of Mohmand and other tribes of Afghan origin. There the hills to the eastward are comparatively low, though they shut in the valley closely. Beyond them are the Bajour uplands. To the west are the great mountains of Kafiristan, called Kashmund, snow-capped and running to 14,000 ft. of altitude. Among them are many wild but beautiful valleys occupied by Kafirs. From 20 to 30 mi. up the river on its left bank, under the Bajour hills, are thick clusters of villages, among which are the ancient towns of Kunar and Pashat. The chief tributary irom the Kafiristan hills is the Pechdara, which joins the river close to Chagan Sarai. It is a fine, broad, swift-flowing stream, with an excellent bridge over it (part of Abdur Rahman's military road developments), and has been utilized largely for irrigation. Above Chagan Sarai, as far as Arnawai, where the Afghan boundary crosses the river, and above which the valley belongs to Chitral, the river narrows to a swift mountain stream obstructed by boulders and

hedged in with steep cliffs and difficult *parris* or slopes of rocky hillside. Wild almond there sheds its blossoms into the stream, and in the early summer much of the floral beauty of Kashmir is to be found. At Asmar there is a slight widening of the valley, and the opportunity for a large Afghan military encampment, spreading to both sides of the river and connected by a very creditable bridge built on the cantilever system. There are no apparent relics of Buddhism in the Kunar, such as are common about Jalalabad or Chitral, or throughout Swat and Dir. The Kunar valley route to Chitral and to Kafiristan was developed by Afghan engineering.

KUNBI, the great Hindu agricultural caste found chiefly in western India. It corresponds with the Kapu of the Telugu country in Madras, the Kulbi of Belgaum, the Kulambi of the Deccan, the Kulwadi of the southern Konkan, the Kanbi of Gujarat and the Patidars of Broach. The Kunbi permit the remarriage of widows and polygamy, but the latter is rarely practised. Their principal festival is the Pola, in the middle of the rainy season, when they have a procession of plough-bullocks. The upper-class Mahrattas and the agricultural Kunbi are ethnically akin. In both there is a distinct aboriginal strain.

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KUNCKEL (KUNKEL) **VON LÖWENSTERN, JOHANN** (1630–1703), German chemist, who shares with Boyle the honour of having discovered the secret of the process by which Brand of Hamburg had prepared phosphorus in 1669. was born in 1630. near Rendsburg, his father being alchemist to the court of Holstein. He became chemist and apothecary to the dukes of Lauenburg and then to the elector of Saxony, John George II, who put him in charge of the royal laboratory at Dresden. In 1679 he became director of the laboratory and glass works of Brandenburg, and in 1688 Charles XI brought him to Stockholm. gave him the title of Baron von Lowenstern in 1693 and made him a member of the council of mines. He died on March 20, 1703 (others say 1702), at Dreissighufen, his country house near Pernau. Kunckel found how to make artificial ruby (red glass) by the incorporation of purple of Cassius.

Kunckel's work also included observations on putrefaction and fermentation, the nature of salts and the preparation of pure metals.

Although Kunckel derided the notion of the alkahest, or universal solvent, and denounced the deceptions of the fraudulent alchemists, he apparently believed in the possibility of transmuting metals.

His chief works were *Oeffentliche Zuschrift von dem Phosphor Mirabil* (1678); *Ars vitriaria experimentalis* (1679); *Laborutovium chymicum* (1; 16).

KUNDT, AUGUST ADOLPH EDUARD EBERHARD (1839–1894), German physicist, who studied light and sound, was born at Schwerin in Mecklenburg on Nov. 18. 1839. He studied at Leipzig but afterward went to Berlin. In 1867 he became *Privatdozent* in Berlin university, and in the folloning year professor of physics at the Zürich Polytechnic; then, after a year or two at Würzburg, he was called in 1872 to Strasbourg. where he was one of the founders of the Physical institute.

In 1888 he succeeded to the chair of experimental physics and the directorship of the Berlin Physical institute. He died at Israelsdorf, near Lubeck, on May 21, 1894. In the field of sound he developed a valuable method for the investigation of standing waves within pipes. He used a finely divided powder, such as lycopodium. dusted over the interior of a tube to show the position of the nodes. The method can be used for the determination of the velocity of sound in gases and in solids.

In light August Kundt's name is widely known for his inquiries in anomalous dispersion, not only in liquids and vapours but even in metals, which he obtained in very thin films by means of a laborious process of electrolytic deposition upon platinized glass He also carried out many experiments in magneto-optics and succeeded in showing the rotation under the influence of magnetic force of the plane of polarization in certain gases and vapours.

KUNENE (CUNENE), formerly the Nourse, a river of southwest Africa, with a length of 587 mi., mainly within Portuguese territory but in its lower course forming the boundary between Angola and South-West Africa. The main stream rises in 12° 30' S. and about 160 mi. in a direct line from the sea at Benguela and runs generally from north to south through four degrees of latitude. but finally flows west to the sea through a break in the outer highlands. A little south of 16° S. it receives the Kulonga from the east, and in about 16° 50′ the Kakulovar from the west.

Between the mouths of the Kulonga and Kakulovar the Kunene traverses a swampy plain, inundated during high water and containing several small lakes at other parts of the year. From this swampy region divergent branches run southeast. They are mainly intermittent, but the Kwamatuo. which leaves the main stream in about 15° 8' E., 17° 15′ S., flows into a large marsh or lake called Etosha, which occupies a depression in the inner tableland about 3,400 ft. above sea level. From the southeastern end of the Etosha lake streams issue in the direction of the Okavango, to which in times of great flood they contribute some water. From the existence of this divergent system it is conjectured that at one time the Kunene formed part of the Okavango, and thus of the Zambezi basin. *(See* NGAMI.)

On leaving the swampy region the Kunene turns decidedly to the west and descends to the coast plain by a number of cataracts, of which the chief (in 17° 25′ S., 14° 20′ E.) has a fall of 330 ft. The river becomes smaller in volume as it passes through an almost desert region with little or no vegetation. The stream is sometimes shallow and fordable, at others confined to a narrow, rocky channel. Near the sea the Kunene traverses a region of sand hills, its mouth being completely blocked at low water. The river enters the Atlantic in 17° 18' S., 11° 40' E. There are indications that a former branch of the river once entered a bay to the south.

KUNGRAD, a town in the Kara-Kalpak Autonomous Soviet Socialist Republic of the Uzbek S.S.R., U.S.S.R.. in lat. 42" 58′ N., long 58° 50′ E., on the Taldyk arm of the delta of the Amudarya, 50 mi. S. of Lake Aral, altitude 260 ft. Population 3,098. It was the centre for caravan routes linking the Khorezm oasis and Khiva with Krasnovodsk and other places on the Caspian, and with the Emba river, and the region of Aktyubinsk.

KUNGUR, a town in the Perm *oblast* of the Russian S.F.S.R., U.S.S.R., in 57° 25' N., 56° 48' E., on the railway from Perm to Sverdlovsk, where it crosses the Sylva river. Pop. (1959) 65,000. It has a civic electricity and water supply, and its industries include the making of alabaster, leather goods and beer. The town was founded in 1642 and frequently was attacked by the tribes of the Volga during the 17th century. Its fortress, erected in 1673, was destroyed at the beginning of the 19th century. Its situation on the main road to Siberia and on a navigable river led in prerailway times to its development as a trading centre; its leather goods were noted in Moscow and Gorki, and its merchants imported tea and other goods direct from Kiakhta.

KUNIYOSHI, YASUO (1893–1953), Japanese-American painter, a gifted artist, an influential teacher and a leader of artists' organizations, was born in Okayama. Sept. 1, 1893. After 1906 he lived in the United States. He received his artistic direction essentially at the Art Students league under Kenneth Hayes Miller.

Kuniyoshi's early drawings and paintings were imbued with naive fantasy and delightful humour. His mature work, in which figured predominantly moody, sensuous women, shows his indebtedness to Jules Pascin. His landscapes are at times reminiscent of Derain or Dunoyer de Segonzac. With the beginning of World War II the artist developed a deep social and political consciousness for uhich he created his own pictorial symbols. His colouring developed from earthen tones to luminous pastel hues. Kuniyoshi himself believed that there remained a basic connection between his concept and the Japanese pictorial tradition.

Kuniyoshi was the first president of Artists' Equity association. He taught at the Art Students league after 1933, at the New School for Social Research, New York city, and the artists' colony in Woodstock, N.Y., where he died on May 14, 1953.

See Lloyd Goodrich, *Yasuo Kuniyoshi* (1948) ; Milton W. Brown, *American Painting* From *the Armory Show to the Depression* (1955).
(W. M. V. D. R.)

KUNLUN MOUNTAINS (K'UN-LUN SHAN; sometimes spelled KUENLUN or KWENLUN), the longest mountain system of Asia and called the backbone of Asia by F. von Richthofen, stretch along the northern limit of the Tibetan plateau in China, south of the Tarim basin between 74° and 103° E. and 34° and 40° N. The Tsinling Shan (*q.v.*), an eastward extension, running south of and parallel to the Wei river, is not usually included in the system. In a narrower sense the term Kunlun has sometimes been restricted to the ranges which separate the Takla Makan (*q.v.*) desert of the Tarim basin in Sinkiang (*q.v.*) from the Tibetan plateau between the Pamirs and the Kara Muran Darya which flows northwest from a point west of Mt. Ulugh Muz Tagh in about 86° E. Although the name is thus restricted, the mountain system so designated in fact extends eastward as far as the Tsaidam (*q.v.*) depression (about 95° E.). The Kara Muran Darya, however, is more usually regarded as the border between the western and eastern Kunlun.

The Kunlun mountains thus extend about 1,800 mi. from east to west, and while in the west their constituent ranges are folded and squeezed, in places being only 30 mi. broad with their summits being correspondingly high, in the east they spread out to some 370 mi., the ranges there being less folded, and consequently flatter and lower. The mean height of the crests is about 20,000 ft. but there are few individual peaks of commanding elevation, as there are in the Himalayas. The highest peak is Ulugh Muz Tagh (25,340 ft.). At the extreme western end of the Kunlun, which is known as the Muz Tagh Ata or Kashgar range, are the peaks of Kungur (25,146 ft.) and Muz Tagh Ata (24,388 ft.).

The western Kunlun consists of two systems of ranges approximately similar in size; the outer and inner mountain chains are divided by a belt of deep and narrow intermont depressions. This feature of a double mountain chain, and also the intermont lake basins, continues in the eastern Kunlun and is a peculiar feature of the Tibetan plateau. East of Yarkand, the Kunlun broadens out to about 90 mi., the northern ranges bearing the names Tiznaf, Sanju Tagh and Karanghu, while the more southerly ones are the Raskem, Karlik Tagh and Suget Tagh. Although they all decrease in altitude from west to east, they nevertheless reach elevations of 19,000 ft. with individual peaks about 2,000 ft. higher. On the north the ascent is steep, and the passes across both sets of ranges lie at great altitudes; the Karlik, Suget and Hindu Tash passes are all more than 17,000 ft. and the Yangi pass more than 19,000 ft. Beyond the meridian on which Khotan lies (80° E.) the outer, northern chains rapidly decline in altitude and disappear so that the breadth of the Kunlun decreases to less than 30 mi.; the main range is the glacial Muz Tagh Ata, with its peak of the same name.

Between the upper transverse glens of the Kara Muran and the Cherchan Darya stretches the short range of Tokuz Davan. From it the eastern Kunlun mountains, in about 86° E.. become much broader and again form two chains of ranges. In the north these are the Russian, Astin Tagh and Nan Shan ranges, while in the south there are several parallel series including the Przhevalsky (Arkha Tagh), Columbus (Kaltaalaghan) and Marco Polo (Bokalyk Tagh) ranges. The two chains are separated from one another by the huge tectonic basin of Tsaidam. lying at an altitude of 8,800 ft. In the eastern Kunlun the main peaks exceed 23,000 ft. and have high level passes. The Przhevalsky is the highest range with the peaks of Ulugh Muz Tagh at its western end and Shapka Monomakha at the eastern end, both more than 25,300 ft.; the passes of Kara Muran and Requiem are at 18,300 and 17,800 ft. respectively. The broad features of the surface configuration are a series of nearly parallel mountain ranges, separated by high intermont valleys, choked with disintegrated material and divided into shallow lacustrine basins. Usually the crests of the ranges are worn down to rounded domes by subaerial denudation. Hard rock (mostly granite and crystalline schists, with red sandstone in places) appears only in the transverse glens, which are often choked with debris. The flanks of the mountains are deeply buried in debris and are barren of vegetation. As each successive range proceeding southward represents a higher step in the terraced ascent from the Gobi desert to Tibet, the ranges when viewed from the north frequently appear like distinct mountain ranges and this appearance is accentuated by the steepness of the ascent; but when viewed from the south, because of their long and gentle slope in that direction, they have the appearance of comparatively gentle swellings. As a rule the streams flow east or west down the intermont latitudinal valleys, until they break through to the north. There is a marked difference in precipitation between the valleys of the outer, northern ranges and those of the south. Those in the north are arid and desolate in the extreme, while those of the Przhevalsky range and beyond are so damp that, in summer, the surface is in many parts little better than a quagmire. Vegetation throughout is scanty and animal life poor in species.

Northeast of the Tsaidam depression the main ranges, which there run from northwest to southeast, are the Richthofen. Humboldt, South Tsing Hai and the Mushketov ranges; the latter is continued to the southeast by the Semenov and Tasurkhai ranges, which terminate south of Lan-chou (Lanchow). These parallel ranges of the Nan Shan, as the northern part of the system is called, have broad, flat longitudinal valleys, at altitudes of 12,000 to 14,000 ft., declining to 9,000 to 10,000 ft. in the southwest. There are two large lakes, the fresh-water Khara Nur (Ch'ing-yü Hu), and the salt-water Koko Nor (*q.v.*) which lies at an altitude of 10.500 ft. and covers an area of 1,630 sq.mi.; the latter is rich in fish, but is frozen from November to March.

Generally speaking. the Nan Shan plateau with a mean altitude of 12,000–14,000 ft. is intersected by wild, stony and partly snow-clad mountains towering another 4,000–7,000 ft. above its surface, and arranged in narrow, parallel chains. The chains of mountains are from 8 to 17 mi. wide. seldom as much as 35 mi., while broad, flat valleys between them attain widths of 20 to 27 mi. Passes are at 12,000 to 14,000 ft., and the peaks reach 18,000 to 20,000 in the west, while in the east they are 2,000 ft. lower The western Kunlun, near the Pamirs, and the extreme northern chains, such as the Astin Tagh and Nan Shan, usually have a snow line at an altitude of 14,000 to 14,700 ft., while the inner, more southerly ranges have a snow line approaching 20,000 ft.

The mineral resources of the area have been little studied. Deposits of iron, copper, gold and coal are, however, known to exist. Copper and salt occurs in the northern foothills of the Kunlun between Yarkand and Khotan, while gold occurs from the region of Khotan eastward to the Tokuz Davan range. Yarkand (*q.v.*), which is a busy market, has a population of about 60.000 in the Moslem part; the Chinese part of the city is called Shache. Zinc deposits have also been located in the Khotan district, and jasper is mined there; the town has a population of about 50,000. The population of the Kunlun area is very sparse in general and consists mainly of Uigurs who engage chiefly in nomadic pastoralism, but with some agriculture. The western Kunlun and the eastern parts of the Nan Shan are quite well watered and, especially on the moister northern slopes, are able to support meadow vegetation and coniferous woods; in the former area, alpine meadows are found between altitudes of 9,800 ft. and 11,400 ft., while above that height up to about 13,700 ft. there are conifers; in the eastern Nan Shan are rich meadows and many coniferous woods at heights from 10,400 ft. to 13,000 ft. The Kunlun are very inaccessible for the whole of their length, but especially in the west, because of the swift streams and the deep cover of debris, the steepness of the passes, and the lack of water and vegetation in the central section of the system. All tracks across the Kunlun are suitable only for pack animals and are mainly in the western and eastern extremities where grass and shrubs grow in the valleys. A motor road runs from Lanchow (Lan-chou) to Kashgar (*qq.v.*) skirting the northern foothills and the Takla Makan desert. This route follows part of the old Silk road which was used from about 100 B.C. to convey Chinese silk to the oases of the Fergana valley and central Asia and also to the populated centres of what is now Afghanistan and the India-Pakistan subcontinent.

In 1950 China and the U.S.S.R. concluded an agreement for the formation of mixed joint-stock companies for the extraction of oil and nonferrous metals in the autonomous region of Sinkiang; in connection with this, exploration of the mineral resources of the area, which includes part of the northern foothills of the Kunlun, has been intensified.

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K'UN-MING (formerly YÜNNANFU), capital of Yiinnan province. Pop. (1953) 698,900; (1957 est.) 880,000. Long isolated from the rest of China in traditional times, the city is now a regional political and cultural centre situated in a level lake plain on the Yiinnan plateau. It has comparatively easy transport routes east to the Hsi-chiang (West river) in Kwangsi, northeast to Kuei-yang, and southwest to Burma; there is also a sure local food supply from the surrounding large expanse of fertile alluvium. Modern influences came in 1910 with the opening of the twisting, narrow-gauge French-built railway from Haiphong, 530 mi. away. During World War II K'un-ming received many refugees from eastern China and later from southeast Asia, and became a Chinese military base. It was also of great importance as the transport terminus for the Burma road and for cargo flown over the "Hump" by the U.S. air force. During this period, industries were developed for the manufacture of cotton cloth, electrical and radio parts, specialized metals, cement, copper smelting and for truck repair. Four institutions of higher learning temporarily moved into the city. These events helped change the physical appearance of K'un-ming. The old walls were demolished, streets widened and paved, modern-style buildings and stores erected, electric light and power increased, and residential development grew up around the south shore of sparkling T'ien ch'ih (lake). However, much of this mushroom growth has since declined. The city is now a major transportation centre with the railway to Haiphong reconstructed, and the extension of newer lines north to Szechwan, and northeast to Kweichow and beyond. K'un-ming is the seat of Yiinnan university and also has a medical college and an institute of technology. Students from more than 50 national minorities of southwest China are accommodated at the city's Institute for National Minorities. (TE. H.)

KUNZITE, a transparent lilac-coloured variety of spodumene, used as a gem stone. See SPODUMENE.

KUOMINTANG. Literally "national people's party," the Kuomintang or Chinese Nationalist party ruled China from 1928 until 1949, when communist armies defeated it in civil war and drove it to the island of Formosa (Taiwan). Originally a revolutionary league working for the overthrow of the Chinese monarchy, the Kuomintang became a political party in the first year of the Chinese republic (1912). It participated in the first Chinese parliament, which was soon dissolved by a coup d'état (1913). This defeat moved its leader, Sun Yat-sen (*q.v.*), to organize it more tightly, first (1914) on the model of a Chinese secret society; later, (1923–1924) under Russian guidance, on that of the Bolshevik party. The Kuomintang owed its early successes largely to Soviet aid and advice and to close collaboration with the Chinese Communists (1924–1927). After Sun Yat-sen's death in 1925, the party's leadership passed gradually to Chiang Kai-shek (*q.v.*), who brought most of China under its control by ending or limiting regional warlord autonomy (1926–1928). Kuomintang rule, inseparable from Chiang's, became increasingly dictatorial but never totalitarian. The party program rested on Sun Yat-sen's Three People's Principles: nationalism, democracy and people's livelihood. Nationalism demanded that China regain equality with other nations; this was accomplished by repelling the Japanese invasion (1931–1945) and by securing the abrogation of China's unequal treaties with the west (1943). By contrast. the realization of democracy through successive constitutions (1936, 1946) remained largely a formality. Equally ineffective were attempts to improve the people's livelihood, although in its long-range programs the party anticipated some of the sweeping economic changes wrought by its communist successors. Its failure to effect such changes itself derived partly from weaknesses in leadership and partly from forced preoccupation with fighting the Japanese without and the Communists within. See also CHINA: History. (C. BT.)

KUOPIO, one of the ten administrative departments (*lääni*) of the republic of Finland, with that of Oulu (Uleaborg) on the north, Vaasa (Vasa) on the west and Mikkeli (St. Michel) on the south. The U.S.S.R. lies to the east. Area, 13,826 sq.mi., excluding lakes. Pop. (1950 census) 469,054.

The surface is hilly, from 600 to 800 ft. of altitude in the north (Suomenselka hills) and from 300 to 400 ft. in the south. It is built up of gneisso-granites, which are covered, especially in the middle and east, with younger granites, and partly of gneisses, quartzite and talc schists and augitic rocks. The whole is covered with glacial and later lacustrine deposits. The soil is of moderate fertility but often full of boulders. Large lakes cover 16% of the surface, marshes and peat bogs over 29% of the area, and much of the remainder is forest clad. The climate is severe, the average temperature being for the year 36° F., for January 13° and for July 63°.

A very small portion is under cultivation. Rye, barley, oats and potatoes are the chief crops. Dairy farming and cattle breeding are of rapidly increasing importance. Iron ore is mined and smelted. There are small engineering and chemical works, tanneries, sawmills, paper mills and distilleries. The preparation of carts, sledges and other wooden goods is an important domestic industry. Timber, iron. butter, furs and game are exported. The chief town is Kuopio (*q.v.*).

KUOPIO, the chief town of Kuopio department, Finland, in 62° 50′ N., 27° 35′ E., on Lake Kalla-vesi and on the railway. Pop. (1950 census) 33,353. Kuopio, in consequence of rail and steamer communication with middle Finland and the sea (via Saima canal), is a trading centre of considerable importance. There is an agricultural school at Levais, close by.

KUPKA, FRANTISEK (FRANK, FRANÇOIS) (1871–1957), Czech abstract painter, born at Opocno, Bohemia, Sept. 23. 1871, studied at the Prague and Vienna academies and at the École des Beaux-Arts in Paris, where he settled in 1895. There he produced satirical drawings (in Cocorico, Le Canard sauvage, etc.) and illustrations (for C. M. R. Leconte de Lisle's Les Erinnyes, 1908; Aristophanes' Lysistrata, 1911; etc.). In 1908–11, however, he experimented with Fauvism and pointillism, and his interest in Georges Seurat's colour-contrast theories led him to study the use of prismatic colours.

Kupka, in his painting "Disks of Newton" (1912), and Robert Delaunay, in his similar "Disks" (c. 1913), were the earliest exponents of curvilinear pure abstraction. This art (called *simultantisme* — simultaneous colour contrasts — by Delaunay) was dubbed "Orphism"—an art of "musical" colour lyricism — by Guillaume Apollinaire in 1913. Kupka painted abstractions with such titles as "Fugue à deux couleurs" (1912) and "Solo d'un trait brun" (1913). In 1920 Kupka was at the Prague academy as a professor. In 1937 he won the gold medal at the Paris International exposition for his painting "Abstraite."

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KUPRILI, in modern spelling KOPRULU, the name of a family of Turkish statesmen.

MOHAMMED KOPRULU (1583?–1661) was the grandson of an Albanian who had settled at Kopru, now Vezirkopru, near Amasia in Asia Minor. He began his career as a confectioner in the imperial kitchens, then became purse bearer to Khusrev Pasha and thereafter rose to be master of the horse, "pasha of two horsetails" and governor of a series of important cities and sanjaks, as a result of his keenness of intellect and his well-deserved reputation for incorruptibility. In 1656 he was appointed to the grand vizierate in order to deal with a janissary revolt. Among the major causes of the Ottoman decline in the 17th and 18th centuries

was the ever-increasing turbulence of the janissaries and the anti-Islamic tendencies of the Bektashi sectaries with whom they were inextricably linked. Mohammed had previously been known as a kindly man, but he saw that this was no time for kindliness and ruthlessly crushed the disaffected elements in the state. Among the thousands he executed was the Greek patriarch, who had written to the voivode of Walachia to announce the approaching downfall of Islam.

Mohammed then turned his attention to foreign enemies. The Venetians' victory off Chios (June 26, 1656) had been a severe blow to Turkish sea power, which he set himself energetically to repair. A second battle, fought in the Dardanelles (July 17–19, 1657), ended by a lucky shot's blowing up the Venetian flagship. The losses of the Ottoman fleet were repaired, and in the middle of August Mohammed appeared off Tenedos, which was captured on Aug. 31 and reincorporated permanently in the Turkish empire.

When Mohammed Koprulu had been nominated to the grand vizierate, the French ambassador, Denis de la Haye, had neglected to bring him the customary gifts, having no reason to suppose that he would remain in office longer than his immediate predecessors had done. The offended minister waited three years to avenge the slight. The French had been secretly aiding the Venetians, with whom the Turks had been fighting for possession of Crete since 1645. In 1659 a French courier turned traitor and handed to Mohammed some dispatches from the Venetians in Crete, intended for La Haye. The grand vizier bastinadoed and imprisoned the ambassador's son; a special envoy, sent by Louis XIV to demand reparation, was treated with studied insult. Cardinal Mazarin thereupon abandoned the pretense of fidelity to the Turkish alliance and openly threw the power of France to the Venetian side.

Mohammed's last activity as a statesman was to spur the sultan to press the war against Hungary. Before his death (Oct. 31, 1661) he recommended the appointment of his son as his successor, and so founded a dynasty of able statesmen who occupied the grand vizierate almost without interruption for half a century.

KOPRULUZADE FAZIL AHMED PASHA (1635–1676) was the eldest son of Mohammed Koprulu, who, himself almost illiterate, had seen to it that his sons had a good education. For ten years, Ahmed ("Fazil" is an honorific, meaning "excellent") was a *muderris* or lecturer at the Fatih mosque before embarking on a political career. He was recalled from his governorship of Damascus in 1659 because of his father's failing health, and he succeeded him as grand vizier in 1661. Three years later, Turkey suffered a crushing defeat at the battle of St. Gothard and was obliged to make peace with the Holy Roman empire. But Ahmed's influence with the sultan remained unshaken. and in 1669 Crete fell to his arms. He fought against Poland in defense of the Cossacks, who had appealed to Turkey for protection. At first successful, Ahmed later was defeated by John III Sobieski at Hotin and Lemberg (Lwów). The Turks. however, continued to hold their own, and finally consented to honourable terms of peace by the treaty of Zurawno (Oct. 16, 1676), retaining Kamenets, Podolia and most of the Ukraine. A fortnight later, Ahmed died. He was a liberal protector of art and literature and founded the still extant Koprulu library in Istanbul.

KOPRULUZADE FAZIL MUSTAFA PASHA (1637–1691), second son of Mohammed Koprulu, became grand vizier to Suleiman II in 1689, after disaster had driven Turkey's forces from Hungary and Poland and its navies from the Mediterranean. He recruited volunteers to reinforce the regular army, drove the Austrians back and recaptured Belgrade, but mas killed at the battle of Slankamen (Szalankemen) on Aug. 19, 1691, which ended in a Turkish rout and the expulsion of the Turks from Hungary.

KOPRULUZADE HUSEIN PASHA (d. 1702), surnamed AMUJAZADE ("nephew"), mas the son of Hasan, a younger brother of Mohammed Koprulu. After serving as *kapudan pasha* (grand admiral) and governor of Chios, he became grand vizier in 1697, after the disastrous defeat at Zenta. Although he succeeded in driving the Austrians back over the Save, he let the English ambassador persuade him to come to terms with the Austrians by the treaty of Karlowitz, which brought about the first dismemberment of the Ottoman empire. Husein dealt firmly with the subsequent revolts in Arabia, in Egypt and in the Crimea and then conciliated the *rayas* by remission of taxes. Public works mere undertaken and fortresses restored. Husein continued his family's traditional war against the twin perils of janissary indiscipline and heterodoxy, but ill health and the intrigues of his enemies compelled him to resign his office on Sept. 5, 1702. He died less than three weeks later.

KOPRULUZADE NUMAN PASHA (1668–1719), son of Fazil Mustafa, after holding a number of governorships, married Ayshe Sultan, daughter of the sultan Mustafa II, and became grand vizier in 1710. His courageous refusal to raise money by the conventional method of extortion led to his dismissal after only nine weeks in office. He nevertheless held several more governorships before his death in Jan. 1719.

KOPRULUZADE ABDULLAH (d. 1735), another son of Fazil Mustafa, was appointed *kainzakam* or deputy to the grand vizier in 1703. He commanded the Persian expedition in 1723 and captured Tabriz in 1725, resigning his office in 1726. In 173j he again commanded against the Persians, but fell at the disastrous battle of Baghaward. (G. L. L.)

KUPRIN, ALEXANDER IVANOVICH (1870–1938), Russian writer, received his education at the cadet school in Moscow and entered the Russian army in 1890. In 1897 he resigned his commission and devoted his time to literature. His first collection of short stories was published in 1903, but it was not until 1905 that his name was made famous by his novel *The Duel,* a realistic picture of garrison life on the western frontier, which made Kuprin popular with the radicals, who accepted the book as a categorical condemnation of the army. In the revolution, however, he was anti-Bolshevik, and emigrated to France after the collapse of the White army. Unlike the usual Russian type of story, his tales are full of action, but his style shows his lack of a literary education.

Kuprin's works were published in 1910 at St. Petersburg (now Leningrad) in 6 vol.. later increased to 14 vol. The following, among others, have been translated into English: *The Bracelet of Garnets* (1911; Eng. trans. by Leo Pasvolsky, 1919); *Sasha* (Eng. trans.. 1920); *The River of Life* (Eng. trans. by S. Koteliansky and J. Middleton Murry, 1916); *A Slav Soul* (trans. 1916. with introduction by Stephen Graham). His novel *Yama* uas translated into French under the title La *Fosse aux filles* (1923). He died March 1j, 1938.

KURA'AN: *see* NUBA.

KURAKIN, BORIS IVANOVICH, PRINCE (1676–1727), Russian diplomatist, brother-in-law of Peter the Great, was one of the earliest of Peter's pupils. In 1697 he was sent to Italy to learn navigation. He filled many important diplomatic missions. He was sent to Rome in 1707 to prevent papal recognition of Stanislaus Leszczynski as king of Poland. From 1708 to 1712 he represented Russia at London, Hanover and The Hague successively, and, in 1713, was the principal Russian plenipotentiary at the peace congress of Utrecht. From 1716 to 1722 he was ambassador at Paris, and when in 1724 Peter set out on his Persian campaign, Kurakin was appointed supervisor of all Russian ambassadors accredited to the various European courts.

"The father of Russian diplomacy" was most useful to Russia perhaps when the Great Northern war (*see* SWEDEN: *History*) was drawing to a close. He prevented Great Britain from declaring war against Peter's close ally, Denmark, at the crisis of the struggle. Kurakin's autobiography, carried down to 1709, is a historical document of the first importance. He wrote *History of Tsar Peter Aleksievich and the People Nearest to Him* (1682–94).

See *Archives of Prince A. Th. Kurakin* (Rus) (St. Petersburg, 1890); A. Brückner, *A Russian Tourist in Western Europe in the Beginnzng of the XVIIIth Century* (Rus) (St. Petersburg, 1892).

KURANDVAD (KURUNDWAD), former Indian princely state in the Deccan and Kolhapur agency. and geographically within Bombay; part of the southern Maratha *jagirs* Created in 1772 by a grant from the Maratha peshwa or king the state was divided in 1811 into tno parts. one of which. called Shedbal, lapsed to the British government in 18j7. In 18jj Kurundnad was

further divided between a senior and a junior branch. The territory of both was widely scattered among other native states and British districts. Area of the senior branch, 200 sq.mi.; pop. (1941) 52,552. Area of junior branch, 126 sq.mi.; pop. (1941) 46,609. The town of Kurundwad; in which the rulers of both branches had their residence, is 135 mi. S.S.E. of Poona, on the right bank of the Panchganga river near its junction with the Kistna. Pop. (1951) 9,744. In 1949 the junior branch was incorporated in Sholapur and Belgaum districts and the senior branch in Bijapur, Belgaum and Satara South districts. Bombay.

KURANKO, a tribe of Mandingo origin, living on the Niger sources in French Guinea and Sierra Leone in close contact with the northern Kissi tribe, and with the Islamized Malinke. They have elected high chiefs. The nephew usually marries the widow of his maternal uncle. Descent is patrilineal. Family property is inherited by the brother of the deceased, and personal possessions by his son. Each clan has its *tana* or tabu animal. Secret societies exist for men and women (*Segere*, *Andomba*, Kono). The Kuranko practise cultivation and arboriculture (Kola tree).

See N. W. Thomas, *Anthropological Report on Sierra Leone* (London, 1916).

KURBASH or **KOURBASH,** a whip or strap about a yard in length, made of the hide of the hippopotamus or rhinoceros. It was an instrument of punishment and torture used in various Mohammedan countries, especially in the Turkish empire. "Government by kurbash" denotes the oppression of a people by the constant abuse of the kurbash to maintain authority, to collect taxes or to pervert justice.

KURDISTAN, in its broadest or ethnographical acceptation, means the region inhabited by the Kurds, an area stretching north and south from Mount Ararat to the Diyala tributary of the Tigris, and east and west from about 28° E. to the Kara Su. Thus the country occupied more or less continuously by the Kurds is 600 m. in length from south-east to north-west and from 120–150 m. in breadth. The territory is now divided between Persia, 'Iraq and Turkey and probably has a total Kurdish population of about 1,500,000.

In Persia the Kurds occupy mainly the provinces of Kermanshah and Kurdistan as well as the southern part of Azerbaijan and the mountainous region of the districts of Urmia, Khoi, and the southern slopes of Ararat. Colonies of Kurds are found also in Khurasan, Fars and Burujird (Luristan). In Asiatic Turkey the principal localities occupied by Kurds lie just along the Turco-Persian frontier and Kurds mingled with Christians inhabit the region around Lake Van. Between the upper courses of the Tigris and Euphrates Kurds are found mainly to the north of a line joining Feshkhabur (near Jazirat ibn Omar) to Sumaisat above Birejik and they are also found considerably westward of the Euphrates. They are numerous around Bitlis, Erzinjan, Diarbekr, Erzerum and on the western slopes of Ararat. In the mandated territory of 'Iraq, in what was formerly the Turkish *vilayet* of Mosul, according to the census of 1939, they numbered 500,000; they occupy the whole of the town of Sulaimaniya, and form a majority in Erbil and Kirkuk. (In Russian Transcaucasia the Kurds of Erivan and Kars were said to number 125,000 in 1910.) The Kurdish race is thus distributed under three jurisdictions: a condition which is likely to retard their development into a homogeneous community.



BY COURTESY OF THE NEAR EAST RELIEF

KURD WOMAN AND CHILD

Kurdistan, in the narrower sense, is a province of Persia situated in the mountainous country between Azerbaijan on the north, and Kermanshah on the south, extending to the frontier of Iraq on the west and bounded east by the provinces of Gerrus and Hamadan.

The administrative headquarters is Sinandaj (more generally called Sinneh). The revenue of the province is small in comparison with the area and due to the fact that a great part of the population consists of restive and turbulent nomads who are resentful of official control.

The province occupies the mountainous system which starting from the range of Anti-Taurus sweeps east to become the Zagros, which the Kurds share with the Lurs farther south. The country presents either masses of mountains heaped upon each other or great upland tablelands covered with flocks and the tents of the Ilyats. The valleys are deep and narrow, wherein the villages are commonly built in situations which protect the inhabitants from the inclemency of the weather. The soil in the valleys is good and would yield in abundance, but the Kurds prefer a pastoral life. The district of Ardalan in particular produces excellent pasture. The chief natural productions are wheat, barley, cotton, tobacco and all kinds of fruits (particularly cherries) and vegetables. The walnut tree is common and the oaks here yield great quantities of gall-nuts which are largely exported. Snow falls for four months of the year during which the sedentary people live much in underground houses as a protection from the weather, where they store food for themselves and fodder for their cattle. The great need is fuel and dried dung is carefully stored for this purpose.

The population consists almost wholly of hill people and nomad tribes, except at Sinandaj and a few other populous centres. Sinandaj is situated in 35° 15' N. and 47° 18' E., at an elevation of 5,300 ft. and is 200 m. S. of Tabriz, 80 m. N.W. of Hamadan and 87 m. N. of Kermanshah to all of which places cart-tracks lead. The population is estimated at about 32,000, of whom a few hundreds are Jews and Armenians. The town lies snugly in a valley and in general appearance is pleasing, the houses being generally well built among gardens. The residence of the governor is a castle called Dar ul Ayaleh on a hill above the town. The chief industries are the making of carpets of wool and felt and as the local wool is of excellent quality the products are highly prized. Other articles of trade are hides, skins, sheep and cereals.

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(P. Z. C.)

HISTORY

The origin of the Kurds cannot yet be accurately defined. The oldest Sumerian records leave little doubt that not later than 2,000 B.C. a people named Gūtū or Kūti, later on called Kūrtie by the Assyrians, held the region of middle Tigris from the district of Bohtan roundabout Mount Gûdi (perverted into Jebel Judi by the Arabs), across Bezabda (*Jezirat Ibn* Omar of the Arabs), to the mountains of Kuh-i-Shengar (Jebel Sinjar) in the west and the chains of Zagros in the east. Another group of kindred tribes named Kassites (Kassu) descended into Babylon from the southern hills of Zagros and governed Babylonia (Akkad) for about six centuries (1800–1200 B.C.). It appears that these original

Kurdish tribes, perhaps of pure Aryan stock, were one of the oldest autochthonous people of those mountain regions.

Called Kardu by later Assyrians and pre-Moslem Arabs, Gortūkh by Armenians, and Carduchi (Καρδοχοῦι) Gordse, Cyrti, etc., in the Greek and Roman classics, the history of the Kurds has consequently been very confused and illusory. There is, however, little doubt that by a comparative study of the records of Sargon II and Assarhaddon of Assyria, of Herodotus, of Moses of Chorene (Armenian) and Persian epic poems some of the great Kurdish tribes, the Bokhtis, the Mukris, the Hadabanis, the Mihranis (Millis), the Babans and others, can be identified as existing as early as the 6th century B.C. and living the same sort of life as today. They constitute the oldest aristocracy throughout the world in so far as their tribal names are concerned.

From the dawn of history the Kurdish tribes have scarcely submitted to any empire or conqueror for long. They fought the Sumerian dynasties, one of which called itself Gutium. The Hittite monarch Shubbilukuma (1370 B.C.) refers to them as Gurda and to their god Gir. As the chief constituent elements of the Nairi confederation they fought all the great Assyrian monarchs from Salmanasor I onward until they helped Cyaxares and Cyrus to overthrow both Nineveh and Babylon. Viewed from an historical angle, it appears that the Assyrian empire, even at the height of its power, felt secure only in the plain of Nineveh and westwards; whereas the Kurdish tribes in the north, north-east, and on the borders of Elam caused increasing trouble to Assyria by their unvanquished self-assertion. On the downfall of the Median empire, the Kurds seem to have absorbed the remnants of Mede warriors as they absorbed later Assyrians, Armenians and the Turkomans; just in the same way as they have themselves been absorbed by their neighbours. Under Cyrus and Darius, the Kurdish tribes were completely Aryanized and their national characteristics were formed. On a more or less equal footing with the great satraps of Achaemian Persia, they not only supplied troops but they became the privileged guardians of Zoroastrian temples (the Ravandi tribe). They fought the Greeks of Xenophon on their retreat through Bohtan, as well as the Seleucids who tried to dominate them, and they were prominent under the Sassanians.

Many Invasions.— The Kurds were not subdued by Arab occupation of their land (7th–9th century). They knew the Aryans, but the Arabs anticipated the later ruthless destruction of Kurdish cities by Mongols. Ruins of these destructions can be seen from Hamadan and Kermanshah to the Tigris. This region formed the Kurdish independent kingdom of Shahrizor (11th to 16th century). The ruins of Yassin Tepe represent the site of the capital city and castle of Shahrizor.

Another independent Kurdish kingdom, the Mervan family, ruled at Diarbekr in the first half of the 11th century, succumbing to the Seljuks. When Salaheddin the Great (Saladin) fought the crusaders and united most of the Kurdish tribes under his rule in Syria (12th century) Kurdish power was at its height.

When the Mongol Great Khan Mangu sent his brother Hulagu (1252) to conquer Western Asia, he was to suppress those Kurdish "robbers" of Kurd-i-kuh (Shahrizor) who hampered the free movements of the Mongol armies. The Kurds massacred 20,000 Mongols in 1257 before the castle of Arbil.

When the Turks occupied Armenia and Kurdistan in 1514–36, during their wars with Persia, Sultan Selim I entrusted the organization of these practically independent countries to Mullah Idris, a Kurd of Bitlis. Idris transferred many Kurdish clans into the Arax valley, and Arab Sheikh families into the Kurdish tribes, to convert them to the Sunni faith. Although the Turks conferred honours on Kurdish chiefs the sympathy of the Kurds remained always with Persia, and by close co-operation with their Christian neighbours the Kurds waged unceasing warfare against the Turks for the maintenance of their independence. Led by Bedzkhan Bey of Bohtan, the Yezidi chief of Revanduz and of Hakkiari, the tribes rose against the Turkish reforms, and from 1832 to 1847 the Turks sent army after army to overcome those courageous tribes and destroy their castles. Many of the Kurdish *Derebeys* (Lords of Valleys) were replaced by Turkish governors.

In order to disrupt the unwritten pact of friendship between the Kurds and their Christian neighbours, Abdul Hamid organized in 1890, in his own name, cavalry divisions from the Kurds, which became a scourge to all indiscriminately. This privileged Kurdish force considerably retarded the growth of national self-consciousness among the Kurds and produced hostile feeling between them and the Armenians. (See ARMENIA.)

With the downfall of Abdul Hamid, the Kurdish cavalry was suppressed in 1909, and more enlightened Kurds came forward to lead their people. Several Kurdish deputies in the Ottoman chamber and senate took up the national cause. Kurdish newspapers and party clubs were established in Constantinople, Baghdad and Mosul to cultivate a common language for the use of all Kurds. The Young Turks waged war against Ibrahim Pasha of the Millis, the Sheikh Barzani near Mosul, the Hamavends and the tribes of Dersim.

None of the Kurdish tribes had any interest in World War I; yet from the beginning they were involved both on Caucasian and the Mesopotamian fronts and suffered heavy losses.

At the peace conference in Paris in 1919 Sherif Pasha, a Kurd, represented the claims of the Kurdish race, demanding independence from Turkey. In the treaty of Sèvres, Kurdistan was defined as a narrow strip of territory lying between the southern frontier of Armenia and Northern 'Iraq. The treaty of Lausanne did not mention Kurdistan; it left the delimitation of the northern boundary of 'Iraq to a friendly agreement between Great Britain and Turkey; failing this, the dispute was to be solved by the council of the League of Nations. (See MOSUL.)

While the council of the league was discussing this essentially Kurdish problem a Kurdish rebellion broke out in Turkey in Feb. 1925, having Ginj and other middle Taurus heights as its centre. Sheikh Said, followed by some well-known tribal chiefs, had initial successes. The Turks collected regular troops and, after short and decisive assaults, broke the Kurdish rebellion and captured the ringleaders. A Turkish court martial was set up at Diarbekr, which condemned to death Sheikh Said, Dr. Fuad and 46 other Kurdish nationalist leaders. They were all executed in Aug. 1925. The president of the Turkish court martial stated later that the rebellion had a purely nationalist motive. Later the Turkish Republican Government passed a law transferring the Kurdish leaders from their historic homes in Bohtan Sasun and Bayazid to the coasts of Anatolia. See further KURDS.

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KURDS, an Iranian-speaking people who occupy the great arc of the Zagros and Taurus mountains extending from about Kermanshah in western Iran through northeastern Iraq to Erevan in the Armenian Soviet Socialist Republic to the north and Erzerum and Erzincan in eastern Turkey to the west. Some non-Kurdish communities are found within this mountain area, and some Kurds live outside it, such as those around Aleppo in the United Arab Republic (Syria). There are also Kurds in northeastern Iran, transplanted by Shah Abbas the Great in the late 16th century. Kurdish nationalists sometimes claim a total Kurdish population of 10,000,000, but this figure includes the related Lur and Bakhtiari tribes of Iran who do not consider themselves Kurds. An informed estimate numbered the Kurds at approximately 5,000,000 in 1957, with over 1,000,000 in Iran, about 900,000 in Iraq, perhaps 2,000,000 in Turkey, about 250,000 in Syria, and several thousand in Soviet Armenia.

The Kurds are descended from the Guti, shepherd tribesmen who occupied the Zagros mountains around 2000 B.C. and occasionally

descended into the plains of Mesopotamia on raids. Although since that time the Kurds have absorbed fragments of Turkic, Persian and other tribes, the distinctive features, strong nose and deep-set eyes, limned in early Mesopotamian art are still found widely among modern Kurds.

The Kurds speak an Iranian language that is divided into two mutually unintelligible dialects, northern and southern Kurdish. Most of the Kurds are Sunni Moslems of the Shafi'i rite, but a few belong to two aberrant Shiite sects: the Yezidis in the Mosul region of Iraq, who speak Kurdish but do not consider themselves a part of the Kurdish community; and the Ahl-i Haqq, "People of the Divine Truth," who are called Ali-Ilahi in western Iran and Kakai in the area around Khanaqin and Kirkuk in eastern Iraq.

The Kurds were traditionally pastoral nomads, migrating through the seasons to find pasture for their flocks of sheep and goats and dwelling in the black tents characteristic of the middle east — pavilions made of woven black goat hair draped over poles. The Kurds had village-dwelling neighbours in the plains, however, and through the centuries there was a gradual transition on the part of individuals, families and tribal segments from the nomadic to the settled way of life.

The adoption of village agriculture was greatly accelerated after World War I. when Kurdistan was divided among several countries, the governments of which encouraged settlement because village dwellers are more amenable to control than nomads. In the second half of the 20th century very few year-round nomads remained; many lived in villages during the winter, where they planted crops, but in summer moved out into mountain valleys with their tents and flocks. Many had become fully sedentary.

Many Kurds, whether seminomadic or sedentary, are still tribal in social organization, being organized in segmented regional kin groups under a hereditary chief who looks after their interests in exchange for the taxes they pay him. Elsewhere, however, the structure became essentially feudal, with the chiefly families owning the land that had once been tribal and collecting rent as a landlord from both Kurdish and non-Kurdish tenants. Some of the chiefs are unlettered tribesmen, others are educated. In addition to the chiefs, there are religious leaders (called sheikhs by the Kurds), who exert considerable influence over the people.

Travelers in Kurdistan have remarked on the freedom of Kurdish women in comparison with the restrictions placed on their Persian, Arab and Turkish neighbours. Kurdish women go unveiled, speak freely to strangers and participate in the activities of the larger group Several Kurdish women have become tribal chiefs on the death of their husbands, and one widow regularly represented her villages near Rowanduz in parliamentary elections despite the Iraqi law limiting electors to males.

Throughout history individual Kurdish chiefs made their bid for power and established kingly dynasties over an area extending beyond their tribal territory. The most famous such chief was Saladin (*Salah ud-Din*), who made himself master of the Arab world bordering on the eastern Mediterranean and led the Moslem forces against the crusaders in the late 12th century. Semiautonomous Kurdish kingdoms survived into the 19th century; indeed the Turkish empire encouraged their existence as buffers along the Persian border. None of these kingdoms encompassed all of Kurdistan, however It was only in the 19th century, when the Turkish empire was crumbling and European political ideas were filtering into southwest Asia, that Kurdish nationalism found a tentative foothold in Kurdistan. In the second quarter of the 19th century Badr Khan led an independent confederacy extending from Diyarbakir in Turkey to Saujbulaq (Mahabad) in Persia, and in 1897 members of the Badr Khan family founded the first Kurdish newspaper. It was not until the end of World War I, however, when the old Turkish empire collapsed and Pres. Woodrow Wilson, in his Fourteen Points, enunciated as Point 12 that Turks should have control over Turkish people only, that an active Kurdish nationalist movement developed. In the treaty of Sèvres, signed in Aug. 1920, it was stipulated that an independent Kurdistan should be created frorn a part of the former Turkish empire. This treaty was never ratified, and the treaty of Lausanne which superseded it made no mention of Kurdistan although it provided for independent Arab states. The Kurds of the empire became minority groups in the new states of Iraq, Turkey, Syria and Soviet Armenia, and at about the same time Riza Shah Pahlavi introduced a policy of settling the tribes in Iran.

Beginning in 1920 there was a flowering of Kurdish publications, written in the southern Kurdish dialect spoken in western Iran and the adjacent parts of Iraq, which were nationalist in inspiration. But the Kurds had never had a common government, and like most pastoral nomads were little accustomed to unified action. The revolts that occurred from time to time in the countries in which Kurds lived were motivated less by nationalism than by normal tribal resistance to outside control. The idea of nationalism was limited to a small educated minority. One of the most publicized of the Kurdish revolts began as a nationalist movement directed by the Komala-i-Zhian-i-Kurd, the Committee of Kurdish Youth, formed in 1943 by educated young Kurds in Mahabad in Iran. Soviet agents offered assistance, and although the Kurdish leaders had no interest in communism they accepted Soviet aid. In December 1945 the Kurdish Republic was established at Mahabad under the presidency of Qazi Muhammad, a highly educated religious leader. This government received little tribal support, however, and when Soviet troops were withdrawn from Iran in late 1946 the republic fell and Qazi Muhammad was executed. Subordinate figures escaped to Soviet Armenia, as have leaders of other revolts. In the second half of the 20th century the Kurds of Turkey appeared to have made an adjustment to Turkish national life. In Iran and Iraq many Kurds had made this adjustment, some of thern holding important government positions.

There were dissidents, however, for the transition from nomadic to settled way of life and from tribal to state government is difficult at best. The drive toward Kurdish nationalism after World War II was largely Soviet in inspiration, and appealed to literate, town-dwelling Kurds rather than to settled or nomadic tribesmen. The Kurds were adjusting, as they had been doing for some 4,000 years, to their non-Kurdish neighbours.

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KURE, a city and port of Japan in Hiroshima prefecture, southwest Honshu. With an excellent natural harbour surrounded on the land side by mountains and screened from the Inland sea by mountainous islands, Kure had a seclusion which appealed to Japanese naval authorities who established a major naval base there in 1886

The population was about 238,200 in 1940, grew to 420,000 during World War II and dropped to 199,304 in 1955. In the same period its area was increased by amalgamation from about 18 sq.mi. to 56 sq.mi. The shipyards and foundries, which during the war produced the super battleship "Yamato," build merchant ships and oil tankers of 80,000 to 100,000 tons. (C. A. MR.)

KURGAN, a town in the Kurgan *oblast* of the Russian S.F.S.R., U.S.S.R., at the head of steam navigation on the Tobol river, in 55° 23' N., 65° 27' E. Pop. (1959) 145,000. Its position in the centre of a rich agricultural district and on the river and railway has made it a collecting centre for the butter industry, which started in 1893, and grew with such rapidity that Kurgan was exporting more than 8,000 tons of butter per annum before 1914. It also collects and exports tallow, soap, candles, grain, cattle, leather and hides, and has three annual fairs. Its industries include the making of agricultural machinery, leather goods, sausage making and flour milling and it has an electric turbine. Cherries are grown in the district. Settlements have existed there from remote antiquity and the town receives its name, which means tumulus, from the great number of prehistoric burial mounds. The Tobol is frozen from Nov. 16 to May 8, and the climate is extreme. Average January temperature —1.5° F., July 68.7" F., rainfall 16 to 20 in., mainly in the three summer months.

KURIA MURIA ISLANDS, a group of five islands off the coast of Arabia, British since 1854, formerly attached to Aden

but in 1931 transferred to the Persian Gulf residency. Lofty and rocky, composed principally of granite with Cretaceous and Tertiary limestones resting on it, their total area is 28 sq.mi., the largest, Hallaniya, being 20 sq.mi.

The islands are probably the ancient *Insulae Zenobii,* and were ceded by the sultan of Muscat to Britain in 1854 as a cable station. They are inhabited by Arabs, who speak a dialect. The islands yield some guano.

KURIL ISLANDS, a chain of small islands in the North Pacific. stretching in a northeasterly direction from Nemuro bay, on the extreme east of the island of Hokkaido, to the Kuril strait, which separates them from the southernmost point of Kamchatka. They extend from 43° 20′ to 50° 56′ N. and from 145° 24′ to 156° 30′ E. Their area is 6,023 sq.mi.; their total number is more than 25, and the names of the 8 principal islands counting from the south are Kunashir, Shikotan. Iturup (Etorotu or Etorop, and known formerly to Europe as Staten Island), Urup, Simushir, Onnekotan, Paramushir and Shumshu.

There are many volcanic mountains in the group of islands, which lie entangled in a vast net of seaweed.

The Kurils are the resort of innumerable birds, and formerly were largely frequented by seals and sea otters, which, however, were almost completely driven away by unregulated hunting.

Near the southeastern coast of Kunashir stands a mountain called Mendeleyeva (2,940 ft. high). On the west coast of the same island is a boiling lake, which deposits on its bed and around its shores black sand, consisting almost entirely of pure sulfur. This island has several lofty peaks: Gerasimova near the west coast, and Tyatya and Ruruy in the north. Tyatya (5,978 ft.) is described by Chamberlain and Mason as "a cone within a cone, the inner and higher of the two being—so the natives say—surrounded by a lake." The island has extensive forests of conifers with an undergrowth of ferns and flowering plants, and bears are numerous.

The island of Shikotan is remarkable for the growth of a species of bamboo having dark brown spots on the cane. Iturup has a coast line broken by deep bays, of which the principal are Dobroye Nachalo, Kuybyshevski and Kurilski on the northern shore and Kasatka on the southern. It is covered almost completely with dense forest, and has a number of streams abounding with salmon. Kurilsk, the chief port, is in Kurilski bay. Its mountains are Atsonupuri (3,930 ft.) and Chirip (5,207).

Among the other islands three only call for notice on account of their altitudes, namely, Ketoi, Rasshua and Matsua, which rise to heights of 3,845, 3,136 and 4,911 ft. respectively.

Not much is known about the aborigines. By some authorities Ainu colonists are supposed to have been the first settlers, and to have arrived there via Hokkaido; by others, the earliest comers are believed to have been a hyperborean tribe traveling southward by way of Kamchatka.

History.—The Kuril Islands were discovered in 1634 by the Dutch navigator Martin de Vries. The three southern islands, Kunashir, Iturup and Shikotan, are believed to have belonged to Japan from a remote date, but at the beginning of the 18th century the Russians, having conquered Kamchatka, found their way to the northern part of the Kurils in pursuit of fur-bearing animals, with which the islands then abounded. Gradually these encroachments mere pushed farther south, simultaneously with aggressions imperiling the Japanese settlements in the southern half of Sakhalin.

Under an agreement established at the Yalta conference in Feb. 1945, the Kurils, as well as the southern half of Sakhalin, were to be ceded to the U.S.S.R. Soviet forces occupied the islands in Sept. 1945. In 1947 it became part of Sakhalin oblast, R.S.F.S.R.

See Capt. H. J. Snow, Notes on *the Kurile Islands* (1896).

KURISCHES HAFF (COURLAND lagoon, Rus. KURSKIY ZALIV), a lagoon of the Soviet Union, partially in former East Prussia, on the coast of the Baltic, stretching from Labiau to Memel (Klaipeda), a distance of 60 mi., having an area of nearly 680 sq.mi. It is shallow and only close to Memel attains a depth of 23 ft. It is thus unnavigable except for small coasting and fishing boats, and seagoing vessels proceed through the Memeler Tief (Memel deep), which connects the Baltic with Memel and has a depth of 19 ft. and a breadth of 800 to 1,900 ft.

The Kurisches Haff is separated from the Baltic by a long spit, Kurische Nehrung (Courland spit), 72 mi. long and 1 to 2 mi. wide. The latter is fringed throughout its whole length by a chain of dunes, which rise in places to a height of nearly 200 ft. and threaten, unless checked, to be pressed farther inland and silt up the whole Haff.

KURNOOL, a town and district in Andhra Pradesh, India. The town is built at the junction of the Hindri and Tungabhadra rivers at a branch railway terminus, 240 mi. N.W. of Madras city. The town is the capital of Andhra Pradesh. It is also a trade centre. Cotton cloth and carpets are manufactured. Pop. (1951) 60,222.

KURNOOL DISTRICT has an area of 9,277 sq.mi.; pop. (1951/56) 1,618,621. Two long mountain ranges, the Nallamala (highest point 3,187 ft.) and the Erramala, extend in parallel lines north and south, through its centre. The Erramala (highest point 2,097 ft.) is a low range, generally flat-topped with scarped sides. Several low ridges run parallel to the Nallamala, broken here and there by gorges with mountain streams, several of which were dammed to form irrigation tanks under native rule. The principal rivers are the Tungabhadra and Kistna, which bound the district on the north. The Kistna there flows chiefly through uninhabited jungles, sometimes in long smooth reaches, with intervening shingly rapids. The Bhavanasi rises on the Nallamala, and falls into the Kistna at Sungameswaram, a place of pilgrimage. During the 18th century Kurnool formed the jagir of a semi-independent Pathan nawab whose descendant was dispossessed by the British government for treason in 1838. The former principality of Banganapalle, a fief of Hyderabad ceded to Madras in 1800, was merged with Kurnool district on Feb. 23, 1948. Banganapalle town, 17 mi. S. of the Guntakal-Bezwada railway line, has a diamond mine.

The principal crops of Kurnool are millets, cotton, pulses, oilseeds and rice. with a little tobacco. Many minerals occur, and barytes, iron and steatite are worked.

Kurnool suffers severely in time of drought. A government irrigation canal (25 mi.) starts from the Tungabhadra river near Kurnool town. Apart from the weaving of coarse cotton cloth, the chief industrial establishments are cotton presses, an oil mill and saltpetre refineries. The district is served by the Southern railway.

KUROPATKIN, ALEXEI NIKOLAIEVICH (1848–192j), Russian general, entered the army in 1864. In 1875 he was employed in diplomatic work in Kashgaria and in 1876 took part in military operations in Turkistan. Kokan and Samarkand. In the war of 1877–78 against Turkey he earned a great reputation as chief of staff to the younger Skobelev, and after the war he wrote a detailed and critical history—Lovche *and Plevna* (1885)—of the operations, which is still regarded as the classical work on the subject After the war he served again on the southeastern borders in command of the Turkistan rifle brigade, and in 1881 won further fame by a march of 500 mi. from Tashkent to Geok-Tepe, taking part in the storming of the latter place.

In 1882 Kuropatkin was promoted major general. at the early age of 34, and was henceforth regarded by the army as the natural successor of Skobelev. In 1903 he took command of the Russian army then gathering in Manchuria for the contest with Japan. His ill success in 1904–05 was largely attributable to his subjection to the superior command of Adm. Evgeni Alexeiev, the tsar's viceroy in the far east, and to internal friction among the generals, though in his history of the war (Eng. tr., 1909) he frankly admitted his own mistakes. After the defeat of Mukden and the retirement of the whole army to Tieling he resigned the command to Gen. Nikolai Linievich, taking the latter officer's place at the head of one of the three armies in Manchuria. (See RUSSO-JAPANESE WAR.)

In World War I Kuropatkin fought at first on the western front, and in 1916 became governor-general of Turkistan. In

1917 he was teaching in a village school. He died at Shemshurino (Pskov) on Jan. 24, 1925.

See D. Story, The *Campaign with Kuropatkin* (1904).

KURRAM, a river and an agency in the northwest frontier region of \Vest Pakistan, and politically in the Dera Ismail Khan division. The Kurram river drains the southern flanks of the Safed Koh, enters the plains a few miles above Bannu and joins the Indus 13 mi. S.E. of Isa Khel (Mianwali district) after a course of more than 200 mi.

The KURRAM AGENCY has an area of 1,303 sq.mi.; pop. (1951) 163,200. It lies between the Miranzai valley and the Afghan border, and is inhabited by the Turis, a tribe of Turki origin who are supposed to have subjugated the Bangash Pathans early in the 18th century. It is highly irrigated, well populated and crowded with small fortified villages, orchards and groves. The beauty and climate of the valley attracted some of the Mogul emperors of Delhi, and the remains exist of a garden planted by Shah Jahan. The principal place is Parachinar, 16 mi. from the Afghan frontier at Peiwar pass.

Formerly the Kurram valley was under the government of Kabul, and every five or six years a military expedition was sent to collect the revenue, the soldiers living meanwhile in free quarters provided by the people. It was not until about 1848 that the Turis were brought directly under the control of Kabul, when a governor was appointed who established himself in Kurram. The Turis, being Shiah Mohammedans, never liked the Afghan rule.

When the British first annexed Kohat district the Turis gave much trouble. They repeatedly leagued with other tribes to harry the Miranzai valley, harbouring fugitives, encouraging resistance and frequently attacking Bangash and Khattak villages in the district. Accordingly in 1856 the Kurram expedition was undertaken, a British force of 4,896 men under Brig. Gen. Neville Chamberlain traversed their country, and the tribe entered into engagements for future good conduct. During the second Afghan War, when Sir Frederick Roberts advanced by way of the Kurram valley and the Peiwar pass to Kabul, the Turis lent him every assistance, and so their independence was granted them in 1880. The administration of the Kurram valley was finally undertaken by the British government, at the request of the Turis themselves, in 1890. During the frontier risings of 1897, however, the inhabitants of the Kurram valley, chiefly the Massozai section of the Orakzais, were infected by the general excitement, and attacked the British camp of Sadda and other posts. A force of 14,230 British troops under Col. W. Hill traversed the country, and the tribesmen were severely punished. In Lord Curzon's reorganization of the frontier in 1900–01 British troops were withdrawn from the forts in the Kurram valley, and were replaced by the Kurram militia, reorganized in two battalions and chiefly drawn from the Turi tribe.

KURSK, an *oblast* of the Russian Soviet Federated Socialist Republic, U.S.S.R., lying north of the Ukrainian S.S.R. and bounded by the *oblasti* of Bryansk and Orel on the north, Belgorod on the south and Voronezh (*q.v.*) on the east. Area 11.506 sq.mi. Pop. (1959) 1,483,305 (urban 320.412, rural 1,162,893). It forms part of the recently created Black Earth area (Central). It occupies the southern slopes of the central Russian plateau (700–1,100 ft.) and is deeply entrenched by numerous river and stream valleys. Cretaceous and Eocene rocks prevail and chalk, ironstone, potter's clay and phosphates are worked. The magnetic anomaly extending in a broad belt running southeastward from the north of the *oblast* and extending into the southwest corner of Veronezh *oblast,* was observed many years ago. Investigations have resulted in the location near Shchigry at a depth of 525 ft. of valuable iron deposits, which may lead to the industrialization of the *oblast.*

A famine (1891) because of the lack of spring rain resulted in a better railway net's being constructed, while a heavy July rainfall in 1882, in which a quarter of the usual annual rainfall fell within an hour, resulted in the destruction of part of the Moscow-Kursk railway built in 1867.

The whole *oblast* is covered with loess black earth, though in the northern part, forest spread on the black earth with moister conditions This forest has been cut, and the region is now "lyesso-steppe," the soil having a humus content of only 4%–6%.

The *oblast* forms an interesting transition region between Great and Little Russia. As Belgorod, lying in a valley that opens toward the southern plain, is approached, cloud, sunshine, scenery and people more and more closely approximate to the Little Russian (Gkrainian) type. Belgorod still enjoys autumn when Kursk is under winter snow, and the picturesque thatched uhite huts, surrounded by cherry orchards, dotting the area to the south of it, are unknown in the north. The chief crops of Kursk are rye and oats. Millet, potatoes, sugar beets, hemp, wheat and sunflower seed are also grown. The number of sheep, cattle, horses and pigs was markedly diminished during the civil war of 1917–20 and the famine following it Numbers rose again until 1924, but diminished again to a marked degree between 1924 and 1926, a serious situation in view of the need for manure, and of the value of horses and cattle as draught animals. Sugar-beet, fruit, melon, pumpkin and sunflower-seed cultivation are the most intense in the south and diminish toward the north, being replaced by oats, buckwheat, potato and hemp cultivation.

Factory industries include flour milling, oil pressing, tobacco manufacture, sugar refining, brewing and distilling, the production of chalk and the manufacture of rope. Iron mining and smelting was beginning in the Shchigry area, which is also noted for horse breeding Kustar (peasant) products to supply local needs are common, and toys, caps, vehicles, baskets and pottery are made. A peasant boot and shoe artel in the Miropol-Sudzhansk area has 1,000 members, and there are artels for carpet weavers.

The population is mainly Great Russian, with Little Russians (Ukrainians) in the south. The general poverty led to the emigration of thousands of peasants to Siberia and the south between 1896 and 1914. The outbreak of war was followed by reckless mobilization of agricultural labourers and commandeering of horses. and this was followed by civil war and by the formation of troops of bandits The 1921 famine still further undermined agriculture and left the survivors weakened as well as reduced to a poverty even lower than the general pre-1914 level.

KURSK, the chief town of the above *oblast,* is 51° 42' N., 36° 11' E Pop. (1959) 203,000. It is built on two hills (750 ft), the slopes of which are covered with orchards. The surrounding noods are famous for their nightingales. It is an important railway junction with a grain elevator and is a centre for the agricultural region around; its yearly Korennaya fair was important before World War I. It manufactures machinery, confectionery, tobacco, soap, bricks, cartridges and alcoholic drinks. It is essentially a provincial town and is noted as the birthplace of the Russian saint Theodosius.

KURUMBA (KURUMAN), the name of a stunted, conspicuously flat-nosed tribe of southern India. It is divided into two groups, one on the Nilgiri plateau, speaking its own dialect, the other in the plains, more civilized and speaking Kanarese. The former practise adelphogamy, and have no marriage rites. Like the Kurubas. they have many primitive usages of great interest

KURUNEGALA, a town in the northwestern province of Ceylon; the residence of the kings from A.D. 1319 to 1347. Pop. (1953) 17,505. It is finely situated under the shade of Adagalla (the Rock of the Tusked Elephant). which is 600 ft. high. Kurunegala is the centre of rice, coconut and tea cultivation.

KURYLOWICZ, JERZY (1895–), Polish historical linguist uho demonstrated in 1927 the identity of Hittite *ḫ* uith the Indo-European speech sounds postulated in 1879 by the Swiss scholar Ferdinand de Saussure, thus laying a cornerstone of Indo-European phonology. He was born at Stanislawow (Ukraine, formerly Poland) on Aug. 26, 1895, and. after Romance and Germanic studies in Poland, worked on Indo-European linguistics in Paris under A. Meillet. Kurylowicz's contributions in these fields began from 1924; from 1928 he was professor at Lwow, and after World War II at Wroclaw and Krakow. His major works are *Études indo-européennes* I (1935), *L'Accentuation des langues indo-européennes,* 2nd ed. (1958), *L'Apophonie* en *indo-européen* (1956). (C. Ws.)

KURZ, HERMANN (1813–1873), German writer chiefly

remembered for his powerful historical novels Schiliers *Heimatjahre* (1843) and Der *Sonnenwirt* (1855), and colourful tales of Swabian life, such as *Erzählungen* (3 vol., 1858–63). Born at Reutlingen, Nov. 30, 1813, he studied at Maulbronn and Tubingen, and later earned his living by writing. His work, still neglected despite its high quality, brought him little profit or recognition, even in the homeland which he portrayed so vividly. He produced some good translations from English, Spanish, Italian and Middle High German, and from 1843 to 1854 was active as a political and literary journalist and editor.

Later he held a post as university librarian at Tübingen, where he died on Oct. 10, 1873. His collected works were edited by Hermann Fischer in 12 volumes (1904).

See Isolde Kurz, Herman *Kurz* (1906); Wilhelm Kosch, in Deutsches Literatur-Lexikon, vol. 2, pp. 1435–36 (1953).

ISOLDE KURZ, his daughter, born at Stuttgart, Dec. 21, 1853, lived 27 years in Italy. Her poems, Gedichte (1888, 1905 and 1933), stories, *e.g., Florentinische* Novellen (1890) and *Italienische Novellen* (1895) and novels have won her a high place among German women writers, partly for her sense of form and style. She died at Tubingen, April 4, 1944. Her collected works were edited by G. Muller in 6 volumes (1925).

See Wilhelm Kosch in Deutsches Literatur-Lexicon, vol. 2, pp. 1435–36 (1953). (L. H. C. T.)

KUSCH, POLYKARP (1911–), U.S. physicist and co-winner of the 1955 Nobel prize for physics, was born in Blankenburg, Ger., on Jan. 26, 1911, and moved to the United States at the age of one. He graduated from Case Institute of Technology, Cleveland, O., in 1931, and received his Ph.D. in 1936 from the University of Illinois, Urbana, for research in optical spectroscopy. After a year at the University of Minnesota, Minneapolis, he went to Columbia university in 1937, where he worked with I. I. Rabi on the first radio-frequency atomic beam experiments. After a period of technical research at the Westinghouse (1941–42), Columbia Radiation (1942–44) and Bell Telephone laboratories (1944–46), he returned to Columbia as professor of physics in 1946.

The slightly anomalous hyperfine interaction found by J. E. Nafe, E. B. Nelson and Rabi in hydrogen in 1947 led G. Breit to suggest, on empirical grounds, that the intrinsic magnetic moment of the electron might not be in agreement with existing theories of the electron. Through precise atomic beam studies of the Zeeman effect in several kinds of atoms, Kusch demonstrated this anomalous property of the electron. The simultaneous theoretical studies of J. Schwinger showed that the anomalous spin moment, with the Lamb shift in hydrogen, formed the principal experimental basis for important developments in the theory of radiation. Kusch subsequently (1952) made definitive measurements of the electron magnetic moment and hyperfine interaction in hydrogen. For the discovery of the anomalous electron spin moment Kusch shared the Nobel prize with W. E. Lamb. In work characterized by great accuracy and reliability Kusch has measured numerous atomic, molecular and nuclear properties by radio-frequency beam techniques. (H. M. FY.)

KUSHK, a river of Afghanistan, which also gives its name to the chief town in the Afghan province of Badghis, and to a military post on the border of Russian Turkistan. The river Kushk, during a portion of its course, forms the boundary between Afghan and Russian territory; but the town is about 20 mi, from the border. Kushk, or Kushkinski Post, is on a Russian branch railway from Merv, the terminus of which is 12 mi. to the south, at Chahil Dukteran. It is served by the Transcaspian and the Orenburg-Tashkent railways. The terminus is only 66 mi. from Herat.

KUSTANAISK or KUSTANAI, a town of the Kazakh S.S.R., on the Tobol river in 53° 24' N., 63° 40' E., in the centre of a fertile grain-growing black earth area. Pop. (1959) 86,000. It is the terminus of a branch railway from Troitsk. Since its establishment in 1871, it has grown rapidly and has an electric plant. flour mills, millet-stripping mills, breweries and small leather and tallow industries. An annual cattle fair is held. The population is mainly Russian, and it is the centre for one of the numerous patches of Russian colonization in the north of the Kirghiz-Kazakh steppe. Gold is found in the Kustanaisk steppe.

KUTAIAH, KUTAYA or KÜTAHYA, the chief town of Kutaiah province in Turkey, is situated on the Pursak Su, an affluent of the Sakaria (anc. Sangarius). The town lies at an important point of the great road across Asia Minor from Constantinople to Aleppo, and is connected by a branch line with the main line from Eski-shehr to Afium Kara-Hissar, of the Anatolian railway. It has a busy trade; pop. (1955) 27,180. Kutaiah represents the ancient Cotiaeum.

KUTAIS (Georgian: Kutaisi, formerly Kutatisi), a town of the Georgian S.S.R., U.S.S.R., on the Rion river in 42° 19′ N., 42° 44' E. Pop. (1959) 128,000. It is on both banks of the Rion river, which is navigable, and which is spanned by three bridges. It is linked by a short branch line to the Trans-Caucasian railway, and also has a branch line to the Tkvibuli coal mines. It is in the midst of a fruit and vine growing district. The chief trade of the town is in these products and in silks and cloth. Until 1924 the cloth was the product of handicraft industries, but in that year a cloth factory was opened in the town. It is also a market for coal from the Tkvibuli and Gelati mines. Kutais (Aea or Kutaea) was the ancient capital of Western Georgia, which was known first as Egrisi or Colchis, later as Apkhazeti or Abasgia, and finally as Imereti or Imeretia. It is the Kotatision of Procopius; the fort which he mentions was destroyed by the Russians in 1770. Persians, Mongols, Turks and Russians have repeatedly laid waste the town and its fortress (see GEORGIA).

KUT-AL-AMARA (kōōt′ĕl ạm-ah′rạ), Iraq, a small town on the left bank of the Tigris in 32° N. 45° E., of importance during World War I; the eastern terminus of the metre gauge railway. It lies at the mouth of the Shatt al Hai and was formerly the centre of the grain traffic, corn being brought up the Shatt al Hai from the Euphrates region. It possesses large grain stores and is also a centre for the making of carpets. Even at low water the river has a depth of 5 ft. but the town, population (1957) 26,524, has no means of handling goods, other than local trade.

Siege of Kut-al-Amara, Dec. 8, 1915–April 29, 1916.—This historic siege, which ended in the surrender of General Townshend and his force, after the failure of costly and ill-managed efforts to relieve them, is described under WORLD WAR I: Events of *1915*. The place also gives its name to a successful battle which Townshend fought on Sept. 28, 1915, during his advance up the Tigris toward Baghdad. The actual site of this battle was at Es Sinn, just below Kut. In 1916 Kut was the pivot of the methodical operations by which General Maude dislodged the Turkish force holding the place, as a preliminary to his successful advance to, and capture of, Baghdad.

KUTCHEAN LANGUAGE: see TOCHARIAN LANGUAGE.

KUTUSOV, MIKHAIL LARIONOVICH, PRINCE OF SMOLENSK (1745–1813), Russian field marshal, was born on Sept. 16, 1745 at St. Petersburg (Leningrad), and entered the Russian army in 1759 or 1760. He saw active service in Poland, 1764–69, and against the Turks, 1770–74; lost an eye in action in the latter year; and after that travelled for some years in central and western Europe. In 1784 he became major-general, in 1787 governor-general of the Crimea; and under Suvorov, whose constant companion he became, he won considerable distinction in the Turkish War of 1788–91, at the taking of Ochakov, Odessa, Benda and Ismail, and the battles of Rimnik and Mashin. He was now (1791) a lieutenant-general, and successively occupied the positions of ambassador at Constantinople, governor-general of Finland, commandant of the corps of cadets at St. Petersburg, ambassador at Berlin, and governor-general of St. Petersburg. In 1805 he commanded the Russian corps which opposed Napoleon's advance on Vienna (see NAPOLEONIC CAMPAIGNS), and won the hard-fought action of Diirrenstein on Nov. 18–19.

On the eve of Austerlitz (*q.v.*) he tried to prevent the Allied generals from fighting a battle, and, when he was overruled, is said to have taken so little interest in the event that he fell asleep during the reading of the orders. He was wounded in the battle. From 1806 to 1811 Kutusov was governor-general of Lithuania and Kiev, and in 1811, being then commander-in-chief in the war against the Turks, he was made a prince. He was called by the

unanimous voice of the army and the people to command the army that was retreating before Napoleon's advance. He gave battle at Borodino (*q.v.*), and was defeated, but not decisively, and after retreating to the south-west of Moscow, he forced Napoleon to begin the celebrated retreat. The old general's cautious pursuit evoked much criticism, hut at any rate he allowed only a remnant of the Grand Army to regain Prussian soil. He mas now field marshal and prince of Smolensk—this title having been given him for a victory over part of the French army at that place in November 1812. Early in the following year he carried the war into Germany, took command of the allied Russians and Prussians, and prepared to raise all central Europe in arms against Napoleon's domination, but before the opening of the campaign he fell ill and died on March 25, 1813, at Bunzlau.

KUWAIT, an Arabian port at the northwestern angle of the Persian gulf, 29" 20' N. and 40° 00' E., lying on the south side of a bay 20 mi. long and 5 mi. wide, the mouth of which is protected by two islands forming a fine natural harbour. It is the capital of the sheikhdom of Kuwait, under British protection, with a population of 104,551 by the 1957 census. Its name is a diminutive form of kut, "fort"; and it has an alternative name in Qurain (the Grane or Grain of some maps). Surrounded by unrelieved desert for 200 mi., its population depends entirely on the sea and trade.

Horses for the Bombay market: sheep, wool, *samn* and other Arab products came there from the interior to be exchanged for piece goods, rice: sugar, tea, etc. Later, however, political reasons gave impetus to the development of the Hasa ports and the decline of the horse trade further prejudiced Kuwait. In 1850 Kuwait was recommended by Gen. F. R. Chesney as the terminus of his proposed Euphrates Valley railway; and 50 years later it attracted much attention as a desirable site for the terminus of the Berlin-Baghdad railway. In fact Turkey made an attempt to occupy Kuwait in 1898, only to be met with a British protest against any infringement of the *status quo;* and in 1899 Sheikh Mubarak ibn Sabah placed his interests under British protection.

World War I put a temporary end to the Berlin railway scheme; and British military units were stationed there in connection with the blockade of the Turks, with whom the sympathies of Salim, son of Mubarak, were engaged. During Salim's reign relations with Nejd were unsatisfactory and in 1919 a Wahhabi attack was repulsed by British airplanes. The boundaries of Kuwait and Nejd were fixed by the treaty of Mohammerah in 1921. A small neutral zone was later established. Another Wahhabi attack took place in 1927–28 without success. In 1934 a concession was granted to the Kuwait Oil company, owned equally by the Anglo-Iranian Oil company and the Gulf Oil corporation of the United States. Production rapidly expanded to the same order as that of Iran and Saudi Arabia. See PERSIAN GULF.

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KUYPER, ABRAHAM (1837–1920), Dutch theologian and politician. mas born on Oct. 29, 1837, at Maassluis, and educated at the University of Leiden. He became pastor of the Dutch Reformed Church at Beesd in 1863, and in 1876 leader in Amsterdam of the antirevolutionary party which aimed at the restoration of Calvinistic doctrine in the guidance of state affairs. In 1879 Kuyper expounded the principles of his party in *Ons Program* ("Our Programe"). He founded a Calvinistic university at Amsterdam, where he became professor of theology, and in 1886 established the strictly orthodox Calvinistic Reformed Church community. In 1903, as minister of the interior (1901–05), he crushed a railway strike by rushing through a bill making illegal a stoppage of work by those engaged in the public services, thus rousing the enmity of the Dutch Socialists. During the South African War Kuyper took a prominent part in the attempts to get the Netherlands to mediate between Great Britain and the Boers. In 1913 he entered the upper chamber, where he led the antirevolutionary party. Kuyper died on Nov. 8, 1920.

KUZNETSK 1. A town in the Penza *oblast* of the Russian S.F.S.R., U.S.S.R. Pop. (1959) 57,000. Its manufactures include agricultural machinery! the preparation of leather and sheepskins, rope and brick making. It is a trade centre for grain, salt and the products of *kustar* industries; especially wooden and leather goods.

2. A town on a coal field in the Kemerovo *oblast* of the R.S.F.S.R., at the head of navigation, on the right bank of the Tom river. The Kuznetsk coal beds extend from Sudzhenka to 40 mi. S. of Kuznetsk, and on the west in places to the Ob river, covering an area of about 5,000 sq.mi. Pop. (1959) 377,000.

KVASS (KWASS, a Russian word for "leaven"), an alcoholic drink, is made, by a simultaneous acid and alcoholic fermentation, of wheat, rye, barley and buckwheat meal or of rye bread. with the addition of sugar or fruit. It has been a popular drink in the U.S.S.R. since the 16th century. Kvass is of very low alcoholic content (0.7 to 2.2%). There are, besides the ordinary kind, superior forms of the drink, such as apple or raspberry kvass.

KWAKIUTL. This important group of natives on Vancouver Island and the mainland of British Columbia forms, together with the Nutka, the Wakashan linguistic stock. Originally the name applied only to the settlements about Fort Rupert; it is now used in ethnological literature for the entire aggregate of Haisla, Heiltsuk, Bellabella, Koskimo. Quatsino, Nimkish, Lekwiltok and other bands which pass under local names. Intensive and critical study was devoted to them for many years by F. Boas. The Kwakiutl form a transition between the matrilineal Tsimshian, Haida and Tlingit of the northern North Pacific coast and the patrilineal Nutka, Salish and Chinook of the south. Descent. for instance. is a curious compromise, by which rank goes to the daughter's son via the son-in-law as trustee. In art and ceremonies they likewise affiliate both ways. (A. L. K.)

KWANDO (Portuguese CUANDO), a river in Africa, rises in the Kalahari sandveld at about 13° S., 19° 12' E., and flows in a general southeasterly direction forming, for rather more than 100 mi.. the boundary between Angola and Northern Rhodesia, and reaching the northern boundary of the Caprivi strip about 400 mi. from its source. In this area it is known locally as the Mashi. To the south of the Caprivi boundary it spreads out into marshes and is known to different tribes as the Linyanti and the Chobe. The Linyanti marshes, as they are generally called, cover an area estimated at about 550 sq.mi. in which is Lake Liambezi. The drainage of these marshes is toward the Zambezi (*q.v.*) river, a great deal of floodwater from the Zambezi mingling with the Chobe waters in the flood plain of the two rivers. The confluence of the two rivers is located a mile or so below an exposure of basalt which the Zambezi clears at the Mambova rapids and the Chobe at the Kasane rapids.

The regimen of the Chobe is indicated by a rise of the water level in May at the northern Caprivi boundary, to a high flood level in June, the normal rise of the water level in the swamps being about 3 ft. The annual discharge of the river, from the 57,000 sq.mi. of its basin, was tentatively estimated at 2,500,000 to 3,000,000 ac.ft. (an acre-foot is the equivalent of 43,560 cu.ft., or 1,233.5 cu.m.).

In years of high flood the Linyanti receives water from the head of the Okovango delta along the Makwegana (or Selinda) spillway. Formerly, water from the marshes passed along the Savuti channel to the Mababe depression but the channel is now completely choked by reeds. The canalization of the Makwegana spillway and the Savuti channel for the irrigation of the Mababe depression is part of a development project. (J. H. WN.)

KWANGJU, a city in South Korea, 40 mi. N.W. of the port of Mokp'o, is the hub of an important rail network. Formerly an old market site, it was developed into a major cotton textile and commercial centre. Other industries are breweries and rice mills.

In the surrounding hills are ancient temples and tombs. During the Korean war the city became a major military training centre. Pop. (1955) 233,358. (S. McC.)

KWANGSI (KUANG-HSI SHENG), a former province of south China renamed in 1957 the KWANGSI CHUANG AUTONOMOUS REGION, is drained chiefly by the Hsi (West) river that enters the sea south of Canton. Kwangsi forms the upper part of this basin, sloping east and southeast from 3,000 ft. almost to sea level.

The area is everywhere hilly to mountainous, largely the result of surface dissection of this edge of the Yunnan plateau together with underground solution of limestone strata that have produced numerous broad lowland pockets often marked by resistant tower-like remnants.

The Hsi tributaries long have been important routeways. At the extreme east, the Kuei drains southeast from the Kuei-lin area to Wu-chou; next, the Liu rising in Kweichow flows southeast through Liu-chou to Kuei-p'ing; while into Nan-ning pours the main stream of the Hsi from Yunnan to be joined by the Tso or Li from North Vietnam. More important as a land route is the pass formed by the upper Hsiang flowing into southern Hunan. Area 84,526 sq.mi.; pop. (1953) 19,560,822.

Historically the Han Chinese entered Kwangsi up the rivers from Kwangtung and Hunan. They took over as farmers, merchants and administrators forcing the non-Hans back into the hills and western mountains. Although the Chuangs, a Thai people and the largest minority group in China, formed only about 37% (6,500,000) of Kwangsi's population by the second half of the 20th century, they were the dominant ethnic group over more than half the total area; eight other non-Han groups have been recognized, living chiefly in the mountains. The change in Kwangsi's political status indicates at least in principle an attempt to change the traditional conflict relation between Han and non-Han Chinese in the region.

Kwangsi suffered considerable damage during World War II. In late 1939 Japanese troops pushed north from the Gulf of Tonkin to seize the railway into central China, but settled down eventually in Nan-ning. Again in 1944 they moved south from Hunan, north from Indochina, and west from Canton to break up Chinese and U.S. air bases and to open a corridor across the Asiatic mainland. The large cities quickly fell and the Japanese pushed up the railway toward Kwei-yang (Kuei-yang), but most of the area was recovered by June 1945.

The Tropic of Cancer runs through Wu-chou, and Kwangsi is green all year with subtropical hardwoods, hillside pines and heavy bamboos. Two rice crops and one dry crop annually are possible on the lowlands, while corn and sweet potatoes have become common on the drier and poorer uplands. Citrus, especially the famous Sha-t'ien pomelo, cinnamon, cassia, aniseed, camphor and tung oil, are basic commercial crops, moving downstream mainly to Wu-chou. Hillside land is not very productive because of the poor soils and coarse grasses.

All the main cities are river ports for native craft, since Kwangsi does not touch the coast. Many of these cities were growing in importance in the early years of the second half of the 20th century with the building of railways through the river valleys. The Hunan-Kwangsi line touches North Vietnam at Mu-nan-kuan, while a spur southeast from Li-t'ang to Chan-chiang in south Kwangtung. 190 mi. away. offers access to a deep-water port that promised to change greatly the flow of outside trade. Under government planning, Kuei-lin. Liu-chou and Nan-ning were to be developed for light industry.

Kwangsi has been an important producer of antimony and manganese, with indications of areas of aluminum clays, iron ore, bituminous coal and crystals. Except for the coal, however, none of these had much significance for Kwangsi's immediate industrial growth.

Early in 1956 the fossilized remains of a giant ape were found near Liu-ch'eng in central Kwangsi, apparently of the same age as Peking man but not generically related. (TE. H.)

KWANGTUNG (KUANG-TUNG SHENG), the southernmost coastal province of China is the main trade artery between south China and the rest of the world. It lies south of the 1,000 ft. Ta-yu range and is marked by alternating long ridges and troughs parallel to the coast, broken through completely only at two points: the Han river in the extreme east to form the Swatow delta, and the Hsi (West) river in the centre to form the Canton delta. The valleys of the Hsi and its tributaries, the Pei (north) and Tung (east), are the core of the province in which Canton is the focus. These river valleys are the natural avenues of communication with the rest of China to the west and north. Kwangtung also includes Hainan Island (*q.v.*) to the south and a long coastal strip to the west stretching almost to the Red river in North Vietnam, thereby cutting off Kwangsi (Kuang-hsi sheng) from the South China sea.

Population is concentrated on the alluvium of the valley floors and delta lowlands, in contrast to the infertile granitic hills of the coast and the coarse sandstone uplands of the interior. Total population was (1953) 34,770,059 within 84,367 sq.mi., ranking Kwangtung eighth in order of density among the provinces of China. Since only 10% of Kwangtung is lowland, actual crowding on arable land and even on to the waterways is intense. The Swatow delta and the eastern coastal strip are inhabited by the Hoklos of Fukien, and the upper basins of the Han, Tung and Pei by the Hakkas ("guest people"), a vigorous mountain folk with marked group consciousness and distinct social characteristics. In the early 1950s three areas of limited autonomy were designated for national minority groups: two counties for Yao and Chuang peoples along the mountainous northwest border of Hunan, and a larger area for Li and Miao in the southern half of Hainan.

Kwangtung has been one of the main scenes of European contact with China. For almost a century Canton was the only port through which foreign trade was permitted, and from Kwangtung and Fukien has come most of the traditional emigration to southeast Asia and other parts of the world. Conversely, it is to their native areas that many of the overseas Chinese have returned, either for retirement or visits, so that distinct evidences of new influences appeared, whether of civic improvements or bizarre building styles intended to demonstrate worldly success abroad. The main centres in Kwangtung have been Swatow, Ch'ao-an, Mei-hsien, Canton, San-shui, T'ai-shan, Chung-shan and Ch'iung-shan in Hainan. Two foreign holdings remain along the coast.

British Hong Kong and Portuguese Macao on either side of the entrance to the Pearl river, are both directly dependent on Kwangtung for articles of daily use and as a market for many of their imports.

Under the imperial regime Kwangtung had a persistent reputation for disaffection, and to a large extent the active leaders of the revolution were fellow Cantonese of Sun Yat-sen, a native of the Chung-shan district. During the war lord period Canton became the centre of the reorganized Kuomintang, the struggle against foreign treaty rights and the formation of strong labour unions.

The lowlands are the only part of China with a truly tropical climate. Uniformly high temperatures and a fairly well-distributed rainfall of 60 in. or more permit cultivation of two rice crops and one dry crop on the valley floors, but rice is always shipped into the province. There is not much hillside terracing because of infertile soils and strong cultural aversion, so that the slopes are used for growing trees (mainly pines) and bamboo and for desultory grazing.

Other important crops are oranges, bananas, litchi nuts, pomelo, sugar cane and some pineapple. Silk has long been raised in the Canton delta, while fine grass-cloth linen made from ramie is a specialty of Swatow; on the dark-red soils of the upper Pei river farmers grow a high-quality cigarette tobacco that is popular in southeast Asia.

The Japanese captured the Canton area in 1938, Swatow and much of Hainan in 1939, all important coastal bases for Japanese naval and air units. In and around Canton (*q.v.*) were most of the large, modern provincial factories, so that with their loss to the Japanese more industries were started at Chiu-chiang on the Pei river. After the war these were quickly forgotten in favour of reviving the usual concentration around Canton and Swatow. Heavy industry does not have a good resource base in Kwangtung.

The most promising coal deposit in the second half of the 20th century was in the Ju-yuan district on the upper Pei river, with an estimated 50,000,000 tons of coal of questionable coking value. On Hainan Island, Japan exploited rich iron ore and bauxite deposits during its occupation, Tin is panned sporadically near Chieh-yang, inland from Swatow, and wolfram is likewise produced from small deposits in northeast and south central Kwangtung; both of these minerals are largely exported to Hong Kong.

Clays for pottery and earthenware abound widely, and are made into graceful small figures and gardenware in Shih-wan, 20 mi. W. of Canton: good oil shales were producing at Mao-ming in the southwest.

Industry by the early years of the second half of the 20th century had been largely the processing of agricultural and fisheries products, making of handicrafts from local plants and clays and some imported materials, and the manufacture of light consumers goods in the cities.

Canton is a rail and air centre between Hong Kong and central China, and in 1957 the government opened a large new port at Chan-chiang, formerly Fort Bayard in the French leased territory at Kwangchowwan on the eastern side of the Luichow peninsula. A modern port with a depth of 33 ft., joined by rail to Li-t'ang, on the Hunan-Kwangsi railway, 190 mi. N., it promised to stimulate one of Kwangtung's most backward areas and markedly reduce Canton's monopoly of trade with southwest China. (TE. H.)

KWANTUNG (KUANG-TUNG), a name applied in the late 19th century to the southern tip of Liaotung peninsula of northeast China, now within Liaoning province. The peninsula projects south from a silting coast into the ice-free Gulf of Chihli, only 60 mi. across from the Shantung peninsula. Rocky hills overlook the sea and restrict farming. Its strategic significance is obvious for north and northeast China and for western Korea.

Lu-shun (38° 48' N., 121° 16' E.) on the southeast tip was captured by the British in 1860 and renamed Port Arthur, but Russia built it into a deep-water naval base as part of the 25-year lease of the Kwantung territory, 925 sq.mi., forced from the Ch'ing dynasty in 1898. Two years before, Russia had extended a broad-gauge railway south from Harbin to Dairen (Ta-lien) (38° jj' N., 121° 39' E.), only 20 mi. from Port Arthur along the east coast. Following the Russo-Japanese War (1904–05), Japan took the territory and the railway, expanded the area to 1,338 sq.mi. with some islands, and in 191 j extended their lease to 1997. It became one of Japan's most closely guarded industrial and military areas, of which Dairen was the industrial centre for machinery and machine tools, textiles, cement, glass, chemicals, shipbuilding, and as the main port for shipping soybeans, soybean cake, wheat, hemp, peanuts, salt, coal and metallic minerals and products.

Dairen looked like and was a modern Japanese industrial port, the gateway for both Japanese business and technical people into Manchuria and for thousands of poor Chinese farm families migrating from Shantung to the new lands in the north. It also boasted an elaborate educational system, including technical and commercial colleges. Port Arthur, called Ryojun by the Japanese, was a key naval base. Aside from copper, sea salt and fisheries, the southern end of the peninsula does not share in the natural wealth of the rest of Liaotung peninsula.

The area was much damaged by aerial bombing toward the end of World War II, just before its occupation by Soviet forces. By treaty between the Republic of China and the U.S.S R. in 1945, the territory and the whole Ch'ang-ch'un railway (formerly the Chinese Eastern across northern Manchuria plus the South Manchuria railway) reverted to China with special rights of use and management to the U S S.R , while Dairen became a free port for all nations, with Soviet nationals sharing in the administration of the harbour. Port Arthur was designated a joint-use naval base for 30 years, the defense to be under the U.S S.R. By subsequent treaty between the Chinese People's Republic and the U S.S.R. (1950), Soviet administration of the railway (renamed the Harbin railway) was ended, Dairen's status was not much changed, and Soviet forces were to be withdrawn from Port Arthur by the end of 1952 (later extended to May 1955). These forces were to return at the request of China "in the event of either party becoming the object of aggression by Japan or any state collaborating with Japan and becoming therefore involved in hostilities." In 1954 the Chinese placed the Lu-Ta municipality (Lu-shun-Ta-lien) under the administration of Liaoning province; the population of Lu-Ta in 1953 was 1,100,000, of which Dairen had about 776,400. Under Chinese control but without the Japanese, both cities expanded their previous functions (TE H)

KWANZA (COANZA or CUANZA), a river of west Africa, 596 mi. long, entirely in the Portuguese overseas province of Angola. The source lies in about 13° 40′ S., 17° 30' E. on the Bihe plateau, at an altitude of over 5,000 ft. It flows northward and by a wide arc enters the Atlantic 40 mi. S. of Loanda. At about 12° S. it is 60 yd. wide and 13 to 16 ft. deep. In about 10°, and at intervals during its westerly passage through the outer plateau escarpments, its course is broken by rapids, the river flowing in a well-defined valley flanked by higher ground. The lowest fall is that of Kambamba, or Livingstone, with a drop of 70 ft. Thence to the sea, a distance of some 160 mi.. it is navigable by small steamers, though very shallow in the dry season, and is little used because the fertile district of the middle basin is served by railway. There is a shifting bar at its mouth, difficult to cross.

See ANGOLA.

KWEICHOW (KUEI-CHOU SHENG), an upland province in south est China, consists of a lofty plateau lying between the upper courses of the Yangtze on the north and the Hsi (West) river on the south, and continuous with the higher plateau of Yunnan to the southwest. Although the general slope of drainage is from west to east. Rwei-yang (Kuei-yang), the capital, marks the general drainage apex in the centre of the province over 3,400 ft. above sea level. The tributaries of the Yangtze flow north and northeast as the Ch'ien river in Szechwan and the Yuan in Hunan, while the Liu flows into the Hsi in southeast Kwangsi. The deeply incised river meanders do not provide easy routes for boat. truck or train. so that most highways avoid the river valleys. Most of the fertile land is on the less dissected plateau around Kwei-yang, but even there much of it is in sunken limestone pockets that result in isolated settlements and costly transportation. In China, Kweichow has the reputation of one of the poorest and hilliest parts of the country, with abrupt limestone peaks that typify traditional Chinese landscape painting. Area 65,713 sq.mi.; pop. (1953) 15,037,310.

The province has a temperate climate because of its altitude. Rice grows on the limited valley floors under Chinese farmers, while on the slopes and upland surfaces corn, wheat. beans and potatoes are cultivated to a large extent by the non-Han tribes. Valuable forests exist. protected by the high cost of transportation; they include the camphor tree, the varnish tree and tung tree, as well as conifers and hardwoods. The best-known mineral deposit is mercury, normally the largest in China, and mined since the 14th century around T'ung-jen on the upper Yuan river in the northeast corner. Iron ore is known in the western part, close to the projected railway link with the line being built between Szechwan and Yunnan.

About 4,000,000 of the 15,000,000 inhabitants are non-Han. The Chinese may be descendants of soldier colonists settled there as early as the 8th century, or immigrants during the last 200 years. The province was organized primarily from the Miao territory plus the basin of the Ch'ien river formerly within Szechwan. Chinese pushed the aboriginal tribes out of the fertile valleys onto the slopes and uplands, where, except for the major trade centres on the plateaus, the non-Hans still live, concentrated particularly in the southwest. The record of exploitation, revolt and reprisal is an old one.

Cnder the Chinese People's Republic a new approach was attempted with the setting up of autonomous areas for the Miao, Tung. Pu-yi, and smaller groups, and training in the Kuei-yang Institute for National Minorities. These people of Thai and other early stocks have their own languages, customs: and music, while the Miao are especially famous for intricate coloured cross-stitch work and heavy silver ornaments.

World War II began the opening up of Kweichow with the construction of the Yunnan extension of the Burma road through Kwei-yang and 170 mi. N. to Chungking, as well as east into Hunan and Kwangsi. The railway from Liu-chou, Kwangsi, was built as far as Tu-yun, 90 mi. from Kwei-yang, and which became at the end of 1944 the farthest point of Japanese military penetration toward Chungking.

Railways were under construction in the second half of the 20th century south from Chungking to Kwei-yang. and through the western end on the line from K'un-ming to southwest Szechwan,

as well as east to Ch'ang-sha in Hunan. In Kwei-yang an iron and steel plant of 40,000 tons capacity, a new textile mill of 1,000 looms, and a modern chemical fertilizer plant, were established for local needs. (TE. H.)

KWENI, a dark-skinned, robust, strongly built people of medium stature called Gouro by the Baoule, and Lo by the Mandinga, living in the valleys of the middle Bandama and the Upper Davo of the French Ivory Coast. The language belongs to the Mande-fu group. Each village consists of several extended family groups comprising a number of households, under a politico-religious chief (*firazan*), who is succeeded by his brother and then by his eldest son, and a war chief (*ninazan*). They practise communal labour, and also individual husbandry. The property of the family group and household property is inherited by the brother of the deceased and then by his sons. The dowry is paid by installments, and a dower is customary. The Kweni engage in cultivation, cattle-raising and arboriculture (kola and palm). They are animists, have secret societies (*Die,* Gori), age classes and sacerdotal classes. There are many tribal, family and personal tabus, and traces of totemism exist.

See Tauxier, *Nègres Gouro et Gagou (Centre de la Côte d'Ivoire)* (1924).

KYANITE is a rock-forming mineral composed of alumina and silica ($Al_2O_3.SiO_2$). It is a major source of mullite (*q.v.*), used in spark plugs and other refractory porcelains. It crystallizes in the triclinic system and occurs in rocks as long, bladed crystals. Its colour ranges from gray-green to black to blue, with blue and blue-gray being the commonest colours. It has cleavage and is particularly marked by having a variable hardness. The hardness is approximately 4.5 parallel to the length of the crystals (the *c* crystallographic axis), and 7 at right angles to it (parallel to the b crystallographic axis). Specific gravity is 3.6.

Kyanite is one of the many phases in the system $Al_2O_3.SiO_2$ and can only form stably over a limited range of pressures and temperatures. It may be formed in the laboratory, and is presumably formed in nature, at pressures exceeding 14,000–18,000 atmospheres, over the temperature range 600"–goo° C. At pressures below these, the stable phase is sillimanite (*q.v.*). At high pressures, *i.e.,* in excess of 25,000–30,000 atm., kyanite in turn inverts to another denser polymorph; at low pressures, the minerals mullite and andalusite (*q.v.*) exist as stable phases.

Kyanite is formed in nature by the metamorphism (*q.v.*) at high pressures of clay-rich sediments. It is an indicator of deep burial of a terrain and not of stress as it has been commonly supposed. It occurs principally in gneiss and in mica schist. It is often accompanied by garnet, quartz and micas. (G. C. KY.)

KYAUKPYU, a district in the Arakan division of Lower Burma, on the eastern coast of the Bay of Bengal. It consists of, first, a strip of mainland along the Bay of Bengal, extending from Hunter's bay to the Ma-i river, and, secondly, the large islands of Ramree and Cheduba, with many others to the north. The mainland in the north and east is highly mountainous and forest-clad, and the lower portion is cut up into numerous islands by a network of tidal creeks. Between the mainland and Ramree lies a group of islands separated by deep, narrow, salt-water inlets, forming the north-eastern shore of Kyaukpyu harbour. The principal mountains are the Arakan Yomas, which send out spurs and sub-spurs almost to the sea-coast. The An pass, allowing access by bullock cart with the heart of Burma, rises to a height of 4,664 ft. above sea-level. The Da-let and the An rivers are navigable by native boats for 25 and 45 mi. respectively. Above these distances they are mere mountain torrents. Considerable evergreen forests of hardwood trees occur on the hills, but large areas are occupied by useless bamboo "brake" and there are only small tracts of cultivated land. Kyaukpyu contains numerous "mud volcanoes," caused by the disruption of mud charged with inflammable gas. From time to time evanescent islands have been formed along the coast by the mud volcanoes which are also numerous in the heart of Cheduba. Mud volcanoes are usually indicative of the presence of oil. Petroleum does occur in small quantities in Kyaukpyu, but the production, despite exploration by modern methods, is very small. Area 4,767 sq.mi.; pop. (1941) 252,281, showing an increase in the decade of 29,989.

The chief town, Kyaukpyu, had a population in 1953 of 7,335. It is a municipality and is a port under the Indian Ports Act (X. of 1889), and the steamers of the British India Navigation company call there once a week going and coming between Rangoon and Calcutta.

KYAUKSE, a district in the Mandalay division of Burma, with an area of 1,245 sq.mi., and a population in 1941 of 152,506. It consists of a generally level strip running north and south at the foot of the Shan hills, and of a hilly region rising up these hills to the east, and including the Yeyaman tract, which lies between 21° 30' and 21° 40' N. and 96" 15′ and 96° 45' E., with peaks rising to between 4,500 and 5,000 ft. This tract is rugged and scored by ravines, and is very sparsely inhabited. The Panlaung and Zawgyi rivers from the Shan States flow through the district and are utilized for the numerous irrigation canals. Notwithstanding this, much timber is floated down, and the Panlaung is navigable for small boats all the year round. Rain is scarce, the average for the district is about 30 inches, but the canals supply ample water for cultivation and all other purposes. They are said to have been dug by King Anawrahta in 1092. He is allegedto have completed the system of nine canals and weirs in three years' time. Others have been constructed since the annexation of Upper Burma. At that time many were in serious disrepair, but most of them have been greatly improved by the construction of proper regulators and sluices. Two-thirds of the population are dependent entirely on cultivation for their support, and this is mainly rice on irrigated land. The great majority of the population is pure Burmese, but in the hills there are a good many Danus, a cross between Shans and Burmese. The railway runs through the centre of the rice-producing area, and feeder roads open up the country as far as the Shan foot-hills.

KYAUKSE town is situated on the Zawgyi river and on the Rangoon-Mandalay railway line, and is well laid out in regular streets, covering an area of about a square mile. It has a population (1953) of 8,659, mostly Burmese, with a colony of Indian traders. Above it are some bare rocky hillocks, picturesquely studded with pagodas.

KYD, THOMAS (1558–1594), one of the most important of the English Elizabethan dramatists who preceded Shakespeare. Kyd remained until the last decade of the 19th century in what appeared likely to be impenetrable obscurity. Even his name was forgotten until Thomas Hawkins about 1773 discovered it in connection with The Spanish Tragedy in Thomas Heywood's *Apologie* for Actors. But by the industry of English and German scholars a great deal of light has since been thrown on his life and writings. He was the son of Francis Kyd, citizen and scrivener of London, and was baptized in the church of St. Mary Woolnoth, Lombard street, on Nov. 6, 1558. His mother, who survived her son, was named Agnes, or Anna. In Oct. 1565 Kyd entered the newly founded Merchant Taylors' school. He apparently followed, soon after leaving school, his father's business as a scrivener. But Nashe describes him as a "shifting companion that ran through every art and throve by none." He showed a fairly wide range of reading in Latin. The author on whom he draws most freely is Seneca, but there are many reminiscences, and occasionally mistranslations of other authors. Nashe contemptuously said that "English Seneca read by candlelight yeeldes many good sentences," no doubt exaggerating his indebtedness to Thomas Newton's translation. John Lyly had a more marked influence on his manner than any of his contemporaries.

It is believed that Thomas Kyd produced his famous play, The *Spanish* Tragedy, about 1587 or 1588; the quarto in the British Museum (which is probably earlier than the Gottingen and Ellesmere quartos, dated 1594 and 1599) is undated, and the play was licensed for the press in 1592. The full title runs. The Spanish Tragedie containing the Lamentable *End* of Don Horatio and *Belimperia;* with the *Pitiful* Death of Old Hieronimo, and the play is commonly referred to by Henslowe and other contemporaries as Hieronimo. This melodrama, in which the means of inspiring horror were unsparingly and skillfully applied. enjoyed all through the age of Elizabeth and even of James I. and Charles I. so

unflagging a success that it has been styled the most popular of all old English plays. Certain expressions in Nashe's preface to the 1589 edition of Robert Greene's *Menaphon* may be said to have started a whole world of speculation with regard to Kyd's activity. Much of this is still very puzzling; nor is it really understood why Ben Jonson called him "sporting Kyd." In 1592 there was added a sort of prologue to *The Spanish Tragedy,* called *The First Part of Jeronimo, or The Warres of Portugal,* not printed till 1605. Prof. Boas concludes that Kyd had nothing to do with this melodramatic production, which gives a different version of the story and presents Jeronimo as little more than a buffoon. Kyd's name has been connected with what German criticism calls the *Ur-Hamlet,* the original draft of the tragedy of the prince of Denmark. (*See* HAMLET.) His next work was in all probability the tragedy of *Soliman and Perseda,* written perhaps in 1588 and licensed for the press in 1592, which, although anonymous, is assigned to him on strong internal evidence by Boas. It was reprinted, after Kyd's death, in 1599.

Towards the close of his life Kyd came into close connection with Marlowe. In 1590–93 both dramatists were in the service of the same "noble lord," perhaps Lord Pembroke or Lord Strange or the earl of Sussex, to whose countess Kyd dedicated his *Cornelia* (1593–94), an adaptation of Garnier's tragedy. When, in May 1593, the "lewd libels" and "blasphemies" of Marlowe came before the notice of the Star Chamber, Kyd was immediately arrested, papers of his having been found "shuffled" with some of Marlowe's who was imprisoned a week later. A visitation on Kyd's papers was made in consequence of a seditious libel attached to the wall of the Dutch churchyard in Austin Friars. Of this he was innocent, but there was found in his chamber a paper of "vile heretical conceits denying the deity of Jesus Christ." Kyd was arrested and put to the torture in Bridewell. He asserted that he knew nothing of this document, and tried to shift the responsibility of it upon Marlowe, but he was kept in prison until after the death of that poet (June 1, 1593). When he was at length dismissed, his patron refused to take him back into his service. He fell into utter destitution, and sank under the weight of "bitter times and privy broken passions" ("Dedication" to *Cornelia).* He must have died late in 1594, and on Dec. 30, of that year his parents renounced their administration of the goods of their deceased son. To Kyd are ascribed two prose pamphlets: *The Householder's Tragedy* (1588), translated from Tasso, and *The Most Wicked and Secret Mwdering of John Brewer, Goldsmith* (1592).

The Spanish Tragedy held its own right through the careers of Shakespeare, Ben Jonson and Fletcher. It was not any shortcoming in its harrowing and exciting plot, but the tameness of its archaic versification, which probably led in 1602 to its receiving "additions," which have been a great stumbling-block to the critics. It is known that Ben Jonson was paid for "additions," but the new scenes are unlike all other known writings of his, and several scholars have independently conjectured that John Webster wrote them. The influence of Kyd is marked on all the immediate predecessors of Shakespeare, and the bold way in which scenes of violent crime were treated on the Elizabethan stage appears to be directly owing to the example of Kyd's innovating genius. His possible relation to *Hamlet* has already been roted, and *Titus Andronicus* presents and exaggerates many of his characteristics German critics have pushed too far their attempt to find indications of Kyd's influence on later plays of Shakespeare. The extraordinary interest felt for Kyd in Germany is explained by the fact that *The Spanish Tragedy* was long the best known of all Elizabethan plays abroad. It was acted at Frankfort in 1601, and published soon afterwards at Nuremberg. It continued to be a stock piece in Germany until the beginning of the 18th century; it was equally popular in Holland, and potent in its effect upon Dutch dramatic literature. (E. G.; X.)

Kyd's works were first collected and his life written by Prof. F. S. Boas in 1901. Of modern editions of *The Spanish Tragedy* mav be mentioned that by Prof. J. M Manly in *Specimens of the Pre-Shakespearean Drama,* vol ii. (Boston, 1897), and by J. Schick in the *Temple Dramatists* (1898). *See* also *Cornelia* (ed H. Gassner, 1854); C. Markschcffel, *T. Kyd's Tragodien* (1885); Gregor Sarrazin, *Thomas Kyd und sein Kreis (1892);* G. O. Fleischer, "Bemerkungen über Thomas Kyd's Spanish Tragedy" (*Jahresbericht der Drei-Königschule zu Dresden-Neustadt*) (1896); J. Schick, 'T. Kyd's Spanish Tragedy" (*Literarhistorische Forschungen,* vol. 19, 1901); R. Koppel, in Prolss, *Altengl. Theater* (vol. i., 1904); O. Michael, *Der Stil in Thomas Kyd's Originaldramen* (1905); C. Crawford, *Concordance to the Work of Thomas Kyd* (1906–10); J. Schick, *Die Entstehung des Hamlet* (1902); W. Creizenach, *Die Vorshakespearesche Hamlettragodie* (1906); J. Fitzgerald, *The Sources of the Hamlet Tragedy* (1909); M. J. Wolff, *Zum Ur-Hamlet* (1912); J. M. Robertson, *The Problem* of *Hamlet* (1919).

KYFFHÄUSER, a double line of hills in Thuringia, Germany. The northern part looks steeply down upon the valley of the Goldene Aue, and is crowned by two ruined castles, Rothenburg (1,440 ft.) on the west, and Kyffhauser (1,542 ft.) on the east. The latter, built probably in the 10th century, was frequently the residence of the Hohenstaufen emperors, and was finally destroyed in the 16th century. The existing ruins are those of the Oberburg with its tower, and of the Unterburg with its chapel. The hill is surmounted by an imposing monument to the emperor William I., the equestrian statue (erected in 1896) of the emperor being 31 ft. high and the height of the whole 210 ft. There is an interesting legend associating the emperor Frederick Barbarossa with the mountain. The legend states that he is asleep within the mountain but he will one day awaken and lead the united peoples of Germany to victory against her enemies. But G. Vogt has advanced cogent reasons for believing that the real hero of the legend is Frederick II., not Frederick I. Around him gradually crystallized the hopes of the German peoples, and to him they looked for help in the hour of their sorest need. But this is not the only legend of a slumbering future deliverer which lives on in Germany. Similar hopes cling to the memory of Charlemagne, sleeping in a hill near Paderborn; to that of the Saxon hero Widukind, in a hill in Westphalia; to Siegfried, in the hill of Geroldseck; and to Henry I., in a hill near Goslar.

KYLSANT, OWEN COSBY PHILLIPS, 1ST BARON (1863–1937), English shipowner, who at one time controlled the largest shipping organization in the world, was born at Warminster, Wiltshire, on March 25, 1863. After apprenticeship to a shipping firm at Newcastle upon Tyne, he had by 1888 already set up a shipping company of his own on the Clyde. By 1902 he had become chairman of the Royal Mail Steam Packet company, operating between Europe and the West Indies and South America. He soon added to this company most of the competing lines in the South American refrigerated meat trade. He also acquired old-established liner companies such as Elder Dempster, and in 1912 the Union-Castle line. After World War I he amalgamated many small coastal shipping companies into the Coast Lines group, and also purchased, for nearly £7,000,000, the White Star line. Eventually Kylsant controlled a merchant fleet totaling nearly 3,000,000 tons gross, besides obtaining control of Harland and Wolff, the largest shipbuilding company in the world.

In 1931, during the slump in international trade, Kylsant was tried and found guilty of having published a false prospectus and was sentenced to imprisonment for 12 months. He had earlier twice been a member of parliament, and was raised to the peerage in 1923. He died at Coomb, Carmarthenshire, on June 3, 1937. (P. DE.)

KYNASTON, EDWARD (NED) (1640?–1706), English actor, probably the last and certainly the best of the male actors of female roles, was born in London and first appeared in Rhodes's company at the Cockpit in Drury lane. His personal beauty admirably fitted him for female parts, the last of which was Evadne in *The Maid's Tragedy* in 1661 with Killigrew's company. Earlier in that year, Pepys reports having seen Kynaston play several parts in *The Silent Woman,* one as a woman gallant in fine clothes: "And in them was clearly the prettiest woman in the whole house; and lastly, as a man; and then likewise did appear the handsomest man in the house."

Kynaston was an excellent actor, and by 1665 he was one of the leading actors, in male roles, in the company at Covent Garden. He joined Betterton at Lincoln's Inn Fields in 1695, but soon his memory began to fail him, and he received less important roles, retiring in 1699. Kynaston died in 1706. (M. Rs.)

KYŌSAI, SHŌJŌ (1831–1889), known also as KAWANABE KYŌSAI, was a Japanese painter of considerable distinction and the designer of a few very fine prints. He was born on May 18, 1831, in Kogo. After working for a short time as a boy with Utagawa Kuniyoshi, Kyōsai received most of his artistic training in the studio of Kano Tōhaku. He soon abandoned the formal traditions of this master for the greater freedom of the popular school. Katsushika Hokusai (*q.v.*) greatly influenced his work and like that artist Kyōsai delighted in sketching figures. Even in his roughest sketch his aptitude for conveying in a few masterly strokes the impression of living energy and momentary action was marvelous.

During the ferment which produced and followed the political revolution of 1867, Kyōsai attained a considerable reputation as a caricaturist. Often arrested and imprisoned by the authorities, he continued to express his opinions in caricatures with great popular success. Many of his caricatures were published. as well as his sketchbooks and a five volume work on hawks. Kyōsai's originality and humour are obvious in his sketches of goblins and animal life, especially birds, fishes and reptiles.

Kyōsai was fond of drinking sake and is said to have done his best work when under its influence. Many of his prints, illustrated books and sketches are signed "Shōjō (drunken) Kyōsai." He died on April 25, 1889, in Tokyo.

See Mortimer Menpes, "A Personal View of Japanese Art: A Lesson From Kyōsai," *Magazine of Art,* pp. 192–199 *(1888)*; William Anderson, "A Japanese Artist, Kawanabe Kiosai," ***The*** *International Studio,* 6:38 *(1899).* *(M. O. Gs.)*

KYŌTO, once the capital city of Japan and residence of the imperial family for nearly 11 centuries from 794 to 1868, is still a cultural and industrial centre. Located in the great Yamashiro fault basin at 35° 00′ N., 135° 45′ E., in the prefecture of the same name (see below), the city is surrounded on three sides by low mountains.

It increased more slowly in population in the 20th century than the other great cities of Japan. Pop. (1955) 1,204,084; (1960) 1,284,818.

During its long history the city has been rebuilt many times after earthquakes. fires and war. The most complete destruction was during the Ōnin no Ran War, 1467–77, which left little of the previous city remaining.

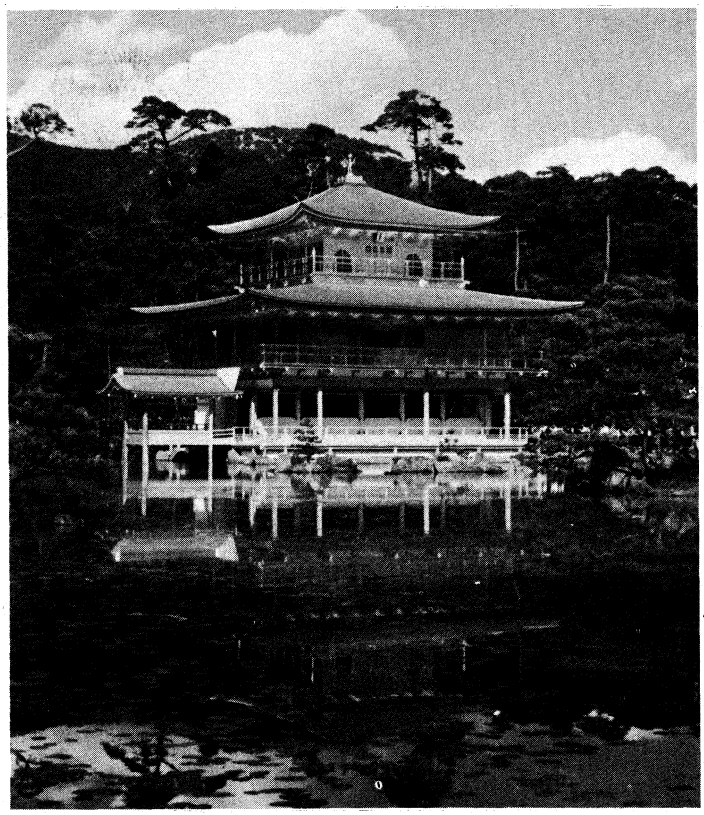
In the late 16th century the city was rebuilt by Toyotomi Hideyoshi, who was responsible for many of the magnificent Shinto shrines, Buddhist temples, palaces and gardens.

In 794 the emperor Kwammu moved his capital from Nagaoka, which had only briefly been the capital, to the nearby village of Uda which he renamed Heian-kyō ("capital of peace and tranquility"). Although this name has been given to the Heian period of Japanese history, 794–1185, the capital has been more frequently known as Miyako, Raku, Rakuyo or Kyoto—various words of Chinese origin meaning capital. Heian-kyō was modeled after the T'ang capital of Ch'ang-an. The principal streets crossed at right angles and were 98 to 131 ft. wide while the secondary streets were 43 to 66 ft. wide. The city extended about four miles north to south and three miles east to west. The palace of the emperors was located in the middle of the northern section of the city. Considerable change has occurred in the city plan and the palace constructed by Toyotomi Hideyoshi in 1591 was about one mile east oi the original site. From the early days of the founding of Kyoto the tendency has been for the city to expand eastward and southeastward. By 518 the population may have been over 500,000—greater than that of any contemporary European city. In later centuries the population fluctuated with the fortunes of the city. In the 13th century when the military capital was at Kamakura, the popuiation of Kyōto fell to about 100.000. While there is considerable variation in estimates of the population during the Tokugawa period (1603–1867), it gradually increased until it was more than 1,000,000 in the early 19th century.

After the restoration of 1868 the residence of the emperor was moved to Tōkyō ("eastern capital") but the palace in Kyoto continues to be used for coronations. Kyoto was renamed Saikyō ("western capital") but this name has not become popular. The city contains the headquarters of some of the most important Buddhist sects and contains many Shinto shrines. The Kyoto National museum (the former Kyōto Imperial museum) is one of the most important museums of Japan.

Long a traditional centre of education, Kyōto contains several important universities, including Kyoto university, founded in 1897 and one of the leading universities of the country. Dōshisha university has been a centre of Christian education since its founding in 1875 in co-operation with the American Board of Foreign Missions.

Classical Chinese music, which was introduced from China in the early days of the city, is still performed. Nō plays owe much of their early development to the patronage of the Ashikaga shoguns who were residents of Kyoto. They are performed in special Nō theatres.



AUTHENTICATED NEWS

THE GOLDEN PAVILION. KYŌTO, BUILT 1394. DESTROYED BY FIRE 1950. REBUILT 1955. ORIGINALLY THE VILLA OF THE SHOGUN YOSHIMITSU. THE BUILDING BECAME A BUDDHIST TEMPLE WHEN HE DIED

Fine brocades and other silks, lacquerware. pottery and books are important products of the city, which has a long tradition of producing materials of high quality and art goods for the discriminating taste of the court. Expanding industries in the second half of the 20th century included other textiles. machinery and chemicals.

KYOTO, an urban prefecture of Japan. was formed from the provinces of Yamashiro, Tango and five counties of Tamba after the restoration of 1865. It contains in addition to the old capital city of Kyoto (see above), the cities of Fushimi, Maizuru and Miyazu. Historic sites and famous buildings associated with the long history of the area are found throughout the prefecture. Pop. (1960) 1,993,403; area 1,789 sq.mi. (C. A. MR.)

KYRIE, a petition used at the beginning of the Mass and in other offices of the Eastern and Roman Churches. in full. Kyrie *eleison* ("Lord. have mercy"). In the Anglican Book of Common Prayer, the Kyrie is introduced into the orders for Morning and Evening Prayer, and also. with an additional petition, as a response made by the congregation after the reading of each of the Ten Commandments at the opening of the Communion service.

KYRLE, JOHN (1637–1724), English philanthropist, was born at Dymock, Gloucestershire, on May 22, 1637. On completing his studies at Balliol college, Oxford, he settled on the family property at Ross, and devoted himself to the improvement of the town. He died on Nov. 7, 1724, and was buried in the chancel of Ross church. His memory is preserved in the Kyrle society, founded in 1877, to improve the lot of the working people by laying out parks, encouraging house decoration, and gardening.

See **A.** Pope, The Third Moral Epistle (1732).

KYSHTYM, Upper and Lower, copper mining settlements two miles apart on the Kyshtym river, in 55° 41′ N., 60° 40′ E., in the Sverdlovsk *oblast* of the Uralsk region of the Russian Soviet Federated Socialist Republic, U.S.S.R., on the Chelyabinsk to Sverdlovsk railway.

Population 15,973.

KYUSTENDIL, a town in S.W. Bulgaria.. capital of the department of the same name, 43 mi. S.W. of Sofia by rail. Pop. (1956) 24,876. The town is chiefly notable for its hot mineral springs, in connection with which there are nine modern bathing establishments.

Vines, tobacco and fruit are cultivated. There is a mixed secondary school, and a vintners' and fruitery school. In Roman times it was known as Pautalia, Ulpia Pautalia and Pautalia Aurelii, in the 10th century as Velbuzhd. In the 14th century it was the seat of an independent principality of Northern Macedonia, its despot, Constantine Dragash, being overthrown and killed by the Turks in 1394.

LASCESTORS of this letter were Semitic 𐤋 (*lamedh*) which may derive from an earlier symbol representing an ox-goad. and Greek, Λ, Λ (lambda). The form appearing on the Moabite stone was rounded. Other Greek forms were ⅃, Λ in early inscriptions from Attica and Corinth. The former was also usual in the Chalcidic alphabet and the Etruscan form was similar ⅂. Thus the Latin and Faliscan alphabets derived their form L with the oblique stroke becoming horizontal. Another Faliscan form was ⅃. In the Lydian alphabet the form of the letter was ⅂. The modern form L derives from the Latin.

In the uncial writing of the 7th century or earlier the vertical stroke was raised above the line, the shape of the letter being ʟ. In Latin cursive of the 6th century appears a rounded form, ℓ, and this is the parent of the Carolingian l from which derive the current rounded minuscule ℓ or the straight form l. The sound consistently represented by the letter throughout its history has been the liquid or "lateral" for which it at present stands. This is not made like the sound of R by twirling the tip of the tongue. but by allowing the air to escape at both sides of the tongue. or (as in Welsh) at one side only (written *ll* a breathed consonant). In some languages, *e.g.*, in certain Slavonic languages, the contrast between a back 1 and a front *l* is distinctive. This is not the case in English, but in general the English 1 is pronounced farther back than the 1 in German and certain other continental languages. The 1 in "could." "would" is silent. An *l* is never doubled at the beginning of an English word except in a few words of Spanish or Spanish-American origin (*e.g.*, "llama") or Welsh origin (e g, "Lloyd").

NAME OF FORM	APPROX-IMATE DATE	FORM OF LETTER
PHOENICIAN	BC 1200	𐤋
CRETAN	1100·900	1
THERAEAN	700 600	3
ARCHAIC LATIN	700.500	⅂
ATTIC	600	1 ⅃
CORINTHIAN	600	1
CHALCIDIAN	600	⅂
IONIC	403	1
ROMAN COLONIAL	PRE-CLASSICAL AND CLASSICAL TIMES	⅂
URBAN ROMAN		L
FALISCAN		J
OSCAN		J
UMBRIAN		J
CLASSICAL LATIN AND ONWARDS		L

THE DEVELOPMENT OF THE LETTER "L" FROM THE PHOENICIAN. THROUGH THE CLASSICAL. DOWN TO MODERN TIMES

See also ALPHABET. (B.F.C.A.; J. W. P.)

LA ALTAGRACIA (now LA ROMANA), the largest province in the Dominican Republic. 1,445 sq.mi. in area, occupies the rolling plains of the extreme eastern part of the nation and includes Catalina and Saona islands off the Caribbean coast. It is a leading sugar producer and cattle-raising centre. Pop. (1960) 104,987. The capital. La Romana, (1960) 24.058, was founded near the end of the 19th century and grew rapidly after the establishment of a large sugar mill in 1911. The old town of Higuey, founded in 1502, has an elaborate shrine. The name of the province was changed to La Romana in 1961. (D. R. D.)

LA BADIE, JEAN DE (1610–1674), French divine, founder of the school known as the Labadists, was born at Bourg. near Bordeaux, on Feb. 13. 1610. the son of Jean Charles de la Badie, governor of Guienne. He held pastorates in Geneva and London, Middelburg and Amsterdam, where he preached in a Separatist church. He had enthusiastic disciples, Pierre Yvon (1646–1707) at Montauban, Pierre Dulignon (d. 1679), François Menuret (d. 1670), Theodor Untereyk (d. 1693), F. Spanheim (1632–1701), and, more important than any, Anna Maria v. Schurman (1607–78), whose book *Eucleria* is perhaps the best exposition of his ideas, which included community of goods within the church. the continuance of prophecy, the sanctity of marriage between two believers, the continuous sabbath. etc. The life and separatism of the community brought them into frequent collision nith their neighbours and with the magistrates, and in 1670 they accepted the invitation of the princess Elizabeth, abbess of Herford in Westphalia, to Herford. They migrated to Bremen in 1672, and afterward to Altona, where they mere dispersed on the death of the leaders. There were also small communities in the Rhineland, and a missionary settlement in New York. Jean de la Badie died in Feb. 1674.

La Badie's works include *La Prophétie* (1668), *Manuel de piété* (1669), *Protestation de bonne foi et saine doctrine* (1670), *Briève déclaration de nos sentinzents touchant l'Église* (1670). *See H.* van Berkum, *De Labadie en de Labadisteiz* (Sneek, 1851); M. Göbel, *Gesch. d. christl. Lebens in der rheinisch-westphälischen Kirche* (Coblenz, 3 vol., 1849–60); H. Heppe, *Geschichte des Pietismus* (Leiden, 1879); A. Ritschl, *Geschichte des Pietismus,* vol. i (Bonn, 1880); W. Goeters, *Die Vorbereitung des Pietismus* (1911); and especially Peter Yvon, *Abrégé précis de la vie et de la conduite et des vrais sentiments de feu* Mgr. *de Labadie,* and Anna Maria v. Schürman, *Eucleria* (Altona, 1673, 1678).

LABANOTATION. The system for recording movement originated by Rudolf Laban (*Kinetographie Laban,* published 1928) further developed by the Dance Notation Bureau and used in dance. drama. anthropology, physical therapy and industry. See DANCE NOTATION. (AN. H.)

LABARUM, the sacred military standard of the Christian Roman emperors, first adopted by Constantine the Great in 312. The name seems to have been known before, and the banner was

simply a Christianized form of the Roman cavalry standard. The first labarum consisted of a long gilded spear, crossed at the top by a bar, from which hung a square purple cloth, richly jewelled. At the upper extremity of the spear was a golden wreath encircling the sacred monogram, formed of the first letters of the name of Christ. In later banners the monogram was sometimes embroidered on the cloth. *See* FLAG.

LABÉ, LOUISE CHARLIN PERRIN (d. 1566), French poet, called LA BELLE CORDIERE, was born at Lyons, probably between 1510 and 1520, the daughter of a rich ropemaker, named Charley or Charlin. At the siege of Perpignan she is said to have fought on horseback in the ranks of the dauphin, afterward Henry II. Some time before 1551 she married Ennemond Perrin, a ropemaker. She formed a library and gathered round her a society which included many of the learned ladies of Lyons—Pernette du Guillet, Claudine and Sibylle Scève and Clémence de Bourges, and the poets Maurice Scève, Charles Fontaine, Pontus de Tyard; and among the occasional visitors were Clément Marot and his friend Melin de Saint-Gelais, with probably Bonaventure des Périers and Rabelais. About 1550 the poet Olivier de Magny passed through Lyons on his way to Italy in the suite of Jean d'Avanson, the French envoy to the Holy See. As the friend of Ronsard, "Prince of Poets," he met with an enthusiastic reception from Louise. It is said that her passion for Magny inspired her eager, sincere verse, and the elegies probably express her grief at his first absence. A second short visit to Lyons was followed by a second longer absence. Magny's influence is shown more decisively in the sonnets in her *Oeuvres,* which, printed in 1555, attained great popularity. They were in private circulation before this time and are dedicated to Clémence de Bourges. During his second visit to Italy Magny had apparently consoled himself, and Louise, despairing of his return, encouraged another admirer. Claude Rubys, when her lover returned unexpectedly. Louise dismissed Rubys, but Magny's jealousy found vent in an ode addressed to the Sire Aymon (Ennemond), which ruined her reputation; while Rubys, angry at his dismissal, avenged himself later in his *Histoire véritable de Lyons* (1573). This scandal struck a fatal blow at Louise's position. Shortly afterward her husband died, and she returned to her country house at Parcieu, where she died on April 25, 1566, leaving the greater part of her inherited fortune to the poor. Such is the usual account of Louise Labé's life. But the accounts of it vary. The importance of Louise lies in the reality of her passion, whatever its object, and in the new vehemence and frankness of its expression. Her works include, besides the *Elegies* and *Sonnets* mentioned, a prose *Débat de folie et d'amour* (trans. into Eng. by Robert Greene in 1608).

LABEO, MARCUS ANTISTIUS (c. 50 B.C.–A.D. 18), Roman iurist. the greatest figure in imuerial jurisprudence before the age of Hadrian, came of a superior plebeian family of Samnite origin. His father. also a jurist, was of Brutus' circle and the younger Labeo adhered, almost aggressively, to the same republican views. He attained the praetorship but refused the consulate when it was offered to him by Augustus, devoting himself to jurisprudence. A pupil of Trebatius. Labeo had a wide general culture and a special interest in dialectics and language as aids in the exposition of the law. He is reputed to have written 400 books. including commentaries on the XII Tables, the praetorian edicts and pontiiical law, collections of cases (*Epistulae* and *Responsa)* and the *Pithana,* a collection of definitions and axiomatic legal propositions. His progressive outlook is confirmed in the fragments of his works and the abundant citations of his views by subsequent jurists. His prestige is evidenced in later epitomes and annotations of his works and, most strikingly, in the fact that his *Posteriora,* a systematic exposition of the law, was published posthumously, the only known instance of the procedure.

Labeo was also a teacher and is regarded as the first of the Proculian school (named after his follower, Sempronius Proculus), while Labeo's rival, C. Ateius Capito, is considered the first Sabinian.

See L. A. A. Pernice, M. *Antistius Labeo. Das romische Privatrecht im ersten Jahrhunderte der Kaiserzeit* (1873–92). (J. A. C. T.)

LABERIUS, DECIMUS (c. 105–43 B.C.), a Roman knight and one of the tno leading ariters of mimes; a man of caustic wit. In 46 or 45 he was compelled by Julius Caesar to accept the challenge of his rival, Publilius Syrus (*q.v.*), and appear in one of his own mimes; the dignified prologue which he pronounced on this degradation has survived. Caesar awarded the prize to Publilius but restored Laberius to his equestrian rank, which he had forfeited by appearing as a mime. The titles of about 42 of his mimes have been preserved. nith fragments.

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(WM. BE.)

LABIATAE or the mint family constitutes a large, readily recognizable and widely distributed family of flowering plants, many of which—such as lavender, marjoram, peppermint and thyme—have been in use as condiments and medicines since antiquity because of their pungent, aromatic oils. More than 150 genera and over 2,000 species, mostly of herbs, shrubs and occasionally trees or climbing plants, are included in this family. Many labiates have four-angled stems, simple, opposite or whorled leaves and bisexual, mostly two-lipped (bilabiate) flowers with tubular corollas, often grouped in whorled inflorescences (verticillasters). The four (rarely two) stamens are attached to the inside of the corolla and may differ in length, one pair being longer than the other. The superior ovary consists of two carpels and usually contains four ovules, but soon becomes four lobed (each lobe then containing an ovule). The shortly two-branched (at the apex) style is inserted between these four chambers of the ovary and usually matures after the stamens do. The fruit, normally surrounded by the persistent calyx, breaks up into four independently attached nutlets which are one seeded and commonly smooth. Most labiate seeds lack endosperm. The pungent aromatic oils are secreted in special glandular hairs.



ROCHE
SPOTTED DEAD NETTLE (LAMIUM MACULATUM)

Variation within the family affects especially the nature and composition of the inflorescence and the structure and appearance of the flower. Generally the corolla consists of a tube (base to middle) and a limb. which may be straight or sigmoid in shape. The upper lip is often hooded or boat shaped and contains the stamens and the style branches. The loaer lip is generally spreading and three lobed. the middle lobe often being expanded and shaped like a dipper or boat. The corollas, like the calyxes, contain a ring of hairs above the ovary or higher. These may secrete nectar and assist in bringing about pollination by insects and hummingbirds.

Floners with short tubes are mostly bee-pollinated. whereas those with long tubes are normally pollinated by butterflies or moths. Visiting insects either use the lower lip as a resting place while obtaining nectar and dusting their backs with pollen, or they cover their bellies and legs with pollen.

As a family. the labiates have a world-wide distribution, but the different tribes do not. Distribution of individual groups is apparently linked to growth habit and ecological preferences. Genera are primarily found in four main types of habitats. (1) openings peripheral to dry tropical hardwood forests, (2) open areas peripheral to temperate hardwood forests; (3) shrublands of the great cordilleras of both hemispheres; and (4) arid and desert subtropics. These habitats are of fairly recent origin, at least in their present expanse. Although the fossil record of the family is very meagre, it is quite probable that certain modern genera have been in existence since early Cenozoic times in areas where they now occur.

On the other hand nutlets of the genus *Hancea,* which is now

found in eastern Asia, are represented in the famous London Clay flora of Eocene age. The few fossil records together with the modern distribution patterns suggest that the family mas differentiated during Mesozoic times into groups similar to its present tribes. Local topographic and climatic changes during Cenozoic times opened up vast areas of brushland, grassland and desert and brought about greater differentiation within the tribes.

Volatile (essential) oils, abundant in labiates! are secretion products of numerous multicellular hairs found as modified epidermal outgrowths primarily on leaves, stems! petioies and sepals. Oils derived from certain labiates are of great economic and pharmaceutical importance. Mint oils are used mostly as carminatives, whereas oils of basil, marjoram, sage, savory, lavender and rosemary are used primarily as condiments and in cosmetics.

Peppermint, *Mentha piperita,* a perennial found in temperate parts of Europe, Asia and America, is one of the most important aromatic herbs. It has long been in cultivation in Europe and, since the middle of the 19th century, in the United States, especially in Indiana, Michigan, New York and the Pacific northwest, where it is grown in mucky soils, unsuited for other crops. Peppermint oil is used extensively in flavouring gums, candy, perfumes, soaps and tobacco, as well as in pharmaceutical preparations for both external and internal application. Hundreds of thousands of pounds of peppermint oil are produced annually in the United States, and more are imported from England, South America and Australia. Peppermint oil is a clear, colourless liquid with an, aromatic odour and pungent taste, obtained by distillation from the fresh aerial parts of the plant during flowering time. Two varieties are the main sources, namely M. *piperita* var. *oficinalis,* white peppermint with green stems, and var. *vulgaris,* with purple stems (the latter supposedly yielding more oil than the former). As the plants hybridize freely. the crude oil is never uniform and must always be blended. Menthol or peppermint camphor, a saturated cyclic alcohol, is the chief constituent (50%–75%), valuable as an antiseptic and used in the treatment of colds. Japanese peppermint, *M. arvensis* var. *piperascens,* widely cultivated in Japan and the United States as a source of menthol, yields more (but very bitter) menthol. Synthetic menthol is generally produced from thymol and other terpcne derivatives. Spearmint oil, derived from fresh aboveground parts of M. *spicata,* probably of hybrid origin, has a sweeter odour than peppermint oil but lacks the latter's cooling action.

Other important labiate oils are: basil oil, derived from *Ocimum basilicum;* lavender oil, obtained from *Lavandula oficinalis;* rosemary oil, procured from *Rosmarinus oficinalis;* patchouli, obtained from *Pogostemon cablin;* and perilla oil, derived from *Perilla frutescens.* Well-known savoury herbs are marjoram, *Marjorama hortensis;* sage, *Salvia oficinalis;* horehound, *Marrubium vulgare;* savory, *Satureia hortensis;* and thyme, *Thymus vulgaris.* Thymol, a derivative of the oil of thyme, is used in dentifrices and as an internal medicine.

Several labiates are cultivated as vegetables because of their tuberous rhizomes. These include the Chinese artichoke, *Stachys sieboldii; Coleus rotundifolius* in tropical Asia and Africa, *Coleus edulis* in Abyssinia and *Coleus parviflorus* in tropical Asia; and various species of *Plectranthus.*

The number of Iabiates grown as ornamental plants is legion, including representative species of more than 75 genera. Outstanding among them are species of the American genera *Monarda* and *Salvia;* the old world genera *Coleus* and *Plectranthus,* gronn because oi their foliage forms; and the numerous herbs and culinary plants. Because of their aromatic properties labiates are particularly suitable for cultivation in gardens for the blind. *See* also PERFUMES; ESSENTIAL OILS; and articles on the various individual members of the family, as MINT. (T. K. J.)

LABICHE, EUGÈNE MARIN (1815–1888), French playwright. author of popular farces, was born in Paris, May j, 181j. He took a law degree and then became a journalist. In 1838 he published his first book, *La Clef des champs,* and collaborated with M. Michel and A. Lefranc in writing his first play, *Coyllin, ou l'homme infiniment poli.* Later collaborators included E. Martin, L. Delacour, P. Dumanoir and V. Varin. A long series of hilarious full-length and one-act plays, produced mainly at the Palais Royal, the home of light comedy, treated the theme of man's stupidity from every angle. The best known are *Le Chapeau de paille d'Italie* (1851; produced, New Tork, as *Horse Eats Hat,* 1936; London, as *The Italian Straw Hat,* 1952), typical in being based on a fantastic situation and full of improbable incident, and *Le Voyage de M. Perrichon* (1860), which, like *Le Misanthrope et l'Auvergnat* (1852) and *La Poudre aux yeux* (1861), shows in sight into human nature despite the obvious dramatic devices used to express it. He was well served by actors, particularly by Jean Geoffroy, nho seems to have inspired the ridiculous bourgeois nhom he portrayed in many plays. During the Franco-German War, Labiche formed a company of sharp shooters. and was made a Chevalier of the Légion d'Honneur. In 1880 he was elected to the Académie Française. He died in Paris, Jan. 23. 1888, His *Théâtre Complet,* 10 volumes, with preface by E. Augier, was published in 1878–79.

See P. Soupault, *E. Labzche, sa vie et son œuvre* (1945). (D. Ks.)

LABLACHE, LUIGI (1794–1858), Franco-Italian singer, was born at Naples on Dec. 6, 1794, the son of a merchant of Marseilles who had married an Irish lady. In 1806 he entered the Conservatorio della Pietà de' Turchini, where he studied music under Gentili and singing under Valesi, besides learning to play the violin and violoncello. As a boy he had a beautiful alto voice, and by the age of twenty he had developed a magnificent bass with a compass of two octaves from E♭ below to E♭ above the bass stave. In England he took part in many provincial musical festivals, and taught singing to Queen Victoria. On the operatic stage he was equally successful in comic or tragic parts. He was one of the thirty-two torch-bearers chosen to surround the coffin at Beethoven's funeral in 1827. He died at Naples on Jan. 23, 18 j8, and was buried at Maisons-Lafitte, Paris.

LABOR, DEPARTMENT OF: *see* GOVERNMENT DEPARTMEKTS.

LABORI, FERNAND GUSTAVE GASTON (1860–1917). French lawyer best known as a defense advocate in political cases and who is especially remembered for his defense of Alfred Dreyfus. was born at Reims on April 18, 1860, and called to the bar in 1884. He defended the anarchists Duval and Pini; Émile Zola, prosecuted for libel because of his championship of Dreyfus (1898); Thérèse Humbert in the Crawford inheritance case (1902); and Mme. Joseph Caillaux. a ho was acquitted of the murder of Gaston Calmette. editor of *Le Figaro,* in 1914. Labori's defense of Dreyfus continued from his trial in 1894 through the revisions of 1898 and 1899. Labori was also the founder of the *Revue du Palais* and the editor in chief of the *Gazette du Palais.* His works include *Le Mal politique et les partis* (1902) and *Les Idées morales et la politique* (1903). He died in Paris on March 14. 1917

LABOUCHERE, HENRY DU PRE (1831–1912), British politician, was born in London on Nov. 9, 1831. He was educated at Eton, and, after spending a short time at Trinity college, Cambridge, entered the diplomatic service in 1854, becoming in 1863 second secretary to the British embassy at Constantinople. In 1864 he abandoned diplomacy for politics, and in 1866 was elected Liberal member for Windsor, but was unseated on petition. In 1867 he won a by-election for Middlesex, but failed to be re-elected in 1868. In 1880 he again entered the House of Commons as Radical member for Northampton, and this seat he retained until his retirement in 1906. He began his journalistic career with *The Daily News,* of which he became part proprietor just before the Franco-German War. In 1874 he became associated with Edmund Yates on *The World,* but three years later he started *Truth,* which had a remarkable record in the exposure of shams and organized impostures, especially frauds on the charitable. Labouchere was a strenuous advocate of the abolition of the House of Lords; at the time of the Parnell Commission he had much to do with the unmasking of Pigott; and he was a member of the inquiry into the Jameson Raid, his hostility to Chamberlain being as pronounced as against Lord Xosebery when the latter became leader of the Liberal party. After 1903 he lived mainly in Italy, at a villa near Florence, where he died on Jan. 1j. 1912.

See A. L. Thorold, *Lzfe of Henry Labouchere* **(1913).**

LABOUR. In economics, as in ordinary discourse, the word labour is used as a name for the general body of wage-earners. It is in this sense, for example, that one speaks of "organized labour." In a more special and technical sense, however, labour means, in economics, any valuable service rendered by a human agent in the production of wealth, other than the accumulating and providing of capital or the assuming of the risks which are inseparable from the responsible planning and direction of business undertakings. It includes the services of manual labourers, but it covers many other kinds of services as well. It is not synonymous with toil or exertion, and it has only a remote relation to "work done" in the physical or physiological senses. The application of the physical energies of men to the work of production is, of course, an element in labour, but skill and self-direction, within a larger or smaller sphere, are also elements. A characteristic of all labour is that it uses time, in the specific sense that it consumes some part of the short days and years of human life. Another common characteristic is that, unlike play, it is not generally a sufficient end in itself, but is performed for the sake of its product or, in modern economic life, for the sake of a claim to a share of the aggregate product of the community's industry. Even the labourer who finds his chief pleasure in his work commonly tries to sell services or products for the best price he can get.

If labour could be measured adequately in simple homogeneous units of time, such as labour-hours, the problems of economics would be simplified. But labourers differ and tasks differ also, as, for example, in respect of the amount and character of training and the degree of skill, intelligence, capacity to direct one's own work or the work of others, and the other special aptitudes which they require. They differ, furthermore, in respect of their irksomeness, the prospects which they offer for permanent employment and advancement, the social status generally associated with them, and in respect of other characteristics which make one task more attractive than another. Quite apart, therefore, from the circumstance that the mobility of labour is imperfect, that it cannot be transferred easily and quickly to the employments in which its products have the highest value, there is the further circumstance that the wages of different kinds of labour cannot be taken to be payments for larger or smaller "quantities of labour." The price per unit of time which a particular kind of labour commands in the market depends not only upon the technical efficiency of the labourer but upon the demand for the particular services which he is able to furnish, upon their relative scarcity, and upon the supply of other productive agents. The attempts of the older economists and of some of the Socialists to find a simple and direct relation between the value of a product and the quantity of labour which it embodies were fruitless.

Different uses of the available supply of labour, however, whatever its composition, can be compared with reference to the quantity and the value of the products which they yield, and such comparisons are being made continuously in the ordinary course of the planning and management of competitive business undertakings. By means of economic analysis, moreover, it is often possible to know whether a proposed change in the organization of the community's labour or of the uses to which it is put (as, for example, by encouraging certain types of industries at the expense of others) would be more likely to increase or to decrease the annual production of wealth. For the individual worker, as well as for the community as a whole, the practicable way of measuring the "labour costs" of production is by reference to the other possible products which might have been secured by means of the same labour, or to possible alternative uses of the time given to labour. Thus the fact that in most countries both the number of hours per day and the part of the average worker's life which are given to labour are less than they were 100 years ago, means, not that labour has become intrinsically more arduous or more painful, but that it has become more costly, in the sense that, with the increase of the general level of incomes, the alternative uses of the worker's time have become relatively more valuable. (See also ECONOMICS; WAGES.) **(A. YO.)**

LABOUR, HOURS OF: see HOURS OF LABOUR.

LABOUR, MINISTRY OF: see GOVERNMENT DEPARTMENTS.

LABOUR, PRIMITIVE. It is often thought that all native peoples are naturally indolent, and that only by the pressure of white authority can they be induced to perform hard and consistent work. As regards normal tribal conditions this idea is quite erroneous. Even in the primitive agriculture of the Pacific long hours are spent for days at a time in steady toil, embracing a series of operations, from the arduous clearing and breaking up of the ground to the careful monotonous weeding, which cover a cycle of weeks or even months of work. In the hewing-out, carving, launching and sailing of a canoe, again, extraordinary patience and effort are displayed. Such facts can be paralleled from the economic life of any native folk who have not been too greatly changed by civilization.

The secret of such arduous and consistent labour lies in the nature of the motives behind it. The desire to utilize a share of the product, or to reap some other material reward is a constant inducement to work. The real scheme of motivation, however, is much more complex. Other incentives are often equally strong. In primitive society great emphasis becomes attached to the personal relation between a man and his work; the absence of any widespread system of delegated employment renders the product peculiarly his own, and allows scope for the development of the spirit of craftsmanship and delight in the task for its own sake. This largely accounts for the extra finish and decoration so often applied to weapons and tools beyond the corresponding increase in utility. Social factors also are of the greatest importance: vanity in seeing his handiwork admired, an intense spirit of rivalry, rooted in the desire to attract public attention, coupled with obedience to tribal usage and traditional teaching, are responsible for much of the exacting labour of the primitive workman. The production of food is often not dictated by pressure of immediate physical wants, but by social considerations, as the need of supplies for a marriage or a mourning feast, or by the wish to gain prestige by the accumulation of stocks of surplus wealth.

Organization of Work.—In general the primitive economic system is not marked by any complex division of labour. The work of the community is normally split up between men and women, the separation being enforced by custom and taboo. Men usually perform the heavier, though more interesting and even dangerous work, women that which involves less physical strain but is more regular and monotonous. The savage woman is thus no drudge for an idle husband; a certain economic equality is observed within the family. Other broad divisions of employment are made on the basis of age and rank. Specialist craftsmen occur to a limited degree, as canoe-builders and carvers in Polynesia, or the caste of smiths in central Africa. Specialization in work is closely associated with the knowledge of technique and magic.

The large scale on which some native enterprises are conducted, as house-building, gardening and fishing, demands for them to be effective, that there must be strong forces of organization to ensure that the contribution of each person is adequate, and, more important, that it is harmoniously welded into the whole scheme of work. In general, the bonds which secure co-operation in labour are represented by the ties of kinship between members of the working group, by the authority of chief and elders, by the obedience to magical rules, and by the prestige of the local magician. In such tasks, competent leadership is of the greatest importance. To relieve the fatigue of labour and beguile its monotony, primitive man adopts a number of devices, as music, work-songs and choruses, or in some communities, narcotics. Working in company also has in itself a cheering effect. A powerful factor in assisting to keep the activity of individual workers up to full pitch is the pressure of public opinion, often made explicit through traditional tales and proverbial sayings.

Since care and skill in work usually bring reputation to a person and act as a distinct marriageable asset, young folk in a primitive community are provided with an additional incentive to industry.

The study of such problems of motive and organization in work

has a practical as well as a theoretical interest, since it bears on certain aspects of native labour in Africa and the Pacific.

See B. Malinowski, Argonauts of the Western Pacific (1922), "Labour and Primitive Economics," Nature (Dec. 26, 1925); also K. Biicher, Arbeit *und Rhythmus* (6th ed., 1924); R. Thurnwald, "Die Gestaltung der Wirtschaftsentwickelung" in *Erinnerungsgabe für* Max Weber, i. (1923), L. H. D. Buxton, *Primitive* Labour (1924).

(R. F.)

LABOUR DAY. May 1, the date generally selected by trade unions, Socialist parties and labour organizations in general for a public celebration. It is observed by a portion of the population in nearly every industrial country except the United States and Canada **(see** below). Labour day is also celebrated on May 1 in Mexico and most of the countries of Central and South America. In the Communist countries it is an official holiday.

The connection which certain Socialist writers have attempted to make between "Labour day" and the old May day festivals appears imaginary. Robert Owen in 1833 appointed May 1 as the day for the commencement of the millennium, but apart from this mention the observance of the day cannot be dated earlier than 1889. in which year the first (Paris) congress of the second Social-, ist international selected the date for annual international celebrations. By the movers of the motion it was originally intended that the workers should by direct action enforce a holiday on May 1 no matter what day of the week it might be. Attempts were made to do this regularly in Europe, and frequently sanguinary conflicts occurred with the police.

In Great Britain the Labour day celebration generally takes place on the first Sunday after May day; in London the traditional meeting place is Hyde park. The first Labour day celebration was not held in Great Britain until 1892.

Labor day is celebrated on the first Monday in September in the states and territories of the United States and in the provinces of Canada. Agitation for the celebration of the day was begun by the Knights of Labor who, in 1882, 1883 and 1884, paraded on that day in the city of New York. In 1884 the organization adopted a resolution that the first Monday in September should be considered Labor day. and steps were taken to have it recognized as a holiday. Workmen of all organizations aided in the movement. Oregon, on Feb. 21, 1887, passed the first law recognizing the day, and New York, New Jersey and Colorado soon followed. On June 28, 1894, a bill passed congress making the day a legal holiday throughout the union. Further legislation was passed by the separate states to put the law into operation. Labor day is observed in all the states and the District of Columbia! as well as the territories and outlying possessions of the United States. In Canada Labour day is a statutory public holiday and also dates from 1894. As in the United States, most industrial employees who do not get the day off receive extra pay for working on the holiday.

Celebration of the day in the United States and Canada differs from that in Europe in that it is participated in by all classes and marked by the closing of factories and stores, by meetings, picnics, parades, speeches, athletic events and other holiday activities.

Various other dates have been set aside for the celebration of Labour day in certain countries, for example, Japan (Nov. 23), New Zealand (Oct. 22) and Spain (July 18).

LA BOURDONNAIS, BERTRAND FRANÇOIS, COUNT MAHÉ DE (1699–1753), French naval commander, was born at St. Malo on Feb. 11, 1699. In 1718 he entered the service of the French India company as a lieutenant. In 1724 he was promoted captain, and took his title from the capture of Mahé of the Malabar coast.

For two years he was in the service of the Portuguese viceroy of Goa, but in 1735 he returned to French service as governor of the Ile de France and the Île de Bourbon. At the outbreak of hostilities with Great Britain in 1740, La Bourdonnais was put at the head of a fleet in Indian waters. He saved Mahé, relieved General Dupleix at Pondicherry, defeated Lord Peyton, and in 1746 participated in the siege of Madras. He quarreled with Dupleix over the conduct of affairs in India, and his anger was increased on his return to the Ile de France at finding a successor installed there by his rival. He set sail on a Dutch vessel to present his case at court, and was captured by the British. but allowed to return to France on parole. He was arrested (1748) on a charge of peculation and maladministration, and imprisoned for over two years in the Bastille. He was tried in 1751 and acquitted. He died in Paris on Nov. 10, 1753.

La Bourdonnais left valuable memoirs which were published by his grandson (modern edition. Paris, 1890).

See G. B. Malleson, Dupleix (Oxford, 1895); Anandaranga Pillai, Les *Français dans l'Inde,* Dupleix et Labourdonnais, *extraits* du journal *d'Anandaran-gappoullé 1736–1748,* trans. in French by Vinsor in *École spéciale* des langues orientales vivantes, series 3, vol. xv (Paris, 1894).

LABOUR LAW. This article is divided into the following sections:

I. Definition and Scope
II. United States
  A. Early History
    1. Common-Law Criminal Conspiracy
    2. The Labour Injunction
    3. The Illegal Purpose Doctrine
    4. Justification Theory
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I. DEFINITION AND SCOPE

Labour law is a convenient term to include all those rules of law governing the conditions under which persons may work under the control of other persons, their employers. The expression "industrial law" is often used to cover the same ground. But this is apt to be understood in too narrow a sense, as including only that part of the law which affects industrial undertakings. It seems, therefore, better to avoid the use of an expression which would tend to imply any limitation of the subject to certain branches of employment. If a person is engaged by and works under the control of an employer, there is a relationship which becomes the necessary subject of legal regulation. It may be

necessary also for the law to intervene to help a person who desires to be so engaged or an employer who desires to find a worker to work for him. Whenever the relationship of employer and dependent worker exists, either actually or potentially, we are within the sphere of labour law. It does not matter whether the work to be done is manual labour or brainwork. The subordination of the worker to the employer is the only test to be applied, and the word labour seems convenient to convey this idea of subordination, provided it is clearly understood that labour does not mean only manual labour. It is not always an easy matter to draw exactly the line which divides a dependent worker from an independent contractor or from a professional expert. The rules of English common law relating to an employer's responsibility for the acts of or for injuries to a servant have laid it down that in order to be an "employer," a person must control the worker as regards the manner in which he does his work, as well as controlling the kind and amount of work to be done (*Quarman* v. Bennett, 1840, 6 M. arid W. 499). 'This general definition suggested for the scope of English labour law must be accepted with caution, since there are exceptions which spread outside it. But it can be taken as a rough working rule to define the branches of law included within the term "labour law."

The English law considered in this article can be roughly divided into two branches: the law affecting the contractual relations of employer and employed; and the law expressly intended to protect the weaker party, the worker, from possible injury by imposing duties on the employer enforceable not by the worker as a civil right but by governmental authorities in quasi-criminal proceedings. In other words, the law regulating contracts of service may be distinguished from the law for the express protection of the workers or prorective law. It is convenient to consider labour law with this distinction in mind, but a strict line of division cannot be drawn. Laws often possess both characteristics at the same time. This is most often the case in connection with acts affecting wages, where the civil right of the worker to sue for wages legally due to him under the act is commonly combined with penalties imposable on the employer for breaking the law passed for the worker's protection. It is primarily with these two aspects of labour law that this article deals but these do not by any means exhaust the sphere of labour law.

In a general survey of the subject it is logically impossible to rule out any law expressly affecting employers (or potential employers) or workers (or potential workers) as such. For instance, the law relating to the civil rights of workers and employers to organize in deiense of their interests is an important branch of labour law (see TRADE [LABOUR] UNIONS). Again, measures for the insurance of workers against accidents, sickness or old age iorm. strictly speaking: a branch of labour law (see SOCIAL SECURITY). There is, too, the vast question of unemployment (*q.v.*) which involves much labour law regarding the establishment and control of employment exchanges, the organization of unemployment insurance (*q.v.*) and various other measures intended to prevent or relieve unemployment. Even emigration and immigration laws may or may not be labour law within this definition according to their scope and intention.

Labour law, covering the ground indicated above, cannot be found conveniently and completely codified in any country. It is to be sought in rules of unwritten common law, where any such system exists, in legislative enactments of all kinds, acts of parliament, decrees of autocratic governments and codes of all sorts—civil, industrial, commercial, labour. Even in written constitutions principles of labour law exist. The decisions of higher courts of law must also be considered wherever these are of a binding nature, as in England. These decisions may take the form of expositions or applications of common-law principles, or they may be interpretations of the statute law. In some branches of English labour law the decisions interpreting the statute law are extremely important.

In some countries, especially Australia, conditions of work are governed also by the terms of compulsory arbitration awards issued by special courts established for the purpose. Similarly in England during World War II it was made possible for one party in a trade dispute to bring the other party, without the latter's consent, to industrial arbitration. This method of unilateral reference of disputes to arbitration continued, to a more restricted extent, under the Industrial Disputes order, 1951 (S.I. 1951, no. 1376).

Another point to be noted is that, in connection with labour law, very free use is made in practically all countries of the method of delegated legislation; that is to say, the delegation by the legislature to executive authorities of power to issue regulations in connection with the law itself. It may, indeed, almost be said that the most important part of the labour law of some countries is contained in administrative decrees. The quasi-legislative functions thus delegated may be of various kinds. Executive authorities may be empowered: (1) to bring a bare principle laid down by statute into practical operation; (2) to supplement the general rules laid down by statute by more detailed and technical provisions; or (3) to issue rules relating to the administration and enforcement of the law.

A common form of quasi-legislative power in connection with labour law is the second given above. The power to issue detailed technical rules suited to widely differing conditions of machinery and industrial processes has been found an effective and practical means of enforcing proper measures to prevent accidents and injury to health. These rules can be drawn up by expert administrators, engineers or medical men, in consultation with the employers and workers concerned, and it is possible for the rules to enter into minute technical and scientific detail in a way which would be impossible in any measure debated in a parliament, the members of which could not be either sufficiently informed or sufficiently at leisure to produce the kind of regulations required. Powers of the third type, namely, to make orders on details of administration or procedure, are common especially in connection with insurance laws.

For the law of the United States, see section II, below. Section III deals primarily with the law of England, which may be taken to include Wales. But a few points may be noted in connection with the corresponding law in other parts of the British Commonwealth. In Scotland the English common law has no application. The law respecting contracts of service must there be sought for in the system of law known as Scots law (*q.v.*). But most of the statutory labour law of England applies also to Scotland. In Northern Ireland and the Republic of Ireland, the labour law of England in operation there at the time of the constitutional changes of 1922 remained in force. The parliament of Northern Ireland can amend this law, subject to the possible intervention of the British parliament. The self-governing countries of the British Commonwealth are free to legislate on this matter independently of the British parliament. The English common law relating to contracts of service applies (subject to statutory amendment) in all overseas British territory acquired by settlement. But in territories ceded or acquired by conquest where an established system of law already existed, any such system still takes the place of the English law. Thus we find Roman Dutch law in South Africa, French law in Quebec, Hindu and Mohammedan law in India. In the commonwealth (except New Zealand), labour legislation is complicated to some extent by the existence of both central and provincial legislatures between which powers are divided. (S. S.; H. Ss.)

II. UNITED STATES

A. EARLY HISTORY

1. Common-Law Criminal Conspiracy. — Early U.S. labour law was almost exclusively the judge-made or common law of the various states. Until 1842 the doctrine of common-law criminal conspiracy generally prevailed. Under this doctrine it was a criminal offense for labour unions to use economic or social pressures to compel workmen to join their associations. Unions were thus unable to organize effectively for successful wage strikes. Popular reaction against this device influenced the Massachusetts supreme court, in the famous case of *Commonwealth* v. Hunt (1842), to lead the way to the virtual abolition of its cgntinued use. It was succeeded by a scattering of state statutes making criminal

the use of economic coercion to organize and to secure the closed shop. But there appear to have been no early authoritative precedents denying organized workers the right to strike for wage and hour adjustments.

2. The Labour Injunction. — Since the criminal law proved politically inappropriate to prevent the growth of unions, the courts cast about for some other suppressive device. During the railroad strikes of the 1870s, the federal judiciary used its contempt power to prevent interference with the operation of roads in receivership. Railroad receivers were officers of the equity courts appointing them; and strike action preventing continued operation of the railroads in receivership was treated as an interference with the administration of justice, punishable as contempt of court. This technique proved so successful that it suggested the general use of the injunction as a basis for the contempt sanction. By 1890 the injunction became the accepted device to prevent illegal strikes. Criminal prosecutions and tort actions for damages required elaborate pleadings with jury trials. Furthermore, the damage would already have been done; and judgments for damages were hard to collect against union leaders. But injunctions were issued before the damage occurred, frequently at the mere request of employers. Then, if the injunction was violated, the offenders were summarily committed to jail for contempt of court, no jury trial being necessary. Thus, the labour injunction was used to smother strikes before any harm was done. Incidentally, these injunctions never compelled the individual strikers to return to work. That would have been unconstitutional involuntary servitude. Rather, they prohibited illegal concert of action. Injunctions were primarily aimed at the strike leaders; and when they desisted or were jailed for contempt, the strike invariably fell apart and the strikers as individuals usually returned to work.

In spite of the ease with which labour injunctions were secured, they could not be upheld on appeal unless they were issued to prevent some threatened legal wrong. Since courts had no power to enjoin crimes, they could use injunctions to prevent only torts or civil wrongs. Strikes and boycotts caused harm to business through economic coercion but did not fall within recognized categories of tort liability. Now business groups frequently used harmful economic boycotts and other pressures against rivals with impunity, the courts usually condoning such infliction of economic harm as justifiable competition in pursuit of gain. But these same tactics employed by labour unionists were generally held to be tortious, because judges failed to perceive that such conduct was likewise in pursuit of economic interests and did not fall into any of the recognized categories of tort liability.

3. The Illegal Purpose Doctrine. — This became known as the illegal purpose doctrine, the standard of illegality being the undesirability of union objectives according to the judges' economic or social views. Thus courts occasionally perceived as illegal objectives of strikes and boycotts attempts by unionists to substitute for free-market controls over labour conditions the "artificial" controls of collective bargaining commonly known as restraints of trade.

But they did not declare illegal simple strikes for wages and other direct conditions of employment. They reserved this theory of control to make unlawful the use of economic coercion by unionists to further organization, such as attempts to secure the closed shop, and the pursuit of other allegedly undesirable objectives such as strikes against technological change, jurisdictional strikes, strikes against unpopular foremen and strikes to compel the hiring of unnecessary workmen.

The vice of the judicial illegal purpose doctrine was that judges drew the line between what was lawful and unlawful on the basis of their social and economic predilections, whereas under the U.S. system of government such policy decisions traditionally are made only by legislatures. A few state courts had the proper approach suggested in some of Oliver Wendell Holmes's famous Massachusetts dissents — that is, combination alone is not illegal at common law; and concert of action becomes illegal only if what the unionists do would be illegal when done by one of them alone. And the proper test of illegality of conduct, in the absence of legislation, is whether or not it falls into a traditional common-law category of tort, like trespass or assault and battery If it does not, it is not unlawful; and it does not become unlawful when done by two or more merely because they act in concert.

4. Justification Theory. — But there is an exception to this rule. That is where harm is intentionally caused to another in a manner which is not in itself illegal, usually by means of economic coercion. Such unqualified commission of harm is unlawful. But it is not unlawful if it is justified by pursuit of self-interest and gain, the classical example of justification being business competition. Although unions almost invariably acted in pursuit of self-interest and gain when they exerted economic coercion against others, only a few courts recognized the same competitive pattern as a justification for the harmful pressures of labour groups. The best example of this was the strike for the closed shop, the arrangement under which the employer may hire only members of a union. Under the illegal purpose doctrine this type of strike was enjoined because it sought to create a monopoly over job opportunities But a few courts perceived that organized labour sought the closed shop to compete with the unorganized labour market. not only for jobs and work but also to protect existing higher union conditions of employment from the undercutting influences of lower nonunion labour standards. Indeed, the highest New York court held that if the labour unionists did not engage in tortious conduct such as trespass or assault and battery, or violate some statute, their harmful economic pressures were perfectly lawful, regardless of their motives.

5. First Anti-Injunction Law. — The liberal justification theory, expanding the scope of permissible union economic self-help pressures, grew steadily until the late 1920s, although it did not become the majority view of U.S. courts at common law. And statutory developments thereafter rendered much of this common-law approach somewhat academic. In the meantime. however. the labour injunction was thought to be so flagrantly abused that several leaders of the bar espoused statutory reforms to end what they called "government by injunction." These efforts at first led to sec. 20 of the Clayton act, adopted by congress in 1914. Under that measure no injunction should be issued by federal judges in cases between employers and employees growing out of labour disputes over terms and conditions of employment unlesa property rights were exposed to irreparable injury for which there was no adequate remedy at law. It then described certain types of union conduct in such disputes as immune from the injunctive process — apparently striking, picketing and the use of secondary pressures; and it concluded by saying that such acts shall not be considered violations of any law of the United States. The gist of this statute was copied in more than a dozen states. Although the unions hailed this legislation as a great advance, it proved to be utterly abortive. The U.S. supreme court in the 1921 ***Duplex*** case held that it applied only in disputes between striking employees and their immediate employers — and then only to conduct which was already permissible under the pre-existing common law. In that year it also decided that state statutes copied after this sec. 20 must be similarly construed or be held unconstitutional. The net effect of sec. 20 was merely to legalize so-called peaceful picketing of their employer by strikers.

6. Early Direct Regulation of Labour **Standards.**—Between 1880 and the 1930s congress and various state legislatures had tried to introduce higher labour standards by direct legislation, such as minimum wage and maximum hour acts, as well as laws governing child labour and the sale of prison-made goods Almost all state legislation of this type was declared unconstitutional under the due process clause of the 14th amend ent to the U.S. constitution, while congressional acts were either held unconstitutional under the due process clause of the 5th amendment or were declared invalid exercises of power under the commerce clause of the U.S. constitution. Employing the concepts of substantive due process and liberty of contract, the U.S. supreme court insisted that everybody be free to make whatever arrangements he chose concerning terms and conditions of employment. This highly individualistic philosophy militated against all government regulation of private enterprise; and it manifested itself in other ways.

Thus many employers required their employees to agree as a

condition of securing or retaining employment that they would not join a union. Such antiunion promises were called yellow-dog contracts. These so-called contracts served employers in combating union organization, since the courts generally held that persuasion of employees by organizers to break these promises constituted the tort of inducing breach of contract. And this tort became the favourite basis for injunctions against labour unionists.

Congress and a few states undertook to outlaw such antiunion promises; but the U.S. supreme court declared these statutes unconstitutional interferences with liberty of contract. Likewise an attempt by Kansas to prohibit strikes in certain industries in favour of compulsory arbitration of bargaining disputes was declared unconstitutional.

Workmen's compensation acts, however, were held constitutional, even though it was contended that compulsory liability of employers toward employees for industrial injuries, in the absence of fault or negligence, was an arbitrary deprivation of property without due process of law—especially since employers were deprived of the defenses of contributory negligence and assumption of risk. Thus commenced the experiment, the precedent later followed in all U.S. states and to some extent by the federal government, of placing on the shoulders of private enterprise these statistically predictable injuries caused by industry, as an overhead cost to be passed on to society through increased commodity prices. Although recoveries of compensation would not be large, they would be certain and quick, thus relieving individual workers from bearing loss caused by industrial injury and from undertaking the risks of litigation for damages. In spite of this development, the pre-New Deal period was characterized by the strict and narrow scope of state and federal power to introduce regulatory labour legislation.

7. Federal Antitrust Laws Before the 1930s.—An essential aspect of labour union development is the part played by the federal antitrust laws. In 1890 congress passed the Sherman act. This statute was aimed primarily at concentration of power among business groups, but it made illegal all combinations in restraint of trade or commerce. It applied only to activities occurring in "interstate commerce," since it was an exercise of U.S. congressional power to regulate commerce among the states. In 1908 the U.S. supreme court held that the Sherman act applied to organized labour, although this had been hotly debated when the act was passed. 4 secondary boycott against the Danbury hatters, interfering with their commerce in hats between Connecticut and other states, was held a violation; and the union members paid them more than $200,000 in triple damages. [Thereupon] Union political pressure secured the inclusion of sec. 6 in the 1914 Clayton act—a provision declaring that the labour of human beings is not a commodity of commerce and that unions, as such, are not illegal combinations. Although this provision was thought to exempt unions from the Sherman act, the U.S. supreme court held that it did not change the law at all, meaning simply that unions as such were not illegal.

The Sherman act, consequently, was construed to prevent any union restraints on the movement of goods from one state to another, except when such interference was caused by a strike. This seemingly illogical rule was necessary to avoid declaring illegal virtually all strikes for immediate objectives such as wages, since by 1920 all large industrial units sold products in other states and any effective wage strike would interfere with their exports. But the supreme court held that, under the Sherman act, if it could be proved that the actual intent of the striking union leaders was to eliminate from interstate markets the competition between union-made and nonunion-made goods, a violation of the act would be shown. And since this was the primary objective of all organizational strikes, proving a violation simply meant unearthing the evidence of such actual intent. Thus in the 1920s the supreme court for the first time grasped the meaning of the Sherman act insofar as it could sensibly be applied to labour unions.

In the meantime, the federal courts and most state courts were committed to opposing the spread of unionism into national affiliations of strong locals throughout different industries. They declared unlawful and enjoined all recourse by unions to self-help economic pressures like strikes for the closed shop, secondary boycotts and organizational "stranger" picketing (*i.e.*, picketing of an unorganized plant in which the picketers were not employed) to compel recognition of the union. Indeed, not until 1927 did any court hold lawful an instance of peaceful stranger picketing. And only shortly before had courts first generally recognized the lawfulness of peaceful picketing by strikers against their own employer.

By 1920 a few courts had recognized the legality of the secondary labour boycott (a threatened strike against A, already organized with the union, unless A agrees to cease doing. business with B, whom the union is trying to organize), but even such courts refused to permit the secondary consumption boycott (organized refusals among the members of several associated unions to patronize any merchants or to buy the products or services of any enterprisers who in turn deal with the employer whom a particular union is attempting to organize). For the associated unions had no particular economic interest of their own to serve by such organized pressure. Hence, like sympathetic strikers, they could not justify the harm they caused by showing pursuit of self-interest or gain.

8. Railway Labor Act of 1926.—Labour unionism in the railroad world has always been complicated and in a class by itself. In 1926 congress passed the Railway Labor act, adopting as law what the railroads and the brotherhoods had evolved as a treaty to govern their continued relations. This unique statutory development contained the following measures. (1) a declaration of the duty of the carriers and the unions to bargain collectively and to settle all disputes; (2) creation of a board of adjustment to process grievances arising under collective agreements; (3) setting up of a board of mediation to assist the parties in handling bargaining disputes; (4) establishment of a voluntary arbitration procedure for the handling of grievances not disposed of by the board of adjustment and for disposition of unsettled bargaining disputes, awards to be final and binding on the parties; and (j) provision for an emergency board if everything else failed. This statute promised well. but it had to be replaced in 1934 by a more thoroughgoing measure, discussed below.

B. Labour Law Under the New Deal

1. *Norris-LaGuardia* Anti-Injunction Act.—In 1932 congress passed the Norris-LaGuardia Anti-Injunction act—the most far-reaching piece of labour legislation enacted up to that time. Justice Felix Frankfurter, then professor of law at Harvard, did most of the work on the drafts of this statute, and it was carefully drafted to achieve what congress was mistakenly thought to have accomplished in sec. 20 of the 1914 Clayton act.

This 1932 statute so clearly defined the conduct to be unenjoinable during the course of a labour dispute that almost all conceivable purely economic pressures were included. Then it so broadly defined a labour dispute—the context within which such purely economic pressures would be nonenjoinable, regardless of the harm they caused—that for the first time in the federal arena unions were free to exert organizational pressures against employers who did not yet recognize any union and did not employ union members. For this definition of a labour dispute expressly stated that the proximate relation of employer and employee did not have to exist between a union and its members on the one hand and the employer under attack on the other. Furthermore, it was so broad that it almost seemed to allow for the exercise of sympathetic pressure in certain instances.

This statute made nonenjoinable any union's inducement of a breach of an antiunion promise by declaring such yello -dog contracts void as against public policy. And it made it difficult to procure injunctions even in those cases where union conduct was not made nonenjoinable, specifying certain conditions and formalities with which applicants for injunctions must comply before they could get either a temporary restraining order or a permanent injunction. The preliminary public policy statement in this statute declared that workers were entitled to organize into unions

autonomously and that employers should not interfere with this process. But this was not a substantive part of the law. purporting to be merely the "sentiments" of congress. Also the statute provided that injunctions should never issue in proceedings against unions based on conspiracy, a measure obviously aimed at antitrust proceedings.

This anti-injunction act applied only to federal judges in cases properly before their courts; but it was copied in more than a dozen states. Together with its state prototypes (excepting Wisconsin's) it did not purport to make lawful for all purposes the self-help pressures in the allowable area of economic conflict. But employers had become so dependent on the labour injunction that, when it was taken away from them, they had no other effective legal remedy and were compelled to resort to direct economic resistance against unions and workers to prevent the spread of organization. As a result the struggle for expansion of unions became intensified, with reprisals against employees who supported unionism.

In the National Industrial Recovery act of 1933, sec. 7(a) declared that workers were entitled to organize without interference from their employers. This statement of policy contained no separate method of administration or enforcement. Nevertheless. a board was appointed to make determinations under it in accordance with its stated policy. Its chief effect, however, was to put employers on guard; and to forestall popular demand for unions, they set up company unions themselves called employee representation plans, completely dominated by management. While the NIRA was declared unconstitutional in 1935, these employee representation plans furnished the core around which industrial unionism was started.

2. Railway Labor Act of 1934.—In 1934 congress passed an amended Railway Labor act which guaranteed to railroad employees the right to form autonomous unions free from interference of management; and it set up a board to administer these guarantees. Moreover. it put teeth into the former method of adjusting grievances and of settling bargaining disputes. The president was empo ered to defer imminent strikes pending the investigation and recommendations of special emergency boards. And the act endowed any union selected by a majority of the employees voting in an election with exclusive bargaining representational rights over the unit in question.

3. Social Security.—Next came developments not new in Europe but previously unheard of in the United States. The impact of the depression, with its distressing economic effects on employment necessitating organized Works Progress administration relief. brought the Social Security act with the Railroad Retirement act. The former was designed to provide pensions for retired workers and in other ways lessen the economic insecurity of old age. The part most closely affecting workers was the unemployment compensation feature. This provided a cushion against the economic hazard of unemployment just as the earlier Workmen's Compensation acts alleviated the hazard of industrial injuries. Although this part of social security is financed through federal taxation, it is administered under separate state laws enacted in conformance to general standards stipulated by congress as a condition to the states' securing the tax funds in question. The Railroad Retirement act provided for compulsory pensions for retired workers of all instrumentalities under the jurisdiction of the Interstate Commerce commission. Its original enactment was held unconstitutional but it was immediately replaced by the modern Railroad Retirement act, still in effect in the late 1950s. There was also enacted a Railroad Unemployment Insurance act, to perform for railway workers what the Unemployment Compensation acts do for employees in general industry.

4. **National Labor Relations Act of** 1935.—The most important New Deal labour legislation was the National Labor Relations act of 1935, commonly called the Wagner act. Passed ostensibly to free interstate commerce from the destructive effects of organizational strikes by eliminating employer interferences with the autonomous organization of employees, this statute was probably adopted as an inflationary measure to combat depression by creating strong unions which, through collective bargaining, could achieve high wages and shorter work weeks, thus providing more total purchasing power and jobs.

Its basic provision. sec. 7, declared that employees should have the "right to self organization, . . . to bargain collectively through representatives of their own choosing, and to engage in concerted activities for the purpose of collective bargaining or other mutual aid or protection." Section 8 set forth five unfair labour practices of employers which were to be prohibited: (1) interferences with attempts of employees to organize into independent unions; (2) the fostering, domination and control of dependent unions; (3) discrimination, such as discharge, against employees for interest in unions, with a proviso that discharge for refusal to join a union under a valid closed- or union-shop contract was privileged—a closed shop being one in which only union members may be hired, and a union shop being one in which anyone may be hired but everyone must join the contracting union to retain his job; (4) retaliation against employees for testifying or participating in proceedings under this act; and (5) the refusal to bargain in good faith with the union representing the employer's workmen.

A board of three—the National Labor Relations board—was established to hear complaints under sec. 8. This board could issue cease and desist orders and also orders requiring affirmative remedies such as reinstatement of discriminatorily discharged employees, with or without back pay. The board had no power to enforce its orders directly. Such orders had to be reviewed by a federal circuit court of appeals, which then issued an order of enforcement if the record sustained the board's action.

Section 9 of this act provided an elaborate representation procedure, under which the board offered facilities enabling employees to get organized. First, the board was to designate the appropriate unit of organization—on a departmental, plant or company-wide basis. Then it could hold elections to decide whether or not a majority of the employees in such unit desired to organize and choose a specified union or, if more than one union was claiming representational rights. which of such unions, if any at all. Of course, an employer was privileged to recognize a union without election if he was convinced that it was the choice of a majority of his employees. Whether a union was chosen by election and certified or was informally recognized, it became the employer's duty to bargain with such union in good faith. When such bargaining culminated in a collective agreement, the board's powers theoretically ceased, since it had no jurisdiction to enforce agreements. It could, however, still intervene during the life of an agreement to deal with discriminatory and other conduct in violation of sec. 8. There was no judicial review for the board's dispositions under sec. 9, since these were not "final orders." Such review was indirectly possible by an employer's refusing to recognize a union certified to him and, in subsequent sec. 8(5) proceedings, he could show that sec. 9 had not been properly interpreted and applied. A rival union dissatisfied with board dispositions under sec. 9 had no recourse at all unless it could persuade the employer to co-operate in this way.

The effective choice of a union in a particular bargaining unit was made by a majority of the employees actually voting, as in ordinary political elections. And a union certified to an employer was the exclusive bargaining representative of all of the employees in the unit in question, whether or not they belonged to the union. Thereafter, it was illegal for the employer to deal with individual employees in the unit concerning terms and conditions of employment.

5. **Changing Constitutional Concepts and Union Policies.**—At first, employers refused to comply with board orders, believing that the statute was unconstitutional. But times were changing and sentiments on the supreme court were sharply divided. Early in 1937 the supreme court upheld a state minimum wage law, thus reversing a historical trend. Then it declared valid the Wagner act and the social security program. For the first time legislatures seemed free to regulate by law the relationship between employers and employees, the due process and liberty of contract constitutional concepts notwithstanding. And the supreme court took a very broad view of congress' jurisdiction to legislate on such mat-

ters, construing its commerce power to warrant regulation of what had previously been regarded as local concerns, such as manufacturing and mining. Actually, this was merely an extension of the existing interstate commerce theory. For, where a strike shut down a plant and thereby caused a stoppage in the interstate movement of goods and raw materials, the flow of interstate commerce was adversely affected.

Under the Wagner act unions began to form everywhere in industries where they had never existed. Coincidentally the Congress of Industrial Organizations was formed, with its various member C.I.O. industrial unions; and the American Federation of Labor was faced with its first real competition. The Wagner act completely changed union organizational activity. Previously unions brought pressure on employers. compelling them to grant recognition regardless of their employees' wishes. Now. what the employer wished or agreed to was no longer important. Indeed, if he influenced the choice of unions, he was guilty of an unfair labour practice. But the Wagner act included no unfair practices of either workers or unions; and unions were free to exert economic organizational pressure against employees. Insofar as such pressures were exerted at plants, they naturally affected employers by interrupting work.

The rivalry created between the A.F. of L. and the new C.I.O., heightened by occasional independent unions, made the National Labor Relations board's task difficult; for it had to make designations of appropriate bargaining units in accordance with varying types of union economic philosophy, with elections to sort out the conflicting claims. Since the board would not consider representational issues where unfair labour practice complaints were pending, it first had to clean up such charges. Fortunately the board had a large staff, with regional offices in various key industrial cities.

The sudden growth of unionism and collective bargaining created the problem of enforcing the resulting agreements. The most cumbersome methods of enforcement existed in the courts, completely inadequate to deal with the substantive issues and procedurally so archaic that the only practicable alternative was to seek enforcement through the strike. Happily, during the years of World War II grievance arbitration provided the answer, as will be shown later.

6. Wage and Hour Legislation. — In 1935 and 1936 congress enacted two statutes dealing with government contracts, based on the belief that the United States could spend its funds as it saw fit and thus could surmount constitutional obstacles by attaching any conditions it pleased to such spending. Thus on government-sponsored building projects and for the government purchase of goods and commodities. the Davis-Bacon and Walsh-Healey acts respectively established labour standards such as the prevailing union hourly rate, maximum hours of work. etc. But these statutes were rendered completely unnecessary by the passage in 1938 of the Fair Labor Standards act. They never would have been passed had congress then believed that the later Fair Labor Standards act type of law would be held constitutional.

The last-mentioned statute; commonly called the Wages and Hours act. was constructed in 1938 on the new constitutional theories of due process and congressional commerce power. While it incorporated many complicated features. its most important are a minimum wage, a maximum work week of 40 hours. with a penalty of time and a half for overtime, certain child. labour restrictions and regulations of homework and other types of sweated labour; and it included certain sanctions against employers violating the act: criminal prosecution. injunction and recovery by underpaid employees of double payment, with costs of litigation assessed against the employer.

The maximum work week feature was put into effect gradually over a two-year period—44 hours per week the first year, 42 the second and then 40; and while the minimum wage was set at 40 cents per hour, it began at 2j cents for the first year, 30 cents for the next six years (except where raised sooner on recommendations of special industry committees) and then 40 cents. In 1956 the minimum wage was made $1 an hour. The original act contained a provision for the setting up of industry committees to recommend accelerating the minimum wage to 40 cents per hour or to some intermediate figure. Several such recommendations were acted on by the secretary of labour. The Fair Labor Standards act was part of the New Deal's fight against deflation by creating more purchasing power and jobs. Penalty overtime was referred to as a make-work device. Several employers co-operated by decreasing work weeks to 40 hours and maintaining weekly take-home pay by increasing hourly rates.

The administrator of this act had a large staff but lacked power to make binding decisions under the statute. His staff mainly inspected books and records of employers to see that the act was being observed. While the administrator issued interpretative bulletins. compliance with his edicts did not protect any employer from liability to employees for back-pay claims if the courts construed the statute differently. Thus, its provisions acquired authoritative definition only in a case-by-case skirmish all the way up to the supreme court. It proved difficult to tell who was covered by the act. While it applied to everyone engaged directly in interstate commerce (with certain exceptions), it also purported to apply to all employees engaged in producing goods, etc., for interstate commerce.

The resulting litigation led to many hairsplitting decisions on who was or was not covered by the act, revolving around notions of whether or not congress had exercised its complete power to cover all workers possible. Moreover, the supreme court read so much into the term "work week" that it threatened U.S. industry with litigation for back pay involving literally billions of dollars for time spent between factory portals and the actual job. regardless of tradition and appropriate provisions bargained between employers and strong unions. Congress in 1947 passed an amendment to the act obviating this difficulty; and it also provided protection to employers relying in good faith on the administrator's bulletins and interpretations.

C. Federal Antitrust Laws After the 1930s

While the constitutionality of the New Deal labour statutes was being established in the courts. other matters affecting the legality of union conduct were developing. During the 1937 wave of illegal sit-down strikes and seizures. a Philadelphia hosiery factory was seized by unionists attempting to organize it. Much damage was done and the union prevented out-of-state shipment of a large quantity of manufactured stockings. In a suit by the manufacturer against the union for triple damages under the Sherman act, the ridiculous paradox of the prior interpretations of the antimonopoly act standing alongside the New Deal labour statutes was first revealed. In this *Apex* case the supreme court in 1940 held that, whatever laws of Pennsylvania the union had broken, it had not violated the Sherman act. Hence, the federal courts did not have jurisdiction. Justice Harlan F. Stone declared that the Sherman act could not be invoked simply because interstate transit of goods was disrupted. He noted that the object of all labour unions was to keep nonunion-made goods from competing with union-made goods in interstate markets. And he declared that attempts to achieve this result by extending organization through economic pressures were not in violation of the Sherman act. The policies of the Norris-LaGuardia and National Labor Relations acts in favour of such an objective reversed the older view But Justice Stone failed to achieve consistency by not overruling the secondary boycott precedents of the supreme court under the Sherman act, under which evidence indicating that a union prevented the shipment of goods to other states by secondary boycott pressures would establish a violation.

The Apex case was so inconclusive that a year later in *U.S.* v. *Hutcheson* the supreme court virtually removed unions entirely from under the Sherman act. That case involved a secondary boycott in interstate commerce; and the officials of the union were indicted. Here the supreme court held that congress in the Norris-LaGuardia act had "overruled" the court's 1921 decision in the *Duplex* case which had so narrowly construed sec. 20 of the 1914 Clayton act. Under the Norris-LaGuardia act. it said. congress had made it amply clear that the union practices described in sec. 4 thereof were nonenjoinable; and in sec. 13 of that act it had

also indicated that the proximate relationship of employer and employee was not necessary for the existence of the necessary labour dispute.

The court observed, however, that congress could not be deemed to have made acceptable in the eyes of equity (*i.e.*, nonenjoinable) the same conduct that would lead an offender to prison or subject him to payment of triple damages. To avoid this dilemma, the court held that the Norris-LaGuardia act, in overruling the *Duplex* decision, had resurrected sec. 20 of the Clayton act by redefining the permissible union techniques and the scope of a labour dispute more broadly, thus allowing effect to the concluding clause of sec. 20 which made the conduct therein described lawful for all purposes under the laws of the United States—including the Sherman act. Thus no violation was shown.

This reasoning of the supreme court was most peculiar, to say the least. For congress had very carefully refrained from repeating in the Norris-LaGuardia act the catchall clause of old sec. 20. Moreover, sec. 5 of the 1932 statute provided specifically that violations of the antitrust laws would not be enjoinable, thus by implication leaving them subject to the other sanctions of the Sherman act.

In any event, congress, in making these union techniques nonenjoinable, did not mean that such cbnduct was acceptable in the eyes of equity but that federal judges could not be trusted with equity jurisdiction in labour dispute cases.

Nevertheless, the *Hutcheson* case took the nonviolent and nonfraudulent economic activities of the labour unions completely out from under the Sherman act, except when it could be shown that unions were colluding with employers in effecting restraints of commerce which would be illegal for the employers to do unaided. In the 1945 *Allen Bradley* case. a large local union in New York city had set up an embargo, implemented by secondary boycott pressures, against the importation into that area of any competing products from outside, whether or not they were union-made. This enabled local producers to charge twice as much in New York for goods sold elsewhere competitively with goods manufactured in other areas. The supreme court approved enjoining only the co-operation between the union, producers and installation contractors in finding out the "leaks" and stopping them with union economic pressures. This left the union free to continue the embargo without assistance from the employers; and it continued to circumvent the policies of the Sherman act while the local producers stood by passively and reaped the benefits of monopoly.

Subsequent attempts to draft legislation making the antitrust laws applicable to labour union activities failed, since in this approach it is hard to avoid curtailing their acknowledged legitimate objectives and techniques. Leading academic authorities believe that labour unions are necessarily monopolistic and that their objectionable activities can practicably be prevented only in statutes like the Taft-Hartley act *(see* below).

D. Picketing

1. Picketing as a Pressure Device.—The New Deal labour legislation spurred unions on to organize all units of all industries—not only to standardize working conditions but also to build up the financial and political strength of the unions themselves. Nothing in these federal laws as yet restricted their use of economic organizational pressures; and a few of the states had already conceded the legality at common law of the favourite union organizational techniques—peaceful stranger picketing and the secondary labour boycott. Stranger picketing occurs when a union moves in on a plant where it has no members, in an attempt to persuade the employees to join the union and strike or otherwise co-operate in organizing the picketed employer. And by peaceful picketing is meant picketing which is nonviolent, nonmass, nonlibelous and nonfraudulent. These types of organizational pressure, both at common law and in the context of a statutory labour dispute, received a broad interpretation by the New York courts in 1937. A union of meat products workers, unable to organize a nonunion manufacturer by picketing his factory, began to picket his retail outlets to persuade consumers not to patronize such stores unless they, in turn, ceased handling the manufacturer's nonunion-made products. Perceiving a "unity of economic interest" between the manufacturer and these retailers, virtually identifying them as nonunion enterprisers, the New York court permitted the union thus to picket the nonunion product. This is what is known as secondary stranger picketing.

Also in 1937 the U.S. supreme court handed down the far-reaching decision of *Senn* v. Tile *Layers Protective Union.* Senn was a tile-laying contractor who, with two or three employees, worked on his own jobs, netting around $1,500 per year, half of which was attributable to his own actual work on his jobs. The tile layers' union wanted to raise employment standards in the industry and confine all available work to its members. It asked Senn to employ only union members and cease working on jobs himself. And it told Senn that he could not become a member of the union himself as a journeyman because he lacked the required apprentice training. On Senn's refusal to comply, the union picketed his office and any premises where he was laying tile under contract. All this virtually put an end to Senn's business; so he sued in the Wisconsin courts for an injunction.

Under its prototype of the federal anti-injunction act, the Wisconsin supreme court denied an injunction, declaring the union's peaceful picketing lawful; whereupon Senn appealed to the U.S. supreme court on the ground that the Wisconsin statute was unconstitutional under the 14th amendment in permitting such picketing. By a 5 to 4 vote the court upheld the Wisconsin statute. The real issue was whether a Wisconsin statute could make lawful a course of conduct like stranger picketing that had hitherto been regarded as tortious. For in a previous 1921 decision the U.S. supreme court had held that an Arizona anti-injunction act based on sec. 20 of the Clayton act was unconstitutional when construed to make nonenjoinable picketing with libelous banners. But Justice Louis D. Brandeis declared that peaceful stranger picketing was permissible at common law, because of the justification based on economic interest, although this was a minority view dating back only to 1927. Hence, he said that the 1921 precedent did not apply and that the Wisconsin statute was constitutional. His opinion has been generally misconstrued to mean that peaceful picketing was constitutionally protected freedom of speech. Actually Brandeis said only that a state may constitutionally permit peaceful picketing. The four dissenting justices denied that proposition, indicating that small enterprisers like Senn had a constitutional right to continue work as they saw fit, free from the molestation of union picketing. But it was already established that nonunion workers had no constitutional right to be protected in securing or retaining employment unconditional on membership in a union. And Senn could hardly be accorded any greater rights than such individual workers. Although the *Senn* decision seems sound, even on common-law principles and aside from legislation, the Wisconsin legislature thereafter changed its anti-injunction act to cover only labour disputes between those in the proximate relationship of employer and employee.

2. Picketing as "Free Speech."—In 1940 the whole approach to peaceful picketing underwent a fundamental change. States reacting against the prounion New Deal legislation began to outlaw peaceful picketing by statute and court decisions. One Thornhill was convicted under an Alabama statute for peacefully picketing; and his conviction was sustained by the state supreme court. Assailing the constitutionality of the Alabama statute, Thornhill appealed to the U.S. supreme court, which declared the statute unconstitutional on the grounds that peaceful picketing was constitutionally guaranteed freedom of speech.

While this notion was not new, it had never been taken very seriously by the legal profession. Indeed, most judges had once regarded peaceful picketing as a nonexistent paradox, believing that all picketing was intimidatory, coercive and tortious. In any event, the legal presumption had always been against picketing; and only three years before the *Thornhill* case, the U.S. supreme court was split 5 to 4 on whether or not a state might constitutionally permit peaceful stranger picketing. Hence the 1940 *Thornhill* precedent was a drastic change. While many people believe it was sound, this decision of the supreme court seems

to have been a serious blunder. Correctly analyzed, peaceful picketing is an economic pressure technique closely related to the strike and secondary boycott, used to further union organizational and collective bargaining undertakings. Indeed, it is a favourite method of engineering secondary pressures. It is not necessarily coercive, because unionists can and do picket peacefully without endangering or coercing anybody physically. Concededly it is a type of communication, which lends plausibility to the conclusion that it is a speech form entitled to constitutional protection. But other forms of communication, such as an employer's statement about unionism to his employees or verbal arrangements among businessmen subject to the antitrust laws. not to mention defamation. fraud, blackmail, blacklisting and invasions of the right of privacy, are all subjects of valid legal regulation or restriction. Peaceful picketing is, it seems, merely a form of economic pressure in pursuit of self-interest and gain which should be subject to legislative regulation exactly as other forms of economic pressure, such as the strike and secondary boycott, are.

3. Decline of Picketing as "Free Speech." — After 1940, however, the supreme court itself drastically modified the *Thornhill* precedent. After deciding that Illinois could not draw a circle of permissible activity so narrow as to permit only picketing by strikers and to exclude stranger picketing, it allowed Texas to enjoin peaceful picketing in a situation which did not fit into the Norris-LaGuardia definition of a labour dispute. But if peaceful picketing were really constitutionally protected free speech, it is hard to see what difference it would make in what economic or social context it occurred, as the dissenting justices pointedly observed in the Texas case.

In the meantime the New York courts were enjoining peaceful picketing of small self-employed businessmen, holding that there was no labour dispute under its prototype of the Norris-LaGuardia act. While this seemed an incorrect reading of the statute involved. still that was solely the affair of the New York courts. But the U.S. supreme court declared such injunctions to be invalid. In 1949, however, occurred a decision which almost completely undermined the *Thornhill* doctrine. A union of ice pedlars requested a certain ice company in Missouri to agree with other ice manufacturers not to sell ice to any nonunion pedlar. If the company so agreed it would violate Missouri's antimonopoly law, thus incurring criminal penalty. When the company refused, the union picketed its plant, thus cutting it off from 85% of its former customers whose union drivers would not cross the picket line. The ice company could stop the picketing only by complying with the union's request, which would be criminal. The Missouri courts enjoined the picketing; on appeal the U.S. supreme court upheld this injunction.

The ice pedlars' picketing was certainly a labour dispute within the meaning of the Norris-LaGuardia act. h'evertheless. the supreme court reasoned, if compliance with the picketing would involve the company in violation of a valid state statute, then the picketing might be enjoined. Here the states found a way around the *Thornhill* precedent, simply by making it unlawful for the employer to do that which the union sought to persuade him to do by its peaceful picketing. Of course, most lawyers thought that it was still unconstitutional for states to outlaw picketing directly or indirectly by making the picketing union's objective unlawful. But shortly thereafter the U.S. supreme court extended its undermining of *Thornhill* in three other decisions.

An association picketed to compel a store to hire Negro clerks proportionate in number to its Negro customers. This was a technical labour dispute; but the California supreme court. without a statute, thought such a practice of proportional hiring was unlawful discrimination against non-Negroes and declared the picketing enjoinable. This approach smacked of the old and disapproved judicial illegal purpose doctrine. The U.S. supreme court later let the state of Washington enjoin peaceful picketing of an employer intended to make him influence his employees to join the picketing union, although it was not illegal for this employer to exert such pressure on his employees but was merely contrary to the public policy declaration of a state statute. Also it held that the state of Washington might enjoin picketing designed to make self-employed businessmen-workers organize and abide by the union rules, although compliance by these businessmen with the union's request was not illegal, such picketing simply being contrary to the state's public policy as declared by its courts. This, of course, mas directly opposite to the supreme court's position on the New York cases mentioned above.

The final blow to the *Thornhill* doctrine occurred when the U.S. supreme court declared that attempts by picketing to exert secondary boycott pressures in violation of sec. 8(b)(4)A of the amended National Labor Relations act, title I of the Taft-Hartley act, were illegal and enjoinable practices. If congress or a state legislature or court can make unlawful the exercise of pressure in connection with a labour dispute under certain conditions, the use of peaceful picketing to implement such pressures is no longer protected under the constitution.

Thus, virtually nothing remained of the *Thornhill* doctrine except a constitutional prohibition against statutes or decisions directly outlawing peaceful picketing as such, regardless of the context in which it occurs.

E. National Labor Relations Act: Crucial Issues

In the meantime the federal courts were giving fairly precise definition to the National Labor Relations act, as it was construed and applied by the board. One of the most important phases of this development concerned the difference between so-called "protected" and "unprotected" activity. Section 7 of the NLRA guaranteed to employees the right to form unions and "to engage in concerted activities for the purpose of collective bargaining or other mutual aid or protection." The board took a broad view of the conduct employees might collectively engage in while remaining immune from employer retaliation, by discharge or otherwise. Consider, for instance, the so-called sit-down strike. Although several prominent educators and outstanding liberals defended the sit-down seizures of 1936–37 as lawful, they were obviously completely illegal. The Fansteel company discharged participants in a sit-doan strike and the NLRB ordered their reinstatement with back pay, after finding that company unfair labour practices had provoked the strike. The U.S supreme court held this order unenforceable. declaring that the NLRB did not have the discretionary power to reinstate workers who had engaged in such illegal conduct; *i.e.*, such activity was not protected under the guarantee in sec. 7. The board had thought itself endowed by congress with discretion to reinstate discharged employees when it believed such remedy was necessary to effectuate the policies of the act. But the supreme court held otherwise.

The board itself later developed precedents indicating that concerted attempts by employees to make their employer do something illegal, such as granting a wage increase without approval from the government during a period of wartime controls or disregarding an NLRB certification. mere unprotected so that the employers might with impunity discharge the employees concerned. But the line between protected and unprotected recourse to concerted economic pressures, such as refusals to do the work assigned or to follow the schedule imposed by the employer, remained a close one, with the federal courts taking the view that employers could discharge employees who behave outrageously, although not necessarily illegally, while engaging in concerted activities.

Another aspect of the NLRA mas the expansion of the employer's duty to bargain in good faith. This duty was originally imposed to prevent employers from discouraging unionism in previously unorganized industries by refusing to recognize and bargain with newly formed unions. It was ultimately used, however, to enlarge the scope of subject matters concerning which employers are obliged to make offers and concede bilateral control. Probably the original purpose of this duty to bargain had reference to conventional and traditional contractual items — wages, hours, seniority and the like. But it was used to expand the collective agreement to cover areas where employers would prefer and need exclusive control and would resist all union demands and strikes if left free to do so. Likewise unions used this duty to secure bilateral control of matters for which they would probably not

strike. With strong unions this duty of employers to bargain in good faith, therefore, proved to be no longer needed, although its original purpose was still served in areas where union organization lagged.

Another development concerns expansion of employers' freedom to discuss unionism with their employees. Originally they had no right to comment on unions at all. But after the U.S. supreme court recognized peaceful picketing as constitutionally protected free speech, it developed an area of immunity for employers, as long as they refrained from coercive or threatening language and did not simultaneously engage in any overt antiunion conduct which could lend a coercive implication to otherwise innocent speech. One aspect of this was the so-called "captive audience" doctrine. When an employer paid his employees to sit and listen to him make a speech which in itself was not violative, but refused to grant a union on its request an opportunity to reply, the board held that the employer's speech was not constitutionally protected, especially if the speech were timed just before a board election. This captive audience doctrine was modified—if not practically abolished—by the Taft-Hartley amendments and later board and court decisions, much to the dislike of labour unions.

F. Taft-Hartley Act

In 1947 congress passed over Pres. Harry S. Truman's veto the Labor Management Relations act of 1947, commonly known as the Taft-Hartley act. Although many union leaders denounced it as a "slave labour" act, it was rather an attempt to curb the effects of greatly increased union power in the industrial economy. Of the five separate titles to this act, title I, the amended National Labor Relations act of 1947, proved the most important.

The 1947 NLRA basically modified the original National Labor Relations act. It increased the board to five members and it made the general counsel independent of the board, giving him alone the function of filing and prosecuting complaints. This change made the board more like a labour court, placing emphasis on its judicial function and relieving it of the former charge that it acted as prosecutor, judge and jury.

1. Union Unfair Labour Practices. — The most conspicuous change was the creation of union unfair labour practices. Under sec. 8(b) unions would commit unfair labour practices if they engaged in the following conduct: (1) coercing or restraining employees in their autonomous choice of a union or employers in their choice of bargaining representatives for themselves; (2) compelling an employer to discharge any employee under a union-shop contract for any reasons other than the nonpayment of initiation fees or reasonable monthly dues; and (3) refusing to bargain in good faith — an ambiguous requirement not fully understood in the mid-1950s. Section 8(b)(4) set the most important of the new restrictions on unions. Subsection A made it an unfair labour practice for a union to exercise pressure on any employer through his employees to cause him to cease dealing with another employer as a means of focusing compulsive pressure on the latter employer. This is the secondary labour boycott. But this subsection would not be violated if the neutral employer on request agreed to help the union by ceasing to deal with another employer. The initial pressure on the neutral employer must be exercised through his employees to show a violation. Such initial illegal pressure might occur through peaceful picketing, which the supreme court held in this particular context not to be constitutionally protected free speech. Subsection A unfortunately proved so ambiguous that it lent itself to the prohibition of union activities long recognized as legal and not, strictly speaking, secondary boycotts at all. Under subsection B such secondary pressures might not be used to force another employer to recognize and deal with a union, unless such union had been certified by the board to such other employer. This subsection curiously seemed to permit secondary pressure through a neutral employer when such certification existed—an unnecessary sanction in view of the board's power to proceed directly against the employer refusing to honour the board's certification. Subsection C prohibited a union from compelling recognition from an employer to whom another union has already been certified by the board. And subsection D outlawed the old-fashioned jurisdictional strike, where union X strikes a general contractor who assigned certain work to the members of union Y, each union contending that its members have sole jurisdiction over the right to do such work. The board might resolve such jurisdictional disputes and make an award to the group it believed should do the work. In title III of the Taft-Hartley act these last four union practices were made the basis of actions for damages by injured employers. And in dealing with complaints concerning these four union practices, the board might secure injunctions to prevent their continuance. pending its hearing and disposition of these alleged violations. Section 8(b)(5) made it unfair for a union acting under a lawful union-shop contract to set excessive initiation fees and dues, and sec. 8(b)(6) prohibited union pressure to make an employer pay an exaction for services not performed — an attempt to stop "featherbedding."

2. Employer Unfair Labour Practices. — Section 8(a) dealing with employer unfair labour practices remained substantially as it was under the Wagner act, with one major exception — in sec. 8(a)(3). Under the old subsection an employer might condition employment on membership in the contracting union under a valid closed- or union-shop contract. But the new subsection outlawed the closed shop. At first a union shop was permissible only after a majority of the workers in the bargaining unit had authorized the union in an election to bargain such a contract; but this union-authority election became unnecessary in 1951. In sec. 14(b) of the act, however, congress permitted state laws against any form of union security to take precedence, so that in the territorial limits of a state which outlawed all union security, an employer would not be privileged under sec. 8(a)(3) to discharge an employee who refused to join a union under an otherwise valid union-shop contract.

In the mid-1950s there were about a dozen of these state laws, commonly known as "right to work" statutes. Although the unions attacked the constitutionality of such statutes, they were upheld by the U.S. supreme court on the ground that there is no constitutional right to have a closed or union shop. In 1952, however. congress amended the Railway Labor act to allo railroads and their unions to make union-shop contracts. This federal provision for union security obviously took precedence over conflicting state "right to work" statutes, since the Taft-Hartley act did not apply to the railroads.

3. Other Changes in the NLRA.—To continue with the amended National Labor Relations act of 1947, sec. 8(c) purported to eliminate from consideration of conduct in violation of sec. 8(a) and 8(b) the expressing of any views or arguments in the usual verbal forms. This provision had little, if any, effect in changing the state of the law prior to 1947, although arguably it was responsible for the subsequent modifications in the "captive audience" doctrine, discussed above.

Section 9, dealing with representational issues, underwent some changes. An employer might deal directly with an employee over grievances; the facilities of the act were no longer made available to supervisory workers; and the board was given less freedom in designating bargaining units. New rules were set governing the eligibility of workers or strikers to vote in board elections and the disposition of runoff elections. Also unions to be eligible to use sec. 9 procedures were required to file certain fiscal information with the U.S. department of labour; and their officers had to take the anticommunist oath. The balance of the amended National Labor Relations act was much the same as the original Wagner act, with a few modifications concerning the board's powers of enforcement and judicial review of board orders.

4. National Emergency Strikes. — Title II of the Taft-Hartley act dealt with so-called national emergency strikes. It set up the Federal Mediation and Conciliation service to act in the adjustment of labour disputes which threaten widespread disruptions of commerce. Thus if the president believed that a big strike would tie up the nation's economy, he might appoint a special board to investigate and to report the facts to him, although this board was not to make any recommendations. Thereafter the president might conclude that there was an emergency and direct the attorney general to secure a court injunction against continuance of

the strike. Such injunction could last 80 days, after which it was to be dissolved. But before such time was up, the National Labor Relations board was empowered to hold an election among the striking employees to determine from them whether or not the employer's last offer was acceptable to them. None of this applied to the railroads, since a separate emergency provision was included in the Railway Labor act. The emergency provisions of title II had been invoked several times by the mid-1950s and proved tolerably effective.

5. Private Actions By and Against Unions. — Title III of the Taft-Hartley act provided for actions at law between unions and employers for breaches of contract, thus in the federal jurisdiction allowing unions as such to sue and be sued for the first time in this particular situation. It also placed extensive restrictions on payments to union representatives. apparently in an attempt to stop graft. Another provision forbade unions to contribute money to the support of political candidates; and the concluding provision forbade government employees to strike, on pain of immediate discharge. although unfortunately no device was established to allow them to air legitimate grievances or demands. Title IV of the act simply provided for the creation of a joint committee of industry and labour representatives to study and report periodically on basic problems of labour relations; and the last title of the Taft-Hartley act merely consisted of a few definitions. The whole statute, under constant fire from the unions, proved to be a major political issue. To the extent that it restrained any of their freedom of activity. the unions were against it. But some restriction on union poner seemed essential, just as it was on the power of employers.

G. Other Developments

1. Federal Pre-emption *v.* States' Rights. — With the expansion of federal jurisdiction under the commerce clause of the U S. constitution. the doctrine of federal pre-emption assumed greatly increased importance in the field of labour relations law. Its application enabled a uniform labour law policy throughout all industry engaged in or affecting interstate commerce. Thus the various states were prevented from enacting and applying legislation in conflict with the prevailing federal labour law, except where such state laws covered purely local matters not affecting interstate commerce or where congress expressly permitted the states to apply conflicting rules within their territorial limits to matters affecting such commerce. Since the U.S. supreme court virtually discarded the old concept of substantive due process as a device for declaring social legislation unconstitutional, this new doctrine came to serve as the means for keeping the states in line. Of course, the substantive due process concept was formerly used to prevent legislation favourable to labour in general. But it had to be abandoned to make may for the wave of social legislation occurring in both state and federal areas during the New Deal period. As the federal policy became more favourable to labour than the policy in the several states, this new constitutional doctrine of federal pre-emption was used to prevent the states from applying antiunion regulations.

Several states passed labour relations acts somewhat analogous to the National Labor Relations act, including prohibitions against stated unfair union labour practices. Others passed laws forbidding strikes without compliance with certain rules, such as notifying state mediation officials, sanction by majority vote, etc. Some of these state laws were held to interfere with the free recourse to unhampered concerted activity guaranteed to workers falling under the federal jurisdiction. For that reason they were declared unconstitutional. The guarantees referred to, of course, appear in sec. 7 and 13 of the National Labor Relations act. As a result of this conflict of jurisdiction, many union concerted activities which would be held unprotected and illegal under state laws were deemed to be protected and lawful by the U.S. supreme court.

There have been some very close decisions on this issue, some of them also concerning the power of state labour relations boards to conduct representational proceedings in plants falling under the federal jurisdiction but where the National Labour Relations board had not assumed or, because of some policy, expressly refused to act. Apparently the general view in the late 1950s was that where congress had jurisdiction to legislate at all and had empowered a federal agency to intervene, whether or not it had so intervened. the states were excluded from acting at all. And this was so, whether the result was to afford protection to certain concerted union activities or to declare them violations of the federal law. If they mere violations, then only the appropriate federal agency was empowered to declare them to be such. About the only things left for the states to handle in industries affecting interstate commerce were those fen concerted activities generally recognized to be unprotected, which also did not fall within some expressed federal category of prohibition under sec. 8(b) of the National Labor Relations act.

Another aspect of federal pre-emption occurred in connection with the various state statutes aimed at local strikes in public utilities, where the utility falls under federal jurisdiction but the strike is isolated and has only a local disruptive effect. Several states outlawed such strikes, substituting compulsory arbitration of the demands in issue. Thus the community would continue to receive service while the demands of the union were settled by a board of arbitrators on the basis of wages and other working conditions prevailing elsewhere for similar work under like circumstances and generally in line with labour standards freely bargained in industries where strikes were still permissible. Reputable authorities believed that such state statutes would be constitutional since title II of the Taft-Hartley act dealt with nation-wide strike emergencies, making it appear that congress had left local emergencies of this kind to be handled by the states. Furthermore. in departing from the concept of substantive due process, the U.S. supreme court had declared that the states would henceforth be free to deal locally with injurious practices, even in the labour relations field, But when one of these state public utility statutes was tested in that court, it was held unconstitutional under the doctrine of federal pre-emption because it interfered with the federal guarantees, in sec. 7 and 13 of the National Labor Relations act, of freedom to engage in concerted union activities and to strike.

The conflict between federal and state power involved in this matter of federal pre-emption is a burning political issue. It is most vital in connection with the regulation and prohibition of concerted union activities thought objectionable both in the states and by congress. The supreme court has insisted that the appropriate federal agency alone deal with these matters if the employers concerned are involved in interstate commerce. Yet the National Labor Relations board was not provided with financial facilities or personnel to cope with the task adequately. Congress may give by express legislation the power to allow the states to handle any aspects of such matters and to dictate the methods of their doing so in order to maintain a uniform labour policy. In the meantime the states were occasionally tempted to deal with the situation directly in a manner plainly unconstitutional under accepted theory — a step which would perhaps prove to be the opening gun in the struggle for the return of a greater share of power to local government.

2. Wartime Controls. — With the manpower shortage and increased production in World War II came the imposition of controls over almost all aspects of the U.S. economy, including wages. Some workable substitute for strikes became necessary when the unions pledged to abstain from striking for the duration of the war. Immediately after Pearl Harbor, a tripartite War Labor board of 12 was set up consisting of four public members, four members representing industry and four representing unions.. Acting under executive authority, the board evolved a technique of control over wages and over labour disputes dealing with nonwage aspects of collective bargaining. The wage control was governed by the so-called "little steel" formula, which was to keep wages down to 15% more than the Jan. 1941 level with allowances for inequities and inequalities of various kinds. The War Labor board and later the Wage Stabilization board considered and acted upon voluntary applications for wage adjustments filed by employers and unions jointly, or disposed of union petitions for wage adjustments which were opposed by employers. Controls over other aspects of collective bargaining were evolved in general policies promulgated

by the board. Thus, the board proceeded on the assumption that it would not permit the inclusion, in collective agreements developed under its tutelage, of novel developments not already fairly generally appearing in such contracts before the war. There were, of course, exceptions to this over-all policy, and a grievance procedure with arbitration as the final step was included in all agreements. Since some prewar collective bargaining agreements provided for arbitration of grievances, this was merely the extension of an acceptable precedent.

The unions wanted the War Labor board to include in agreements provisions for the closed or union shop; but the board would not do that, except where the previous bargaining history indicated the existence of such an arrangement. Rather, it invented a modified sort of union security called union maintenance. Thus, everyone in a union when a contract was signed had 1 j days to withdraw from it. Those who did not thus escape from the union were required to remain in it for the life of the agreement as a condition of retaining employment. This compromise was assailed bitterly by some employers and by the industry members of the board.

The War Labor board had regional offices and local boards, also on a tripartite basis: and the actual hearings between employers and unions where records were built up for submission with recommendations, first to the regional board and then to the big board in Washington, D.C., were conducted before panels of three—industry and union members with a public member in the middle as chairman. Much care had to be taken by the War Labor board and its subordinate boards, panels and workers not to invade the proper province of the National Labor Relations board. The functions of the War Labor board were primarily agreement making or resolving still unsettled issues between employers and unions, whereas the National Labor Relations board's functions were quite different.

During the war, congress passed the War Labor Disputes act under which the government was authorized to seize plants at which occurred labour troubles serious enough to hamper the war effort. But an exceedingly small percentage of manpower hours was lost during the war by strikes and relatively few seizures had to be made by the government because of either employer or union refusal to observe the necessarily stringent wartime labour policy. Seizure of strike-bound plants became a recognized technique of government control during wars or unlimited emergencies. But the steel-industry seizure by President Truman in 1952 during the Korean War resulted in the supreme court's declaration that such action must be authorized by congress and is not within the executive power? especially when the alternative procedure against the union was already established law in title II of the Taft-Hartley act. In any event, experience revealed that government-dictated settlements of labour disputes, except during war, are most unsatisfactory.

3. Judicial Enforcement of Collective **Agreements.**—With thousands of collective agreements suddenly coming into being, the problem of their enforcement became acute. These labour agreements were not regarded as true contracts but, rather, as "gentlemen's agreements," or like treaties, not legally enforceable in themselves. This is partly because labour unions have no legal personality to become parties to contracts or lawsuits except as a result of legislation in a few states and, for certain purposes, in some federal legislation. It is also because they lack the technical requirements of enforceable business contracts such as consideration or mutuality of obligation. The prevailing theory of the collective agreement is that of a series of concessions by management for which the union gives nothing in return. The introduction of "no strike" clauses into these agreements modified this theory somewhat.

Traditionally individual employees may sue employers for damages sustained by nonobservance of contract terms. But this is expensive and time consuming, while the parties become enmeshed in legal technicalities. Furthermore, the law in this field varies from state to state; and the same master agreement between a corporation with plants in ditierent states and an international union with various locals will thus not receive a uniform interpretation. Moreover, collective agreements lasting one or two years are replaced by other contracts before the courts have interpreted the first ones.

4. Arbitration of Grievances.— As a consequence, most collective agreements were enforced in the mid-1950s by private arbitration voluntarily agreed to between the parties. They select their own impartial arbitrators who act for a fee, the parties dividing the fee and expenses equally between them. All grievances arising under collective agreements which are not settled during the earlier steps of their contract grievance procedure are thus submitted to arbitration and are usually disposed of within a few weeks of the time they are heard, the awards by agreement being final and binding on the parties.

Courts will enforce awards against employers who refuse to obey them if the arbitrator has not exceeded his jurisdiction nor acted capriciously. If the employer wins the arbitration award, there is nothing to enforce, because the grievance is an attempt to secure something that the employer has denied under the contract. In the absence of statutory provision, most courts will not enforce agreements in contracts to arbitrate future disputes not yet in being at the time the agreement was made. But an employer who did not honour such a commitment to arbitrate would be guilty of bad faith which would jeopardize his future relations with his employees. Some states made it an unfair labour practice to refuse to arbitrate under such conditions.

Of the thousands of arbitration awards constantly being handed down, few get into the courts. And a common law of industrial relations is steadily building up in the accumulation of such awards, many of which are publicly printed. Such decisions are carefully studied by employers and unions and have a real influence on the future bargaining between the parties. But most arbitrators are reluctant to follow such precedents where the language differs from agreement to agreement and the conditions underlying different grievances vary. Nevertheless, trends toward uniformity are perceptible in this fast-growing and intricate development of grievance arbitration.

5. Miscellaneous Federal **Laws.**—The foregoing account has emphasized the most important developments of statute and decision law in the labour field, in the light of changing constitutional theory. In concluding, a few others deserve brief mention. In 1936 congress made it a crime to transport and use professional strikebreakers in interstate commerce, a practice which the National Labor Relations act more effectively suppressed. Previously, in 1934, congress had passed the so-called Antiracketeering act, to prevent compelling payments for services not rendered in interstate commerce by racketeers acting under the guise of labour unions; but this criminal statute did not prevent such objectionable conduct by members of legitimate labour unions. In 1946 congress passed the Lea act to prevent unions from compelling employers to hire unnecessary employees. The supreme court upheld this statute, even though it made guilt depend on the ambiguous test of what an employer said were unnecessary employees. Such attempts to make "featherbedding" criminal are unwise because they leave employers free to introduce the speed-up. A more satisfactory solution would result from effective collective bargaining or coverage in the Taft-Hartley act.

Before state workmen's compensation statutes were adopted, congress in 1906 passed the Federal Employers' Liability act to facilitate recovery of damages by employees injured on interstate railroads. This was not a true compensation act, contemplating actions at law based on the employer's negligence, with elimination or modification of the common-law defenses like the fellow-servant rule, contributory negligence and assumption of risk, particularly where the railroad violated the federal Safety Appliances and Equipment act. It seemed in the late 1950s politically impossible to supplant this scheme with a true compensation act, since the railroad unions preferred it. For no limitation on the amount of recovery was set as in a true compensation act. Furthermore, this act permitted suits to be brought in state courts; and the G.S. supreme court later demonstrated a tendency to reverse the decisions of state supreme courts for railroads based on findings of no evidence of negligence, ordering such cases to be submitted to juries. This process usually resulted in verdicts far more sub-

stantial than the recoveries allowed in compensation acts. Congress in the Jones act of 1920 provided that the industrial injuries or deaths of seamen were also covered by the same act. But in 1927 it established a strict compensation plan to cover industrial injury and death of longshoremen and harbour workers.

6. Internal Affairs of Unions. — Concerning the internal affairs of labour unions, the common-law tradition has been generally to leave them alone. Courts will interfere when disputes arise concerning the disposition of union property; but they seldom lend assistance to ousted union members except when property interests are involved, and then only when the ousted member has exhausted the remedies provided in the union's internal laws or can show an arbitrary denial of due process in administering such remedies. In the late 1950s unions could still generally exclude anyone from membership, for any reason, except under a few state laws prohibiting exclusion on grounds of race, religion, national origin or political belief. But a change in that general rule seemed likely, since unions selected by a majority of the employees voting in a bargaining unit secured by statute the exclusive right of representing all employees in such unit, whether or not they belonged to the union. For instance, a union enjoying statutory powers of exclusive representation could no longer have at the same time a closed (or union) shop and a closed union, thus being able to deny employment to those whom it did not want to accept as members. But under union security agreements, unions still seemed free to exclude unwanted employees from membership as long as they did not try to get them discharged because of nonmembership. For such a contingency, some unions created "auxiliary" unions, thus affording a second-class nonvoting membership; but this arrangement was merely a device to get the dues of the unwanted members, while excluding them from any participation in the union's affairs.

Most courts still held in the mid-1950s that employees excluded from unions were adequately protected if they were not also excluded from their jobs. They said that such employees were sufficiently accorded their rights when they were given the opportunity to vote for or against the contracting union, or for another union. But minority groups excluded from membership in the contracting union do not have any voice in shaping its policies, although their interests are entirely under its control. There was some judicial authority that federal and state statutes endowing unions with exclusive bargaining representation should be held unconstitutional unless all members of each bargaining unit are enabled to participate in running the union's affairs by enjoying a voting membership in such union.

7. International Aspects. — In concluding this account, it may be observed that developments in United States labour law have little or no impact on the international scene. While the immigration and naturalization program was originally centred in the U.S. department of labour, probably because of the influence of mass immigration on the labour market, its administration was relegated to the department of justice. Almost the only remaining official connection with the outside in labour matters was U.S. cooperation with the International Labour organization, devoted to the improvement of basic labour standards throughout the world. As U.S. internal labour standards are improved, it is to U.S. interest to have similar standards introduced in all other industrial countries, especially in those with whom that country expects to compete in selling goods in the world markets. For U.S. goods cannot compete favourably in such markets if its labour costs notably exceed those of competitors in other countries. The United States co-operated mildly in supporting this program, especially since it became easier for federated nations like the U.S. to support some of the organization's conventions or treaties without precipitating the political difficulties commonly encountered in the consideration of most treaties. Possibly the lack of great interest in the International Labour organization and its program was because its effect is not directly discernible internally. *(See* also CLOSED SHOP; HOURS OF LABOUR; INDUSTRIAL RELATIONS; SOCIAL SECURITY; TRADE [LABOUR] UNIONS, etc.)

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III. ENGLAND

A. PROTECTIVE LABOUR LAW

The whole of the strictly protective laws in England are found in acts of parliament and in orders issued in pursuance of those acts. The acts must be read in the light of judicial decisions of the high court, the court of appeal and the house of lords interpreting them. For the law regulating the contractual relations of employer and employed, it is necessary to examine in the first place the English common law, the principles of which have to be deduced from the judicial decisions of many centuries. For certain purposes rules of equity also must be remembered, although it is no longer necessary in practice to distinguish whether any rule has its origin in common law or equity. But these unwritten rules of law and equity have been greatly developed and overlaid by statute law, which in its turn must be read in the light of judicial decisions interpreting it.

The protective labour law of England (*i.e.*, that part of the law which requires employers of labour, under penalty, to observe certain rules for the protection of the persons they employ) is to be found in a multitude of statutes and orders. The fundamental object of all these measures is to secure to the workers a minimum standard of safety, health and well-being in the various industries and occupations. They deal, in the first place, with industrial methods and processes and the construction and installation of workplaces affected (*e.g.,* by prescribing standards of sanitation and ventilation, measures for preventing accidents, the use of apparatus for drawing off injurious fumes or dust or even by entirely prohibiting the use of certain materials or processes). In the second place, they regulate the hours of work of certain classes of workers considered to be especially in need of such protection or whose occupations involve special risks from long hours of work. In the third place, they exclude from work in all or certain employments persons who, by reason of age. sex or physical condition, are especially liable to suffer injury to health from industrial employment in general or from especially dangerous occupations. The enactments dealing with these matters fall into several more or less distinct groups, dealing with (1) factories; (2) mines; (3) shops; (4) merchant ships; and (5) railways. But it must be observed that there are also acts which affect more than one of these groups. For instance, a new grouping of workplaces under the term "industrial undertaking" was introduced into English law in order to conform to certain conventions of the International Labour organization. This expression was defined in the Employment of Women, Young Persons and Children act, 1920, in such a way as to include (although not exclusively) all factories, mines and railways (as defined in the English law on those subjects), but not shops. The act also applied expressly to ships. There are other acts cutting across these divisions insofar as they affect the employment of children in any gainful employment whatever, and the Public Health acts have to be remembered in connection with hygiene in various kinds of workplace.

It will be observed that there is no mention in this classification

of measures for the protection of agricultural workers or of persons employed in office work of any kind. In England there was no special code regulating conditions of work of office workers during the late 1950s, but the Public Health acts made it the duty of the local sanitary authority to ensure that workplaces including offices should be sufficiently ventilated, kept clean and free from noxious effluvia and should not be overcrowded. There was likewise no legislation expressly for the protection of regular agricultural workers, apart from the Agricultural Wages act (see below). But again, the Public Health acts intervened regarding the accommodation to be provided for occasional workers brought from the towns, whole families together, for such work as picking hops and fruit. Provided these points are borne in mind. it will be most convenient to follow the main divisions into which English labour legislation falls and to consider appropriate parts of the subject under the headings (1) to (5) given above.

1. Special Enactments.— I. The law relating to factories covers the whole of manufacturing industry. The consolidating Factories act. 1937, was amended by the Factories act, 1948, so that English factory law is comprehended in these two enactments. In order to bring a place under the acts, it was provided that manual labour had to be exercised either in the making of any article or in the altering, repairing, ornamenting, finishing, cleaning or breaking up of any article or in the adapting for sale of any article. It was further provided that the labour should be exercised "by way of trade or for purposes of gain" and that the employer of the persons employed in the factory have the right of access or control.

English factory legislation has grown in the gradual and almost haphazard fashion characteristic of many English institutions. The early factory reformers, such as Michael Sadler and Lord Shaftesbury, had an uphill fight against the principle of *laissez faire* that ruled England's political and economic life during the early 19th century, when legislative interference was looked upon with apprehension as a bar to industrial and commercial progress. They concentrated first on removing child labour; second, on setting up a factory inspectorate. a system of government inspection of factories that was copied by many another industrial Country; and third, on reducing hours of work of women and young persons.

After the 1880s, as a result of medical and technical research, factory legislation also dealt with safety measures and with improving standards of health and comfort. This resulted in a code of subordinate or delegated legislation, called dangerous-trade regulations and welfare regulations, with the force of law. Such regulations apply to special classes of factories engaged in processes which give rise to special dangers (*e.g.*, the building trade) or where there are working conditions of special discomfort, as in laundries, bakehouses and sackmaking mills. Even the smallest undertakings come under the general provisions of the acts, contrary to the practice in some countries where the employment of a certain minimum number of workers is necessary in order to bring a workplace under regulation.

Besides workplaces falling within the above definition of a factory, a large number of special premises were specifically brought within the scope of the Factory acts. These include shipbuilding yards and dry docks, laundries carried on as ancillary to another business or for public institutions, premises used for certain processes incidental to factory purposes including sorting, bottle washing, cloth plaiting and making-up, locomotive construction and repair, printing and bookbinding, netmaking and others.

In addition to factories proper the Factories act applied certain of its provisions to other premises or processes. These were building operations, engineering constructions, loading, unloading and coaling ships in dock, electrical stations, docks, warehouses using mechanical power, shipbuilding and ship repairing. These premises, however, were not brought within the whole of the Factories act.

Thus in the case of building operations and works of engineering construction, the following provisions applied: those relating to sanitary conveniences, steam boilers, air receivers, notice of accidents, keeping of registers and posting of notices, and the power to make dangerous-trade regulations and welfare orders. In each case it was necessary to refer to the special section to see which provisions applied and which did not.

2. The law relating to mines is in two divisions, applying respectively to coal mines (including all mines of coal, stratified ironstone. shale and fire clay) and to metalliferous mines (with which for some purposes quarries are included). The acts in question are the Coal Mines acts, the most important of which is the consolidating Coal Mines act of 1911, and for metalliferous mines, the Metalliferous Mines Regulation acts, 1872 and 1875, and the Mines Accidents (Rescue and Aid) act, 1910. The Quarries act, 1894. applied certain provisions of the Metalliferous Mines Regulation acts to quarries.

3. The Shops act, 1950, only applied to retail shops, including places for the sale of food and drink for consumption on the premises. It must be noted that any operation coming under the definition quoted above in the Factories act. 1937, brings the place where it is carried on under the factory and workshop law although it is part of the business of a place that is, in the main, a shop. For instance, the making up of wreaths in a florist's shop mas held to bring the girls so employed under the Factories act although they also served in the shop (Hoare v. Robert Green Ltd. [1907] 2 K.B. 31j).

4. The Merchant Shipping acts, 1894–1908, contained provisions for the express protection of seamen, the most important being the consolidating act of 1894.

5. The acts concerned with employment on railways are the Railway Regulation act, 1893, the Railway Employment (Prevention of Accidents) act, 1900, and the Railways act, 1921.

The protective regulations affecting factories, mines, shops, merchant ships and railways can be most conveniently considered under four heads: health and safety; conditions for admission to work; hours of work and holidays; and administration.

2. Health and Safety.— Factories.— Measures to prevent injury to health from industrial conditions usually take the form of regulating the internal arrangements of the workplace. But where the use or handling of very dangerous substances is in question such measures may prove ineffective, and occasionally the drastic method of entirely excluding the dangerous element is adopted. Thus the Factories act, 1937, in compliance with the Berne convention of 1906, absolutely prohibited the use of poisonous white phosphorus in the manufacture of matches.

General provisions for protecting the health of workers in factories and for the prevention of accidents were incorporated in the Factories act, 1937.

A factory must not, while work is carried on, be so overcrowded as to cause risk of injury to the health of the persons employed therein. A factory must be deemed to be so overcrowded if the cubic space allowed for every person employed in the room is less than 400 cu.ft. Effective provision must be made for securing and maintaining sufficient and suitable lighting in every part of a factory in which persons are working or passing.

The place of employment must be safe; staircases and floor openings have to be guarded and ladders maintained in 2 sound condition.

There are special restrictions relating to the safeguarding of dangerous machinery, young persons employed on dangerous machines, self-acting machines, new machines, plants giving rise to fumes, explosive and inflammable dust, vessels containing dangerous liquids, cranes, hoists and lifts, steam boilers and containers, air receivers, water-sealed gasholders, poisonous substances, lead processes, lifting of heavy weights, shuttle kissing, processes dangerous to the eyes, work in laundries and work in underground rooms.

Normally, factories must have the certificate of the local sanitary authority that they have adequate fire escapes, and rules are laid down about the construction of exits, giving of fire warnings, fire drill and maintenance of unobstructed passageways.

Any court of summary jurisdiction has power to prohibit the use of any dangerous ways, works: machinery or plant in a factory, and also the use of a factory or part of a factory which is in such a condition or so constructed or placed that any process carried on therein would involve risk to the workers. In the matter of welfare facilities, the employer has to provide drinking water; washing

accommodation with soap and clean towels; accommodation for left-off clothing with drying facilities; facilities for sitting for all workers (individual seats of proper construction and standard being required in sedentary work); first-aid boxes, one for each group of 150 employees, each under the supervision of a responsible person.

Factory workers are also placed under specific penalties for disregarding certain provisions of the act, viz., no worker may wilfully interfere with or misuse anything provided under the act for securing the health, safety or welfare of the workers. Further, where anything for securing health or safety is provided for the use of the worker under the act, he must use it. No worker may wilfully and without reasonable cause do anything likely to endanger himself or others. In all these cases a worker is liable to be prosecuted for disobedience and to a fine of £20 in each case.

The minister may, by order, require certain kinds of dangerous occurrence to be reported even though no physical injury is caused to any person. Notification is required in all cases of the bursting of any revolving vessel, wheel or grindstone moved by mechanical power, the breaking of rope or chain used for hoisting purposes by mechanical power, outbreaks of fire affecting any room in which persons are employed serious enough to necessitate suspension of work in it for 24 hours, electrical short circuits causing five-hour stoppage and explosions of containers of gases. A formal investigation into the circumstances of any accident in a factory may be directed by the minister, and the procedure for such investigations and the powers of the court of investigators were laid down in the act.

Dangerous Trades.—In addition to the general provisions above, far more detailed rules are imposed wherever any special risk or danger to those employed is involved or where it seems desirable to make special provision for the welfare of the workers. All medical practitioners were required to notify the chief inspector of factories of the names and addresses of all persons they find to be suffering from lead, phosphorus, arsenical or mercurial poisoning or anthrax believed to have been contracted in a factory or workshop. This list of notifiable diseases was extended, by order, to toxic jaundice, epitheliomatous and chrome ulceration, poisoning from carbon bisulphide and aniline, chronic benzene poisoning and compressed-air illness.

A very important section of the act (s. 60) empowered the minister of labour to certify any particular process as dangerous and thereupon to issue regulations to obviate the dangers involved. Great progress was made during the first half of the 20th century with such regulations.. Codes of regulations were established for the following industries: manufacture of aerated water; asbestos; casting of brass; bronzing; building; manufacture, manipulation and storage of celluloid; cellulose solutions; chemical works; chromium plating; manufacture of motion-picture film; stripping of motion-picture film; loading or unloading. etc., at docks; manufacture or repair of electric accumulators; generation. transformation, distribution or use of electricity; vitreous enameling of metal or glass; manufacture of felt hats with aid of inflammable solvent; file cutting by hand; spinning and weaving of flax and tow; iron and steel foundries; grinding of cutlery and edge tools; grinding of metals (miscellaneous industries); horizontal milling machines; spinning and weaving of hemp, jute and hemp or jute tow; handling of hides and skins; use of horsehair from China and the U.S.S.R.; manufacture of India rubber; kiers in printworks; smelting of materials containing lead; manufacture of red or orange lead and of flaked litharge; manufacture of certain compounds of lead; use of locomotives and freight cars on lines and sidings; luminizing; use of magnesium in grinding of castings; spinning by means of self-acting mules; painting of vehicles with lead paints; manufacture of paints and colours; patent fuel; manufacture and decoration of pottery; making of lithographic transfers, frits or glazes; crushing, grinding, etc., of refractory material, and the manufacture of silica bricks; construction and repair of ships in shipbuilding yards; tinning of metal hollow ware, iron drums and harness furniture; use of woodworking machinery; use of East Indian wool; sorting, willeying, washing, combing and carding wool, goat hair and camel hair; lifting of heavy weights in woolen and worsted textiles; heading of yarn dyed by means of a lead compound.

Welfare Orders.—Trades not so ostensibly dangerous or unhealthy as to be suitable for scheduling and regulating under s. 60 of the act could be regulated by powers given to the minister of labour by s. 46 of the act This section authorized the issue of orders, commonly called welfare orders, where it appears "that the conditions and circumstances of employment or the nature of the processes . . . are such as to require special provision to be made . . . for securing the welfare of the workers." Welfare orders may deal with matters such as the supply of facilities for preparing and taking meals, drinking water, protective clothing, ambulances and appliances for first aid, seats in workrooms, washing facilities, accommodation for clothing and supervision of the workers.

Welfare orders have been issued for the following undertakings: bakehouses, biscuit factories; blast furnaces, copper mills, iron mills, foundries and metalworks (ambulance arrangements); cementworks; sawmills and woodworking factories (ambulance arrangements); use of bichromate of potassium or sodium in dyeing; clayworks; fruit preserving; glass beveling; manufacture of glass bottles and pressed glass articles; gutscraping, etc.; herring curing (Norfolk and Suffolk, the rest of England and Wales and Scotland); hollow ware and galvanizing; laundries; oil-cake mills; the cleaning and repairing of sacks; shell factories (provision of seats); use of bichromate of potassium or sodium in tanning; manufacture of tin- or terneplates.

Mines.—Health and safety in mines is the subject of much detailed regulation, especially in connection with the prevention of accidents. The Coal Mines act, 1911, required that there must be a responsible manager, duly qualified and officially certificated, in charge of every mine. The manager must appoint a suitable number of officially certified firemen, examiners and deputies, devoting their whole time to examining systematically the state of the mine. In addition to this, the workmen may appoint two representatives who are or have been practical working miners to inspect the mine at least once a month. Part ii of the act made provisions as to safety on such matters as ventilation, the use of safety lamps, the arrangement of shafts, the safety of winding apparatus, the state, arrangement and use of haulage roads, the support of roofs and sides, the fencing of machinery, the safety of boilers. the use of electricity and explosives, the prevention of coal dust, the inspection of the mine before work commences and during shifts and the withdrawal of the workmen when the conditions are dangerous. Part iii laid down provisions regarding health. Sanitary conveniences, it required, must be provided above and below ground. Accommodation for drying clothes and taking baths need only be provided where a majority ascertained by a ballot of two-thirds of the workmen so desire, and then only on condition that the workmen undertake to pay half the cost of maintaining the accommodation. Provisions nere also made to safeguard the men from developing fibroid phthisis from the use of drills on silicious rock and requiring the notification to the inspectors of any disease occurring in a mine and occasioned by the nature of the employment.

Part iv of the act required immediate notice to be sent to the inspector of any accident causing loss of life or fracture or dislocation or any other serious personal injury, or caused by explosion or by electricity or by overwinding or any special cause specified by order. Mineowners mere required to make annual returns giving (among other things) particulars of all accidents occurring during the year disabling any worker from earning full wages for more than three days. The Coal Mines act also provided for formal investigations into the cause of any accident. Part v of the act gave powers for the issue of general regulations for the prevention of accidents and for provision for the "safety, health, convenience and proper discipline" of persons employed in mines. In addition, special regulations might be put into operation in any particular mine at the instigation of the owner or a majority of the workmen. General regulations of a detailed nature were put in force under those powers.

Powers to make regulations for the maintenance of rescue and ambulance appliances and the training of rescue brigade and am-

bulance men are contained in s. 85 of the Coal Mines act, 1911; and the regulations in question form part of the general regulations under that act.

Shops.—The Shops act, 1950, places the obligation on employers of providing and maintaining suitable and sufficient ventilation, temperature, lighting, sanitary conveniences. washing facilities and facilities for taking meals. Seats for female shop assistants employed in the serving of customers, in the proportion of one seat to every three such persons employed, were required. The sanitary condition of shops and safety in case of fire in them are regulated also by provisions of more general application contained in the Public Health acts and local bylaws.

Ships.—The safety of merchant ships and the health and well-being of the crew are subjects of detailed regulation under the Merchant Shipping acts. The safety of ships is the main concern of shipping legislation and the safety of the seamen is part of this question, for particulars of which see SHIPPING INDUSTRY: International *Maritime Law.* A few provisions for the welfare of the seamen as such may be noted here. For instance the quantity and quality of water and provisions on board ship is an element essential to the health of seamen.

The Merchant Shipping act of 1894 dealt with the handling of complaints about deficiencies in these respects. and the act of 1906 laid down detailed requirements concerning the scale of provisions to be allowed and dealt nith the inspection of provisions and water for the crew.

Another vital matter is the provision of medicines on board. Scales of medicines and medical stores suitable for different classes of ships and voyages are issued by the board of trade. It was provided that every foreign-going ship having at least 100 persons on board must carry a ship's doctor The minimum accommodation to be appropriated for the seamen was also prescribed by law. The act of 1906 stipulated that this must amount to at least 120 cu.ft. of air space and 15 sq ft. of floor space per man.

Railways.—The Railway Employment (Prevention of Accidents) act of 1900 emponered the board of trade, later the ministry of transport, to make rules "with the object of reducing or removing the dangers and risks incidental to railway service." The employer was bound by the Notice of Accidents act, 1894 (as amended in 1906), to give notice of accidents resulting in loss of life or bodily injury such as to cause an employee to be absent at least one whole day from his ordinary work. This rule about notification of accidents applies to various other types of employment in addition to railway service, namely, any employment in the "Construction, use. working or repair of any railway, tramroad. tramway, gas work, canal, bridge, tunnel. or other work authorized by any local or personal Act of parliament" and also to the "use or working of any traction engine or other engine or machine worked by steam in the open air."

3. Conditions of Admission to Work.—The most important part of the law excluding certain classes of persons from all or specified occupations is that fixing the minimum age at which young people may first enter upon employment. In addition to this, legal provisions excluded women of all ages or below a certain age or male young persons under 18 from particularly dangerous or unhealthy processes and also excluded persons from work by reason of their physical state. Under the Employment of Women, Young Persons and Children act. 1920 regulations governing the admission of young workers to work in all industrial undertakings and also on board seagoing ships mere passed. This act purported to bring British law into exact and full conformity with tno draft conventions adopted by the general conference of the International Labour organization fixing at 14 years the minimum age for admission of children to industrial undertakings and to employment at sea respectively For the definition of industrial undertaking, the act merely referred to the text of the first-named convention, given as a schedule to the act. Because of the international purpose of this measure, no attempt was made to draft a rigid definition of the undertakings covered, but these were expressly declared to include. (1) mines; (2) "industries in which articles are manufactured, altered, cleaned, repaired. ornamented, finished, adapted for sale, broken up or demolished, or in which materials are transformed, including ship-building and the generation. transformation, and transmission of electricity and motive power of any kind"; (3) works of construction and maintenance of all sorts; *e.g.*, of buildings, railways, docks; and (4) transport of passengers and goods by road or rail or inland waterway, including the handling of goods at docks, etc. This would appear to cover the whole ground of the British Factory acts and Mines acts and a good deal besides

The other draft convention, fixing the minimum age for admission of children to employment at sea, excluded children under 14 from employment on vessels. other than those upon which only members of the same family are employed. "Vessel" included "all ships and boats of any nature whatsoever engaged in maritime navigation, whether publicly or privately owned." The act provided that no child shall be employed in any ship except in accordance with the convention.

It was stipulated that a young person could not, up to the age of 18, start employment in a factory without procuring a certificate of fitness issued by the appointed factory doctor (*i.e.*, a medical man appointed for this purpose by the chief inspector of factories), who must examine the young person at the factory where the employment is to be carried on. He could grant the certificate absolutely or qualified by conditions as to the work for which the examinee is suitable. The Merchant Shipping (International Conventions) act, 1925, laid down the rule that young persons under 18 must be provided with medical certificates of fitness also for employment in any capacity in any seagoing ship registered as a British ship, including fishing boats. The act also prohibited the employment of young persons under 18 as trimmers or stokers in any ship.

There are also a certain number of unhealthy occupations from which young persons are expressly excluded by Factories act regulations Cnder some of these, adult women were excluded as well as young persons. In some cases the exclusion lasts only until the age of 16, instead of 18; in others girls are excluded and not boys. or until a higher age than boys. Examples of the exclusion of adult women from specially unhealthy processes are to he found in the regulations for the manufacture of paints and colours. the casting of brass, the smelting of materials containing lead, potteries, the manufacture of India rubber and the manufacture and repair of electric accumulators. Women and young persons were debarred from painting any part of a building with lead paint under the Lead Paint (Protection Against Poisoning) act, 1926, except in such special decorative work as may be exempted from the prohibition by order. Young persons employed as apprentices in the painting trade were also allowed to work with lead paint in certain circumstances.

In addition to the absolute exclusions from dangerous processes mentioned above. various regulations under the Factories act made physical fitness a condition either for starting work or for continuing in a dangerous process. For instance. in certain heavy processes in potteries medical certificates of permission to work were required for women and young persons; the regulations for chemical works required all newly engaged workers in a chrome or nitro or amido process to be provided with certificates of fitness within 14 days of beginning such work. In lead processes in the manufacture of electric accumulators, it was provided that all workers must be examined within seven days preceding or following their entering the employment. Periodical medical examination and suspension from work of the unfit were prescribed by the regulations in all cases where the risk involved is that of poisoning from lead or other industrial poisons, and this applies usually to male as well as female workers. Another statutory exclusion from employment on the ground of physical unfitness was the prohibition to employ any woman in a factory or uorkshop for four weeks following her confinement. Women were also excluded entirely from underground work in mines, both coal mines and metalliferous mines. The Coal Mines act, 1911, prohibited the employment of any woman or girl or of any boy under 16 in moving railway freight cars or in lifting. carrying or moving anything so heavy as to be likely to cause them injury.

4. Hours of Work.—In the regulation of hours of work, Eng-

lish law had not by the early 1950s passed beyond the stage of regulating the hours of only those persons considered to be in special need of protection from overwork, viz., women and young workers. Instances of the regulation by law of the hours of adult men are to be found in coal-mines legislation and in a few dangerous occupations, where the object of the limitation of hours is protection of health from too long exposure to the dangerous element. In other countries the regulation of the hours of women and children was only a step toward the limitation of hours in general, on which subject laws were to be found at mid-century in practically every European country.

This state of affairs may perhaps be accounted for by the fact that the English worker was more successful than his foreign colleagues in procuring the privileges of a short working day by his own organized efforts, without legal intervention. The English worker, in most of the well-organized trades of the country, was able to secure as part of his contract of employment a standard day of 8 hours or a standard week of 48 hours or less. This means that his normal rate of wages is payable in respect of hours worked within that limit for ordinary work, and that if he works beyond the standard limits or on Sundays or holidays, a higher rate of pay will be paid to him.

An arrangement of this sort naturally tends to make employers avoid excessive hours of work. In less well-organized trades there is the same restricting force at work wherever a wages council or an agricultural wages committee fixes. as those bodies are empowered to do, overtime rates of wages as well as ordinary rates and lays down the limit of hours to which the ordinary rate will apply. But this method of fixing standard times for work must not be confused with legal provisions absolutely prohibiting work to be continued beyond certain limits.

The protection of children from overwork or injury to health in the many jobs of ane sort or another which they may be put to do while still of school age (*i.e.,* under the age of 15) is now in England a matter for the law relating to education.

Factories. — The Factories act did not place restrictions on the hours of adult males, but the working hours of women and young persons employed in factories were limited. Limits were placed on normal hours and on overtime. The following limits mere established for normal working hours: (1) The total hours worked must not exceed 9 a day or 48 a meek (44 in the case of those under 16). The period of employment must not exceed 11 hours a day and must begin and end between 7 A.M. and 8 P.M. (in the case of workers under 16, 6 P.M.) on ordinary days; 7 A.M. and 1 P.M. on Saturdays. On the grounds of trade exigencies or the convenience of the persons employed, permission may be obtained for commencing work between 6 A.M. and 7 A.M. (2) Continuous employment was restricted to not more than four and a half hours without half an hour for a meal. If an interval of not less than ten minutes is allowed during it, the spell may be increased to five hours. The morning spell for youths over 16 may be five hours if they work with men and if their continuous employment is necessary to the men carrying on their work. (3) Sunday work is prohibited. (4) Holidays are Christmas, Good Friday and bank holidays (there are certain variations for Scotland); in lieu of any of these days, another whole day may be given, but at least half of the holidays must be given between March 15 and Oct. 1 and three weeks' notice of such substituted holidays must be posted in the factory. (j) Meals must be taken at the same hour by all employees and there must be no working during mealtimes, nor must an employee remain in a room where a manufacturing process is carried on; a notice of the hours and mealtimes must be posted. They may not be changed more than once in three months, and notice of such change has to be given to the inspector of factories. (6) An employee must not work outside the factory except during the permitted period of employment if the employee has worked that day in the factory, subject to an exception for shop employment in the case of women and young persons over 16. (7) No woman may work within four weeks after childbirth.

Meal and rest intervals need not be simultaneous in the following cases: processes necessitating work to be continuous; where different sets of persons are employed on different processes; or when different sets of persons are necessarily divided for the purpose of taking their meals in the employer's canteen.

An hour may be added to the daily hours in five-day-week factories and employment on Saturday is allowed in such factories for four and a half hours if no overtime is worked on any of the five days.

Certain regulations were passed to protect boys over 16 employed in the following processes: the smelting of iron ore; the manufacture of wrought iron, steel or tinplate; processes in which reverbatory or regenerative furnaces, necessarily kept in operation day and night in order to avoid naste of material and fuel, are used in connection with the smelting of ores, metal rolling, forges or the manufacture of metal tubes or rods, or in connection with such other classes of work as may be specified by regulations; the galvanizing of sheet metal or wire (except the pickling process); the manufacture of paper; the manufacture of glass. In occupations necessitating nightwork, a boy over 16 may be employed for not more than 6 turns a week, with at least 14 hours between each turn. He may not be employed between midnight and 6 A.M. in two consecutive weeks, nor more than 56 hours a week or 144 hours in three weeks, and no overtime may be worked. In other work, he may be employed under the shift system between 6 A.M. and 10 P.M. but for not more than 6 turns a week, and with 14 hours between each. The maximum weekly hours are j6, and no overtime may be worked.

The following limitations were placed on the factory overtime employment of women and young persons over 16: (1) not more than 100 hours per year overtime may be worked; (2) not more than 6 hours per week may be worked; (3) it must not take place in more than 25 weeks in the year; (4) the total hours worked in any day must not be more than 10 (in five-day-week factories, $10\frac{1}{2}$); (5) the maximum period of employment each day is 12 hours and must be within the limits already fixed, *i.e.,* 7 A.M. and 8 P.M. (but in the case of women only, it can be 9 P.M.).

In calculating overtime, all time in which any employee is working overtime in that department must be included.

Provisions were made for relaxations of the above overtime limits. Apart from the power of making regulations for factories subject to seasonal or other pressure, the minister of labour was authorized to sanction by order a higher weekly overtime or a greater number of weeks per year in the case of unforeseen pressure of work as a result of sudden orders, or by reason of a breakdown of machinery or plant or other unforeseen emergency. The minister of labour was further authorized to make regulations by which (1) he could increase the yearly allowance of 100 hours overtime to 1 jo in the case of women; (2) he could increase, for not more than 8 weeks per year, the daily maximum overtime hours for women, in work subject to pressure (*i.e.,* so as to be more than 10 hours per day); (3) where the nature of the business involves different persons being employed overtime on different occasions to a great extent, the minister could allow the overtime to be reckoned by reference to the individual worker, subject to a still further reduced maximum of 75 hours per year for women and 50 for young persons, and he could restrict overtime for young persons in processes where overtime would injure their health; (4) he could reduce overtime in any industry if satisfied as a result of representations and an inquiry that it would not involve serious loss to the industry.

The minister was given the power to authorize the two-shift system of employment of women and young persons over 16 between 6 A.M. and 10 P.M. (6 A.M. to 2 P.M. on Saturday). It was stipulated that the average shift per day must not exceed 8 hours (in five-day-week factories, 10 hours, but not exceeding 48 hours in a week or 88 hours a fortnight), the consent of the majority of the workpeople concerned being necessary.

Certain restrictions were also placed on the hours of work and overtime of young persons outside a factory in collecting, carrying or delivering goods, carrying messages and running errands.

One of the objects of the Employment of Women, Young Persons and Children act was to put expressly into operation the terms of the draft convention of 1919 to prohibit the nightwork of women and young persons in industrial undertakings. The act pro-

vided that no young person or woman shall be employed at night in any industrial undertaking except to the extent to which such employment is permitted in the conventions set out in the schedule to the act. The two conventions, concerned respectively with the nightwork of women and of young persons, both defined night as "a period of at least 11 consecutive hours, including the interval between ten o'clock in the evening and five o'clock in the morning" and the employment of women and young persons is, in general, prohibited at night so defined.

Mines.—The hours of work of all underground workers in mines coming under the Coal Mines acts were brought under regulation by the Coal Mines Regulation act of 1908, as amended in 1919 and 1926, and those of women and boys employed above ground by the Coal Mines act, 1911. The hours of work of boys below ground in metalliferous mines to which the act of 1908 did not apply were brought under regulation by the Metalliferous Mines Regulation act, 1872. The Coal Mines Regulation act, 1908, remained the principal act restricting the hours of underground workers, but the original limits of eight hours for workmen and nine and a half hours for firemen, examiners or deputies, onsetters, pumpminders, fanmen or furnacemen were reduced to seven hours and eight hours respectively by the act of 1919. The rule established by these acts was that no workman shall be below ground in a mine (*i.e.*, one coming under the definition now in the Coal Mines act, 1911) for the purpose of his work or of going to and from his work for more than 7 hours during any consecutive 24 hours. The workmen were given the right to appoint persons at their own cost to observe the times of lowering and raising, in the same way as they might appoint checkweighers. The seven hours' period could be extended by not more than half an hour, but a register had to be kept of such extensions.

In addition to making provision for exemptions in cases of emergency, the act of 1908 provided that the prescribed limit of hours below ground might be extended in any mine on not more than 60 days in any calendar year. Boys under 16 working underground in metalliferous mines not coming under the act of 1908 were not allowed to work more than 54 hours a week or 10 hours in any one day. Their period of employment was defined as beginning at the time of leaving the surface and ending at the time of returning to the surface. The hours of women and girls and boys under 16 on the surface in connection with mines coming under the Coal Mines act, 1911, were limited to 54 a week and 10 a day; and employment of such persons continuously for more than 5 hours without an interval of at least half an hour for a meal or for more than 8 hours in any day without intervals amounting to 1½ hours altogether was prohibited.

Shops.—In shops 44 hours was made the maximum working week for young persons and it was required that they must, as a general rule, be allowed an interval of at least 11 consecutive hours (including the period 10 P.M. to 6 A.M.) every day. Some check, however, was put upon the hours worked by all shopworkers, men and women alike. Work was required to cease about the business of a shop not later than 1:30 P.M. on one day a week; certain intervals for meals were prescribed; and the local authorities were empowered to issue closing orders fixing the hours for closing all or specified kinds of shops on each day of the week (but these orders could not fix closing hours inconsistent with those prescribed by the Shops act of 1928). On premises for the sale of refreshments, the week's work was limited to 65 hours. A certain standard of holidays and mealtimes for shop assistants employed on any premises for the sale of refreshments, where the occupier voluntarily elects to accept that limitation instead of applying the general provisions relating to the compulsory half-holiday for shop assistants, was imposed. Shops as a rule were required to be closed not later than 9 P.M. one day in the week, and 8 P.M. on the other evenings of the week, the late day being a Saturday unless the local authority fixed some other day either for all or certain shops, or for certain districts or certain periods of the year. In various cases the local authorities allow later closing hours (up to 10 P.M.) than those stated.

Where exemptions were allowed for exhibitions or during the busy seasons in holiday resorts, the local authority was given the power to attach to its order conditions limiting the hours of employment of the shop assistants affectedand, in the case of seasonal exemptions in holiday resorts, to require the assistants to be given a holiday, on full pay, corresponding to the extra hours worked. For special occasions, a local authority might suspend the operation of the statutory closing hours and its own closing orders on not more than seven days in the year. The home secretary also was given power to suspend the provisions of the act and orders at Christmas and other special occasions. There are a number of transactions not prevented by the act or closing orders. These are connected with the sale of refreshments and tobacco in certain places, medicines, motor accessories and the like.

Ships.—There are no restrictions on the hours of duty on board ship in English law.

Railways.—Under the Transport act, 1947, the Transport commission was required to consult the appropriate organizations for settling by negotiation all questions relating to rates of pay, hours of duty and other conditions in the railway service.

5. Administration.—The various measures considered above, whether dealing with factories, mines, ships, railways or workplaces of various kinds under the Public Health acts, and also certain of those described in the following section, insofar as they are protective in character, all provide for means to be taken to enforce and administer the law. The appropriate authorities are given power by the acts to appoint the necessary inspecting officers and those officers are endowed with power to enter and inspect places affected, examine registers and so forth. Provision is also commonly made for instructing the workers in the terms of the law for their protection by requiring abstracts of the law, copies of regulations or information of various other kinds to be posted for all to see.

Employers are also required to keep registers (for instance, of persons employed, of medical examinations, of accidents or cases of ill-health) in order to facilitate inspection. Some of the acts contain interesting rules of procedure for such matters as inquiries into the causes of accidents and the issuing of regulations or orders. Provision is also made, in some cases, for proposed regulations to which exception is taken by interested persons to be submitted to arbitration. It must be remembered that provisions of this kind form an essential part of all protective labour law. but it is not possible to discuss them in detail within the confines of this article.

B. Contractual Relations

The contractual relations of employer and employed are governed by the rules of common law and equity concerning the creation and validity of contracts in general. The essential point is, therefore, that in return for whatever the one party undertakes to do under the contract, the other must undertake to give "valuable consideration."

Thus, to create a valid contract of service it is only necessary for two parties intending to create a legal relationship to agree upon the services to be rendered and the remuneration to be received. The terms of the agreement need not be stated expressly. They may be merely implied by conduct. Neither writing nor even words are essential at common law, though there are statutory exceptions (see below). In common law, if one person does work for another without that other rejecting his services, there may be an implied contract of service with an implied undertaking to give consideration for the services rendered. "Consideration" is a very wide term. It may consist "either in some right, interest, profit, or benefit accruing to the one party, or in some forbearance, detriment, loss or responsibility given, suffered or undertaken by the other" (*Currie* v. *Misa,* 1875, L.R. 10 Ex. 162).

Apart, then, from statutory provisions, a contract of service may be entirely informal. Where disputes arise over merely implied terms in such a contract, the litigants must produce what evidence they can as to what those terms should be taken to be. It may be that a custom in the trade can be established which may be presumed to have been tacitly adopted in the absence of any express agreement to the contrary. There may be some rules of the works or establishment to which reference may be made. The law on this subject was stated in *Carus* v. *Eastwood* (1875, 32

L.T. 855) by Justice Colin Blackburn, who said that "it would be very cogent evidence of a contract" based upon certain works rules which were in question "if a copy of them were proved to be posted in a prominent place" and brought to the workman's knowledge; and also that "a well-known custom in the district might also be sufficient to establish a contract."

Still more usual is it in England for the individual contracts of large numbers of workmen to be based on the terms of a national or district agreement drawn up by representatives of employers' and workers' organizations. Such collective agreements, in strict law, are of no effect, in the sense that any individual employer could legally engage a workman on express terms differing from those of the agreement (cf. *Hilton* v. *Eckersley* referred to below). But in actual practice such collective agreements establish the terms of all the individual contracts of workers employed in the undertakings concerned. Any dispute between an individual worker and his employer is settled by reference to the trade-union agreement impliedly included in the contract.

1. Termination of Contract. — There are no rules of English common law restricting the duration of a contract of service or the conditions of giving notice to bring it to an end such as are to be found in the codes of some countries. The parties are free to make whatever arrangements they will on these points. If no definite arrangement is made, the implied terms must be sought for as best may be.

The fact that wages are paid at certain intervals, such as weekly or monthly, is in itself strong evidence, though not necessarily conclusive evidence, of a corresponding hiring by the week or the month. "If the reservation of weekly wages be the only circumstance from which the duration of the contract can be collected, the presumption is that it is to continue for a week only" (R. v. *St. Andrews,* 1828, 8 B. and C. 679). Apart from special circumstances, such as misconduct, and in the absence of any express terms to the contrary in the contract, a contract of service can only be terminated after reasonable notice *(In re African Association Ltd.* v. *Allen* [1910], 1 *K.B.* 396). If an employer dismisses his employee without notice or without awaiting the normal termination of the contract, it is for him to prove that there were circumstances justifying instant dismissal. These circumstances are either certain voluntary acts or behaviour on the part of the servant, or his incompetence. The servant may be dismissed for any act or behaviour which falls within the general rule of law stated by Lord Esher in the following words: "Where a person has entered into the position of a servant, if he does anything incompatible with the due or faithful discharge of his duty to his master, the latter has a right to dismiss him" *(Pearce* v. *Foster,* 1886, 17 *Q.B.D.* at p. 539). Consequently a servant may be dismissed for wilful disobedience to his master's lawful orders *(Turner* v. *Mason,* 1845, 14 *M.* and W. 112), but not for refusing to do work or take risks not contemplated in his contract *(Burton* v. *Pinkerton,* 1867, L.R. 2 Ex. 340). He may also be dismissed for habitual neglect of his duties. The betrayal of the employer's secrets is a good ground for dismissal. A servant may be dismissed at once for gross incompetence in performing the work he has undertaken to do *(Harmer* v. *Cornelius,* 1858, 5 C.B.N.S. 236). The question of when a servant is entitled to leave without notice has not received much attention in the courts.

There is one clear case in which a servant may leave on the instant and that is where he has been misled as to the dangers involved in the employment (*Woodley* v. *Metropolitan District Railway,* 1877, 2 Ex. D.). The question is of more importance in connection with seamen. It has been held that it does not amount to desertion (involving forfeiture of wages) if a seaman leaves the ship on account of inhuman treatment *(Edwards* v. *Trevellick,* 1854, 4 *E.* and B. 59) or on account of insufficiency of provisions *(The Castilia,* 1822, 1 Hag. 59).

In the absence of any express or implied terms in the contract as to the effect of the servant's illness and his right to wages during illness, an employer cannot instantly dismiss a worker for absence through illness or injury, nor is the contract brought to an end automatically when the worker for such reason ceases to carry our his part. But in the case of a contract of some length, permanent incapacity or illness for an unreasonably long time will entitle the employer to rescind the contract. If the employer does not do so, the servant is entitled to his wages during the time he cannot serve. A contract of service is dissolved by the death of either party *(Farrow* v. *Wilson,* 1869, L.R. 4 C.P. 744).

2. Remedies for Breach of Contract. — For breach of contract, English law provides two remedies. The most usual one is a claim against the offending party for damages to make good the loss sustained. For cases where pecuniary compensation does not provide an adequate remedy, the court of chancery invented the equitable remedy of "specific performance"; *i.e.,* an order to the offending party requiring him actually to perform what he has undertaken to do.

It is important to note that the courts refuse to apply this remedy for a breach of a contract of personal service, although the other equitable remedy of injunction is sometimes applied to restrain a person from infringing a negative clause in a contract of service or to prevent him from committing a breach of faith such as is an implied term in all contracts of service *(Robb* v. *Green* [1895], 2 Q.B. 315). Thus no servant will be compelled to carry out a contract to serve a master, and no master will be compelled to take into or retain in his service a servant he has engaged, though either party may, in suitable circumstances, be restrained by injunction from doing something he has contracted, expressly or by implication, not to do. The usual remedy for breach of a contract of service is therefore a claim for a sum of money as damages. In assessing the amount to be awarded, the courts aim at placing the injured party as nearly as possible in the position he would have been in if no breach had been committed. If a servant is engaged on terms making him liable to be dismissed on a week's or a month's notice (or whatever period of notice may be agreed upon), the measure of his loss if he is discharged on the instant is clearly the wages he would have received had he been allowed to work out the agreed term of notice. It must be noted that a wrongfully dismissed servant cannot be awarded any vindictive or exemplary damages in respect of his wounded feelings for the harsh manner of his dismissal, in an action for breach of the contract of service (*Addis* v. *Gramophone Co.);* though, of course, if the circumstances warranted it, he could bring an action for defamation of character against his employer. If the master after engaging a servant rescinds the contract before the service has actually begun, the servant may institute proceedings at once, without awaiting the day when the service was due to begin *(Hochster* v. *de la Tour,* 1853, 2 E. and B. 678).

If it is the servant who unlawfully throws up the employment, the master is likewise entitled to bring an action for damages for any loss he sustains, though such an action is rare. The employer cannot retain any wages actually due to be paid when the servant breaks off the contract, but the servant cannot claim wages for a broken period in respect of which wages would have been due if it had been completed. When it is the employer who breaks off the contract it must be noted that the servant, whatever the terms of payment may be, can always recover wages in respect of the service actually accomplished, by ignoring the broken contract and suing on a *quantum meruit; i.e.,* on an implied contract to be paid for work actually done, if for any reason he prefers this course.

There is no obligation on a master, in English common law, to give a servant anything of the nature of a certificate of employment or of character when the engagement comes to an end (note, however, certain statutory provisions on this subject in the Merchant Shipping act, 1894).

3. Illegal Contracts. — It has, so far, been assumed that the contract of service is a legal one. A contract of service, like any other contract, is illegal if it involves the doing of something which the law either expressly forbids (such as the employment of children below a statutory age limit) or merely discourages as being contrary to public policy (such as one too greatly infringing a man's liberty of action or "in restraint of trade"). The illegality may go to the root of the contract rendering it wholly void. Or, on the other hand, one or more illegal terms tnay be held not to vitiate the whole of the contract. Thus where a miner was work-

ing under an agreement by which he was paid in a manner contrary to the Coal Mines Regulation act, 1887, it was held that the contract as a whole held good in spite of this illegal stipulation, and the miner was not entitled to leave his employment without giving the fortnight's notice required by the contract (*Kearney* v. *Whitehaven* Colliery Co. [1893], 1 Q.B. 700). The case of *Pountney* v. Turton (1917, 10 B.W.C.C. 601) is an example of a contract involving a direct and punishable infringement of law which wholly vitiated it. A boy was employed before reaching the age of 14 contrary to the Employment of Children act, 1903. Since his contract was wholly illegal and void, it was held that he could not recover compensation for an accident under the Workmen's Compensation act. The most important type of contract of service contrary to public policy but not involving the doing of any punishable offense is in the case where undue restraint is placed upon personal liberty of action, especially any "restraint of trade." "The law of England allows a man to contract for his labour, or allows him to place himself in the service of a master, but it does not allow him to attach to his contract of service any servile incidents" (*Davies* v. Davies, 1887, 36 Ch. D. at p. 393). Thus a man cannot contract to submit to imprisonment at the hands of his master if he should be guilty of misconduct (Clarke v. Gape, 1596, 5 Rep. 129). Moreover, the courts will interfere where a party is unduly fettered in his right to dispose of his labour as he will or his liberty of action in other respects so that he is reduced to an almost servile condition (see Horwood v. Millar's Timber Co. Ltd. [1917], K.B. 305). The common law will not allow the enforcement of an agreement by which workmen bind themselves to work or masters bind themselves to employ workers only on terms decided by a majority of those affected (*Hilton* v. Eckersley, 1856, 6 E. and B. 47). Thus it is impossible for members of workers' or employers' associations to bind themselves under penalty to abide by the decisions of the majority, and no collective agreement made by such associations can ever be enforced by process of law.

The doctrine of restraint of trade is especially important in connection with contracts purporting to restrict the activities of an employee after he leaves his employment. It is, as noted above, an implied term in all contracts of service that the servant shall keep faith with his master and not divulge his trade secrets or take an unfair advantage of his position and knowledge either during the service or after it has come to an end (*Amber* Size Co. v. *Menzel* [1913], 2 Ch. 239). But it is not unusual to insert in the contracts of employees in positions of some responsibility or requiring special skill, or in which they acquire special knowledge, provisions binding them not to exercise their skill or use their knowledge in competition against their former masters either in particular districts or for a certain number of years after the employment comes to an end. The chief points to notice are: first, that any such contract is prima facie bad, as being in restraint of trade, so that the onus is on the party trying to enforce it to show that it is reasonable in the circumstances; second, that it must be reasonable from the point of view of both parties; third, that as a master is not entitled to bar the competition, as such, of a servant who has quitted his employ, no restraint can be justified except insofar as it may be required for the purpose of preventing the servant from making improper use of his acquaintance with his master's customers or knowledge of his trade secrets. The remedy where such terms have been proved to be reasonable is usually the recovery of damages. In some cases the courts have granted injunctions to restrain a former servant from breaking a restrictive agreement of this sort.

4. Capacity to Contract.——Married women did not suffer any incapacity to bind themselves by contracts of service or freely to dispose of their wages after the passing of the Married Women's Property acts, 1882 and 1893.

Where an infant enters into a contract of service it is necessary to see whether it satisfies the general rule of law that no contract will be enforced against an infant unless it is for his benefit. Contracts to learn a trade or serve for wages are prima facie for an infant's benefit and consequently will be enforced unless they are wholly disadvantageous to him (Corn v. *Matthews* [1893], 1 Q.B. 310). The mere fact that some of the terms are unfavourable does not necessarily vitiate the whole contract. It is necessary to consider whether the contract as a whole was for the advantage of the infant (*Clements* v. London and North Western Railway Co. [1894], 2 Q.B. 482).

Apprenticeship is purely a voluntary matter in England and no particular formality is required for making a contract of apprenticeship. Since the term of apprenticeship is commonly for more than a year, however, such a contract must as a rule be in writing. A parent cannot bind his child as an apprentice without the child's consent and the indenture (if any) must be signed by the apprentice, not merely by the parent or guardian (Rex v. Arnesby [1820], 3 B. and Ald. 584). The sickness or incapacity of the apprentice does not relieve the master of his obligations under the contract; *e.g.*, to provide for the apprentice and pay him wages (*Patten* v. Wood, 1887, 51 J.P. 549). A contract of apprenticeship expires on the death of the master except where it is so drawn as to require the apprentice to continue to serve the master's representatives carrying on the same trade (Cooper v. Simmons, 1862, 7 H. and N. 707). An apprentice cannot recover any part of the premium from the representatives of his deceased master unless there is an express stipulation in the contract enabling him to do so. Regulations governing disputes between apprentices and their masters were established under the Employers and Workmen act, 1875 (see below). The effect of bankruptcy on a contract of apprenticeship was covered by s. 34 of the Bankruptcy act, 1914.

C. Statute Law

The general rule of common law that the parties to a contract of service are free to make what terms they will has been considerably modified by acts of parliament. Some of these, adopted expressly in the interests of the worker, might be more properly included under the heading of protective labour law insofar as contraventions render the employer liable to quasi-criminal prosecution. But insofar as they also give the worker a civil right of action or strengthen his position as contracting party, they may conveniently be considered rather from the contractual point of view.

The statutes in question either place restrictions on the nature of the consideration or on the place where wages are to be paid, or they provide means for fixing the minimum rate of wages to be paid, or require the employer to give the workers certain facilities for checking or calculating the amounts due to them. It will also be convenient to note here the special procedure provided by statute for settling contractual disputes between employer and worker.

(After World War II the sphere of state insurance was extended, and this enlarged the duties and privileges of employers and employees. The National Insurance act, 1946, and the National Insurance (Industrial Injuries) act, 1946, ensured to all workers under a contract of employment weekly allowances of fixed amounts in return for contributions from every employer and worker, these allowances being payable during (1) incapacitation from industrial injury or industrial disease; (2) sickness; (3) unemployment; (4) retirement; allowances to widows and orphans, maternity benefits and death benefits were also included. Further, the freedom of the employer to select his workers was hedged in (1) the Disabled Persons act, 1944, obliged an employer of 20 or more persons to include a prescribed quota of disabled persons; (2) the National Service acts bound each employer to reinstate his employees on completion of their compulsory national service.)

1. Truck Acts.—The Truck acts (1831, 1887 and 1896), regulating the nature of the consideration for services in certain cases and also requiring agreements for certain purposes to be in writing, were adopted as a result of abuses which arose, in the first place, from the so-called truck shops, owned by employers, out of which wages were paid in the form of goods or where the workers were constrained to spend their nominally cash wages; and, in the second place, from the habit of making oppressive and arbitrary deductions from wages.

The acts apply to all workmen engaged in manual labour. The

act of 1896, dealing with disciplinary fines (inter *alia*), was so drafted as to apply such fines expressly to shop assistants as well as to manual workers. In the first place, the Truck acts made all payment of wages otherwise than in current coin of the realm illegal, null and void. Wages paid in a manner contravening this rule were ruled entirely void and the workmen could sue for the money value of the wages due without the employer being able to recover any goods supplied instead of wages.

In the second place, the Truck acts rendered illegal any contract requiring the workman, directly or indirectly, to spend any part of his wages in any particular manner or at any particular shop. An employer, however, was allowed to contract with any workman to supply him with certain commodities specified in s. 23 of the act of 1831, provided that the contract was in writing and signed by the workman.

In the third place, the Truck act of 1896 regulated deductions from wages. It required the terms of any contract authorizing the employer to impose disciplinary fines and deduct the amount from wages to be posted where they could be easily seen and copied by the workers affected or else to be contained in a written contract signed by the workman. Particulars of the acts or omissions for which a fine might be imposed and the amount of the fines were required to be stated in the contract; the offense had to be likely to cause damage or loss to the employer or interruption to his business. It was further provided that a contract to make deductions for bad or negligent work must likewise be posted or in writing and signed, and the deduction must not exceed the actual or estimated loss occasioned to the employer. The amount deducted, whether as a disciplinary fine or in respect of bad work, must, moreover, be "fair and reasonable, having regard to all the circumstances of the case." Particulars of deductions or payments for materials, tools, machinery, etc., used by the workman must also be posted or contained in a written and signed contract. They might not exceed the cost to the employer or what is a fair and reasonable rent or charge. On each occasion when a disciplinary fine is to be imposed or a deduction made for bad work or for the use of materials, etc., the workman must be given written particulars of the reason for the deduction and its amount. The enforcement of the Truck acts was not left to the unaided efforts of the workers affected. They could sue for wages paid in an illegal manner or for the recovery of amounts illegally deducted from wages. But, in addition to this, employers who failed to observe the acts were made liable to prosecution and fine. Akin to the Truck acts is the Shop Clubs act, 1902, prohibiting compulsory contributions to shop clubs and shop funds save under certain conditions safeguarding the workers, the Payment of Wages in Public Houses Prohibition act, 1883, certain provisions to the same end contained in the Metalliferous Mines Regulation act, 1872 (s. 9), and the Coal Mines act, 1911 (s. 96).

2. Merchant Shipping Acts.—The Merchant Shipping acts, 1894 and 1906, incorporated a number of sections regulating seamen's contracts and the payment of their wages. The master of any ship (except one of less than 80 tons registered tonnage exclusively employed in trading between different ports on the coast of the United Kingdom) was made liable to a penalty if he put to sea without having entered into an agreement with the crew made in the prescribed manner.

The act of 1894 also required all seamen serving in British foreign-going ships to be formally discharged before a superintendent at the termination of the engagement and to be given a certificate of discharge. In some cases a report as to conduct, character and qualifications was required. The Merchant Shipping (International Conventions) act gave a seaman the right to wages for not more than two months if he was unemployed before the termination of his engagement as a result of his ship being wrecked.

3. Minimum Wage Laws.—Machinery for fixing legal minimum rates of wages was established in England: (1) under the Wages Councils acts, 1945–1948; (2) for workers in agriculture; (3) for underground workers in mines. The Wages Councils acts continued the system begun by the Trade Boards acts, 1909 and 1918, under which trade boards could be set up for any trade in which "no adequate machinery existed for the effective regulation of wages throughout the trade" and to which it was expedient to apply the act "having regard to the rate of wages prevailing in the trade or any part of the trade." The act of 1909 was of an experimental nature, being the first attempt to regulate wages known to English law, although similar measures had for many years been operating in some of the Australian states. It had been adopted as a result of a popular agitation against the so-called "sweating system." The Wages Councils acts thus remained fundamentally protective in intent.

To give the workers of the type in contemplation merely a civil right to sue their employers for any deficiency in the wages they received below the minimum fixed by the appropriate trade board would have been of little use to them. Consequently provision was made for the prosecution of employers who are guilty of paying less than the rates fixed.

But the acts also necessarily provided for the enforcement of the worker's contractual right to receive the minimum fixed for his trade. Not only could the worker himself sue his employer for any deficiency in the amount paid to him, but the officials of the ministry of labour, responsible for enforcement of the law and if necessary the prosecution of defaulting employers, might themselves institute civil proceedings on behalf of the worker if he failed to do so himself; and, moreover, when an employer is prosecuted for an offense under the acts, the court adjudicating on the prosecution could, in addition to imposing the appropriate fine on a convicted employer, order him, on the same occasion, to pay whatever sum is civilly due to the worker. For details of these measures see MINIMUM WAGE. Here it is only necessary to mention this legislation in order to show how parliament intervened to overreach the common law principle as to the freedom of the parties to fix whatever consideration they will.

The Agricultural Wages act, 1948, is also intended to assist members of a poorly organized class of workers to secure a reasonable consideration in their contracts of service. Each agricultural wages committee was given the duty of fixing minimum time rates of wages for the agricultural workers in its district, and it also could fix minimum piecework rates and higher rates for overtime worked beyond some specified limit. The act provided that the rates fixed by the local committees had to go to the Agricultural Wages board (covering the whole of England and Wales) for an order to be made to put them into operation. Like the Wages Councils acts, this act provided for both penalties on the employers who pay less than the minimum fixed and for enforcing the worker's civil claim to have any deficiency made good in the amount paid to him. Here again the court might make an order for the amount of wages owing to a worker to be paid to him at the same time as it imposed a fine upon the employer.

Workers in coal mines are on a different footing. The National Coal board was given, under the Coal Industry Nationalization act, 1946, the duty of consulting representative organizations to establish machinery for settling by negotiation terms and conditions of employment of workers in coal mines. Coal miners whose wages depend on the amount of mineral hewn by them are bound to be paid by weight, and the mineral must be weighed as near to the pit mouth as is reasonably practicable (Coal Mines Regulation act, 1887, s. 12). All such workers were given, in addition, the statutory right to appoint their own representatives (checkweighers) to check the weighing of the mineral (see the Coal Mines Regulation act, 1887, s. 13; the Coal Mines [Check Weigher] act, 1894; and the Coal Mines [Weighing of Minerals] act, 1905). A similar right was given by the Checkweighing in Various Industries act, 1919, to workers engaged in the manufacture of iron and steel, in loading and unloading goods at docks, in quarrying chalk and limestone, in the manufacture of cement and lime and in any other industry to which the act may be applied by regulations of the secretary of state. This act provided for the checking by a representative of the workers of the measuring as well as the weighing of material produced, handled or gotten, where the wages are paid according to measure instead of by weight.

To enable workers paid by the piece to know if the correct

amount of wages is paid to them, the Factories act, 1937, required employers to give all workers in textile factories particulars of the rate of wages applicable to the work in question and of the work given them to do. These particulars were required to be given in writing to each individual worker or exhibited on a placard in the workroom (or, in some cases, both methods were required). These provisions were extended, with appropriate modifications, to a large number of other trades, under powers given to the minister of labour in the same section.

4. Employers and Workmen Act.—The chief purpose of the Employers and Workmen act, 1875, was to provide a simple procedure for the settlement of disputes between a workman and his employer or an apprentice and his master. It gave to courts of summary jurisdiction, whose normal function is to deal with offenses of a criminal or quasi-criminal nature, power to hear and determine with the same powers as a county court purely civil disputes between an employer and a workman arising out of the contract of service, uhere the amount claimed did not exceed £10. This arrangement gave the workman very quick and cheap facilities for suing his employer for small amounts of wages. The act also gave the courts of summary jurisdiction wide powers in dealing with disputes between masters and apprentices.

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LABOUR PARTY, THE (BRITISH). The British Labour party was founded in 1900, under the name Labour Representation committee (L.R.C.), as a federation of socialist societies, trade unions, trades councils and local labour electoral bodies, to promote independent labour representation in the house of commons and also in local government. The co-operative movement was invited to join, but refused; only in 1917 did the co-operatives enter politics by forming a separate Co-operative party which thereafter worked in close alliance with the Labour party. Members of the Co-operative party who are elected to parliament join the parliamentary Labour party, and many have taken office in Labour governments. The oldest socialist body, the Social Democratic federation. which had a Marxian basis, attended the inaugural conference of the L.R.C., but withdrew almost at once.

Origins and History.— The way was prepared for the Labour party by Keir Hardie's Independent Labour party (I.L.P.), formed at Bradford, Yorkshire, in 1893, mainly out of local bodies which had been established after the Reform acts of 1884–85 to promote independent labour representation. Before that, there had been several attempts to procure the election of working-class representatives to parliament. The Chartists had fought a number of contests in the 1840s and 1850s; and in 1866 the London Working Men's association had tried to institute a national movement, under the auspices of which a number of seats were contested in 1868—the year following the Reform act of 1867 which gave votes to many urban workers. This movement took shape in the Labour Representation league (L.R.L.) of 1869; and at the general election of 1874 two miners, Alexander Macdonald and Thomas Burt, were elected as the first Labour M.P.s. The L.R.L., however, died out after 1880, and the few Labour men returned to parliament allied themselves with the Liberal party. The Labour Electoral association (L.E.A.), formed by the Trades Union congress in 1886, worked for the next ten years in alliance with the Liberals. Many of the local bodies which helped form the I.L.P. had broken away from the L.E.A. in protest.

The I.L.P set to work to persuade the national trade unions to join the movement for independent Labour representation; and, at length, the T.U.C. was persuaded to call the socialist-trade union conference which set up the L.R.C. in Jan. 1900. At the immediately ensuing election, only two L.R.C. candidates were returned but one of these subsequently reverted to Liberalism. The other, Keir Hardie, was joined by three by-election victors (including Arthur Henderson) before the general election of 1906, at which the L.R.C., now renamed the Labour party, won 29 seats, with an additional gain of 1 when J. W. Taylor joined the party immediately upon election. The rapid growth of the Labour party between 1900 and 1906 was mainly due to the Taff Vale judgment which, by establishing that a trade union could be sued for damages arising out of a trade dispute, put all trade union funds in jeopardy.

The Trade Disputes act of 1906 reversed this decision; but the Labour party was faced in 1908 with the Osborne judgment, which pronounced all political action by trade unions to be unlawful. The two general elections of 1910 had thus to be fought without trade union funds, and the Labour party could support only a limited number of candidates. Yet it won 40 and 42 seats at these two elections. With the accession of the miners, the Liberal-Labour group of trade union M.P.s disappeared.

The L.R.C. was not constituted as an explicitly socialist party; nor did the Labour party from 1906 to 1914 profess distinctively socialist aims, though socialist resolutions were carried at its annual conferences. Throughout this period, despite its formal independence, it was acting as the ally of the dominant Liberal party, first at the election of 1906 and subsequently in connection with the budget of 1909, the struggle with the house of lords and the Irish question. In 1913 the Trade Union act restored to trade unions a limited freedom to take political action.

Labour During World War I.—The outbreak of war in 1914 found the party still hardly more than a group. War conditions, by greatly enhancing trade union power, increased its influence; and after playing a minor part in the first coalition government under H. H. Asquith, it was given a larger place in the Lloyd George coalition. The main body of the Labour party supported the war; but its chief socialist constituent, the I.L.P., took an antiwar line, while retaining its affiliation to the party. J. Ramsay MacDonald, who had replaced Keir Hardie as leader, resigned in 1914; and Arthur Henderson became the chief Labour representative in the Asquith and Lloyd George coalitions. In 1917, however, Henderson was driven out of the war cabinet for supporting the projected Peace conference at Stockholm, Swed The Labour party remained in the coalition; but working-class feeling in favour of a negotiated peace grew rapidly and Henderson. out of office, devoted himself to remodeling the Labour party as a truly national party, with a definite, though moderate, socialist program. The Liberal split offered Labour the chance to make a bid to replace Liberalism as the main party of the left and the new Labour party constitution and program of 1917–18 staked out its claim. The new constitution provided for setting up in every constituency a local Labour party with individual, as well as affiliated, members; and in the general election of 1918 the party nominated for the first time candidates in a majority of areas. It met with little success in face of the strong coalition against it; but its 61 M.P.s and its vote of 2,250,000 made it the leading opposition party.

Labour in Office.—During the next few years the Labour party grew rapidly and in 1924, with Liberal support, MacDonald formed the first, shalt-lived Labour government, only to be turned out by the defection of the Liberals before the end of the year, mainly in protest against a proposed loan to the Soviet Union. The first Labour government was not in a position to institute any socialist measures; it devoted itself to legislation on housing, unemployment benefits and other social reform matters and attempted to improve international relations.

In the general election of 1924 the Labour party met with a serious reverse, largely because of the confusion attending the publication of the alleged "Zinoviev" letter, calling upon British Communists to undertake measures of what amounted to revolu-

tionary sabotage. The depression following the return to the gold standard in *1925* led to serious industrial disputes which culminated in the general strike of *1926*. The defeat of this movement considerably weakened the trade unions but did not prevent political Labour from gaining strength. In 1929, MacDonald formed his second Labour government, with Labour still in a minority but the largest party—for the first time ahead of the Conservatives. This second Labour government was brought down by the onset of the world economic depression in 1931. Again, having no majority and depending on Liberal support, the government could carry no socialist measures; its achievements were once more in the fields of social reform and of foreign relations. Henderson made a great reputation at the foreign office, but the government showed itself helpless in dealing with mounting unemployment and financial crisis; and in 1931 its leader and a few colleagues seceded from it when the cabinet refused to endorse cuts in social benefits at the expense of the unemployed. MacDonald formed a national coalition government with the Conservatives and Liberals; in the ensuing general election the Labour party's strength fell from *289* to *46* (or, if *6* candidates returned under I.L.P. auspices or as Labour Independents are added. to *52)* and its poll by *2,000,000.* The I.L.P., which had quarrelled with the party earlier, fought the election separately, returning five M.P.s, all from Clydeside. All the important former ministers, except George Lansbury, who succeeded to the leadership, and Clement Attlee were beaten; but at the next election, in 1935, its strength rose to 154.

Both before and after 1935 there were serious differences within the party arising out of the advance of fascism. There was a pacifist section led by Lansbury, who resigned the leadership and was succeeded by Attlee in Oct, 1935, when it became plain that the majority of the party favoured rearmament to resist fascism.

World War 11.—In *1938* the Labour party had opposed the Munich surrender; and from the outset it gave full support to the war of 1939–45. Indeed in 1940 it played the leading part in overthrowing the Neville Chamberlain government and in putting the Winston Churchill coalition into power. Labour ministers, especially Ernest Bevin, Herbert Morrison and Clement Attlee, held key positions in the government from 1940 to 1945.

The Postwar Period.—From 1932 onward the Labour party, spurred on by the defeat of 1931, had been busily recasting its program on more ambitious lines, working out detailed projects of socialization, social security and colonial and international development. In *1936* it had formulated an "immediate program" designed as a first instalment of the advance to socialism; and this, largely revised and developed during World War II, formed the basis for *Let* Us *Face the Future,* its short-term program.

At the end of the war against Germany, the Labour party declared its willingness to continue in the coalition government for a further period; but Churchill rejected its terms. At the general election in July 1945 Labour secured *394* seats, including that of a member from Northern Ireland who fought under the auspices of the North of Ireland Labour party, out of *640,* though it polled only 11,992,292 votes as against *9,960,809* for the Conservatives and *2,239,668* for the Independent Liberals. The armed forces voted largely for the Labour party, as did also many white-collar workers as well as the industrial centres.

With Attlee as prime minister and Bevin as foreign secretary, the government set promptly to work to carry out its election program. During its first term of office, it socialized the Bank of England. the coal mines, inland transport, electricity, gas, civil aviation and cable and wireless communications and passed an act socializing iron and steel. It established a comprehensive system of social insurance and an all-embracing national health service. It consolidated measures for agricultural development, transformed to a peacetime basis the war controls over food supplies and rationing and undertook important projects for the economic development of the depressed areas. It also took action to implement the Education act of 1944, and was aided generally by a marked advance in its strength on the elective local authorities. It also further restricted the power of the house of lords to delay legislation passed by the commons. In foreign affairs it was faced with a difficult international situation; despite a U.S. loan and the Marshall plan, it wrestled, like most of western Europe, with a formidable balance of payments crisis arising out of the shortage of dollars.

In the general election of Feb. 1950 the Labour party won 315 of *625* seats and resumed office; but in Oct. 1951 it lost power to the Conservatives, who got *323* seats against Labour's *295.* At the election of *1955* the number of seats held by Labour fell to 277. After this defeat it set to work to revise its program and reshape its constituency organization. Hugh Gaitskell succeeded Attlee as leader in Dec. 1955. In the general election of Oct. 1959, however, the Labour party suffered a further net loss of 23 seats, winning only *258* out of a total of *630.*

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(G. D. H. C.; X.)

LABOUR TURNOVER. Labour turnover refers to the changes in personnel of a company or industry over a specified period. It is most commonly considered as a problem of labour instability and therefore something to be minimized, although a certain amount of mobility is unavoidable and under some circumstances desirable. The causes and extent of turnover have been a major concern of management since the beginning of the scientific management movement which aroused employers to a consciousness of the costs involved in the hiring and training of new workers. Studies made before and following World War I indicated, for example, that the annual rate of terminations in many concerns amounted to more than 300%. Costs of labour turnover to the employer are both direct and indirect. There are the bookkeeping costs involved in taking persons on and off the payroll. The greatest expense is that incurred in the interviewing, selection and training of new workers. During this period, there is not only loss in production but also hazards of greater spoilage of materials, wear and tear on machines and increase in accidents. For laid-off employees there is the cost of unemployment insurance in addition to the expenses involved in the hiring of new workers when these jobs must again be manned. Labour turnover is measured in terms of both separations and accessions. Separations include voluntary quits, layoffs, discharges, separations to enter the military service and such other reasons as retirement, death, etc. Rates of discharges vary little from year to year and usually include only about 4% or 5% of the total separations. Accession rates naturally increase during times of prosperity and expanding business. Voluntary quits also tend to increase when workers have many opportunities to seek better jobs elsewhere. During war periods the quit rate, as well as the accession rate, are abnormally high because many of those hired are persons outside the normal labour market—for example, women with families who cannot continue employment for prolonged periods. Excluding wartime conditions, there are indications that the voluntary quit rate began to decline as a result of important changes which took place in industrial relations after the middle 1930s. One of these was the general adoption of seniority rules for layoffs and promotions. A worker not only hesitates to lose his accumulated seniority by transferring elsewhere, but he finds it harder to secure employment in another plant because the present employees of that plant also have established seniority rights which tend to minimize the available openings for outsiders. Shortening of the work week and paid vacations no doubt contributed to a reduction in the quit rate. Private pension programs also discourage workers from leaving their present employers and thus forfeiting their accrued pension rights. Unionization and collective bargaining agreements, which usually provide machinery for adjustment of employee grievances and appeals of discharges, undoubtedly have an effect on labour turnover. (F. PN.; X.)

LABOUR UNIONS: *see* TRADE UNIONS.

LABRADOR (or ARCTIC) **CURRENT,** a cold, low-salinity ocean current flowing south along the coast of Labrador. Originating in Baffin bay and fed by some water from the west coast

of Greenland and Hudson strait, it often carries icebergs and occasionally field ice to its confluence with warm water from the Gulf stream (*q.v.*) at the southern edge of the Grand Banks off Newfoundland. There the cooling of the breezes blowing from warm water over cold produces the local fog so prevalent in spring and early summer at the height of the ice season.

During periods of poor visibility the ice, particularly the bergs and berg fragments, is hazardous to shipping. Following the sinking of the "Titanic" in 1912 by a collision with an iceberg, an international ice patrol was established to safeguard shipping near the terminus of the Labrador current. See SHIPPING ROUTES.

(C. A. Bs.)

LABRADORITE, in mineralogy, is the name given to the range of composition in the plagioclase feldspar (*q.v.*) solid solution series having from 50% to 70% of the anorthite molecule. The colour is commonly gray, brown to black and, in one of its main occurrences, has a characteristic iridescence of blues, greens and reds on cleavage faces, especially when wet. This iridescence is the result of optical interference from minute inclusions in the mineral. On coarse-grained specimens, a series of parallel striations from repeated twinning is easily seen on certain surfaces.

The rock composed mainly of plagioclase feldspar called anorthosite is usually composed of this iridescent labradorite wherein the individual crystals measure from a fraction of an inch up to several feet in length. Anorthosite occurs in many folded mountain regions throughout the world. Anorthosites are remarkable in their uniformity in appearance and restricted range of composition for the plagioclase. Labradorite without the iridescence is a major constituent in many igneous gabbros, norites and dolerites and in many volcanic basalts. Olivine, pyroxene and hornblende (amphibole) occur as minor constituents in anorthosite and as major constituents in the other rocks containing labradorite. Iron and titanium oxides are also commonly present. For some reascn, labradorite is one of the most common ranges of composition for the plagioclase series. Iridescent labradorite was originally described from the coast of Labrador and is sometimes used as an ornamental building stone. (G. W. DEV.)

LABRADOR TEA (Ledum *groenlandicum*), the popular name for a small evergreen shrub of the heath family (Ericaceae) growing in bogs and swamps in Greenland, Canada and the more northern parts of the United States. The leaves are tough, densely covered with brown wool on the underface, fragrant when crushed and have been used as a substitute for tea.

LABRADOR-UNGAVA, the great peninsula (the Labrador peninsula) forming the northeast section of the North American mainland, which has an area of approximately 625,000 sq.mi., is bounded on the west by James and Hudson bays, on the north by Hudson strait and Ungava bay and on the east and south by the Atlantic ocean and the Gulf of St. Lawrence, respectively. The southwest boundary is difficult to define, the best limit being an arbitrary line connecting the mouths of the Rupert river, in James bay, and the Saguenay river on the Gulf of St. Lawrence.

Politically Labrador-Ungava embraces the "Coast of Labrador," a portion of the Canadian province of Newfoundland and a large section of Quebec province. North of the Eastmain river, northern Quebec was initially the old Ungava district of the Northwest Territories, awarded to Quebec in 1912 by the Boundaries Extension act. This area is sometimes called Ungava or, alternatively, Nouveau Quebec, but the term Labrador-Ungava is considered preferable for the entire peninsula.

PHYSICAL GEOGRAPHY

Relief. — The peninsula, which lies between latitudes 48° and 62° 50′ N., and longitudes 77° and 80° W., may be likened to an immense saucer tilted down toward the northwest. The southern rim, overlooking the St. Lawrence, forms the massive Laurentide escarpment which rises abruptly from the narrow coastal plain to heights exceeding 3,500 ft.

From the escarpment's crest a vast plateau, with countless lakes, bogs and low hills, slopes gradually northwestward. This "lake plateau," with an average altitude of about 2,000 ft.. in the south, 1,600 ft. in the centre and below 1,000 ft. in the north and west, slopes gradually beneath Ungava and Hudson bays. In the extreme northwest, along Hudson strait, an upwarping of the land mass has produced a local. highland block rising to more than 2,000 ft.

The highland rim of the south continues along the Atlantic coast, culminating northward in three mountain groups. The Kiglapait ("Dog-teeth") mountains lie north of the Atlantic fishing village of Nain, Nfd., with peaks over 3,000 ft. The Kaumajet ("Shining Tops") project seaward to form Cape Mugford south of Hebron, the highest summit, Mount Brave, exceeding 4,000 ft. The northern group, the Torngat ("home of the spirits") extend along the coast for 125 mi. with summits attaining 5,500 ft. The mountains, deeply eroded by rivers and glaciers, form a fiord landscape of great beauty. They rise so abruptly from the sea that early travelers estimated their height at 7,000 to 10,000 ft.

The Atlantic watershed of Labrador-Ungava, which forms much of the boundary between Newfoundland and Quebec, is extremely irregular. In the north it lies between 10 and 100 mi. from the coast but at latitude 55° N., north of Hamilton inlet, it sweeps westward to include the great basin of the Hamilton-Ashuanipi and Naskaupi rivers, which drain into Lake Melville. The south shore of the lake rises abruptly for 4,000 ft. to form the uplifted block of the Mealy mountains.

On the central plateau practically 20% of the surface area is water. The rivers are irregular and flow haphazardly from lake to lake. All the great rivers, such as the George, Eastmain, Whale, Fort George and Kaniapiskau-Koksoak, originate on the plateau. Hamilton river, perhaps the best known, exceeds 500 mi. in length and at Grand falls, 250 mi. from its mouth, descends abruptly 302 ft. from the plateau to plunge into a deep gorge.

Geology. — The entire peninsula forms part of the Canadian shield, comprising some of the world's oldest rocks — the Precambrian, divisible into two groups, the Archaean and the Proterozoic. The Archaean rocks cover by far the largest area and are primarily metamorphosed igneous and sedimentary rocks cut by younger dykes and sills.

Following the Archaean, local down warping allowed the penetration of arms of the sea, particularly in a narrow zone running south-southeast from the west side of Ungava bay. In these waters great thicknesses of Proterozoic sediments, eroded from the Archaean mountains, were laid down and later folded and crushed to form the Labrador range. Later erosion removed all but the roots of these mountains, which remain as a zone of parallel ridges running for more than 400 mi. from south of Schefferville to Ungava bay and forming what is known as the "Labrador trough," important for its iron deposits. Sediments of comparable age and composition border the Richmond gulf coast and form the Belcher islands. Another narrow zone, known as the "Nickel belt," runs from Cape Smith eastward to Ungava bay. The Proterozoic rocks are relatively little-altered limestones, shales, quartzites and ironstones, in places intercalated with numerous lava flows.

Glaciation.—Labrador-Ungava probably was glaciated on four or more occasions although, except in the northeast, only evidence of the final Ice Age has been found. The peninsula formed one of the major centres of ice accumulation and dispersal in North America, the entire area, including the Torngat mountains, at some time being buried beneath an ice sheet which exceeded 8,000 ft. in thickness in the interior. During the last Ice Age many of the high coastal mountains, and even sheltered lowland areas, remained ice-free. The final melting took place as little as 6,000 years ago, some of the last masses to melt being situated 20–30 mi. north of Schefferville. although even today small cirque glaciers occur in the Torngat mountains.

Climate. — Its situation on the northeast seaboard of the continent. high altitude and proximity to the cold Labrador current give Labrador-Ungava its severe climate. Winters are long and cold, with temperatures falling to −50° F. over wide areas. Heavy snowfall characterizes the Laurentide escarpment, but northward snowfall becomes moderate and, in the north, slight. Since the land is tilted up toward the south this offsets the effects of decreasing latitude and the lake plateau experiences a remarka-

ble uniformity of climate, especially in winter.

Spring is late and short, usually beginning in May, although ice often remains on the lakes until well into June, and much longer farther north. Patches of snow persist sometimes throughout the summer on the lake plateau, while the frost-free period is as little as 7j days and frosts may occur any month of the year. Mild cloudy summers are typical. with July and August mean temperatures in the low jos, although temperatures occasionally rise to 70° and even 85° F. Mean annual precipitation is of the order of 20 to 30 in. The mean annual temperature is about 24° F., being lower toward the north and much higher on the southern coast. Snow usually falls in September and remains on the ground from mid-October onward. The strong northwest wind sweeps the ridges snow free in minter and increases the already appreciable hazard of frostbite. The northern sections are underlain by permafrost with isolated patches occurring as far south as latitude 53° N.

Vegetation. — The flora, controlled largely by climate, may be divided into three great east-nest zones. The northern zone of arctic tundra lies north of the tree line which runs across the base of the Ungava peninsula from Hudson bay to Fort Chimo before sninging southeastward to approach the coast north of Nain. The tundra is characterized by a mat of lichens and mosses nith small arctic-alpine flowering plants and, in sheltered places, by dwarf birch and willow. Arms of tundra penetrate along the ridges far south of the tree line, and hilltops in latitude 53° N. rise above the trees. This broad area of intermingled tundra and northern spruce forest grades into the second zone, the subarctic lichen woodland, characterized by widely spaced white and black spruce with a ground mass of luxuriant lichens and mosses. Tamarack, balsam fir. birch, willow. alder, Labrador tea and numerous berry-bearing shrubs occur in many places in association nith the spruce

South of latitude 52° N. closed-crown forest prevails, forming a dense, almost inpenetrable growth of evergreens, primarily spruce, with balsam fir, birch and additional boreal species increasing in importance farther south. This forms the northern part of the boreal forest zone of eastern Canada. The wind-swept outer Atlantic coast carries a fringe of tundra south to Battle Harbour. This barren, rocky coast led early explorers to grossly underestimate the luxuriance of Labrador-Ungava's flora

Animals. — Best known of Labrador-Ungava animal life is the barren-ground caribou (caribou *rangifera*), huge herds of which roamed the tundra and lichen-spruce areas until the 1910s, although subsequent rapid decline threatens total extinction. The wolf has been reduced in numbers with the reduction of caribou, its chief victim. Lemming, mice. squirrel, hare and porcupine are found, while the beaver, fox, mink, martin and ermine made the peninsula famous for its fur produce Marine mammals include seal, whale and polar bear. Inland the black bear is very numerous.

Birds, especially sea birds and waterfowl, are very numerous in summer. Birds of prey include the snowy owl, rough-legged hawk, bald eagle and golden eagle. Perhaps the ptarmigan is the most characteristic of the Labrador-Ungava birds, occurring in large numbers and turning white in winter. The raven and Canada jay also stay through the winter. Many small species also frequent the area.

Fresh-water fish include varieties of trout, specimens up to 30 lb. having been caught. The landlocked salmon (ouinanishe), pike and arctic char are found over wide areas. Salmon, sea trout and cod occur primarily along the Atlantic coast, the latter long forming the main economic staple of the area, although by thc 1960s much reduced in importance.

Mosquitoes and black flies make life almost unbearable on warm still days. The black fly is rarely found north of the tree line, but the mosquito persists to the northernmost tip of the peninsula.

ECONOMIC

Until the 1950s animal and plant life of land and sea formed the basis of the economy — principally codfishing and sealing along the Atlantic coast and fur trapping in the interior. These pursuits were the main attractions to the early white settlers. Subsistence hunting and fishing originally sustained both Indians and Eskimos until trapping was added to their way of life. Although vast forests cover much of the southern half of the peninsula, slow growth, the small size of trees and poor accessibility render this asset of limited value. Only in the Lake Melville area and farther south is lumbering considered practical.

Agriculture is impossible in the normal sense, except bordering the Gulf of St. Lawrence, although cultivation under glass is feasible on the plateau near mining settlements. An experimental farm is operated at Fort Chimo by the federal department of agriculture, and sheep farming is practised by the local Eskimos.

Minerals provide the economic foundation of Labrador-Ungava. Although discoveries were made late in the 19th century, the great iron ore deposits of the interior nere not mined until 1954; the industry resulted in the mushroom growth of Schefferville (Knob lake). where 400,000,000 tons of ore has been proven. and of Sept-Iles (Seven Islands), its port, to which it is connected by 36j mi. of railway. Ore is shipped from April until November, when it begins to freeze in the trucks. The ore in the Lake Wabush area is 35% iron compared with 55% at Schefferville so beneficiating plants are needed. Ore shipments from the Mt. Wright area, 140 mi. by railway from Shelter bay, west of Sept-Iles, began in 1961. Iron ore from western Ungava bay can be ferried during the short summer navigation period to a port in southwest Greenland, open all year.

The extensive development of mining, including copper, in the extreme southwest in the Chibougamau area, forms part of the main industrial and mining area of Quebec province. while extensive mineral exploration is centred on the Nickel belt nest of Ungava bay.

Hydroelectrical development, focusing mainly on Grand falls with a potential of 4,000,000 h p.. and smaller undertakings near the new mining tonns, is also of great importance. British Newfoundland corporation plans to produce 120,000 h.p from Twin falls on the Unknown river, by 1961 for the Lake Wabush area. There was extensive development of mineral exploration in the 1950s. Showings of nickel, copper, gold and uranium-bearing ores have been discovered in various parts of the peninsula.

POPULATION

Eskimos. — The principal coastal population, excluding the gulf coast and the Atlantic coast south of Hopedale, is comprised of small groups of Eskimos, who are part of an almost circumpolar people of northeast Asian origin (*see* ESKIMOS). The Eskimo once extended to Newfoundland but, with the coming of the Europeans, their economy gradually declined. Only the efforts of the Moravian Brethren and Grenfell missions on the Atlantic coast, and government assistance in the 20th century have maintained them as a distinct group. Dependent originally upon seal hunting and fishing, their economy has been gradually disrupted by their groning tastes for European food and clothes, the tendency to group themselves in settlements about the churches and trading posts, and by participation in a monetary economy. Disease and liquor, acquired from the whites, and the hard bargaining of the trading companies accentuated their decline, which reached a crisis in 1918 with the "Spanish influenza" epidemic. Their numbers increased steadily after that, although the northern settlements of Port Burwell, Nachvak, Ramah, Zoar, Okak, Nutak and Hebron have been abandoned. In 1951 the Eskimos numbered about 2,600, only some 600 of them living on the Atlantic coast. The development of defence installations and mineral exploration have provided work for an increasing number at Hopedale, Saglek, Fort Chimo, Payne Bay and Great Whale but their virtual extinction as a distinct racial group in the region is a serious possibility.

Indians. — Traditionally hostile or indifferent to the Eskimo, the dwellers of the interior are of Algonkian linguistic stock. They are divisible into two main groups, the Montagnais of the south and west, and the Naskapi of the northeast.

The Montagnais originally lived nomadically by hunting and fishing but. after contact with the whites and their conversion to the Roman Catholic faith in the 19th century, trapping was added to their economy. Annual visits to the gulf coast to sell their furs and visit their priests became common and many are becom-

ing gradually assimilated into the white way of life.

The Naskapi bands originally centred on Indian House lake on the George river, where they assembled in late summer for hunting caribou. They suffered great hardship with the caribou's decline, and even in times of comparative plenty, a change in the caribou's migratory routes brought near starvation. The bands finally broke up in the 1920s, one group settling at Davis inlet, another at the Hudson's Bay company's post of Fort Mackenzie on the Kaniapiskau river. This second group later moved to Fort Chimo and in 1956 to Schefferville, where they live adjacent to the Montagnais group, dependent upon government assistance, sporadic hunting and employment in the towns and mines. The Naskapi are one of the last of the Canadian Indian groups to maintain their traditional way of life and continue to speak their native tongue.

Whites.—Until the development of iron mining the white population was principally coastal, concentrated in the French settlements of the St. Lawrence area and the Scottish and English settlements of the south Atlantic coast. In many cases the lot of the "liveyers" (those who live here), in contrast to that of the seasonal fishermen and whalers, was little better than that of the Eskimo, and they subsisted by fishing, hunting and trapping. They became the main objective of the mission established in 1892 by Sir Wilfred Grenfell. Better school and hospital services and the growth of economic opportunity did much to improve their conditions and to compensate for the 20th-century decline of the codfisheries. Construction of Goose Bay airport during World War II and maintained both as a U.S. base and a civilian airport proved a lasting influence in the Lake Melville area. The development of hydroelectric resources at Grand falls by the British Newfoundland corporation, and the possibility of lumbering, may see continued improvement for these settlers.

The rapid growth of the white population attendant upon the development of Sept-Iles and Schefferville (Burnt Creek) brought an entirely new and heterogeneous group into Labrador-Ungava, originating primarily in English- and French-speaking Canada, but including appreciable numbers of immigrants from Europe, Africa and Australia. The population of Schefferville (1956) 1,632, exceeded 4,500, including about 270 Indians, in 1958. The speed of growth was accentuated by the addition of retail stores, construction and service companies and the establishment of the base for the maintenance of the eastern section of the mid-Canada defense line. Daily air service is maintained between Schefferville and Sept-Iles, Quebec and Montreal. A theatre, hotel, restaurant, Roman Catholic cathedral, two protestant churches and three schools are some of Schefferville's conveniences. The population of Sept-Iles was 1,866 in 1951 and 5,592 in 1955. Approximately 750 Indians (Montagnais) live in the vicinity.

HISTORY

The Labrador coast probably was the first section of the new world to be discovered. In A.D. 986 the Norseman, Bjarni Herjolfsson, was on his way to Greenland when, driven off route by a storm, he touched land somewhere on the Atlantic coast. This discovery led Leif Ericsson to organize several expeditions from Greenland about AD. 1000 to colonize parts of the new land, and it is certain that settlers wintered over and came into contact with the aborigines.

The Greenland colonies declined and the early discoveries faded from memory except perhaps in north European ports, for there is evidence of a pre-Columbian voyage by Jon Scolp and J. V. Cortereal about 1472–73. John Cabot (1498) and Gaspar Cortereal (1500) are the accredited discoverers of Newfoundland and the Labrador coast, followed in 1534–41 by Jacques Cartier. In the 16th century many famous explorers, including Martin Frobisher, Thomas Button, Henry Hudson and John Davis were associated with the Atlantic coast but their main objective was the Northwest passage; the opening of Hudson's and Davis' straits resulted in the subsequent neglect of Labrador-Ungava, except by Basque, Portuguese and English fishermen. The 17th century nitnessed the earliest settlements by fishermen, and at its close Maj. George Cartwright from England sponsored settlement on the southeast coast.

James Cook, in 1763–67, was responsible for the first reliable charting of the east coast, but the interior remained virtually unknown until the completion of the travels of John Maclean (1825–50), factor of the Hudson's Bay company and discoverer of Grand falls, and of the Canadian government geologist, A. P. Low, in the 1890s. The latter's spectacular canoe journeys place him in the front rank of Canadian explorers. Even by 1900 only a rough sketch map of the interior was available and large areas remained unknown until the development of mapping from aerial photography after 1945. More recent travelers who deserve recognition as primary explorers include A. S. Packard, Dillon Wallace, Mrs. Leonidas Hubbard, W. B. Cabot, Clive Todd, E. P. Wheeler 2nd, and the handful of pioneer bush pilots of the 1920s and 1930s who first opened up the interior for mineral exploration.

For political information, *see* NEWFOUNDLAND; *see* also QUEBEC; UNGAVA.

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LA BRUYÈRE, JEAN DE (1645–1696), French moralist known for one work, *Les Caractkres ou les moeurs de ce sibcle,* which puts him in the front rank of French writers. He was born in Paris, where he was baptized on Aug. 17, 1645. His father had a fiscal post in the Hôtel de Ville, his mother belonged to a legal family and his forebears are said to have supported the League in the religious wars of the 16th century. Proud of his common stock, he used to sign his name in one word, Delabruyitre. After studying law at Orléans, La Bruyère in 1673 bought an office in the revenue department at Caen. but soon moved to Rouen and then back to Paris. It is said to have been on Bossuet's recommendation that the great Condé in 1684 appointed him as one of four tutors to his grandson Louis, duc de Bourbon (1668–1710). La Bruyitre's tutorial duties ended in 1686, but he was retained as member of the Condé household and put in charge of its library at Chantilly. His years in the service of the Condés were probably unhappy. He was a constant butt because of his ungainly figure, morose manner and biting tongue. and the bitterness of his book reflects the inferiority of his social position. Yet he had devoted friends, and the duc de Saint-Simon, no flatterer of the middle class, made a point of describing him as honourable, lovable, unpretentious and unselfseeking.

La Bruyitre is said to have been working for ten years on his masterpiece, and the fact that he published it as an appendage to a translation of Theophrastus (in fact of Isaac Casaubon's Latin version) suggests he was uncertain of its reception. The book appeared in 1688. under the title *Les Caractbres de Théophraste, traduits du grec, avec les Caractères ou les moeurs de ce siècle,* and made the fortune of the publisher, Estienne Michallet. to whose little daughter La Bruyitre is said to have offered the profits. Of the eight editions published by Michallet in the author's lifetime the first three (all 1688) contained 420 reflections (divided into 16 chapters), but the fourth (1689) contained 344 more, which La Bruyère may be supposed to have withheld from the earlier editions as they can hardly have all been written in the interval. The topical allusions in the book made La Bruyère's election to the Académie Française difficult, and there was talk of political pressure applied in his favour when he was eventually elected in 1693 (barbed allusions have been read into the speech of welcome and into his reply). La Bruyitre died at Versailles in the night of May 10–11, 1696. Shortly afterward Michallet brought out the ninth authorized edition of *Les Caractkres* (1696). Nine dialogues by La Bruyitre on quietism were edited by L. Ellies Dupin (1699).

Les **Caractères.**—The title of La Bruyitre's masterpiece is frequently misunderstood as referring to social types. But there were comparatively fen portraits at first: the idea seems rather to have been to make pungent reflections on the "characteristics" or manners of the time. This was the plan of Theophrastus: to define qualities, such as dissimulation, flattery or rusticity, and

then to give instances of their occurrence in actual people. It is piquant to find one of the most original books in French opening with a disclaimer of any originality save that of presenting a true picture of the times, the sole utility of which is to reform manners. The first chapter, "Des ouvrages de l'esprit," opening with the resounding *"Tout est dit et l'on vient trop tard"* ("All has been said and we come too late"), reads like a literary introduction concocted after the rest had been written, just as the last, "Des esprits forts" (on freethinkers), suggests an attempt to establish religious orthodoxy. The remaining 14 chapters contain epigrams and sketches grouped as follows: "Du mérite personnel," "Des femmes," "Du coeur," "De la société et de la conversation," "Des biens de fortune," "De la ville," "De la cour." "Des grands," "Du souverain, et de la république," "Des jugements," "De la mode," "De quelques usages" and "De la chaire."

The main ingredient is satire, remorselessly exposing the falsity inseparable from court or social life, the power of money in a demoralized society, the tyranny of social custom, the perils of aristocratic idleness and the fads and fashions by which men sought distraction. The bizarre nature of these (the passion for tulips, for birds, for gadgets) made for quick popularity, and as readers began putting real names to the personages of the sketches, "keys" to the book were demanded, and several still exist, some in manuscript, some in print. The author denied authority to all these keys, claiming that no portrait was that of a single individual but that he took features from several people and compounded them to make a likely character. The most famous portraits indeed can be shown to have been generalized. Ménalque, for example, may have been modeled on the absent-minded duc de Brancas, but includes features belonging to other cases and seems to attempt the moral anatomy of absence of mind. The same classical tendency is seen in the mordant descriptions from which any human touch has been withheld, until the last phrase.

Yet the classical attitude is allied in this book to a new spirit. La Bruybre is ready to include elements omitted from the classical synthesis and introduces disturbing social phenomena, such as the condition of the common people. He declares that he would, if given the choice, "opt" to live in their penury rather than with the idle great. But he is no revolutionary, except in technique. His device of suggesting attitudes through surroundings makes his material seem more new than it is. People are described by their dress, actions, speech, without comment. The fop bows to people who are there and to people who are not; you have to look very carefully at the dandy to discover his sex; the statesman is defined as a chameleon by an immense list of balanced and contradictory activities (this last example, as Albert Sorel pointed out, could be read as a manual of 17th-century diplomacy). By contrast with the mass of detail, La Bruybre's occasional global judgment is the more impressive, as on the popularity of executions: *"vaine, maligne, inhumaine curiosité."*

The glory of the work is its style. The epigrams stand comparison with the best: for instance *"La cour ne rend pas content, elle empêche qu'on le soit ailleurs"* ("Life at court does not make men happy, it prevents their being happy elsewhere"). The satire is constantly sharpened by variety of presentation. The queer detail, exclamation. dialogue, catalogue, all these means are employed and all suggest, but never express, scorn or distaste.

La Bruybre allows his general impression to emerge from a cascade of telegraphically listed details or from a series of apparently disconnected observations. His enemies reproached him with disregarding the connectives of speech: this is his triumph, and gives him effects of shock and speed which were new to French prose. His Phédon loses sleep, is uneasy in company, sits on the edge of chairs, walks furtively: *il est pauvre*. These hammer blows have their full satiric effect following on a paragraph of exactly similar structure, about Giton, who walks jauntily, flaunts his handkerchief, snores and spits in public, interrupts, reproves, spreads himself: *il est riche*.

There are editions of the La Bruybre's works by G. Servois, new printing, 6 vol. (1922), in the Grands Bcrivains de France series; and by Julien Benda (1951) in the Pléïade series.

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(W. G. ME.)

LABUAN, an island 6 mi. off the N.W. coast of Borneo, in j° 16' N., 115° 15′ E., 725 mi. from Singapore; area, 38 sq.mi. In 1960 the population was 14,904. Formerly part of the Straits Settlements, it was transferred to the crown colony of North Borneo in 1946. The settlement comprises seven smaller islands, some of them cultivated. Victoria harbour is a safe port, easy of access, and the town of Victoria is the headquarters of the administration. A weekly mail steamer links Labuan with Singapore and North Borneo, and there is a wireless station on the island. On the small island of Pappan at the entrance to Victoria is an important lighthouse. While the rainfall is heavy, averaging 134 in. a year, and the climate is hot and moist, Labuan is not unhealthful for Europeans. A new meteorological station and electric power plant were completed in 1938 There are 41 mi. of roads. A few snakes and lizards are found, but there are no wild animals. The most interesting birds are the megapodes, which lay their eggs in a mound constructed by themselves. and the beautiful black and white pigeon which though, like the megapode, common to these islands, does not frequent the mainland. A small breed of native cattle thrives on an extensive plain. Originally Labuan was covered by thick forest, but the heavy timber was almost completely cleared, either by the lumbermen or fire, and succeeded by secondary growth. In 1938 the area under coconuts was 3,422 ac., under rubber 1,834 ac. and under rice 710 ac. Sago and other palms thrive, as do oranges, mangoes, bananas and pineapples. Coal deposits on the island were worked for many years. There are two schools in Labuan, one of them maintained by the government.

History.— The East India company in 1775, after expulsion from Balambangan by Sulu pirates, sought to make Labuan a trading station. The attempt failed and the island became wholly uninhabited and rarely visited except by the pirates. It came into prominence when in 1846 on the initiative of James Brooke, afteraard first rajah of Sarawak, and Admiral Sir Henry Keppel, it was ceded by the sultan of Brunei to Great Britain. It was taken over as a naval station where British ships might careen and refit, where crews might be exercised in rifle range practice, and where stores and merchandise, necessary for carrying on trade with Brunei, might be kept. Great Britain undertook to suppress piracy and unlawful traffic. In 1848 it was made a crown colony and continued as such for forty years. A garrison of imperial troops was maintained till 1871. The colony was assisted by grants in aid till 1869, when it became nominally self-supporting, but year by year it got deeper into financial difficulties and in 1889 its administration was handed over to the British North Borneo company, whose chief officer became governor. The scheme, however, did not work satisfactorily and in 1905 the governor of the Straits Settlements was appointed also governor of Labuan, the island still remaining a separate colony. In 1907 it was annexed to the Straits Settlements and declared part of the settlement of Singapore; and in 1912 it was constituted a separate settlement. Administration is conducted by a "resident," appointed by the governor of the Straits Settlements. In 1942, during World War II, Labuan was occupied by Japanese forces.

(C. H.; E. S.; X.)

LABURNUM is a genus of trees and shrubs whose butterfly-like flowers obviously relate it to the subfamily Papilionatae (family Leguminosae). The leaves are composed of three leaflets (digitately trifoliolate) and the flowers, resembling those of *Genista* (broom), are disposed in terminal racemes. The pods (legumes) are slender and compressed. L. *anagyroides* (golden chain) is native to southern Europe and is also cultivated as an ornamental. The leaves have elongate stalks and the bright yellow flowers hang in pendulous racemes up to a foot in length.

An interesting form (chimera) that developed from a graft between *Laburnum anagyroides* and *Cytisus purpureus* was formerly known as *L. adami*. It originated at Vitry, near Paris, about 1826, and in habit and foliage is usually similar to L. *anagyroides*, but



ROCHE

HYBRID LABURNUM (L. VOSSI)

its flowers are mostly dull purplish. rarely yellow. although sometimes bearing a few branches with the flowers and leaves of C. *purpureus*. This bigeneric hybrid is known as *Laburnocytisus* and is propagated by being grafted on seedling stocks of *Laburnum*.

The laburnum seeds are highly poisonous. The roots taste like licorice, which is a member of the same family. Occasionally it has proved fatal to cattle, though hares and rabbits are unharmed. The wood of the laburnums has a striking greenish-brown or' reddish-brown hue and takes a good polish. It is ideal for cabinet-making and inlay. It was at one time the most prized timber in Scotland.

(J. D. Dr.)

LABYRINTH, the name given by the Greeks and Romans to buildings, entirely or partly subterranean. containing a number of chambers and intricate passages. which rendered egress difficult. The word is considered by some to be of Egyptian origin, others connect it with Greek. Lydian or Carian words.

Pliny mentions the following as the four famous labyrinths of antiquity.

1. The Egyptian, of which a description is given by Herodotus and Strabo. was situated to the east of Lake Moeris. opposite the ancient site of Xrsinoe or Crocodilopolis. According to Egyptologists, the word means "the temple at the entrance of the lake." According to Herodotus. the entire building. surrounded by a single wall, contained 12 courts and 3.000 chambers. 1,500 above and 1,500 below ground. The roofs were wholly of stone. and the walls covered with sculpture. On one side stood a pyramid 40 orgyiae or about 243 ft. high. Herodotus himself went through the upper chambers, but was not permitted to visit those underground. which he was told contained the tombs of the kings who had built the labyrinth, and of the sacred crocodiles. Other ancient authorities considered that it was built as a place of meeting for the Egyptian nomes or political divisions: but it is more likely that it was intended for sepulchral purposes. It was the work of Amenemhet III. of the 12th dynasty. who lived about 2300 B C. It was first located by the Egyptologist Karl R. Lepsius to the north of Hawara in the Fayum, and in 1888 Flinders Petrie discovered its foundation, the extent of which is about 1.000 ft. long by 800 ft. nide.

2. The Cretan, said to have been built by Daedalus on the plan of the Egyptian. is famous for its connection with the legend of the Minotaur.- It is doubtful whether it ever had any real existence. By the older writers it was placed near Knossos, and it is represented on coins, but nothing corresponding to it has been found during recent excavations. unless the royal palace was intended. Later writers. such as Claudian, place it near Gortyna, but some winding passages and chambers close to that place are, in reality, ancient quarries.

3. The Lemnian was similar in construction to the Egyptian with 1 jo columns.

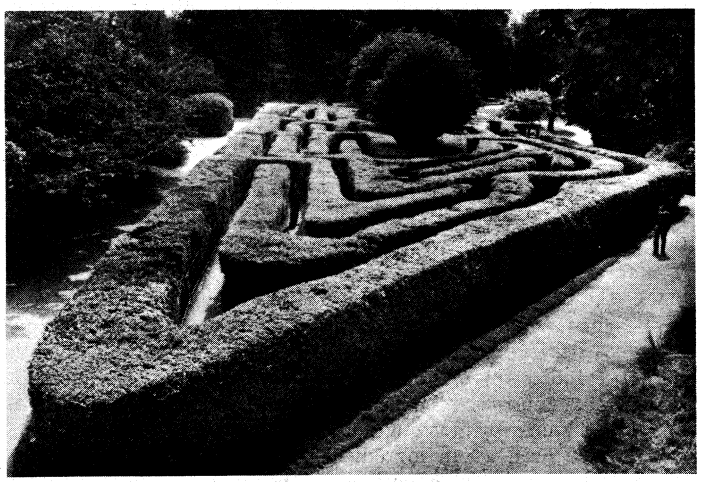
4. The Italian was a highly intricate series of chambers in the lower part of the tomb of Porsena at Clusium. This tomb is said to be recognizable in the mound named Poggio Gajella, near Chiusi.

Lastly, Pliny applies the word to a rude drawing on the ground or pavement.

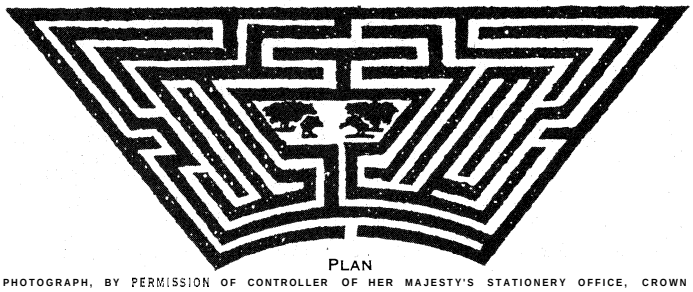
During the middle ages a maze or labyrinth was frequently indicated on the floors of French cathedrals. and the names of the architects were often incorporated in its design. That at Amiens (destroyed in the 19th century but replaced by a copy) contained a verse in which the name of the builders appeared. In the centre were placed figures of the bishop and the three architects: inlaid in white marble. No satisfactory explanation of the existence of these medieval mazes has yet been given.

In gardening. a labyrinth or maze means an intricate netn-ork of pathways enclosed by hedges or plantations of which it is difficult to find the centre or exit. It is a remnant of the old geometrical style of gardening. The more common kind consists of walks. formerly called alleys. kept to an equal width by parallel hedges. which should be too close and thick for the eye readily to penetrate them. The task is to get to the centre, marked in some conspicuous way, then to return: but even those who know the key are apt to be perplexed. Sometimes the design consists of alleys only. such as one published in 1706 by London and Wise. Of a more pretentious character was a design published by Switzer in 1742 showing "six different entrances, whereof there is but one that leads to the centre. and that is attended with some difficulties and a great many stops."

The maze in the gardens at Hampton Court palace, which is considered one of the finest examples in England. was planted in the reign of William III. It is constructed on the hedge and alley system. and was. it is believed. planted with hornbeam. replaced by hollies, yews, etc. The key to the centre is to go left on entering. then. on the first two occasions when there is an option, go right, but thereafter go left.



VIEW FROM ABOVE



PLAN

PHOTOGRAPH, BY PERMISSION OF CONTROLLER OF HER MAJESTY'S STATIONERY OFFICE, CROWN COPYRIGHT

MAZE IN THE GARDENS AT HAMPTON COURT PALACE

The maze in the gardens at Somerleyton hall. near Lowestoft, was designed by John Thomas; the yew hedges were planted about 1880.

There was a labyrinth at Theobald's park, near Cheshunt. when this place passed from the earl of Salisbury into the possession of James I. An 18th-century one is said to have existed at Wimbledon house. the 'seat of Earl Spencer.

LABYRINTHODONTIA, a major group of extinct Amphibia, of ordinal or supra-ordinal rank. They were the dominant amphibians of the late Paleozoic and Triassic; the earliest forms appeared in the late Devonian. The labyrinthodonts may well have included the ancestors of all land vertebrates. and certain of them closely approached the reptiles in structure. The body was newtlike, with limbs of normal pattern. Many were of consider-

able size—as large as alligators—but some were as small as salamanders. Certain of the Permian genera had become terrestrial, but both early members of the group and late degenerate forms were aquatic. *(See* AMPHIBIA.) (A. S. RR.)

LABYRINTH ORGAN, the internal ear, composed of a vestibule, semicircular canals and cochlea. *See* EAR, ANATOMY OF; EQUILIBRIUM, ANIMAL; HEARING.

LAC, a resinous incrustation formed on the twigs and young branches of trees by an insect, *Laccifer lacca,* which infests them. The term lac is the same as the numeral lakh—a hundred thousand—and is indicative of the countless hosts of the insect. Lac is a product of the East Indies, especially Bengal, Pegu, Siam and Assam, and is produced on a number of trees, particularly *Ficus religiosa.* The insect which yields it is closely allied to the cochineal insect, *Coccus cacti;* kermes, *C. ilicis;* and Polish grains, *C. polonicus,* all of which, like the lac insect, yield a red colouring matter. The minute larvae fasten in myriads on the young shoots, and, inserting their long proboscides into the bark, draw their nutriment from the sap. The insects exude the resinous secretion over their entire bodies; and, the separate exudations coalescing, a continuous, hard, resinous layer honeycombed with small cavities is deposited over the twig. From this the females, which form the bulk, never escape. After impregnation, which takes place on the liberation of the males, about three months from their first appearance, each female develops into an amorphous organism consisting in its main features of a large, smooth, shining crimson sac with a beak stuck into the bark, and a few papillary processes above the resinous surface. The red fluid in the sac forms the lac dye of commerce. To obtain the largest amount of both resin and dye the twigs with their living inhabitants must be gathered in June and November. Lac as gathered is known as "stick lac"; the resin, crushed to small fragments, washed in hot water to free it from colouring matter, melted, strained through thick canvas, and spread out into thin layers, is the "shellac" of commerce. Shellac varies in colour from dark amber to almost black; the palest, "orange-lac," is the most valuable. Shellac may be bleached, the product being known as white shellac. Bleached lac takes delicate shades of colour, and dyed yellow it is used in the East Indies for ornaments. Lac is a principal ingredient in sealing wax, and forms the basis of valuable varnishes and polishes of various kinds for finishing both wood and metal articles. This wax is also used as an ingredient in many types of waxy substances which are used extensively in the trades. It is an essential ingredient in phonographic records, in artificial fruit and flouers and various other articles. The extent of its use may be inferred from the fact that more than 50,000,000 lb. of this material are collected and used every year.

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LACAILLE, NICOLAS LOUIS DE (1713–1762), French astronomer and geodesist who mapped the constellations in the southern hemisphere. was born at Rumigny in the Ardennes on May 15, 1713. He was destined for the church, but his scientific interests took him to the Paris observatory, where he won the approval of Jacques Cassini who found employment for him. In 1739 he was appointed professor of mathematics in the Collkge Mazarin, Paris, and two years later was admitted to the Académie des Sciences. His early surveying was done in western France. and he played a leading part in the accurate measurement of an arc of the meridian. At the Collkge Mazarin he had a small observatory, and his work was such that he was authorized to make an expedition to south Africa. In 1677 Halley had observed the positions of more than 300 stars in the far south, and since then no more work of this kind had been done. In two years (1751–53) Lacaille, using a small transit instrument at Cape Town, determined the position of nearly 10.000 stars. He laid down and named the southern constellations in nearly their modern form, and many stars are still referred to by their numbers in his catalogue. His southern observations of the moon, Venus and Mars, in conjunction with similar observations made in the northern hemisphere, led to the working out of more accurate values for the distances of these bodies. Before he returned from the Cape he found time to measure the first arc of the meridian in south Africa. The length he determined did not agree with that expected from observations in the northern hemisphere. The same arc was measured nearly a century later by T. Maclear, his majesty's astronomer at the Cape. The new measurements confirmed the original ones, and the anomalous results are attributed to irregularities in the direction of the plumb line. After his return to France Lacaille laboured alone at the reduction of his observations, and this appeared to hasten his death which occurred in Paris on March 21, 1762. His *Caelum Australe Stelliferum* was published in 1763. (J. JN.)

LACAITA, SIR JAMES [GIACOMO] (1813–1895), Anglo-Italian politician and writer. Born at Manduria in southern Italy, he practised law in Naples. In 1851 after the restoration of Bourbon autocracy he was arrested for having supplied Gladstone with information on Bourbon misrule. Through the intervention of the British and Russian ministers he was liberated. but on the publication of Gladstone's famous letters to Lord Aberdeen he left Naples. He first settled in Edinburgh. where he married Maria Carmichael, and then in London where he was professor of Italian at Queen's college (1853–56). In the latter year he accompanied Lord Minto to Italy and met Cavour.

In 1860 Francis II of Naples had implored Napoleon III to send a squadron to prevent Garibaldi from crossing over from Sicily to Calabria; the emperor agreed, if Great Britain would co-operate. Cavour entrusted Lacaita with the task of inducing Russell to refuse co-operation. Lacaita, who was an intimate friend of both Russell and his wife, succeeded in winning over the British statesman just as he was about to accept the Franco-Neapolitan proposal, which was in consequence abandoned. He returned to Naples late in 1860, and in 1861 entered the chamber as deputy for Bitonto. In 1876 he was created senator. He died in 1895 at Posilipo near Naples.

LA CALPRENÈDE, GAUTHIER DE COSTES, SEIGNEUR DE (*c.* 1610–1663), French novelist and dramatist, was born at the Château of Tolgou, near Sarlat (Dordogne), in 1609 or 1610. After studying at Toulouse, he came to Paris and entered the regiment of the guards. becoming in 1650 gentleman-in-ordinary of the royal household. He was the author of several long heroic romances ridiculed by Boileau. They are: *Cassandre,* 10 vol. (1642–50); *Cléopatre* (1648); *Faramond* (1661); and *Les Nouvelles, ou les Divertissements de la princesse Alcidiane* (1661), published under his wife's name, but generally attributed to him. His plays lack the spirit and force that occasionally redeem the novels. The best is *Le Comte d'Essex,* presented in 1638.

See E. A. Seilliere, *Le Romancier du grand condé Gauthier de Costes sieur de La Calprenède* (Paris, 1921).

LACANDONES, an Indian tribe belonging to the Maya-Quiché stock. They occupy the tributary streams west of the Usumacintla river in Chiapas, Mexico. Their tongue is closely related to the Maya of Yucatan. Living in scattered family groups, their total number today is only a few hundred. Formerly, however, they were numerous and opposed the Spaniards so resolutely, especially during the 17th century, that they were never completely subdued. Their culture at present is primitive but they show survivals of higher phases inherited from pre-Columbian times.

See A. M. Tozzer, *A Comparative Study of the Mayas and Lacandones* (1907).

LACCADIVE ISLANDS, a group of coral reefs and islands in the Arabian sea, between 10° and 12° 20' N. and 71° 40' and 74° E., 100–250 mi. off the southwest coast of India. The name Laccadives *(laksha divi,* "hundred thousand isles") was that given by the people of the Malabar coast, and was probably meant to include the Maldives. There are 17 separate reefs but only 14 islands, and four of these are uninhabited. Formerly, the group was attached to the Madras state of India, the northern portion, known as the Amindive Islands, being within the South Kanara

district, and the remainder within the Malabar district. In 1956 the Laccadive, Minicoy and Amindive Islands became a territory Minicoy (Minikoi) lies between the Laccadives and Maldives (*q.v.*). Munyal, Coradive and Sesostris are submerged banks lying north of the islands. Most of them have emerged from the eastern and protected side of the reef. the western being completely exposed to the southwest monsoon. The islands are small, none exceeding a mile in breadth, while the total area is only about 7 sq.mi. The soil is light coral sand. beneath which. a few feet down. lies a stratum of coral stretching over the whole of the islands, generally a foot to a foot and a half in thickness It has been wholly excavated in the principal islands, the underlying damp sand being made available for growing cereals. These excavations—a work of vast labour—were made at a remote period, and according to the native tradition by giants.

Coarse grain, pulse, bananas and vegetables are cultivated; coconuts grow abundantly. For rice the inhabitants must depend upon the mainland.

History.—Albírúní (*c.* 1030) divides the whole archipelago (Dibajat) into the Divah *Kúzah* or Coarie Islands (the Maldives), and the Divah Kanbar or Coir Islands (the Laccadives). The islanders were converted to Islam by an Arab apostle named Mumba Mulyaka. whose grave at Androth still gives a peculiar sanctity to that island. The kazee of Androth was in 1847 still a member of his family, and was said to be the 22nd who had held the office in direct line from the saint. The Portuguese discovered the Laccadives in May 1498, and built forts upon them. but about 1545 the natives rose against their oppressors. The islands subsequently became a suzerainty of the raja of Cannanore, and after the peace of Seringapatam. 1792, the southern group was permitted to remain under the management of the Moplah chief at a yearly tribute. Since this was often in arrear the islands were sequestrated by the British in 1877.

Population and Trade.—In 1951 the population was 13,992. The people are Moplahs *i.e.*, of mixed Hindu and Arab descent, and are Mohammedans. The language spoken is Malayalam (but written in the Arabic character). except in Minicoy, where Mahl (akin to old Sinhalese) is spoken. The chief industry is the manufacture of coir (largely employing women). The islanders also are occupied with boat-building and trade with the mainland. As the frequent coral reefs in the vicinity of the islands make navigation dangerous, commerce is carried on almost exclusively in native vessels manned by skilled sailors.

LACCOLITH, in geology, the name given by G. K. Gilbert to intrusive masses of igneous rock possessing a cakelike form (from Gr. *Lakkos,* "cistern," and *Lithos,* "stone"), first described from the Henry mountains of southern Utah. Their characteristic is that they have spread out along the bedding planes of the strata, but are not so broad and thin as the sheets or intrusive sills which, consisting usually of basic rocks, have spread over immense distances without attaining much thickness (see SILL). Laccoliths cover a comparatively small area and have greater thickness. Typically they have a domed upper surface while their base is flat. In the Henry mountains they are one to five miles in diameter and range to 5,000 ft. in thickness. The cause of their peculiar shape appears to be the viscosity of the rock injected, which is usually of intermediate character and comparatively rich in alkalis. belonging to the trachytes and similar lithological types. These are much less fluid than the basalts, and the latter in consequence spread out much more readily along the bedding planes, forming thin flat-topped sills. At each side the laccoliths thin out rapidly so that their upper surface slopes steeply to the margins. The strata above them which have been uplifted and bent are cracked in many places by extension, and as the igneous materials well into the fissures a large number of dikes is produced. At the base of the laccolith, on the other hand, the strata are flat and dikes are rare, though there must be a conduit up which the magma has flowed into it. The rocks around are often much affected by contact alteration, and great masses of them have in places sunk into the laccolith, where they may be partly melted and absorbed, with resulting changes in physical and chemical composition (see also METAMORPHISM).

Gilbert found that these laccoliths were filled at depths of 7,000 to 10.000 ft. and did not reach the surface to give rise to volcanoes. From the effects on the drainage of the country it seemed probable that above the laccoliths the strata swelled up in flattish eminences. Often they occur side by side in groups belonging to a single period, though all the members of each group are not strictly of the same age. One may be formed on the side of an earlier one, and compound laccoliths also occur. When exposed by erosion they give rise to hills, and their appearance varies somewhat with the stage of development.

In western South America similar laccoliths occur in considerable numbers and present some diversity of types. Some have one steep side, the other gently inclined; others are split into a number of sheets spreading outward through the rocks around. In Britain and elsewhere the term is used for a variety of intrusive masses not strictly identical in character with those of the Henry mountains. Some of these rest on a curved floor (the gabbro masses of the Cuillin hills in Skye); others are injected along a flattish plane of unconformability where rock rests on upturned and eroded edges of an older series, as in the felsite mass of the Black hill in the Pentlands, which followed the line between the Silurian and the Devonian. forcing the rocks upward without much spreading laterally (see also BATHOLITH).

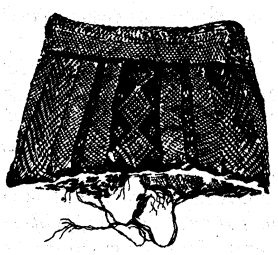
(J. S. F.; X.)

LAC DYE is derived from the lac insect (Coccus lacca or ficus) which lives on the peepul or bo-tree (Ficus religiosa), the jujube (*Zizyphus* jujuba), the dak (*Butea* frondosa) and other trees native to southern Asia. It is an extremely ancient dyestuff, and employed in the east for many centuries before it was known in Europe. Its use in Great Britain dates from about 1790. The insects fasten themselves to the twigs during November, and become covered with a viscous fluid forming a cellule round the animal, which attains its full size in March. From this product. known as "stick lac," the dye is extracted with hot sodium carbonate, the solution evaporated. and the residue moulded into cakes. Lac dye mas at one time important, and shellac merely its by-product; now the position is reversed, the dye being seldom employed. It yields shades similar to those of cochineal (*q.v.*), and was formerly used for dyeing in admixture with the latter. The colouring matter, laccaic acid, $C_{20}H_{14}O_{10}$, is closely related to the carminic acid of cochineal. **(A. G. P.)**

LACE. The word lace is applied to an ornamental openwork fabric formed by looping, interlacing, braiding or twisting threads of flax, cotton, silk, gold or silver, mohair or aloe fibre. It is derived from the Latin laqueus.

HISTORY

The cemeteries and tombs of ancient Egypt have preserved fine linen weaves, spindles and loom weights dating from the early dynasties; but with the exception of the *buratto* weave which is said to have been in use in Babylon and (during the XXII Dynasty) in Egypt it is not until the Coptic period, in the first decade of the Christian era, that me have in the plaited thread head-dresses of the native Egyptians any material that may properly be classed as lace. It is to this field that the student of today must turn for documents dealing with the beginning of lace history. In technique these caps, which in many instances resemble bags. are of what has been described as "Egyptian plaiting" although it is not known whether the technique is of Egyptian origin. In the curious twisting of the threads the fabric suggests bobbin work; but up to the present time, Egypt has failed to yield anything indicating that the art of bobbin lace-making was practised in its ancient civilization. In Italy. however, E. M. Bixio, director of the Etruscan museum at Bologna, working on the site of the ancient Roman settlement of Claterna, in 1892,



BY COURTESY OF METROPOLITAN MUSEUM OF ART

EGYPTIAN HEAD-DRESS OF PLAITED THREAD-WORK. COPTIC PERIOD

unearthed a series of small cylindrical objects which in size and form would seem to be identical with modern lace bobbins, and which were, moreover, found in pairs and groups similar to the arrangement of bobbins in the manufacture of bobbin lace.

In the 13th century the art of embroidery in England had attained a perfection that has never been surpassed, a needlecraft requiring a skill and dexterity equal to that of the Venetian lace-workers, and yet England never excelled in the production of needlepoint lace. An early reference to work with bobbins, however, is found in a Harlean manuscript dating from about 1471, which gives directions for making "lace Bascom, lace indented, lace bordered, lace covert, a brode lace, a round lace, a thynne lace, an open lace, lace for hattys' etc.," the illuminated capital letter with which the manuscript opens showing the figure of a woman making these articles. The process there described would seem to be allied to card-weaving, the fingers serving to carry the thread which was occasionally dropped to form a sort of indented lace or braid. Such openwork braid marked an advance in the evolution of gold and silver passementerie from the cords and lacings which many early writers on the subject freely translated as "lace." Fine bobbin lace, being dependent upon the supply of pins, could not of necessity have developed to any great extent prior to the manufacture of brass pins. Early pins were of box-wood, bone, bronze or silver. One of the earliest records is that found in a wardrobe account of 1347 in which a charge for 12,000 pins is made for the trousseau of Joanna, daughter of Edward III.

The history of lace-making, as it developed, records in its evolution various types of openwork thread fabrics: (1) Interlaced and knotted threads varying, of fringed linen, the origin of the *punto groppo* or macrame' of northern Italy; (2) Network, of which there are several varieties: (a) the Coptic type in which a series of threads arranged vertically on a rectangular frame in such a way as to form a double warp are separated by a removable rod or "sword" as they are plaited from the centre of the frame, which process produces simultaneously a weave above and below the point where the fingers are plaiting the thread; (b) also made on a frame, in which the threads forming the net are knotted at the points of intersection (It. *punto* a maglia *quadra;* Fr. *réseau, rezel, rezeuil; filet* brode'; Ger. Netzarbeit); (c) woven net, made on a small hand loom or framework in which the warp threads are twisted at each passage of the weft, the *buratto* above referred to, a technique which is also found in textile fragments of the Swiss Lake-dwellers and in Peruvian weaves of the 9th century (It. *buratto.* Fr. toile clere); (d) net worked by needle over a card-board pattern or a spool, such as is found in the circular disc or "sol" pattern of the Spanish *punto* de *Cataluña* and in the South American nanduti or toile d'arraigne'e.

As finally evolved, however, lace-making comprised four different processes (1) with the needle: needlepoint (It. *punto* in *aco;* Fr. point *à l'aiguille;* Ger. *nähspitzen*) developed directly from drawnwork and cut-linenwork in which processes certain counted threads in a linen cloth are removed to provide open spaces for decorative lace stitchery. When the field for decoration is obtained by withdrawing threads of the linen, the work is termed drawnwork, of which there are several varieties: (It. *punto tirato;* tela *sfilata; fili* tirati e *ripresi* or *lacis; fili tirati* tela *lasciata.* Fr. point tire'; Ger. Durchbruchurbeit; Sp. deshilado). When groups of counted threads are removed by cutting, it is cut-linenwork (It. *punto* tagliato; Fr. point coupe'; Ger. *Doppeldurch-brucharbeit*); (2) With bobbins, pins and pillow or cushion: bobbin or pillow lace (It. *merli* a *piombini;* Fr. dentelle *à* fuseaux; Ger. *Kloppelspitze;* Dutch, gespelde-werkte *kant;* Old Flem, *spelle werk*); (3) With a crochet hook; (4) With shuttles on a loom operated by hand or by power-driven machinery.

The classification of lace' by the historical sequence of design according to centuries, can be roughly grouped as follows: 16th century, geometric type; 17th century, patterns of foliated scrolls supported by tie-bars with no background; 18th century, formal arrangement of symmetrically balanced scrolls reflecting contemporary silk patterns, stylistic floral forms, naturalistic floral motives with ribbons and festoon?; development of the mesh background and elaborate *jours* or ornamental stitches; 19th century, the decadent period of design, ultra naturalistic floral patterns; introduction of machine net.

Italy.—In Renaissance portraits of the late 15th century, rare jewels are worn with costumes of sumptuous velvets heavily trimmed with gold and silver passements. In the early days of lace-making the lace trade was handled entirely by the Paris passementiers who made no distinction between passementerie and lace, applying the same name to both. The confusion of terms resulting therefrom persisted until the middle of the 17th century when in lace nomenclature *passement* and dentelle became two distinct fabrics, the former applying only to flat braid or guimp trimmings of gold or silver thread, the latter to needlepoint and bobbin lace. But lace had not yet become an accessory of dress. From the middle of the 16th century on, however, the history of lace, as recorded in contemporary portraiture, can be traced step by step as the gradual mastery of the art was acquired by the workers in meeting the mandates of fashion. It was this century that witnessed the evolution of needlepoint lace from embroidered and cut linenworks. When in 1542 a sumptuary edict prohibited the extravagant use of silk and gold in embroidery, the early geometric type was already well established. The process of this work was as follows: groups of counted warp and weft threads were drawn or cut out from a piece of linen cloth leaving at set intervals a certain number of warp threads, these with the cut edges of the linen cloth forming a series of rectangular openings; in such spaces added threads, diagonally placed, served to support star and circular motives worked in the simple loop or button-hole stitch (point noue'), which is the foundation of all needlepoint lace. This lace—which the Italians styled reticella (from rete, net) and which has been variously described as "gothic point" and "Greek lace"—Venice exported in large quantities to the court of France during the reign of Louis XIII. where it enriched the collars, knee garters and shoe tops of the King's favourites.

The sumptuary edict of 1542 was an important date in lace history, for the needlecraft workers of Venice, obliged to abandon embroidery in colour, turned their attention to the elaboration of white work; and it was during this period when the finest linen-works were produced in her convents and in the families of nobility, that Italy's lace technique was established—a technique that owed its perfection to the meticulous accuracy with which in the preparation of a pattern each thread of the linen was carefully counted. But the Venetian workers who had long served their apprenticeship as embroiderers and were past masters in the art of reproducing with the needle patterns inspired by the delicate foliated scroll-work found on the borders of missals and in the arabesques of Near Eastern leather work and rug weaves, were not content with the geometric type of patterns, and as their technique developed they strove to abandon the linen foundation in order to reproduce in lace the same patterns that were used for embroidery. At this time, side by side with the already developed geometric type, two varieties of cut-work are found which seem to reflect this tendency on the part of the lace-workers. One of these is the *punto* tagliato (*punto,* stitch; tagliare, to cut) for which the Venetian, Mattheo Pagan, published a book of patterns in 1542, the year of the edict. In this work, which like *reticello* starts with a linen foundation, a sufficient number of counted warp and weft threads are withdrawn to form a simple rectangular framework; this reticulated background is then overworked, and superimposed upon it is a scrolling vine pattern worked in *punto* in aria. The fact that Paris Bordone appears to be the only Venetian painter whose works record this variety of cut-work would seem to indicate that the transitional period was of short duration. The second variety is what is known as *intagliatela,* another version of cut cloth. In this the pattern is elaborately designed with foliated arabesques and pomegranate motives, the occasional open spaces no longer adhering to the earlier quadrangular outline, the geometric stars and circles giving way to stylistic floral motives, figure and animal devices which occupy the irregular fields of openwork.

When the lace-makers realized that their perfected technique no longer required the support of the reticulated background with its linen foundation, they discarded the old process and used patterns

of cloth-backed parchment, on which an outlining thread was couched that served as a supporting framework for the pattern; and on this outlining thread the looped stitchery was worked on the surface but not through the parchment foundation. When the work was finished a sharp knife passed between the parchment, and the cloth-backing cut the couching threads and the lace worked on the surface was released. Thus at the beginning of the 17th century we find the geometric *reticello* type giving way to patterns of deep points—both in needlepoint and bobbin-made laces, which in time were supplanted by patterns of foliated scrolls combined with irregular tie-bars or *brides* that served to hold the edges of the pattern in place. With greater dexterity of workmanship and increasing demand for richer fabrics the simple *punto in aria* soon took on an accentuated cordonnet (Pl. VIII, fig. 7) which in time was varied by the introduction of details worked in high relief and edged with *picots* (loops), the heavy Venetian point (It. *punto tagliato* a *fogliami,* or *punto a relievo;* Fr. *Gros point de Venise;* Ger. *Venezianer Reliefspitze*). The highest stage of its development, however, is found in the *punto roselline* or rose point of the early 18th century with its evenly distributed accentuation and its exquisitely delicate technique. It was thus that Italy's lace-workers, who supplied the world market during the greater part of the 17th century, laid the foundation on which the art of lace-making in other countries was based. Three other Venetian needlepoints should be mentioned before turning to Italian pillow-made lace: (1) *Punto avorio,* closely worked needlepoint bands of silk or linen, a peasant lace peculiar to the Valle Vogna district in northern Italy; (2) The grounded Venetian, which the French term *point de Venise à réseau,* the most delicate of all needle-wrought fabrics, and probably designed to compete with the exquisite Brussels pillow-made fabric; (3) Burano lace, identified by its vertically worked mesh of unevenly spun thread that gives a clouded effect to the ground. The patterns are usually composed of a simple coral spray or a floral disc motive outlined with a heavier thread overcast with a sparsely worked buttonhole stitch.

Of Italian pillow-made laces, those of Genoa and Milan, sometimes termed North Italian *guipure,* are the most important. In the 15th century (1411–20) Genoa was importing large quantities of gold thread from Cyprus, and later became the centre from which the luxurious courts of Europe obtained their gold and silver *passementeries* and laces. English wardrobe accounts of the 16th century record the purchase of Genoese silk lace for Queen Elizabeth, and a *mouchoir de point de Gennes frise* is mentioned among the effects of Marie de Medici.

Among the more important Italian bobbin laces are the following: (1) Pointed lace; Genoese and Venetian of the 16th and 17th centuries, used for neck-ruffs, handkerchiefs and aprons. The Genoese has a characteristic stitch resembling a grain of wheat throughout the pattern; the Venetian is more delicate in texture. (2) Point de Milan, although termed "point," is a pillow-made bobbin lace. The 17th century types are *guipure,* scroll and *bride* pattern without mesh; the 18th century scroll and figure motives in a field of mesh. (3) Tape and needlepoint lace, made to imitate heavy Venetian point has a pattern composed of narrow bobbin tape combined with needlepoint stitchest (4) Ligurian or Genoese types, a 17th century pointed lace of flat bobbin braid-like texture, and a *reticello* type, often termed *point de Gênes frisk,* Hispano-Moresque or Greek lace. (5) *Vermicelli,* a fine-meshed 18th century lace of the Mechlin type in which the pattern is outlined with a heavier thread.

The interrelation between Europe and the Far East during the middle ages and in the 15th century between Italy and the Levant is evidenced not only in the migration of patterns, but also in the transmission of various techniques; thus it is that the graceful arabesques of Persian rug weaves and tooled leather-work combined with the floral motives of Rhodian pottery reappear in Venetian points of the 17th century just as the *tela sfilata* type of Italian drawn-work is undoubtedly of Near Eastern origin.

The Orient.—In the Orient a lace technique similar to that of Italian needlepoint is found in occasional Chinese embroideries of the 18th century. This is a buttonhole stitch with an extra twist in the loop worked in an open pattern over a couched outline, the completed fabric resembling details in Venetian needlepoint and also early English Hollie point. Bobbin lace-making was first taught in China by missionaries settled at Chefoo in the latter part of the 19th century. In 1895 British missionaries commercialized the work which developed into a thriving industry in the Chefoo, Chi Hsia Hsien and Shantung districts where torchon, Maltese, French and Belgian patterns were copied first in silk and later in linen and cotton thread, the finest of which were made at Ching Chou, a town 30 m. W. of Weihsien. In 1920 filet was introduced in the Chefoo district which attained a highly perfected technique and which was exported in large quantities to America, while other laces were marketed in Australia.

The history of lace-work in Persia and Syria is confined to network embroidered in coloured silk, simple drawn-work used in edging embroideries, Greek *bibilia* or Turkish *oyah,* a needlepoint fabric peculiar to the eastern Mediterranean district.

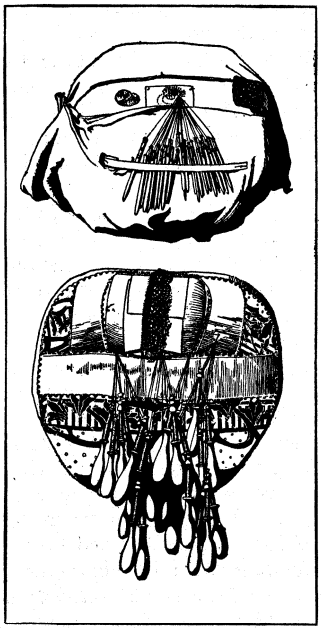
The Mediterranean Area.—In this should be included the islands of the Aegean where in Crete is found a simple type of bobbin lace in which the pattern is outlined in colour; this lace is closely allied to 18th century Spanish polychrome lace and also to a type found in central Europe. In Sicily technique and patterns follow Italian tradition both in network, drawn-work and bobbin laces which in the 19th century were abandoned for embroidered machine net, much of which was used in bridal veils and for trimming ecclesiastical vestments. The old work of Sardinia is described by Signora Ricci as a peculiar type of filet designed with confronted birds often worked in rather coarse blue and white thread, or again a finer quality of white thread is found in works more elaborately designed in which an angular type of scroll is combined with figure motives. The silk bobbin lace of Malta, in which the Maltese cross is a distinguishing mark, has been copied extensively in the Far East, both in China and India, where the work has been introduced by missionaries. Like the old Genoese it has in its pattern the stitch resembling an oat or wheat seed and is likewise of a *guipure* type. Turning to the Barbary States, Morocco is a field rich in embroidery which reflects both Indian and Italian influences, but its lace-work is confined to a very coarse heavily knotted filet designed with archaic animal motives, and a simple type of needlepoint worked in a stitch similar to the *punto avorio* of Italy often used as an *entre-deux.*

Spain.—In Spanish lace, network and drawn-work combine in their patterns in many instances the double eagle or the lions of Castile, alternating with turreted castles set in a field peopled with archaic figures and stylistic birds. These latter motives also occur in similar work throughout the Mediterranean area, Sicily, Aegean islands, Sardinia and in some Moroccan embroideries. In Spanish drawn-work, however, the method employed in overworking the field—where counted warp and weft threads of the linen have been drawn out, leaving an open-work mesh—differs from the Italian in which the remaining threads of the linen are covered with *a* winding stitch while the Spanish process loops the thread through the four sides of the mesh.

What may be termed typical Spanish network is the *punto de Cataluiia* with its characteristic sun or "sol" pattern. Spanish copies of the Italian *reticello* have a much less compact technique and here again the geometric motives reflect the "sol" motive of the *punto de Cataluiia* rather than the star and wheel patterns of the Italian models. Needlepoint corresponding to the *punto in aria* type on the other hand is much more closely worked; the vase form when it appears is more bulbous, while the leaves and flowers are inclined to be round and flat, edged with tightly worked *picots.* The most beautiful Spanish needlepoint of the 16th century is the *punto de España frisado en oro.* This has a foundation of gold thread that forms a series of small *picots* outlining the motives while in the body of the pattern the gold thread is overworked with polychrome silk in a weaving stitch. The *punto de España* of the late 16th and early 17th centuries, corresponding to contemporary *punto in aria* of the Italian workers, is also quite individual in character. The patterns, which show little variation, adhere closely to a gracefully curved leaf form which at times alternates with a diagonally set branch motive.

Spanish portraits of the 17th century record an extravagant use of pointed bobbin lace in the enormous neck-ruffs of the period, a type similar to the Italian but which is claimed to have been a native product. While the church treasuries of Spain are rich in Flemish laces, there are among these occasional variants of the "point de Milan" which are undoubtedly Spanish; in these the patterns are less carefully drawn and the scroll motives that terminate in pomegranate or disc-like flowers are as a rule set in a field of square, open mesh. Another form of bobbin lace from the district of Seville is of coarse thread rather loosely worked; this has a large quadrangular mesh with a pattern of archaic tree motives. To many, however, Spanish lace means the black and white silk blonde lace used for *mantillas;* quantities of these laces were produced at Catalonia, but those made in France at Chantilly, Bayeux and Caen were of much finer ,quality. Machine copies of these laces in which the pattern has a needle-run outline are often sold as hand-made fabrics.

France. — There were already many centres of lace-making in France when, under the royal patronage of Louis XIV., Venetian and Flemish lace-workers were imported to stimulate the industry. In the little museum of Alençon may be seen a few bits of needlework and *reticello* said to have been made by the women of the court of Marguerite de Valois. It was Catherine de Medici, the Italian queen of Henry II., however, whose interest in needlework may be said to have laid the foundations of the lace industry in France, and it was during her sojourn at the French court as wife of Francis II., that Mary Stuart became an adept in the art of the needle. The work of this period comprised embroidered filet (*reseuil*), shown in the Bronzino portrait of Eleanor of Toledo (Pl. I. fig. 2); simple cutwork such as is found in the portrait of Henry II. and in that of his daughter Claudia, and drawn-work like the cap of Holbein's portrait of Anne of Cleves (1539). It was during the reign of Henry III. (1574–89) that Venetian and Genoese laces became so important an accessory of male attire that enormous sums of French money poured into Italy while native industries languished. This continued during the extravagant reign of Louis XIII.; but with the advent of Colbert, the great minister of finance under Louis XIV., a new régime was effected and in 1665 the manufacture of *point de France* was established at Alencon, Argentan, Sedan, Rheims and other centres. Many of the lace-makers of Alençon already knew the technique of the *point de Venise,* a number having been trained by Mme. de La Perriere, who had discovered the process in 1661. Alençon lace of the early period had a large hexagonal, buttonholed, mesh like the *point de France* but without *picots;* later the fine hexagonal mesh became the accepted Alençon type, while the Argentan workers adopted the hexagonal mesh of twisted thread, the *bride tortillée* instead of the buttonholed mesh, the *bride bouclée.* It is difficult to say just when the laces of Alençon and Argentan ceased to be termed *points de France,* but according to Mrs. Palliser an inventory of 1723 is the last to mention *point de France,* while *point d'Argentan* appears in 1738 and *point d'Alençon* in 1741. Skilled workers from Venice were imported to perfect the technique of the native lace-maker in reproducing Venetian points, while others were brought over the border from Flanders to teach bobbin lace-making in order to enable the native industries to meet the demand of the court for *point d'Angleterre* which, though a pillow-made fabric, came to be known as *point de France façon d'Angleterre.* At the time of the reorganization of the industry there were a number of Flemish pillow-lace makers working at Rheims. The first needlepoint laces produced under royal patronage were close copies of the heavy Venetian point which, when made in France, was termed *point Colbert.* In time, however, the French evolved a distinct type by increasing the number of *brides* until they became a large hexagonal mesh, which served as a field or background to the exquisite patterns designed by Le Brun, Berain, Bailly and other skilled draughtsmen working under court patronage. Beautiful works of the great period may be seen in the collections of the Musée des arts décoratifs, Paris, the Victoria and Albert Museum, London, and the Metropolitan Museum of Art, New York. The history of lace as it developed in France during the 17th and 18th centuries is recorded in the engravings of Abraham Bosse and Le Paultre and the portraits of van Loo, Hyacinthe Rigaud, Nattier, Le Brun and other court painters. In the Department du Nord, where several important Flemish lace centres were transferred to France at the time of the Peace of Nimwegen, the lace produced under French surveillance took on all the charm and elegance peculiar to *points de France.* The extravagant uses to which priceless *points de France* were applied during the reigns of Louis XIV. and XV. included not only laces for the *steinkerque* (a long cravat worn alike by men and women), frills, cap crown and lappets for the towering *fontange* head-dress *engageantes* for the Louis XV. sleeve ruffles, and elaborate lace aprons; but these rich fabrics were also used in adorning the boudoir, the dressing-table, the bed and the bath.



BY COURTESY OF THE METROPOLITAN MUSEUM OF ART

Above: Pillow used in making English Honiton bobbin lace
Below: Pillow used in making French bobbin lace

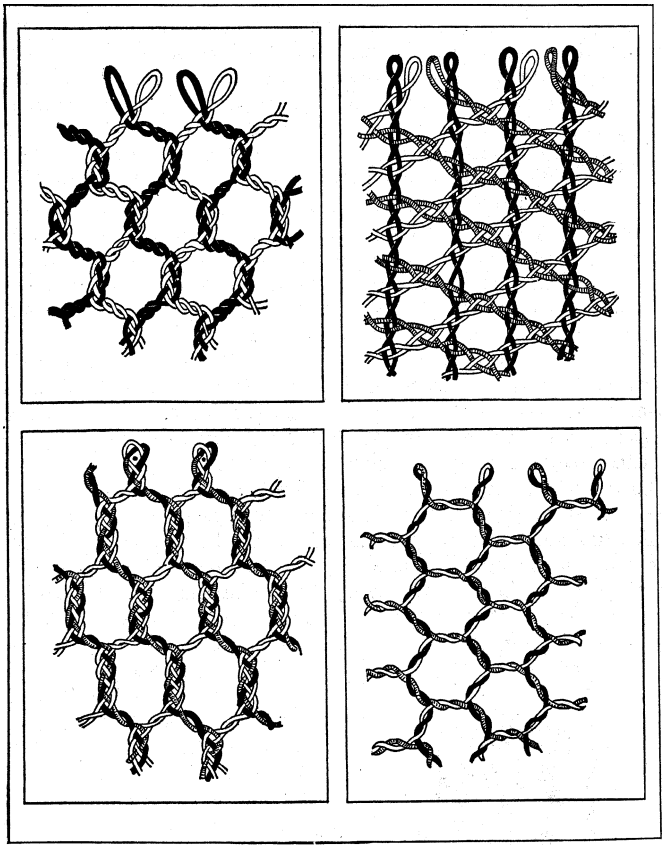
Smaller centres in the Mirecourt and the Haute Loire continued to produce the simpler bobbin laces such as were used in the headdresses of the peasant class while Chantilly, Caen, Bayeux and Le Puy specialized more particularly in black lace which became fashionable toward the middle of the 17th century at the time of the marriage of the young king (Louis XIV.) to the Infanta of Spain in 1660. While this vogue lapsed during the 18th century it was revived again during the Louis XVI. period and attained great popularity in the middle of the 19th century (*c.* 1851) when for 25 years or more fashion decreed that every lady's wardrobe should include a Kashmir or Paisley shawl for winter, and for the summer a black or white so-called Chantilly shawl, many of which were produced at Brussels and Ghent.

The fall of Napoleon brought to a close the brilliant era of lace-making in France, and while exquisite fabrics were still available during the Restoration period when the bishops officiating at the coronation of Charles X. were resplendent in lace-trimmed vestments, the revival was of short duration and, in spite of the attempt on the part of the Empress Eugenie to bring relief to the impoverished lace-makers by placing large orders, the industries were finally forced to the wall owing to the increasing popularity of machine-made fabrics.

Belgium. — Despite the fact that Italy disputes with Belgium the invention of bobbin lace, Belgium will always stand pre-eminent in the art as it was developed in that country in the 18th century at the height of its greatest period. While records fail to throw any light on the early history of lace-making in the Low Countries, save in occasional evidences discovered in paintings of the 15th century, existing documents prove that in Brussels the art was already a thriving industry in the second half of the 16th century. After that date, however, Belgium is rich in dated documents. The earliest of these is the bedspread preserved in the Brussels museum. The fabric, of unbleached linen thread, is designed in a series of compartments; in two of these appear the crowned monogram of Albert and Isabella, while in others are the arms of Brabant, of Spain and of England, the lily of France and the eagle of Austria. Among the personages represented are Philip II., Roman emperors, the' legendary figure of Sainte Gudule and a number of figures associated with the celebrated Cortege de l'Ommegang du Sablon.

Of slightly later date is the splendid cover in the Victoria and Albert Museum said to have belonged to Philip IV. of Spain which bears in its design the crowned Austrian eagle surmounted by the collar of the Golden Fleece. From an historical point a

piece of equal interest is the flounce of *point d'Angleterre* in the Brussels collection (Pl. VII., fig. 7), a work executed presumably at the time of the marriage of Charles III. (afterwards Charles VI. of Spain), and Elizabeth of Brunswick. This lace designed in the earlier style of the *points de France,* combines in its pattern the interlaced monogram of these sovereigns and also their portraits surmounted by the Austrian crown. These with the splendid



UPPER LEFT, MECHLIN MESH UPPER RIGHT, POINT DE PARIS. LOWER LEFT. BRUSSELS MESH. LOWER RIGHT. LILLE. ARRAS AND BUCKINGHAM. SHIRE LACE

pieces preserved in the church treasuries of the 18th century and the number of historical works produced during the World War, form an important group illustrating the historical sequence of Belgian work during the past three centuries.

Eugene van Overloop in his guide to the Brussels collection, classifies Belgian laces according to districts under four general heads: (1) The laces of Brussels and the so-called Brabant laces. (2) The laces of Flanders. (3) The laces of Mechlin and those of the Antwerp district. (4) The laces of Valenciennes and their prototypes the laces of Binche.

In technique, Belgian laces may be divided as follows: (1) Bobbin laces: (a) Those made with a continuous thread on a stationary pillow; a process termed *fil continu,* such as Binche, Valenciennes, Mechlin, Lille, *point de Paris, point de Flandre* or *trolle kant. (Kant* is the old Flemish word for lace; *trolle kant* is a Flemish lace with a pattern outlined with a heavier thread than the body of the lace.) (b) Those made in sections—on a movable pillow that may be turned to follow the curves of the pattern—and the tie-bars *(brides)* or mesh added later; a work described as *à pièces rapportées.* In this variety the bobbins are at times supplemented by a crochet hook when the edges of the pattern have to be connected or additional threads have to be added in working the mesh, the hook drawing a loop of thread through a pin-hole in the edge of the work, in which loop a free bobbin is passed to draw the knot tight, as in the bobbin laces of the 16th and early 17th centuries, the *guipure* laces of Brussels and Bruges and the modern Duchesse. (c) The Brussels hand-made bobbin net *(droschel or vrai réseau)* made in narrow strips of one or more inches in width placed side by side and joined with the *point de raccroche.* The weaving of this delicate hexagonal mesh that has two sides braided and four sides twisted is one of Belgium's greatest achievements in lace-making. (2) Needle-point laces: Those worked on cloth-backed parchment or paper; the Brussels *point à l'aiguille* or *point de gaze. (3)* Bobbin and needlepoint laces, which combine both techniques, the pattern usually worked on the pillow and the tie-bars or the mesh worked in with the needle. Modern lace of this type is often termed *point d'Angleterre.* (4) Applied laces: Those in which the pattern. worked with bobbins or by needle, is applied on hand-made or machine-made net; Brussels *appliqué.* (5) Embroidered machine net: this, when the pattern is in chain stitch worked with a crochet hook, is termed tambour work or *tulle brodé;* when the pattern is embroidered with a needle it is called *broderie à l'aiguille.*

Brussels as a court centre, produced the finest fabrics, a type which has a distinguishing feature in the delicate tape-like veining of its scrolls and leaves worked in a raised technique—a technique that was carried into England by Belgian refugees and reproduced in Devonshire Honiton. Brussels lace is worked in sections and the mesh or *brides* added Especially fine were the old laces of Binche and Valenciennes, both worked *fil continu.* Early Valenciennes is distinguished by its round mesh, 19th century work having a square mesh and a quality less fine, while of special interest is the *potte kant* (flower pot) type of the Antwerp district. During the World War the Belgian relief made considerable progress in establishing better schools with modern methods, some of which have been continued in the different districts.

Holland.—Dutch portraits of the 17th century record in the lace-edged collars of Van Dyck's subjects, a closely worked pointed lace similar to, but less delicate than the Italian fabric. It is probable, however, that such lace may have been of Flemish rather than Dutch origin. What may be strictly termed Dutch lace is that made by the peasants for their native head-dresses. This in its close texture, reflects all the sturdy characteristics of the Dutch people. The fabric is so closely worked as to have the appearance of linen cloth in which the pattern is barely visible. A typical pattern, however, is an oval flower motive resembling a highly conventionalized chrysanthemum blossom considered by some authorities to have been inspired by the Chinese chrysanthemums in Oriental porcelains; other patterns for cap-bands are designed with a floral vase between confronted birds, or again, confronted swans. But little is known of the early laces produced in Holland. The Dutch excelled in bobbin lace.

England.—In the *opus Anglicanum* of the 13th century the art of England's needle-craftsmen had already attained its zenith in the great ecclesiastical embroideries of that period. But despite this perfected technique, England never excelled in the art of needlepoint lace, and it was to foreigners that she owed the introduction and development of her pillow-lace industry. The first reference to such occupation is that contained in a "Complaint" made in 1454 in consequence of the importation of six women, probably Flemings, who, it is said, at that time introduced Netherlandish linen-work and darning into England. Prior to the middle of the 16th century, however, there is little documentary evidence of anything other than imported fabrics, gold, silver and thread "lace" having become an article of commerce during the reign of Henry VII.

The earliest record of "laced linen" occurs in an inventory of 1519 which mentions Holland linen and a yard of lace. In the portraits of the wives of Henry VIII. the caps are edged with simple *purles* except in the case of Anne of Cleves, whose head-dress shows a band of lettered drawn-work designed in the style of the *libertas* piece in the pattern book of Vavassore (1532). During this reign while cutwork and *reticello* decorated the robes and vestments of church dignitaries, it did not yet appear in feminine attire. In Queen Mary Tudor's time (1553–58), however, the use of gold and silver lace and cutworks in costume had attained sufficient popularity to warrant a sumptuary law forbidding foreign cutworks to anyone under the degree of baron, while to a woman of a station beneath a knight's wife it was entirely prohibited. Throughout this early period lace was variously

described as *purle, passemayne* or "bone work," the latter referring to bobbin or pillow-made lace.

The establishment of England's lace industry owes its inception to the influx of continental refugees that poured into the country during the third quarter of the 16th century which occurred at three different times:—(I) 1563. Netherlandish Protestants fleeing from the terrors of the Spanish Inquisition. Among these were many "parchment lace" makers who settled along the coast of Kent. (2) 1568. A second group from the Mechlin lace district settled in Bedfordshire and Buckinghamshire. (3) 1572. A third group of French refugees who emigrated to England at the time of the slaughter of the Huguenots.

Thus at the time of the accession of Queen Elizabeth, while England was well supplied with lace-makers, foreign markets were still supplying the court with Genoese gold and silver edgings and simple Netherlandish bobbin laces such as were needed for the elaborate neck-ruffs, aprons and recently introduced handkerchiefs demanded by the current mode. In the midland counties and Devon, however, these foreign-born lace-workers were laying the foundations of a thriving industry for future generations. The geometric or *reticello* type of the Elizabethan period continued well into the reign of James I.; but with Charles I. the early 17th century mode that demanded elaborated points in lace patterns was established, a mode that gave way toward the middle of the century to broad, rounded scallops which gradually changed to a straight-edged variety in the latter part of the century. This century also witnessed the development of the foliated scroll in lace design following Venetian models.

The reign of Charles I. was marked by profligate extravagance in the use of lace. In the king's wardrobe accounts, one entry alone calls for 994 yd. for 12 collars and 24 pairs of cuffs, and again 600 yd. are required for trimming the ruffs of the king's night clothes. While lace was still imported in large quantities, in the first quarter of the 17th century, the English industry developed rapidly and in 1620 the exportation of a large quantity of gold and silver lace to India for the king of Golconda, recorded by an English company, indicates marked commercial activity. In order to encourage English workers, Charles I., in 1635, issued an edict prohibiting the importation of foreign "purles, cutworks and bone laces." It was at this time that the term *point d'Angleterre* came into use. Whether the lace bearing this name was an English fabric or whether it was a Flemish lace smuggled across the Channel to be sold as an English lace is a point that has caused much controversy.

A portrait of Catherine of Braganza painted by a Dutch artist illustrates the type of lace worn in court circles at the time of the accession of Charles II. The lace in this portrait corresponds closely to that illustrated in Plate V. fig. 2, an important document in English lace history. This lace which was found among some household linens in an old Devonshire shop, has a field of oak branches and acorns that serve as a background to a feather motive surmounted by the royal crown of England variously inscribed as follows: *Carolus Rex, C. 1661 B., Vive le Roi* and C. B. *Baronet.* Similar acorn branches are found in an old Bucks parchment dating from about 1700 illustrated by Wright; also the technique is the close bobbin stitch of the early Devonshire lace. While Dutch in type, there is no reason why a work of this importance should not have been made in England, bearing as it does the initials of Catherine of Braganza and the date 1661, which is not only the year of Charles's coronation and of his betrothal to Catherine, but also the year in which the king issued a proclamation enforcing his father's act prohibiting the importation of Continental lace.

During the reign of James II., England's lace-making population was again augmented by the immigration of refugees from France at the time of the revocation of the Edict of Nantes in 1685; many of these were from the districts of Chantilly, Paris, Alençon and Argentan, who brought with them the technique in which each of these centres specialized.

The court still retained its interest in Flemish laces throughout the reign of William and Mary, during which period the towering lace head-dress, the *fontange* of the French court, like the enormous neck-ruff of earlier days, proved a stimulus to the lace trade. From this time, the lace history of England reflects the popular trend of continental fashion until the early years of the 19th century, when hand industry everywhere was forced to give way to the increasing demand for machine-made fabrics, and in this field England took the lead, for it was an Englishman who built the first machine capable of producing fine Brussels net.

There was a revival of the Honiton industry under William IV. when a petition was addressed to Queen Adelaide in behalf of the distressed lace-makers. At that time the centre of the Devonshire lace industry was at Beer, a little fishing hamlet on the Devon coast between Seaton and Exmouth. Here the workers were furnished with new patterns, and it was here that the wedding lace of Queen Victoria was made, the dress costing £1,000. Honiton lace retained its popularity throughout the Victorian era; schools were established in various districts and every attempt was made by public and private enterprise to perpetuate the art, but these efforts met with little encouragement in the face of increasing interest in the less expensive machine product. (Honiton lace of the Victorian era is considered by some to be a decadent form of 18th century *point d'Angleterre* which such writers claim to have been of Devon rather than Flemish manufacture) By the beginning of the 20th century lace was no longer fashionable, the prosperity of the native industry receiving a desperate set-back when the World War flooded the country with refugee lace-makers and Belgian relief work.

Of Irish lace to-day there are three distinct types. In date the earliest of these is the Carrickmacross *guipure* and *appliqué* which has been made in that neighbourhood since 1820. In this the pattern is cut from fine cambric embellished with needle-point stitches; in making the applied type the same process is employed, the finished work being afterwards applied on machine net. What is known as Limerick lace is the same as the Belgian *tulle brodé,* tambour work on machine-made net, a chain stitch worked with a crochet hook. Irish point, or Youghal lace, originated in the Convent of the Presentation of that town in County Cork. It is a flat needle-point lace and its technique is based on Italian models. All these industries originated as famine relief measures.



BY COURTESY OF THE METROPOLITAN MUSEUM OF ART

PILLOW USED IN MAKING 19TH CENTURY SWISS BOBBIN LACE

Germany.—The German presses produced the earliest pattern books, and German lace derived its technique from Flemish workers who emigrated at the time of the Spanish Inquisition and settled in Saxony. German tradition centres about the historic figure of ,Barbara Uttmann who, in 1561, organized an industry that developed rapidly and in time employed some 30,000 persons in the manufacture of lace work which had its origin in the network used for miners' caps. Dresden in the 18th century was noted for its drawn-work, European fashion for the moment demanding "Dresden ruffles" and "Dresden aprons." Drawn-work of this period followed contemporary lace patterns. In North Germany bobbin laces for native head-dresses, often referred to as Nuremberg lace, resembled the Valenciennes and Mechlin types but were worked with coarser thread which resulted in a much less delicate texture. In central and southern Germany the 18th and early 19th century peasant laces, like those of Russia, are of the serpentine braid type, coarsely worked on crudely drawn patterns; modern peasant laces from this district are of the coarse

torchon or Cluny variety. In the 19th century black silk *guipure* laces were made in Saxony.

Switzerland. — Here also, the first lace-workers were immigrants, French refugees having settled at Geneva in the 16th century; its most important centre, however, developed at Neuchâtel, where lace schools still teach the art, the laces produced resembling those of Lille and Brussels. Switzerland also has to her credit the publication of several early pattern books, one printed in Ziirich in 1540, and another, a reprint of Vicellio's Corona printed at Saint Gall in 1593.

Denmark and Scandinavia. — In Denmark an act of 1643 records the interest of Christian IV. in the nativeindustry. Whatis described as Schleswig Holstein lace is that shown in the portrait of Christian IV. in the Hampton Court Palace collection, a lace closely allied to that in the Charles II. fabric illustrated in Pl. VI. fig. 2. The industry at Tonder that in recent years has been revived was founded in 1647 when workers were imported from Westphalia to teach the art; the modern lace resembles that of Mechlin. Danish cutwork termed Hedebo is closely allied to similar Swedish work; the patterns are based on the Greek key motive. Native drawn-work follows the contemporary type found in France, Germany and the Netherlands. In Sweden the 17th century lace preserved in the Stockholm museum is of the same general type as the pointed bobbin laces of northern Italy. The modern lace industry centres are at Dalecarlia, Rattvik and Wadstena — the laces of Dalecarlia having the angular arrowhead and tree motives outlined with a heavy thread, while those of Rattvik are made of finer thread worked in a lozenge pattern with no distinctive outline.

The United States. — Ipswich, Mass., seems to have been the only place where lace-making was carried on to any great extent. While the industry there was confined to cottage work, the lace-workers of Ipswich are credited with having produced silk lace to the amount of 42,000 yd. yearly, a statement made by Tench Cocxe in an address before the Pennsylvania Society in 1786. The technique followed English traditions, the patterns used resembling those found in the Midland counties; the pillow was round, like those used by the Devonshire workers and the bobbins were slender wooden sticks without bulbed ends. A settlement of Huguenots in the Hudson valley introduced bobbin lace in that district, but it never developed into an industry. (*See* Mabel F. Bainbridge, "Early Lace Making in America," in *House and Garden*, April, 1916.)

LACE-MAKING MACHINES

It is uncertain who invented the first machine capable of making an openwork mesh, but it is generally conceded that an English Nottingham worker named Hammond was one of the earliest in the field and that in 1768 improvements made in the stocking-knitting machine resulted in the production of a lacey material resembling net. It was also in this year that the initial attempt to warp so-called "lace goods" was made by another Nottingham man named Crane, an invention likewise based on the stocking machine. A few years later, between 1771–77, Robert Frost, from the same district, invented a machine for making a coarse square net such as was used by wig-makers, and a finer quality extensively used in ladies' mits. The next step in the development was the introduction of what was termed "point net," a somewhat oblong hexagonal meshed fabric that appeared about 1776. Authorities differ as to the inventor; a patent was taken out by a man named Taylor in 1778 and the invention was finally acquired by the Hayne firm of Nottingham, which, firm is credited with having introduced tambour work described as "stitch splitting and net tambouring." In 1795 William Dawson invented an improvement in the warp machine with which warp edgings were made, an invention that was afterwards applied to lace machinery.

The invention of the Jacquard loom in 1801 marked a new era in the world of machine-made fabrics, and in the early years of the 19th century, the development of power-driven machinery advanced rapidly. The outstanding figure of this period in the field of lace machinery is John Heathcoat, whose invention of the bobbin net machine in 1809 became the foundation of an enormous Industry, the net produced on the perfected Heathcoat machine being a thread net of fine quality imitating the hand-made Brussels fabric. Another important name in the development of lace machinery is that of John Levers, who in 1813 improved and modified the arrangement of the bobbins and carriages in the Heathcoat machine, an invention that is said to have added £3,000,000 yearly to the lace trade. The first factory for the manufacture of machine net was set up at Tiverton, Devon, in 1815. In America the first lace factory was founded at Medway, Mass., in 1818, followed by a second at Ipswich, Mass., in 1824. In France the machine industry was established by the early years of the century by several Englishmen from Nottingham who settled in the Calais district, using a modified type of the Heathcoat machine.

Modern machine lace is made on Levers looms built in Nottingham; these machines are used by American manufacturers in New York, Philadelphia, Bridgeport and Pawtucket; they carry from 5,000 to 10,000 threads, and can produce from 40–180 sq.ft. of net or 40–18 yd. of 4 in. lace, the quality of the product depending largely upon the genius of the designer and the commercial viewpoint of the producer. In Europe, where the cost of production is less, laces of fine quality, close copies of old Mechlin, *point* de *Paris* and Valenciennes, are produced, but the use of mercerized cotton reduces the durability of the fabric.

In recent years the introduction of chemicals in lace manufacture has made possible the reproduction of heavy Venetian point. In this method the design worked in cotton on a silk or wool foundation is subjected to the action of chemicals that destroy the foundation leaving the cotton embroidery intact. This process has been developed with considerable success in the St. Gall district, Switzerland.

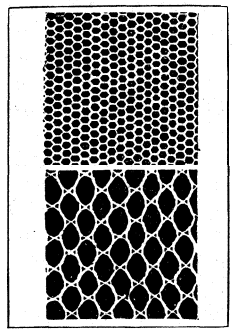
Another process employed in the manufacture of modern laces is one in which a cellulose paste is used in moulding the pattern. It is stated that in 1914 a Lyons factory was producing at the rate of 2,734 yd. of this type of "lace" in 24 hours.

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MACHINE-MADE LACE

Methods of Manufacture. — Lace was first made by machinery in the latter half of the 18th century, and there rapidly formed an extensive industry. The term "lace" is employed in connection with knitted fabric when the plain stitch is altered by the addition of a series of points which are selected according to pattern. These points descend on to the needles of the machine

and, lifting the selected stitches off, move them either to the left or to the right on to neighbouring needles. In the hosiery trade this is spoken of as lace fabric, but it would be more correctly described as openwork. These patterns can be made of full width repeats by the use of the Jacquard selective mechanism and for plain patterns the stitches are transferred *either* towards the right or the left, but always in the same direction. In what are known as double-dip patterns, each lacing course has two selections; the first is transferred towards the neighbouring needle on the right. and the lace points dip again and transfer their second selection towards the left. This gives a larger diversity to the fabric and increases the elegance and style of the pattern This type of texture is used largely for underwear because it can be worked in the same material as the ground and is homogeneous to it.



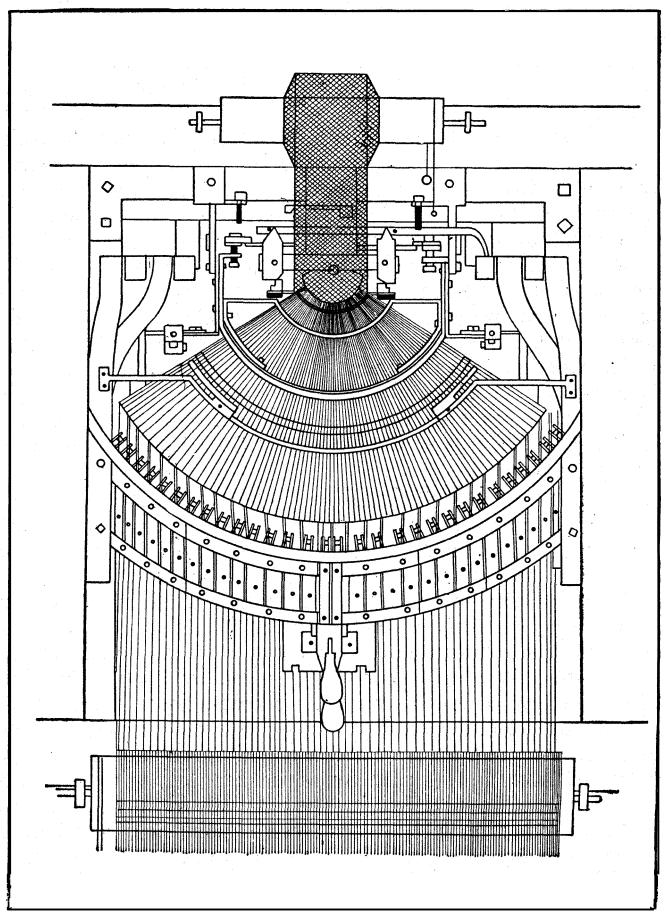
MACHINE-MADE LACE. Above, pattern of bobbin net; below, pattern of mosquito net fabric

In the hosiery trade there has been a great increase of lace-like edgings on garments, which have the advantage that they can be made in the same type of material and can match in colour; what is known as the shell-stitch is largely added to the edges of garments which were formerly trimmed with lace.

New Styles of Lace Curtains.—The decorative laces have experienced reduced demand because of the great changes which have occurred in fashion, which has taken many turns unfavourable to the wide use of lace. There are, however, many directions in which the lace trade has developed; for example, the lace curtain branches are active owing to the demand for the newer styles of lace curtains worked in decorative effects, particularly in the two-material foundation possible by employing viscose artificial silk and the acetate type which can be dyed two colours in the same bath, the viscose taking the colour for which it has affinity and the acetate selecting the other. Efforts have been made to employ idle lace machines in the making of fabrics intended for suitings and overcoatings; but on the whole the lace machine has been found too expensive a means of producing goods of this class in competition with the weaving loom. Many types of lace have their yarns prepared on a beam of the ordinary kind where the threads are first warped from the yarns arranged on a creel or jack. The threads are correctly tensioned and drawn on to the cylinder of the warping machine which is of large circumference and set to revolve the number of times required to give the length of warp When one warp section is complete the operator cuts the threads and completes the section by securing it to the cylinder. He moves to the next space and places the second section of yarn on the new part, and repeats the operation until the warp is complete These threads are next beamed in the usual manner by winding them on to the loom beam, adding flanges at the sides to prevent the edge threads falling over the side and becoming slack in tension. The beam is hung horizontally, with the threads coming up vertically through slcys of brass or woven wire, to guides or perforated steel bars from which they pass between the well of the comb bar, over the facing bar and round the work roller.

The work roller is hung parallel to the warp beam and parallel to it If all the threads are arranged on one beam as is done for the simplest types of laces, it follows that all the constituents of the warp must have the same take-up of thread in the fabric; but in the great majority of laces there are many different lengths of take-up required by the various sets of threads which go to the composition of a pattern, consequently a number of small beams are employed, about 1½in. in diameter, on which the threads of varying take-up are wound. There are often roo or more such beams in a machine Certain lace looms such as the bobbin net type are used to produce grounds of lace texture which are destined to form the bases of further operations in embroidery and other ornamenting agencies.

The Levers Loom.—What is known as the Levers loom is one of the most important types for producing fancy lace. It has bobbins and carriages which may be said to correspond to the spool and shuttle of the weaving loom. The bobbin consists of two circular discs riveted together with sufficient space between to house about rooyd. of yarn. The discs are free to revolve on the verge of a carriage and controlled in tension by a spring A machine having 20 bobbins or carriages to the inch would be known as a 10-point machine. 16 carriages per inch would give 8-point and so on for other gauges, the number of carriages being divided by two to give the gauge. Each comb bar in the loom can hold the full number of carriages back and front, each of which carry the combs set in an arc of about rain., of which the centre is the facing bar. Both comb bars are fixed so that the combs in each bar are directly oppqsite. Along with each comb bar is the catch bar which moves along the curve of the comb, and the function of the catch bar is to move the carriage backwards and forwards. It does this by alternately engaging with the nibs of the carriage. Working in conjunction with each catch bar is a landing bar which supports the extremity of the carriage at each swing across the well of the combs. The usual range of gauges on lace looms are from 4-point to 16-point lace, and recent tendencies have all been in the direction of finer laces, and some idea of this delicacy may be gathered from the fact that the finest yarn which it is possible to spin is used for fine lace. This yarn is produced

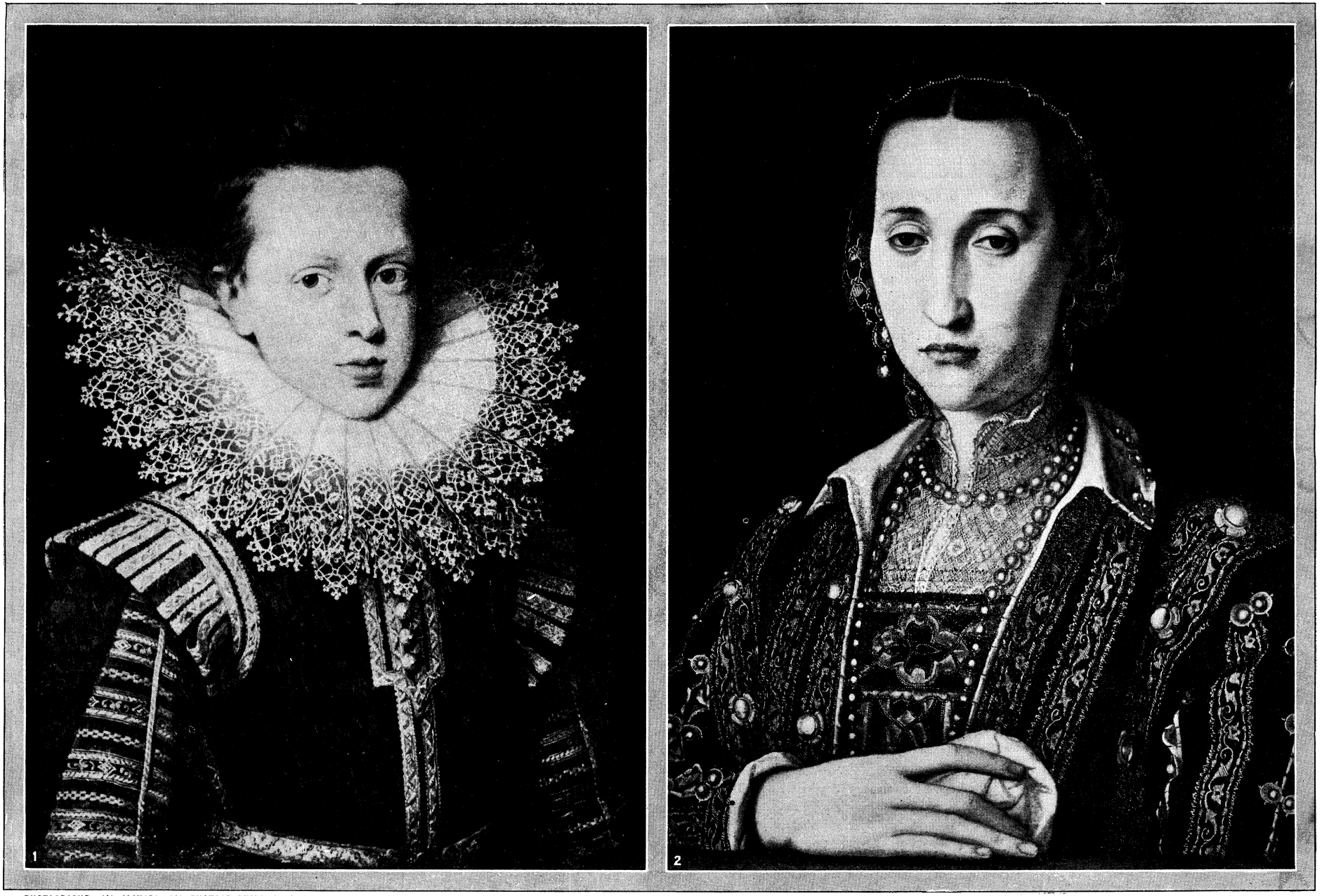


BY COURTESY OF "THE TEXTILE RECORDER"

FRONT VIEW OF JOHN HEATHCOAT'S FIRST LACE MACHINE, 1808

in Lancashire and holds the record in the world for fine cotton spinning. Cotton of 400 counts is used, that is to say 400×840=336,000yd. of this yarn are required to weigh 1 lb., this length being equivalent to 190 miles of yarn—a truly marvellous achievement.

The width of the lace loom is measured similar to the method adopted in the weaving industry, the unit being the quarter yard of gin., thus a width of six quarter (6/4) is equal to 6×9=54in., eight quarter would be 8×9=72in. wide. The unit of measuring lace is known as the rack, and this consists of a definite num-



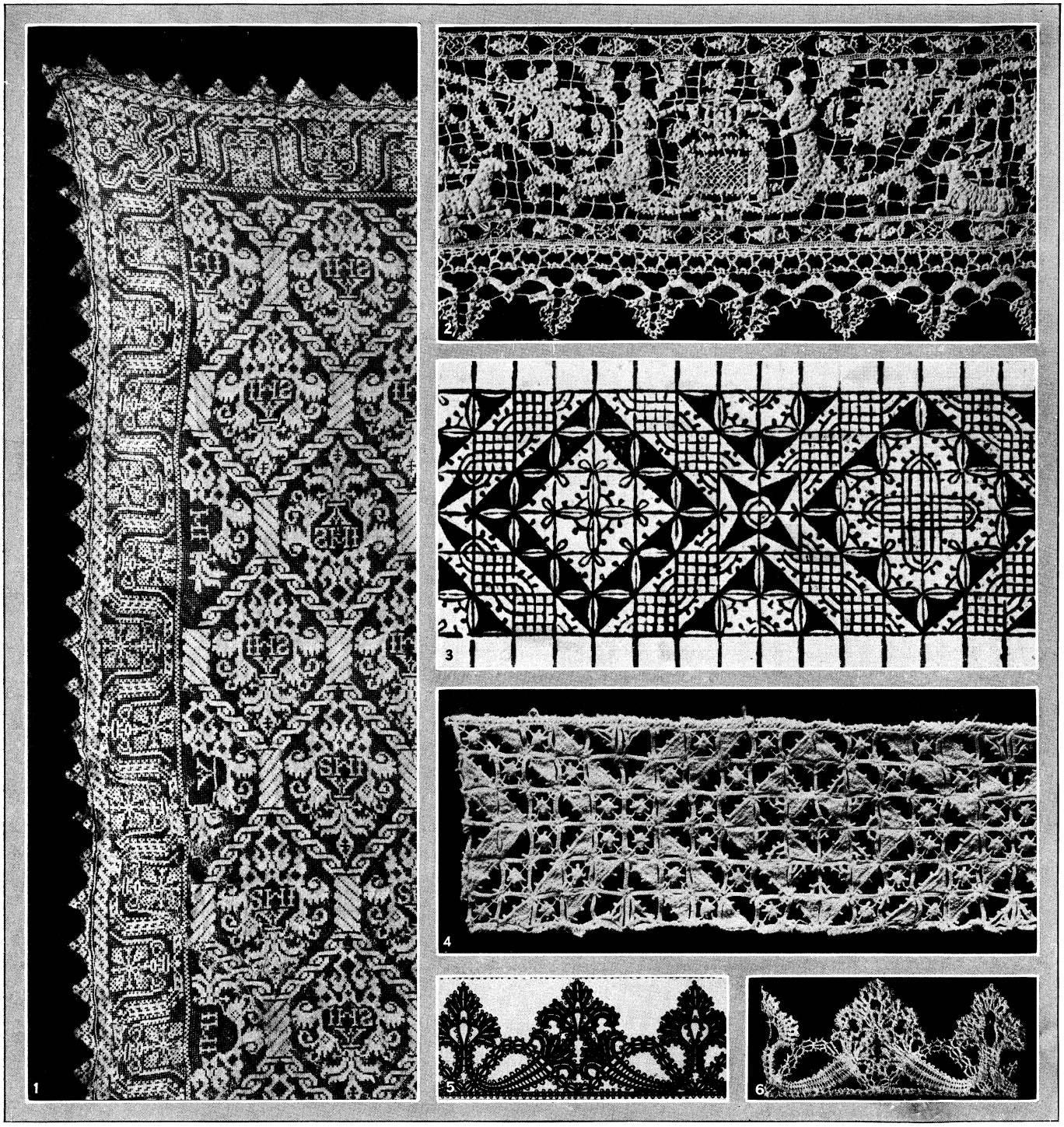
PHOTOGRAPHS, (1) ALINARI, (2) PHOTOGRAPHISCHE GESELLSCHAFT, BERLIN

ITALIAN LACE IN PORTRAITS OF THE 16TH AND 17TH CENTURIES

1. Portrait by Justus Sustermans (1597–1681) of Bartolommeo Corsini, Florence. The ruff is edged with the bobbin lace of the period, Italian 17th century, with five points and very open pattern

2. Portrait by Bronzino (Agnolo di Cosimo Tori, 1503–72) of Eleonora of Toledo. In the Uffizi Gallery, Florence. The neckpiece of net-work is Italian *punto mandilino*, 16th century

LACE



BY COURTESY OF (1, 4) THE METROPOLITAN MUSEUM OF ART, NEW YORK, (2) THE COOPER UNION MUSEUM FOR THE ARTS OF DECORATION, NEW YORK

ITALIAN 16TH CENTURY LACES AND PATTERNS

1. Altar cloth of embroidered net, Italian, 16th century. The central design, with the initials IHS, appears in the pattern book, *Opera* Nova, etc., published by Matthio Pagan in Venice, 1546
2. Needlepoint, punfo *tagliato*, Italian, mid-16th cert. Patterns for this type of work were first published by Matthio Pagan in Venice, 1542
3. Pattern for cut work from Matthio Pagan's pattern book
4. Cut linen work, Italian, middle of the 16th century. This needlepoint *reticello* strip is similar to patterns designed by Matthio Pagan
5. Pattern from "Le Pompe," a pattern book of 1557
6. Modern execution of the pattern in fig. 5, by Madame Paulis, Brussels





PHOTOGRAPHS, (1) LEVY AND NEURDEIN, (2) ANDERSON

FRENCH AND SPANISH LACES

1. Marie Leszczynska (1703–68), queen consort of Louis XV. of France, wearing a bertha and ruffled sleeves of point de France lace; detail from the portrait (1747) by Carle van Loo (1705–65), in the Louvre

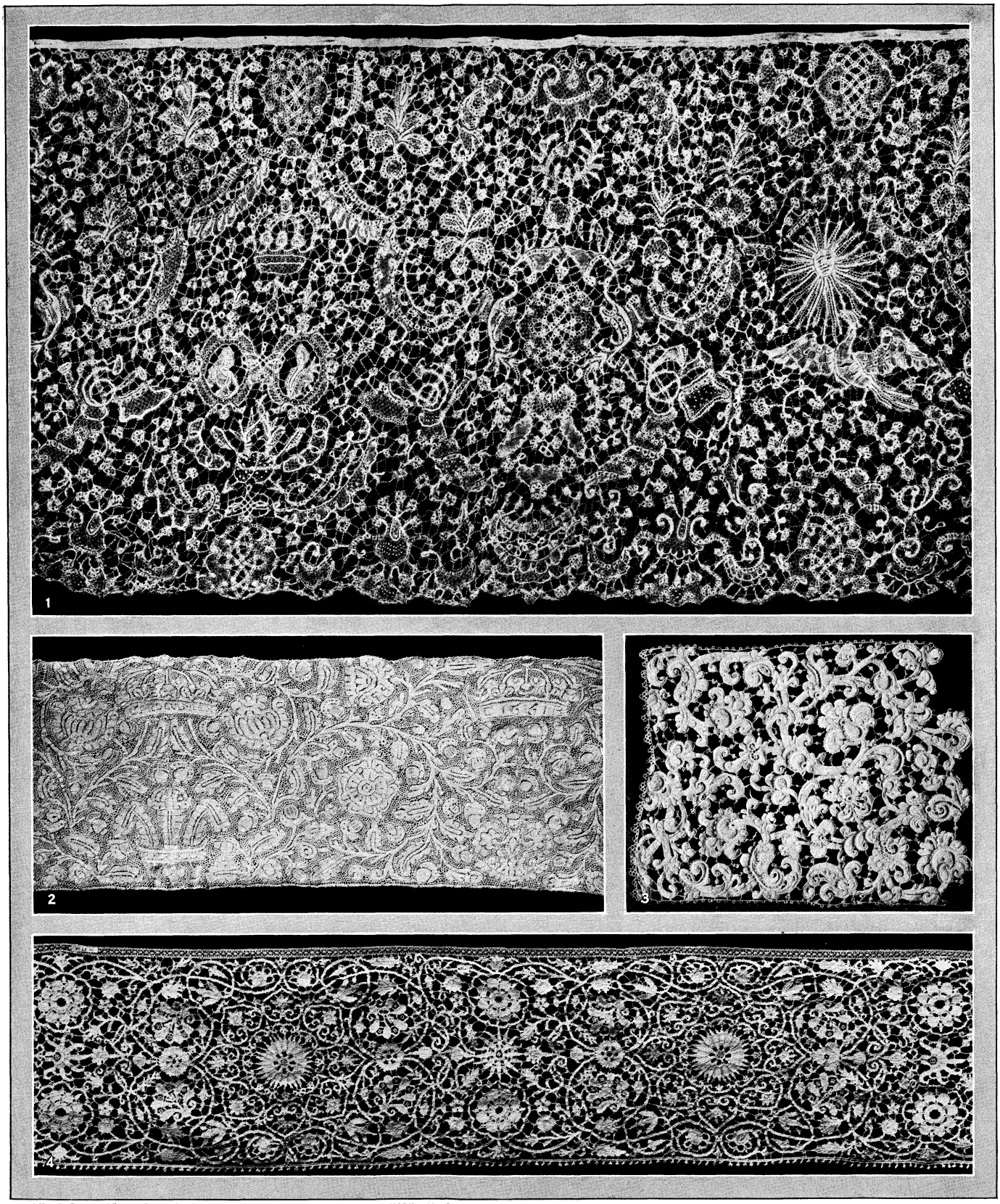
2. Queen Maria Christina of Bourbon, fourth wife (1829) of Ferdinand VII. of Spain (1784–1833), showing characteristic mode of wearing lace, probably Spanish blonde, period of 1830; from the portrait by Lopez y Portaña (1772–1850), in the Prado



BY COURTESY OF THE BARON ROBERT DE ROTHSCHILD COLLECTION, PARIS, PHOTOGRAPH BY MAISON ADOLF BRAUN ET CIE.

FLEMISH NEEDLEPOINT LACE, 17TH CENTURY

Portrait by Rembrandt van Rijn (1607–69) of Martin Daey, 1634. The lace is Flemish needlepoint, *reticello*. The costume illustrates characteristic features of the period in lace collar and cuffs, garters worn like a scarf around the knee, and rosettes on the shoes

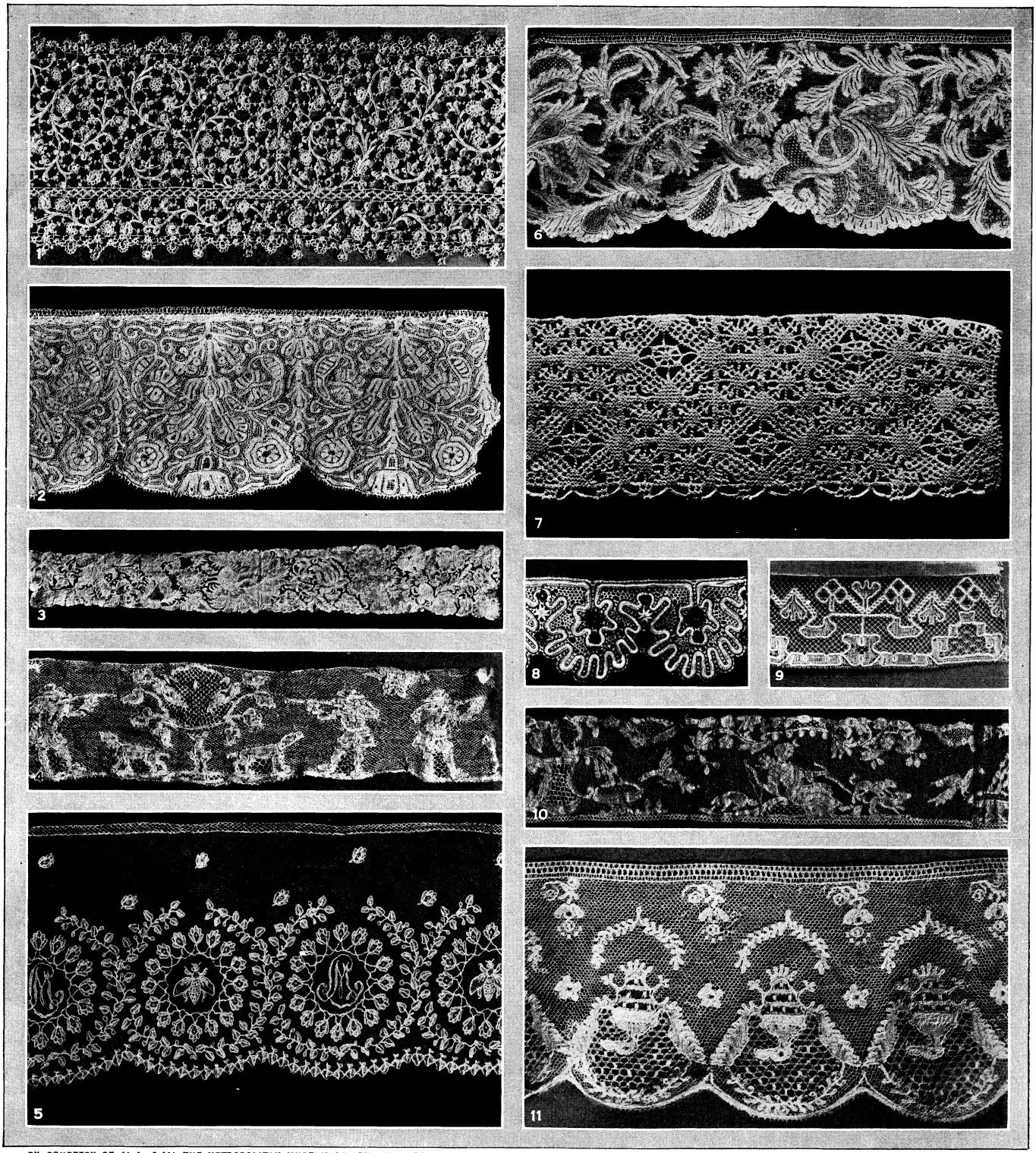


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BOBBIN AND NEEDLEPOINT LACES, 16TH–18TH CENTURY

1. Flounce of Flemish bobbin lace, c. 1708. Another part of this flounce is in the Royal Museum du Cinquantenaire, Brussels. This specimen was made for presentation to Elizabeth of Brunswick, wife of Charles VI., on her entry into Brussels. The intertwined initials C and E, the portrait medallions, and the crown are significant motives. 2. Bobbin lace, probably made in Devonshire, England, 17 century. The pattern shows the British crown, surmounting the royal feather device. The crown motives bear the inscriptions "Carolus Rex," "Vive le Roi," "C. 1661 B," and "C. B. Baronet." The date 1661 is that of Charles II.'s coronation, of his betrothal, and of his proclamation prohibiting the importation of foreign laces. 3. Venetian needlepoint in high relief. 16th–17th century. This heavy Venetian point, with details worked in high relief and often edged with loops, is termed *gros point* de *Venise.* 4. Venetian needlepoint, early 17th century. The motives, derived from Near Eastern art, show the conventional scrolling pattern like that in rugs and tooled leather. The technique is elaborated from the *punto in aria*

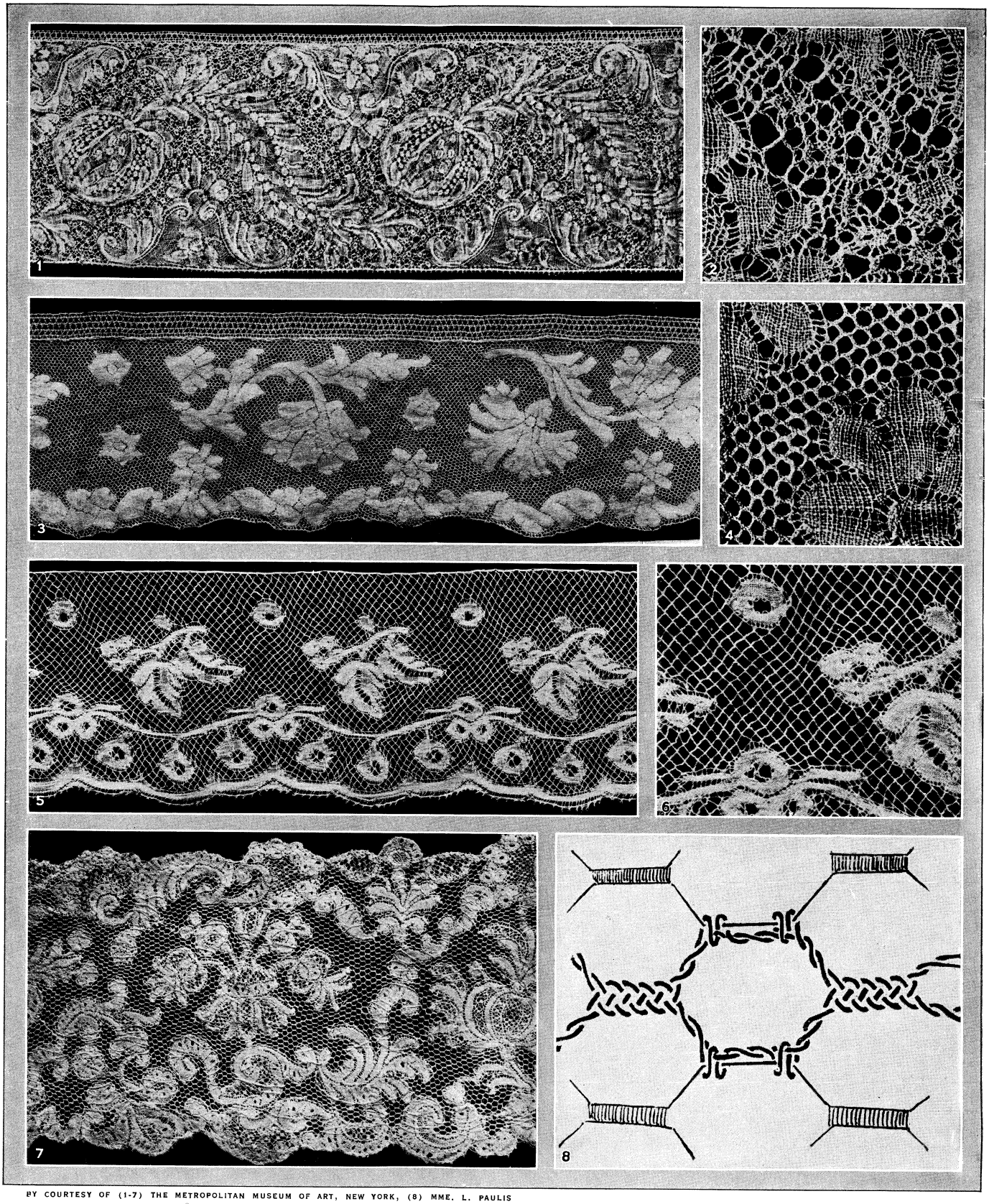
LACE



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NEEDLEPOINT AND BOBBIN LACES, 17TH–19TH CENTURY

1. Needlepoint lace, Venetian rosepoint, 17th and early 18th centuries. This delicate lace is characterized by exquisite technique and evenly distributed accentuation
2. Schleswig-Holstein lace, needlepoint
3. Barbe or lappet of Old Brussels, a Flemish bobbin lace, the so-called *point d'Angleterre,* possibly made in France in the early 18th century, by Flemish workers from French designs. *Point d'Angleterre* was one of the fashionable court laces of the period
4. Bobbin iace, Mechlin, 18th century. The laces of Mechlin and of Antwerp developed a distinct character, the Mechlin type having a hexagonal ground ard an outlining thread, with figures
5. Brussels needlepoint, applied on handmade net. The initials are those of the Empress Marie Louise, wife of Napoleon I.; they alternate with the Napoleonic emblem, the bee
6. Needlepoint, so-called grounded Venetian, *point de Venise à réseau,* Italian, 18th century. The most delicate of all needlepoint laces. The provenance of this type of lace is still a disputed point
7. Modern fine copy of Italian needlepoint worked in *punto avorio* in an 18th century pattern
8. Bobbin lace, Russian, 19th century, with details in characteristic bright colours
9. Bobbin lace, Swedish, 19th century. This Dalecarlia lace shows tie angular arrowhead and tree motives, outlined with a heavy thread
10. Bobbin lace, so-called *point d'Angleterre,* 18th century, showing Diana ard her dogs. The technique is called *à pièces rapportées;* the pattern is worked separately from the mesh
11. Bobbin lace, Mechlin type, of American workmanship, possibly made at Ipswich, Mass. The arms closely resemble those of the Washington family

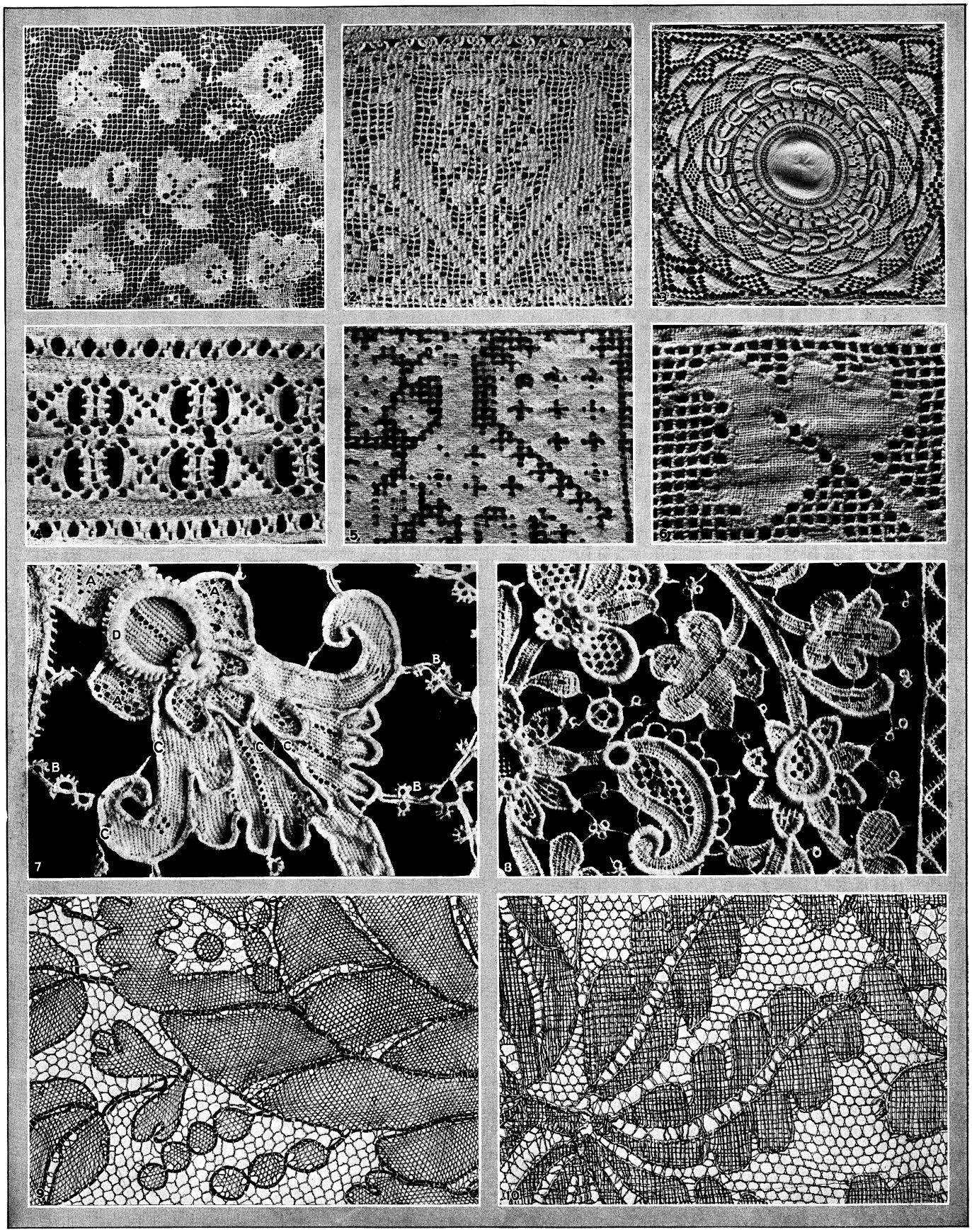


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BINCHE, VALENCIENNES, AND BRUSSELS LACES, 17TH–19TH CENTURY

1. Bobbin lace, Binche, Belgian, the so-called "Old Valenciennes," with *fond de neige* or "snow ground," 17th–13th century. The technique is termed *fil continu*
3. Enlarged detail of Bincho lace
3. Bobbin lace, Valenciennes, 18th century, with round mesh, called *maille ronde*. The technique is *fil continu*
4. Enlarged detail, showing the mesh, *maille ronde*
5. Bobbin lace, Valenciennes, 19th century, with square mesh, called *maille carré*. Ths technique is *fil continu*
6. Enlargsd detail, showing the mesh, *maille carré*
7. Detail of Brussels *point d'Angleterre*, showing threads of the hexagonal braided mesh (*droschel*), carried behind the pattern as in *point de Milan*
8. Line drawing by Madame Paulis of Brussels, showing method of joining the narrow strips of *droschel*, or *vrai réseau*

LACE



BY COURTESY OF THE METROPOLITAN MUSEUM OF ART, NEW YORK

NET, DRAWN WORK, NEEDLEPOINT AND BOBBIN LACES

1. Knotted net worked in *punto* a tela. 2. Woven net, *Buratto.* 3. Spanish net, sol pattern. 4 to 6. Drawnwork: 4. Tela *sfilata*—weft threads drawn out, warp threads overworked with weaving stitch. 5. *Fili tirati* e *ripresi* or lacis — groups of warp and weft threads drawn out, pattern darned in, threads of background overworked. 6. *Fili tirati* tela *lasciata*—groups of warp and weft threads out at edge of pattern, threads of background overworked with winding stitch. 7. 17th cent. Venetian needlepoint, enlarged (A) Ornamental stitches, *jours* or modes (B) Tie-bars or brides (C) Cordonnet (D) High relief work. 8. Machine-made Venetian point type. 9. Bobbin lace, Chantilly, enlarged. 10. Machine-made Chantilly type

ber of motions, a motion being a clear position for the warp threads to shog. A rack of bobbin net equals 240 meshes counted vertically. If it is desired to designate the net quality, the number of holes is counted horizontally and diagonally and the total number of holes in one inch is given as the quality; for example, 13 diagonal holes and g horizontal holes per inch in a fabric would give 13+9=22 quality.

Lace machines are built in widths varying from 146in. to 222in., plain net machines are constructed from 200in. to 360in. wide, the wider machines being usually of a coarser point.

Finishing.— The procedure regarding lace finishing varies in many ways from that adopted in other branches of textiles. The fabric has to be examined or viewed and the examiner has to recreate the pattern where it has broken down, and in the very complicated character of many of those designs it requires one who has a thorough knowledge of the design structure. For white laces the material is bleached in the usual manner and the laces are joined together and given a preliminary softening by steeping them in water overnight. This performs the usual functions of steaming: it softens the material and also frees the larger and grosser impurities from the material. Keir boiling is next done in the usual manner by the use of a keir in which about 2 to 3% of caustic soda is used. After treatment in this way for several hours it is rinsed and at the next stages is treated with chloride of lime, after which the material is thoroughly washed and then run through a weak acid bath to neutralize the lime. It is then treated in the hydro extractor to remove the water, but the material is left damp in preparation for the next process of starching, which makes the fabric very stiff, and in this state it is stentered or stretched over hooks to draw it out to the width required. The narrower laces are then treated with a spray of water to soften them and prepare them for the calender, when they are passed through between several pairs of heated rollers which impart a gloss. (W. Ds.)

LACEBARK TREE, a native of Jamaica, known botanically as *Lagetta lintearia,* from its native name lagetto. The inner bark consists of numerous concentric layers of interlacing fibres resembling in appearance lace. Collars and other articles of apparel have been made of the fibre, which is also used in the manufacture of whips, etc. The tree belongs to the family Thymelaeaceae, and is known in hothouses in Britain.

LACEDAEMON, in historical times an alternative name of Laconia (*q.v.*). Homer uses only the former. and in some passages seems to denote by it the Achaean citadel (Therapnae of later times) in contrast to the lower town Sparta (G. Gilbert. *Studien zur altspartanischen Geschichte,* 1872, p. 34 foll.). It is described by the epithets "hollow" and "spacious" and the name may be probably connected with *laccos, lacus,* "lake" or "basin." The modern department of Lacedaemon is the upper half of the valley, with Sparta as capital.

LACÉPÈDE, BERNARD GERMAIN ÉTIENNE DE-LAVILLE, COMTE DE (1756–1825), French naturalist, was born at Agen on Dec. 26, 1756. His leisure was devoted to music, and in 1781–85 he brought out his *Poétique de la musique.* Meantime he wrote *Essai sur l'électricité* (1781) and *Physique générale et particulière* (1782–84), which led to an appointment in the Jardin du Roi with the opportunity to continue his *Histoire naturelle* in the *Histoire des quadrupèdes ovipares et des serpents* (2 vol.. 1788–89) and *Histoire naturelle des reptiles* (1789). After the Revolution he returned to the study of reptiles and fishes. Turning to politics in 1798, he rose to a distinguished career in the service of the state. He died at Epinay on Oct. 6. 1825.

Eesides the above works, Lacépède wrote *Histoire des cétacés* (1804) and *Histoire générale physique et civile de l'Europe* (18 vol., 1826). (K. P. S.)

LACEWING FLY, the name given to neuropterous insects of the families *Hemerobiidae* and *Chrysopidae,* with long delicate antennae, slender bodies and two pairs of similar richly veined wings. They are world-wide in distribution. The larvae are stout grubs with prominent suctorial jaws and well-developed legs; they roam about vegetation preying upon aphides and other soft-bodied insects. The *Hemerobiidae* include the brown lacewings; their eggs are devoid of stalks and their larvae are generally naked. The *Chrysopidae* include the green lacewings or golden-eye flies; their eggs are laid at the apices of stalks formed of hardened secretion, and the larvae often cover themselves with the empty skins of their prey. *See* NEUROPTERA.

LACHAISE, GASTON (1882–1935), French-U.S. sculptor, whose massive but delicately balanced nudes are well known, was born in Paris, on March 19, 1882, the son of a cabinetmaker. Lachaise entered a fine craft school at 13, was thoroughly trained in many techniques and went to the École des Beaux-Arts in 1898. He designed *art nouveau* objects for the glass master René Lalique. His future wife, an American, persuaded him to emigrate to Boston. There he worked for H. H. Kitson, an academic monument sculptor, for six years, establishing a studio in New York in 1912. In New York he commenced his famous "Standing Woman," bronze casts of which were acquired by many American museums. He was a brilliant portraitist (John Marin, Marianne Moore, E. E. Cummings). His final figures were hugely developed human fantasies. A large retrospective show was held at the Museum of Modern Art in New York city just before his death, on Oct. 18, 1935.

See Albert E. Gallatin, *Gaston Lachaise* (1924); Lincoln Kirstein, *Gaston Lachaise* (1953). (L. E. K.)

LA CHALOTAIS, LOUIS RENÉ DE CARADEUC DE (1701–1785), French jurist, was born at Rennes, on March 6, 1701. He was for 60 years procureur général at the parlement of Brittany. He was an ardent opponent of the Jesuits and drew up in 1761 for the parlement a memoir on the constitutions of the Order, which did much to secure its suppression in France. The year 1763 began the conflict between the Estates of Brittany and the governor of the province, the duc d'Aiguillon (*q.v.*). The Estates refused to vote the extraordinary imposts demanded by the governor in the name of the king. La Chalotais was the personal enemy of d'Aiguillon, and he took the lead in its opposition. The parlement forbade by decrees the levy of imposts to which the Estates had not consented. The king annulling these decrees, all the members of the parlement but twelve resigned (Oct. 1764 to May 1765). The government considered La Chalotais one of the authors of this affair. La Chalotais, his son and four other members of the parlement were arrested on a charge of writing insulting anonymous letters to the governor of the province. On Nov. 16, 1765, a commission of judges was named to take charge of the trial.

La Chalotais was exiled, but after a long conflict, was recalled in.1775, and was allowed to transmit his office to his son. The opposition to the royal power gained largely through this affair, and it may be regarded as one of the preludes to the revolution of 1789. La Chalotais died at Rennes on July 12, 1785.

See, besides the *Comptes-Rendus des Constitutions des Jtsuites* and the *Essai d'education nationale,* the *Mtmoires de la Chalotais* (3 vols., 1766–1767). Two works containing detailed bibliographies are Marion, *La Bretagne et le duc d'Aiguillon* (Paris, 1893), and B. Pocquet, *Le Duc d'Aiguillon et La Chalotais* (Paris, 1901). *See* also a controversy between these two authors in the *Bulletin critique* for 1902.

LA CHAUSSÉE, PIERRE CLAUDE NIVELLE DE (1692–1754), French dramatist, was born in Paris. La Chaussée was 40 years old before he produced his first play, *La Fausse Antipathie* (1734). His second play, *Le Préjugé à la mode* (1735), turns on the fear of incurring ridicule felt by a man in love with his own wife, a prejudice dispelled in France, according to La Harpe, by La Chaussée's comedy. *L'École des amis* (1737) followed, and, after an unsuccessful attempt at tragedy in *Maximinien,* he returned to comedy in *Mélanide* (1741). In *Mélanide* the type known as *comédie larmoyante* is fully developed. *L'École des mères* (1744) and *La Gouvernante* (1747) form, with those already mentioned, the best of his work. He died on March 14, 1754.

For the *comédie larmoyante* see G. Lanson, *Nivelle de la Chaussée et la come'die larmoyante* (1887).

LACHES, a term for slackness or negligence, used particularly in law to signify negligence on the part of a person in doing that which he is by law bound to do, in allowing an unreasonable time to elapse in asserting a right, seeking relief, or claiming a

privilege. Statutes of limitation (*q.v.*) specify the time within which various classes of actions may be brought, and various statutes granting remedies, etc., impose a definite time within which legal action must be taken, *e.g.*, Affiliation, Public Officers Protection acts, etc. Apart from statutes of limitation courts of equity will often refuse relief to those who have allowed unreasonable time to elapse in seeking it, on the principle that the laws aid those who are vigilant, not those who sleep on their rights.

LACHINE, a city in Jacques Cartier county, Que., 8 mi. W. of Montreal, on Lake St. Louis, an expansion of the St. Lawrence river, and at the upper end of the Lachine canal. Pop. (1961) 37,691. It is a station on the Canadian National railway and has an important canal used by steamers plying between Montreal and the Great Lakes. It is the site of the electric works, which furnish power and light for the city of Montreal. It was named in 1669 in mockery of its then owner, Robert Cavelier de la Salle (1643–1687), who dreamed of a westward passage to China. There are major engine, machine, chemical, housewares and woodworking industries.

LACHISH, an ancient Amorite fortress in southern Palestine now identified with Tell el-Hesy, a mound in the Wady el-Hesy, which runs from 6 mi. S.W. of Hebron to the sea between Gaza and Askalon. It is mentioned in the Tel el Amarna letters, and a tablet of the Amarna period was found on the site mentioning Zimrida, known to have been a governor of Lachish at that period, thus confirming the identification. Its fortunes were, generally speaking, those of any city situated on the borderlands between mighty empires, which, when called on to take sides in warfare, does so with fear and trembling. It was destroyed by Joshua, assigned to Judah, fortified by Rehoboam, and was the scene of the murder of King Amaziah. Sennacherib made it his headquarters for his campaign against Judah, and it long resisted Nebuchadrezzar, and maintained a precarious existence—first an outpost of Egypt, then as a frontier fortress of Palestine. Excavations show that eight cities succeeded each other on the site before it was abandoned (*c.* 400 B.C.). (E. RO.)

LACHMANN, KARL KONRAD FRIEDRICH WILHELM (1793–1851), German philologist and critic, a founder of modern textual criticism, was born at Brunswick on March 4, 1793. After studying at Leipzig and Göttingen he joined the Prussian army in 1815. His life was spent in the study of philology, especially Old and Middle High German, and from 1825 he was professor of philology at Berlin.

Lachmann laid down the rules of textual criticism and elucidated the phonetic and metrical principles of Middle High German in early works of 1816 and 1817 by a method more scholarly than had been used by his predecessors. His rigorous method is still clearer in a number of other works in the same field published between 1820 and 1836, one of which, *Der Nibelunge Not und die Klage,* reached an 11th edition in 1892. He then turned to classical studies. Lachmann's *Betrachtungen über Homers Ilias,* first published in the *Abhandlungen* of the Berlin academy in 1837 and 1841, in which he sought to show that the *Iliad* consists of 16 independent "lays" variously enlarged and interpolated, has had considerable influence on modern Homeric criticism, although his views are no longer accepted. His smaller edition of the New Testament appeared in 1831 (3rd ed. 1846); the larger, in two volumes, 1842–50. Besides *Propertius* (1816), Lachmann edited *Catullus* (1829); *Tibullus* (1829); *Genesius* (1834); *Terentianus Maurus* (1836); *Babrius* (1845); *Avianus* (1845); *Gaius* (1841–42); the *Agrimensores Romani* (1848–52); *Lucilius* (edited after his death by Vahlen, 1876); and *Lucretius* (1850). The last, which was the main occupation of the closing years of his life, from 1845, was perhaps his greatest achievement, and has been characterized by H. A. J. Munro as "a work which will be a landmark for scholars as long as the Latin language continues to be studied." Lachmann also translated *Macbeth* (1829).

Lachmann enunciated a statement of the lengthening of vowels in Latin standing before a voiced consonant that is assimilated to a following breathed consonant, that is, *ăgo* but *āctus,* that still goes by his name. Though its main tenet is correct, it still is the subject of argument. He died on March 13, 1851, at Berlin.

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LACKAWANNA, a city of Erie county, western New York, U.S., on Lake Erie, south of, and adjoining, the city of Buffalo (*q.v.*) and a part of the Buffalo standard metropolitan statistical area. In this major steel centre is one of the largest steel plants in the U.S., with a rated annual capacity of 6,200,000 tons. Operating its own ship canal, locks, bridges and storage areas, the steel company employs, at its peak, 20,000 workers. In the city is the basilica of Our Lady of Victory, a Roman Catholic national shrine, and its associated Institutions. Until 1900 permanent settlers came mainly from the New England states. The rapidly growing community, originally known as Limestone Hill, separated from the town of West Seneca, and was incorporated in 1909 as the city of Lackawanna, named for the original steel plant. In the latter part of the 20th century more than 50 nationalities were represented in the population.

For comparative population figures *see* table in NEW YORK: *Population.* (A. G. SE.)

LA CLOCHE, JAMES DE ("PRINCE JAMES STUART") (1644–1669), an imposter whose claim to be the natural son of Charles II convinced not only some of his contemporaries but also Lord Acton, who in 1862 published an article entitled "The Secret History of Charles II," in the *Home and Foreign Review,* based on information found by Father Boero in the Jesuit archives in Rome. Apparently, on April 2, 1668, a man calling himself Jacobus de la Cloche "from the island of Jersey, aged 24" entered the Jesuit house of novices at Rome. He was the bearer of two letters from Charles II, dated Sept. 25, 1665, and Feb. 7, 1667, acknowledging De la Cloche de Bourg du Jersey as his natural son, a certificate from Queen Christina of Sweden, stating that he had been received into the Roman Catholic Church on July 29, 1667, and two letters from Charles II to the general of the Jesuit order, Father Oliva, asking that James be ordained as a priest and come to England to receive Charles secretly into the Catholic Church. These letters insisted that Oliva must not introduce or mention James to Queen Christina and that James, when he came to England, must not be accompanied by the usual *socius* or guardian. With these documents in the archives was another, even more dubious, purporting to be written by Charles II to James, and addressed to "Le Prince Stuart," though none of the Stuart bastards was ever known by this name. It promised that if James wished to desert the priesthood he might claim higher titles than the duke of Monmouth (the only higher title was prince of Wales) and that if Charles and the duke of York were to die childless "the kingdoms belong to you and parliament cannot legally oppose you, unless, as at present, they can only elect Protestant kings"—this, although the English crown was not elective, although there were other nearer heirs after Charles and James, and although there was, at that time, no Bill of Rights to prevent inheritance by a Roman Catholic. Another piece of internal evidence suggesting that all the letters were forgeries was that Charles referred to his mother, Henrietta Maria, as being with him at Whitehall, although actually she had left England in 1665.

Clearly the aim was to extract money from Oliva, who was to finance James's journey to England, with promise of repayment. The plot seems to have been successful: James did apparently visit England, returning with more requests for loans. Little more is known of him. In Jan. 1669 a person calling himself Prince James Stuart appeared in Naples, where he married, and was subsequently arrested as a coiner. He told his confessors that he was the son of Charles II, but Charles, on application from the viceroy at Naples, disowned him. He died at Naples in Aug. 1669, leaving a will claiming for his unborn son the "apanage" of Monmouth or Wales "which it is usual to bestow on natural sons of the king." The son lived until about 1750, a penniless pretender. For an account of the legends surrounding James, including the theory that he was the man in the iron mask (*q.v.*) *see* A. S. Barnes, *The Man of the Mask* (1908).

LA CONDAMINE, CHARLES MARIE DE (1701–1774), French geographer and mathematician, was born at Paris on Jan. 28, 1701, and was trained for the army. With Louis Godin

and Pierre Bouguer he joined the expedition sent to Peru in 1735 to determine the length of a degree of the meridian in the neighbourhood of the equator, but finally separated from the rest and made his way from Quito down the Amazon to Cayenne. His was the first scientific exploration of the Amazon; he published the results with a map of the Amazon in *Mém.* de *l'académie* des *sciences,* 1745 (English translation 1745–47). He visited Rome with a view to determining the length of the Roman foot. The journal of his voyage to South America was published in Paris in 1751. He died at Paris on Feb. 4, 1774.

LACONIA, the ancient name of the southeastern district of the Peloponnese (Peloponnesos) (Gr. Λακωνική) of which Sparta (Sparte) was the capital. It has an area of 1,453 sq.mi., slightly greater than that of Somersetshire, and consists of three well-marked zones running north and south: (1) the valley of the Eurotas, which occupies the centre, is bounded west by (2) the chain of Taygetus (mod. Tavgetos, 7,897 ft.), which runs from the Arcadian mountains on the north to the promontory of Taenarum (Cape Matapan). The eastern portion (3), a more broken range of hill country, rises in Mt. Parnon to 6,348 ft. and terminates in the Cape Maléa. The Taygetus range is well-watered and in ancient times had forests which afforded excellent hunting; also iron mines and quarries of the famous *rosso* antico of Taenarum, as well as an inferior bluish marble. The quarries of green porphyry (lapis Lacedaemonius) were at Croceae. Far poorer are the slopes of Parnon, for the most part barren limestone. The Eurotas valley, however, is fertile and produces maize, olives, oranges and mulberries. Laconia has no large rivers except Eurotas and its largest tributary Oenus (mod. Kelefina). The coast, especially on the east, is rugged with few good harbours. Cythera (Kýthēra) Island, *q.v.,* lies south of Cape Maléa. Important towns, besides Sparta and Gythium (Gýtheion), were Bryseae, Amyclae and Pharis in the Eurotas plain; Pellana and Belbina on the upper Eurotas; Sellasia on the Oenus, Caryae on the Arcadian frontier; Prasiae, Zarax and Epidaurus Limera on the east coast; Geronthrae on the slopes of Parnon; Boeae, Asopus, Helos, Las and Teuthrone on the Laconian gulf; and Hippola, Messa and Oetylus on the Messenian gulf.

The earliest inhabitants in tradition were autochthonous Leleges (*q.v.*). Minyan immigrants settled on the coast and even founded Amyclae in the Eurotas valley; Phoenician traders visited the Laconian gulf, and there are indications of very early trade between Laconia and Crete; *e.g.,* blocks of green Laconian porphyry have been found in the Minoan palace at Cnossus. In Homer, Laconia is the realm of an Achaean prince, Menelaus, whose seat was perhaps Therapne. southeast of Sparta. This Achaean kingdom fell before the Dorians *c.* 1100 B.C. and throughout the classical period the history of Laconia is that of its capital Sparta (*q.v.*).

In 195 B.C. the coast towns were freed from Spartan rule by the Roman general, T. Quinctius Flamininus, and became members of the Achaean league. When this was dissolved in 146 B.C., they remained independent under the title of the "Confederation of the Lacedaemonians" or "of the Free Laconians" (see GYTHIUM). Augustus seems to have reorganized the league, for Pausanias (iii, 21, 6) speaks of him as its founder. Of the 24 cities which originally composed the league, only 18 remained by the reign of Hadrian (see ACHAEAN LEAGUE). In A.D. 395 Goths under Alaric devastated Laconia, and later it was overrun by large bands of Slavs. Throughout the period of middle ages it was the scene of struggles between Slavs, Byzantines, Franks, Turks and Venetians, the memorials of which are the fortresses of Mistra near Sparta, Geráki (anc. Geronthrae) and Monemvasia, "the Gibraltar of Greece," on the east coast, and Passava near Gythium. In the War of Independence a prominent part was played by the Maniates or Mainotes, the inhabitants of the rugged peninsula formed by the southern part of Taygetus who had maintained virtual independence of the Turks and until quite recently retained many mediaeval customs, living in fortified towers and practising blood feud and marriage by capture.

The district had been divided into two departments (nomes), Lacedaemon and Laconia, with their capitals at Sparta and Gythium respectively. Pop. of Laconia (1951) 130,898.

Archaeology. — Besides the excavations undertaken at Sparta, Gythium and Vaphio (*q.v.*), the most important were those at the Apollo sanctuary of Amyclae before 1904 by C. Tsountas in 1890 ('Εφημ. ἀρχαιολ. 1 ff. [1892]) and in 1904 by A. Furtwängler. At Kampos, on the western side of Taygetus, a small domed tomb of Mycenean age was excavated in 1890 and yielded two leaden statuettes of great interest; at Arkina a similar tomb had been explored in 1889. Important inscriptions were found at Geronthrae (Geráki), notably five long fragments of the *Edictum Diocletiani.* In 1904 the British Archaeological school at Athens undertook a systematic investigation of the ancient and mediaeval remains in Laconia. The results, the most important of which are summarized in the article SPARTA, are published in the British School Annual, x, ff. The acropolis of Geronthrae, a hero-shrine at Angelona in the southeastern highlands, and the sanctuary of Ino-Pasiphae at Thalamae have also been investigated.

See the works cited under SPARTA and GREECE.

LACONIA, a city in the lake region of central New Hampshire, U.S., the seat of Belknap county. It borders four lakes and from the city the White mountains and the Belknap mountain range are seen. In 1652 this region was marked by the Massachusetts Bay colony as its northern boundary. Indian artifacts found near the boundary marker are displayed in the Laconia public library. Laconia received a town charter in 1855 and became a city in 1893. The first cotton mill in the U.S. (chartered July 1, 1811) was located there. Socks for the Union army in the American Civil War were made in mills on the Winnipesaukee river which flows through the city. It once was noted for the manufacture of passenger cars for the New York city and Boston subways. Industries include knitting machinery, latch needles, wood handles, skis, plywood, hosiery, shoes, malleable iron castings, boxes, doll clothing and electric relays. The state school for mental defectives is located there.

The office of the supervisor of the White Mountain National forest is in Laconia. The Belknap Mountain Recreation centre is nearby. The state maintains a fish hatchery nearby. For comparative population figures see table in NEW HAMPSHIRE: Population. (E. J. GA.)

LACORDAIRE, (JEAN BAPTISTE) HENRI (1802–1861), French Dominican preacher and outstanding ecclesiastic among the enlightened leaders of the Catholic revolt in France against the skepticism of Voltaire and the idealistic socialism of Saint-Simon, was born at Récey-sur-Ource, Côte d'Or, on May 12, 1802. After practising as an advocate, he entered the seminary of St. Sulpice in 1824, moved in particular by the Essai *sur l'indifférence* en *matière* de religion of H. F. R. de Lamennais (*q.v.*). He was ordained three years later. In 1830 he joined the small band of enthusiastic young men, both clerical and lay, who collaborated under the direction of Lamennais in the production of *L'Avenir,* an exaggeratedly liberal journal which was suppressed when Lamennais' doctrines were condemned in the encyclical Mirari Vos (1832).

Unlike Lamennais, Lacordaire readily accepted its cessation, and saw that social regeneration must flow from an intelligent religious regeneration. He therefore began that course of Christian *conférences* (lectures) which attracted in rapidly growing numbers the largely de-Christianized intellectuals of Paris, first to the Collège Stanislas (1834) and later to Notre Dame (1835). He expounded the need of a new liberalism in the idiom of a contemporary France emergent from the Revolution. His own liberalism eventually won the approval of the Vatican council because it derived from a profound spirituality which was not merely theoretical but personal.

In the Dominicans (*q.v.*), as an order devoted especially to preaching and education, Lacordaire saw a perfect means of pursuing his own high endeavours and at the same time the necessary safeguard of the orthodoxy of these endeavours. Therefore, as a first step toward re-establishing the Dominican order in France (where it had been suppressed at the time of the Revolution), and by its means to further the re-Christianizing of France not only in the purely religious sphere but also in the spheres of educa-

tion, politics and social reform, he joined the order at Rome in 1838.

His return to Paris four years later to resume his preaching in Notre Dame non renewed public, and consequently official. recognition in his country for religious orders in general. As prior provincial from 1850 to 1854 he did much to make the Dominicans a religious and educational power in France. In 1854 he retired to Sorèze, where he established a specifically educational section of the order. Lacordaire was elected to the Academy in 1860 and died at Sorèze on Nov. 21, 1861.

Lacordaire was an unswerving protagonist for that freedom mhich he was convinced could result only from a comprehension and acceptance of total Christian truth; hence his appreciation. for example. of Daniel O'Connell (*q.v.*), manifested in one of the most notable of his renowned funeral orations; hence too his professedly republican leanings, proclaimed (to the disapproval of local ecclesiastical authority) when he was elected briefly to the national assembly. Though his immediate appeal was to the intellectuals his purpose was the social and educational as well as spiritual betterment of the masses; hence his close friendship with A. F Ozanam and C. F. R. de Montalembert (*qq.v.*).

Lacordaire made an effective and lasting contribution to the intellectual and religious reorientation of France, primarily through the influence of his spoken word and his own personality. but also by the practical steps he took to extend and perpetuate that contribution by the re-establishment there of the Dominicans His enduring monument is in the written text of his *conférences*.

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LA CORDILLERA: see CORDILLERA, LA (department).

LACQUER (LACKER), a general term for coloured and frequently opaque varnishes applied to certain metallic objects and to wood The term is derived from lac (q *v.*), which is the basis of some lacquers. (This article deals with artistic lacquer ware; for a discussion of lacquers used as protective or decorative coatings, see VARNISH. *See* also JAPANNING)

The lacquer of the far east, China, Japan and Korea must not be confused nith other substances to which the term is generally applied; for instance, the lac of Burma. which is the gummy deposit of an insect. Coccus *lacca*, and the various solutions of gums or resin in turpentine of nhich European imitations of eastern lacquer have been and are concocted.

TECHNIQUE

Raw Materials. — Lacquer. as used in China and Japan. is a natural product, the sap of a tree, *Rhus vernicifera;* subject to the removal of impurities and excess water, it can be used in its natural state. though it was frequently adulterated The tree. which is indigenous to China, and has certainly been cultivated in Japan at least since the 6th century A.D.. is tapped at about the age of ten years, lateral incisions being made in the bark and the running sap collected during the months of June to September. Branches of a diameter of one inch or more are also tapped. the bark having first been removed Smaller branches are cut off. soaked in water for ten days, and the sap collected, producing a lacquer (*seshime*) of particular quality. used for special purposes These processes kill the tree but the wood, when of sufficient size, is of some use for carpentry. From the roots five or six shoots spring up, which become available for the production of lacquer after about six years, and the operation can be thus continued for a considerable length of time before the growth is exhausted. The Chinese and Japanese methods are practically identical in this respect. but the cultivation of the tree does not seem to have been so systematic in China as in Japan.

The sap is nhite or grayish in colour and about the consistency of treacle On exposure to the air it turns yellow-brown and then black It is strained through hempen cloth to remove physical impurities after being pounded and stirred in shallow wooden tubs to give it uniform liquidity. It is then slightly heated over a slow fire or in hot sunshine and stirred again to evaporate excess moisture. and stored in airtight vessels. The characteristic constituent of lacquer is termed by chemists *urushiol* (from the Japanese name of lacquer. *urushi*), and its formula has been stated as $C_{14}H_{18}O_2$. Japanese lacquer is said by K. Mijama to contain from 64% to 77.6% of *urushiol* as compared with an average of 55.84% for Chinese; the difference being due, probably, to inferior methods of cultivation and extraction, and perhaps in some cases to climatic differences.

Lacquer is a slightly irritant poison, but workers in the industry soon become immune.

The basis of lacquerware, both in Japan and in China, is almost always wood. although it was also occasionally applied to porcelain and brass and white metal alloys. In some instances, objects were carved out of solid lacquer. The wood used. generally a sort of pine having a soft and even grain, was worked to an astonishing thinness. The processes that follow are the result of extraordinary qualities of lacquer itself, which, on exposure to air, takes on an extreme but not brittle hardness, and is capable of receiving a brilliant polish of such a nature as to rival even the surface of highly glazed porcelain. Moreover, it has the peculiar characteristic of attaining its maximum hardness in the presence of moisture The Japanese. therefore, place the object, to secure this result, in a damp box or chamber after each application of lacquer to the basic material (wood, etc.). The Chinese are said (in an account of the industry dating from A.D 1621–28) to use a "cave" in the ground for this purpose, and to place the objects therein at night in order to take advantage of the cool night air. It may, indeed, be said that lacquer dries in a moist atmosphere.

Procedure. — The joiner's work having been completed, and all knots or projections having been most carefully smoothed away, cracks and joints are luted with a mixture of rice paste and *seshime* lacquer, until an absolutely even surface is obtained It is then given a thin coat of seshime lacquer to fill up the pores of the wood and to provide a basis for succeeding operations; in the case of fine lacquer, possibly as many as 20 or 30 or even more, of each of which the following may be taken as typical. On the basis. as above described, is laid a coat of lacquer composition nhich is allowed to harden, and ground smooth with whetstone. Next comes a further coat of finer composition, in which is mixed some burnt clay, which is again ground. and laid aside to harden for at least 12 hours On this is fixed a coat of hempen cloth (or rarely in Japan, but more often in China, paper) by means of an adhesive paste of wheat or rice flour and lacquer, which needs 24 hours at least to dry. The cloth is smoothed uith a knife, and then receives several successive coats of lacquer composition, each demanding the delay necessary for hardening On this is laid very hard lacquer, requiring a much longer drying interval. afterward being ground to a fine surface Succeeding coats of lacquer of varying quality are now laid on. dried and polished.

This preliminary work, requiring for artistic lacquerwork at least 18 days, produces the surface on which the artist in lacquer begins his task of decoration A large number of processes nere at his command especially in Japan, but the design was first generally made on paper with lacquer and transferred to the object while still wet or draan on it direct with a thin paste of white lead or colour. In carrying it out he made use of gold or silver dust applied through a quill or bamboo tube. or through a sieve to secure equal distribution Larger fragments of the precious metals (*hirame* or *kirikane*) were applied separately by hand, with the aid of a small. pointed tool In one typical instance approximately 500 squares of thin gold foil nere thus inserted within one square inch. These decorative processes each entailed prolonged hardening periods and meticulous polishing. Relief was obtained by modeling nith a putty consisting of a mixture of lacquer nith fine charcoal, uhite lead, lampblack. etc , camphor being added to make it work easily Lacquer was sometimes engraved, both in China and Japan.

Carved Lacquer. — The carved lacquer of China (*tiao ch'i*), nhich nas imitated but never equaled in Japan (as the Chinese have never reached the perfection of the Japanese gold lacquerware), needs particular notice. In this, the lacquer was built up

in the method described above, but to a considerable thickness; when several colours were used, successive layers of each colour, of uniform thickness, were arranged in the order in which they were to predominate. When the whole mass was complete and homogeneous, it was cut back from the surface, so as to expose each colour as required by the design. The carving was done with a V-shaped tool kept very sharp, and when the lacquer was cold and hard. The cutting was done with amazing precision—no correction of faults was possible, for each layer had to be exactly and accurately reached, and the final result precisely foreseen and allowed for from the beginning of the work. The red lacquer (tan sha), so well known and justly appreciated, was coloured with cinnabar (red sulphuret of mercury). Other colours which were employed include a deep and a lighter olive-green, buff, brown, black and aubergine.

In Japanese lacquer, the following are the chief processes used: Nashiji (pear skin), small flakes of gold or silver sunk to various depths in the lacquer. *Fundame,* fine gold or silver powder worked to a flat, dull surface. Hirame, small, irregularly shaped pieces of sheet gold or silver placed on the surface. Togidashi, the design built up to the surface in gold, silver and colours with many coats of lacquer and then polislied down to show them. Takamakiye, decoration in bold relief. Hiramakiye, decoration in low relief. *Rōiro,* polished black. *Chinkinbori,* engraved lacquer. *Kirikane,* square dice of sheet gold or silver, inserted separately on the surface. Raden, inlaid shell and metal. From the earliest recorded times shell was used in the adornment of lacquer in China as well as in Japan, being inlaid on the surface in patterns, as well as in small squares like *kirikane* and dust. For this purpose various shells were used, mother-of-pearl for larger work and that of nautilus, pear shell, sea-ear (*Haliotis*, Jap. Awabi) and Turbo *Cornutus* (Jap. Sazaye). For a very charming form, called by the French Lac *Burgautée,* the shell of the sea-ear, of iridescent blue and green, was employed in combination with gold and silver and delicately engraved, as early as the Ming period (A.D. 1368–1644) and also in Japan. Chinese lacquer was also inlaid with hard stones such as jade, malachite, etc., as well as coral, soapstone, ivory, porcelain and other decorative substances.

CHINESE LACQUER

The use of lacquer in China goes back traditionally to legendary times. A late Ming manuscript, the *Hsui-shih-lu,* states that it was first employed for writing on bamboo slips, then for utensils for food made of black lacquer, and subsequently for vessels for ceremonial use of black with red interiors. During the Chou dynasty (1122–249 B.C.) it served for the decoration of carriages, harnesses, bows and arrows, etc., and was the subject of official regulations, being accepted also in payment of taxes. At this time, gold and colours are said to have come into use. About the 2nd century B.C. buildings were decorated with lacquer and musical instruments are similarly described. Under the Han dynasty (206 B.C.–A.D. 220) further development took place and pot-covers of paper, covered with lacquer, were found in 1910 by Ryūzo Torii near Port Arthur which are definitely attributed to this period.

Of the lacquer of the T'ang dynasty more reliable information is available, for the collections still preserved in the Hbryw-ji temple in Japan, founded A.D. 607, and those collected by the Japanese emperor, Shōmu (A.D. 724–749), deposited after his death by his widow in the Imperial Treasury (Shōsō-in) at Nara, contain many objects to which must be given a Chinese origin; in particular, musical instruments with inlay of cut-out figures of gold and silver inserted on the surface, covered with lacquer, which was then rubbed down until the metal ornaments were again brought to view.

Under the Sung dynasty (A.D. 960–1279), the industry further developed and the use of gold and silver lacquer in the utensils made for the palace is particularly recorded. S. W. Bushell considered that all branches of lacquer work now carried on in China can be traced as far back at least as the Sung dynasty and that the chief seat of manufacture at that period was Chia-hsing Fu, between Hangchow and Soochow—the latter city being also an important centre of the industry. A lacquer box of the early Sung period, probably once of rhinoceros horn colour, black and red, with gold dust and silver wire is one of the very few known examples of the period. Toward the close of the period (C. A.D. 1220) it is stated that lacquerwares were exported from Fu-kien to Java, India, Persia, Japan, Mecca and other places. Chinese writers record the existence of carved red lacquer during the time of the Yuan dynasty (A.D. 1279–1368) as well as of pierced ware and that inlaid with shell.

Of the state of the industry under the Ming dynasty (A.D. 1368–1644) there are contemporary Chinese descriptions; for instance, the *Koku* yao lun, published during the reign of the first Ming emperor, and the *Ch'ing pi ts'ang* of A.D. 1595. The *Hsui* shih *lu* dates from A.D. 1621–28 and from these a good account of the progress of the art can be realized. These records indicate that there were, in the early years of the dynasty, special factories of carved red lacquer at Ta-li Fu in Yunnan, which also produced spurious imitations. Nanking was noted for work of the same kind of high quality and for gold lacquer with pictures, as also were Peking and Ning-kuo Fu in Kiangnan. Inlay of mother-of-pearl is also mentioned. The excellence of the carved lacquer made during the reigns of Yung Lo (A.D 1403–24) and Hsiian-Tê (A.D. 1426–35) is also recorded; and also that encrusted with shell, inlaid with sheet gold and silver, and flecked with powdered gold. Examples of carved lacquer are extant which can reasonably be attributed to this period. They are bold in design and free from the superabundance of small detail which characterized later productions; the colour also is generally deeper and richer than that of the 18th-century pieces. The Victoria and Albert museum, London, has several good examples of the period. Toward the end of the Ming dynasty, a factory was established at Peking, but fell into disuse during the troubles accompanying the fall of the Ming emperor.

The first and, perhaps, the greatest of the Manchu emperors, K'ang Hsi (A.D. 1662–1723), revived it in A.D. 1680, when he established, in the precincts of the palace at Peking, a series of 27 workshops for artistic handicrafts. Carved lacquer was, however, also made at Canton, Tongking, Soochow and Foochow; and the Jesuit father, Louis le Comte, who arrived in China in 1687, gave a good account of the flourishing state of the industry at that time. In this connection it is worth noting that the period of K'ang Hsi was that which saw the first considerable importation of lacquerware (and other objects of industrial art) into Europe. The consequent development of imitation lacquer applied to furniture, etc., which, during the reigns of William and Mary and Anne, had so extended a vogue, was one of the conspicuous features of the *Chinoiserie* craze of that time. A screen is still in existence made by command of K'ang Hsi for presentation to the emperor Leopold I, whose badge, the double-headed eagle, is incorporated in the design. Carved lacquer of this period hardly attains to the rich colour of that of the Ming period, nor to the breadth and simplicity of design of the latter—though these qualities are far from negligible.

In technique the K'ang Hsi ware shows an advance and is generally free from the small cracks too often found to have developed in the Ming products. The perfection of this quality, apart from other considerations, is found in the lacquerware of Ch'ien Lung (A.D. 1736–96), a devoted admirer of this branch of industrial art, who employed it on a large scale for the furniture and fittings of his palaces, for ceremonial and commemorative gifts and other purposes. The workmanship of objects made under his auspices is brilliant in the extreme, and ranks with the finest products of a nation whose mere craftsmanship has been almost unrivaled. But the colour is hard compared with earlier work, and the design tends rather to a somewhat stereotyped formalism.

Still, the 18th century can hardly be called a period of decadence in the industrial arts of China—the superb execution of its productions, a characteristic which will always, and justly, command admiration, redeems it from adverse criticism. The downward course began in the 19th century, with loss of originality and a falling-off, due to adulteration, in the quality of the material. What was left of the imperial factories was burnt in 1869, and though carved red lacquer was made after that date, the industry had already ceased

to have artistic importance.

Lacquer in Gold and **Colours.**—Lacquer artists in China, curiously enough, never developed the use of gold lacquer to anything like the extent or to the high standard of merit attained by the Japanese, though, rarely. specimens can be found of fine quality. For the most part, gold was used as a simple. flat decoration. especially on a ground of black as in the screens and boxes. frequently of considerable decorative value, made at Canton and other ports in touch with foreign trade and largely exported by European merchants, especially at the beginning of the 19th century. On the other hand, the Chinese used to advantage a wider range of colour than was generally employed in Japan; and brilliant hues of green, red, brown, cream, purple and other tints are found on objects dating from the later years of the Ming period onward.

Screens. too, were often thus decorated most effectively, and sometimes enriched with applied hard stones, shell or porcelain. The most effective form of this typically far eastern article of furniture is provided by the so-called Coromandel work, in which the design is first cut out in intaglio and then completed nith varied colour or gold. Such screens. which are sometimes of considerable size—as much as 20 ft. in width and 8 ft. in height, and with 12 leaves—were largely imported into western Europe at the end of the 17th and early years of the 18th century, by East India merchants whose headquarters (French and English) were either on the Coromandel Coast or (Dutch) at Bantam in Java—the latter place also providing a name often used by old writers. These imported screens were remorselessly cut up to make cabinets and other articles of furniture, in which form their remains are by no means rare at the present day.

Lac **Burgautée.**—One of the most delicate and charming manifestations of the Chinese lacquerer's art is that called by the French, lac *burgautée*, of which the technique has already been described. The effects of colour produced by the use of iridescent shell, sometimes engraved and occasionally in combination nith gold and silver, are exquisite. This work is generally on a small scale, and though temple utensils and other articles of fair size are to be found, as well as miniature table screens and vases, a favourite production took the form of little ninecups, originally in sets of five and lined with silver. This branch of art dates certainly from the Rling dynasty and its qualities merit a good deal of attention.

Subjects of Decoration.—Chinese ornament as applied to lacquerware (as to other of the industrial arts) is almost entirely symbolical and the subject pieces generally derived from legends of the Buddhist. Taoist and Confucian personages. The more usual of the former are the "Eight Buddhist Emblems of Happy Augury," the "Eight Musical Instruments," and the "Eight Precious Things" (Taoist). The "Hundred Antiques" appear on Coromandel screens and other large works. Among figure subjects may be mentioned representations of Shou Lao, a deification of Lao Tze, the founder of the Taoist philosophy, the "Eight Taoist Immortals," the "Sages of the Bamboo Grove" and those of the winecup. Children at games are much favoured, and landscapes with pavilions, trees, mountains. lakes and formal gardens. Among animals the mythical dragon—if with five claws, peculiar to the emperor—and phoenix or *feng-huang* associated with the empress. The long-tailed tortoise. unicorn (Ch'i-lin), lion crane, bat, butterfly and fish are frequently seen, all being symbolical of long life, good fortune, happiness, etc. The peach. pine, bamboo, peony, lotus, chrysanthemum and prunus are the chief motifs selected from the vegetable kingdom. Of abstract pattern the meander or key-pattern and swastika are the chief. The forms of vessels resemble, as a rule, those either of porcelain or bronzes.

JAPANESE LACQUER

The earliest definite record of the existence of a lacquer industry in Japan consists in an allusion in the *Nihongi* ("Chronicles of Japan") to a high court official who was probably in control of it in the year AD. j87. This implies some development already achieved; and during the following two or three centuries it is certain that the cultivation of the lacquer tree and the use of the material were fostered and controlled by a government department. Lacquer, for instance, was accepted in some districts in payment of taxes. But the history of the art, so far as concerns definite evidence still extant, begins nith the 8th century, and the specimens to which reference may be made are those still preserved at Nara and in the Hōryuji temple referred to above. Although a number of these are of Chinese origin, the collections certainly include treasures that must be given an authentic Japanese origin. Among those may be mentioned the sword scabbard of the emperor Shomu (AD. 724–749), in gold on black lacquer. and others decorated with leaves of gold and silver inlaid in lacquer.

The emperor Kwammu (A D. 781–806) removed the capital from Nara to a new city, Heiankyō—the modern Kyoto; and an increased luxury in the style of living brought about further developments in the art. especially in the use of gold lacquer, due largely to the spread of Buddhistic influence. This period, however, saw the beginnings of a Japanese national style as distinct from the Chinese methods and manner, imported by Buddhist missionaries. Lacquer was used at this time in the decoration of important buildings; and inlay of shell also became popular. The organization of the industry was extended, and as early as A.D. 905 sumptuary edicts began to be issued regulating the dimensions and quantities of material to be used in the domestic utensils—chiefly of black or red polished lacquer—which now began to come into general use. From this time, it is no exaggeration to say that. to a considerable extent, lacquer filled the place occupied in China by ceramic wares. A remarkable development of this period which must not be overlooked was the production of statuary of considerable merit, made with lacquer composition (kanshitsu), a process derived from China. but carried to a high standard in Japan for a brief period, until it was superseded by wood sculpture. Some few authentic examples remain of the fine lacquer of the Heian period, notably the case for Buddhist Scriptures in the Ninnaji temple at Kyoto, made by order of the emperor Uda at the beginning of the 10th century. This is in black lacquer, sprinkled with gold dust and with a pattern of flowers, clouds, birds and Buddhist angels.

During the Kamakura period (A.D. 1192–1333), in spite of the disturbance caused by the famous struggle between the Minamoto and Taira clans, and the establishment of the feudal shogunate at Kamakura. which gives its name to the period, the art of making fine lacquer continued to progress, under the patronage of the Fujiwara family, who maintained the imperial court at Kyoto with ever-increasing luxury. Marked features of this time are improved methods of inlay of precious metals and shell, and especially an attractive form of design in which beautifully written poems are interwoven with the pattern (ashide-ye). The process called *Kamakura-bori*, carved wood thickly lacquered with red or black, also dates from this period and continued to flourish for another two centuries or so. Modern imitations of this work have to be reckoned with by the collector. During this epoch occurred the beginnings of the characteristic Japanese treatment of landscape and flower subjects in design, generally in flat gold lacquer. with nashiji and pewter inlay.

The Ashikaga period (AD. 1336–1573) saw a further technical and artistic development, largely under the patronage of the Shōgun Yoshimasa; who, after holding office for two years only, retired in 1451 and devoted himself to a life of luxury. He gave great impetus to the Tea and Incense ceremonies. to the latter of which was especially due a whole series of new applications of the art, in respect of the exquisitely wrought small utensils required by that ritual. The ostentatious simplicity of the Zen sect of Buddhists was displayed in the use of black lacquer of the first quality with little or no ornament. Excellent work in shell inlay was also a characteristic of the time. The gold lacquer of the Ashikaga craftsmen gained so great a reputation in China that artisans from that country came to Japan to learn the methods by which it was produced, though they seem to have had little success in introducing it into their onn country. Among the leading Japanese craftsmen of the period may be mentioned Kōami Dōchō, Taiami, Seiami, and Igarashi Shinsai, but attribution of specific works to them is

largely a matter of conjecture.

The civil wars which continuously infested Japan during the later middle ages checked the growth of the industry for a while; but the short Momoyama period (AD. 1574–1603) which followed saw at least the work of one of the greatest of Japanese artists in lacquer, Honami Kōyetsu (A D. 1557–1637). He was the founder of a striking and original style of ornament, essentially national in character. His designs were bold and simple in detail, generally executed in high relief with masses of shell or metal inlay. The great Shogun, Toyotomi Hideyoshi (d. 1598) who secured the peace of the country with a strong hand, was an enthusiastic patron of the arts; and under his patronage a real revival took place. At his death, his widow erected the Kōdaiji temple at Kyōto, in which a new method of lacquer decoration was used (*Kodaiji-makiye*). It still contains examples of this ware presented by her.

In 1603 began the rule of the Tokugawa Shogunate, which continued nithout a break until the restoration of the imperial family to actual power in 1868. The first of the line. Ipeyasu, established at Yedo (the modern Tōkyō) the great school of lacquer artists which is responsible for almost the whole of the artistic ware known outside Japan. Technical processes were still further developed with additions such as the engraved lacquer (*chinkinbori*) derived from China, carved red and black lacquer from the same source, and the so-called *Somada* mare of shell inlay on black, but different in character from the Chinese *lac burgautée* already mentioned above.

This period also saw the introduction of a class of work made by workmen, as a rule, specially devoted to it, namely the now a-ell-known *inrō* or portable medicine cases, worn on the girdle and an indispensable addition to the national costume so long as the latter was uncontaminated by western influence. These were small in size. generally oval or cylindrical in section and from $2\frac{1}{2}$ to 4 in. in length. They consisted, as a rule, of from two to five compartments, beautifully fitted into each other and held together by silken cords running along each side, secured by a bead or toggle (*ojime*) and kept from slipping through the sash by a *netsuké,* sometimes of lacquer, but more often of cunningly carved wood, ivory, bone, or other material. On this class of work was lavished some of the finest artistry of the Japanese craftsmen, and the convenient size and intrinsic charm of these dainty utensils (originally. perhaps, made for seals) has caused them to be much favoured by collectors.

The earlier years of the Tokugama period saw a considerable Chinese influence in the design of lacquer, especially in *inrō;* but the work of the greatest of Japanese lacquer artists, Ōgata Kōrin (*c.* 1657–1716), followed and extended the style originated by his master. Kōyetsu. Ritsuō (1663–1747) and Hanzan (18th century) maintained this tradition and a considerable revival of the style took place in the early years of the 19th century. when Hoitsu published his memorial volumes of the designs of the great master. To the latter period belong not a few objects ahich have been accepted as the original work of Kōrin himself. The more formal school of lacquerers included Kōami Choan and Koma Kitō-ye, who was appointed court lacquer artist to the Shōgun Igemitsu in 1636 and died in 1674. His successors held this post for 11 generations. A set of three stands made by Kōami Nagashige in 1637 as a wedding present from Iyemitsu to his daughter on her marriage with the Daimyō of Owari is considered by some Japanese experts to be the finest extant piece of Japanese lacquer. Lacquer artists followed the practice of other craftsmen in Japan, in transmitting their names to sons or selected pupils. Thus, there were ten generations of the family of Yamamoto Shunshō, who died in 1682, aged 63. The Kajikawa family continued the tradition of its founder well into the 19th century, and the same must be said of Shiomi Masanari (Kyōto, *c.* 1716–36) whose work nas notable for the quality of the rubbed-down gold and colour lacquer called *togidashi.*

The *Genroku* epoch (1684–1704) saw, perhaps. the ultimate perfection of style and technique; but the work of the later 18th and. to some extent, of the early 19th centuries has many exquisite qualities. The later periods were characterized by more elaborate detail; but adulteration of the gold with bronze and other metallic powders was too often prevalent. A fiery brown tint of the *nashiji* is a certain mark of quite late date. Nevertheless, there is plenty of good work of the early 19th century, and to this period belongs the last of the great artists of the industry, Shibata Zeshin (1807–91), who was a pupil of Koma Kwansei. His work will bear comparison even with some of the greatest of his predecessors, both in technique and in design.

Modern industrial conditions, however, have practically killed this ancient and beautiful art. It would not have survived so long had not the country been closed to alien influences for two and a half centuries.

The applications of lacquer to various purposes were much more extended in Japan than in China. In addition to the medicine cases already described, and the use of lacquer for all sorts of domestic utensils (it is capable of resisting great heat and is impervious to acids) and for furniture such as sets of shelves, cabinets, screens, etc.. the greatest skill of the craftsmen was applied, for instance. to sets of writing materials including the writing box with its inkstone, waterpot and rack for brushes, a document box, and a low table or stand. Boxes of every kind, sake cups, trays and sword-scabbards were made of lacquer of the best quality and decorated by the leading artists of the industry, while, on a large scale, lacquer was extensively employed in the decoration of temples and other architectural works. Many cabinets imported into western countries from the 17th century on, and often attributed to China, were products of Japan exported through the British, and after the closure of the country. the Dutch and Chinese settlements at Nagasaki, but the first organized display of Japanese lacquer in Europe was at the Paris Exhibition of 1867.

(E. F. S.; X.)

EUROPEAN LACQUER

Although oriental objects of art were brought to Europe in considerable quantity during the 16th century, it was not until after 1600 that a real China trade grew up. fostered by the East India companies of Holland. England and France. Porcelain and lacquer work then became so fashionable that European craftsmen undertook to make their own. The secret of porcelain manufacture was discovered shortly after 1700, and by that time the imitation of lacquer had become established in various parts of Europe. Jesuit missionaries had co-operated with scientists and master craftsmen to create formulas and a small body of writing had appeared, which was to be augmented in the 18th century—the golden age of European lacquer.

Among the earliest surviving examples of this art are the Chinese landscape wall paintings at the Rosenborg castle in Copenhagen (Simon Clause?, 1616) and the ballot box of the Saddlers' company at the Victoria and Albert museum in London, dated 1619. Information on the lacquer process seems first to have been published by the Jesuit Martino Martini (*Novus Atlas Sinensis,* 1655). John Stalker and George Parker's *Treatise of Japanning and Varnishing* (London. 1688) was the first text with pattern illustrations. The English term "Japanning" was inspired by the superiority of Japanese lacquer, which Stalker found ". . . in goodness of black and stateliness of draught . . . more rich, grave and Majestick" than the lacquer of other places, which came to be known as "Indian" or "Bantam" work.

In France, on the other hand, *ouvrage à la Chine* mas the term for the imitation of lacquer practised at the Gobelins from 1672. By the end of the century Berlin had become another centre of experimentation, from which the Fleming Jacques Dagly brought secrets that were to lead to the innovations of the Martin brothers, Guillaume (d. 1749), Simon, Étienne, Julien and Robert (1706–6 They created the lustrous *vernis Martin,* nhich mas praised by Voltaire; the production of it in 1748 became a *manufacture nationale.* The Martins decorated rooms at Versailles and Robert's son Jean Alexandre worked for Frederick the Great at Potsdam. French lacquer was further improved through new information provided by the *Mémoire sur le vernis de Chine,* which the missionary Father Pierre d'Incarville wrote in 1760 and mhich appeared as an appendix to *L'art du peintre, doreur, vernisseur* of

the Sieur Watin (1772), the most precise account of lacquer work that appeared in the 18th century.

In this book Watin examined the recipes of his predecessors and recommended the best formulas for lacquering objects to be used indoors, such as furniture, and outdoors, such as carriages. Although nothing could equal the excellence of oriental resins, he found sandarac from western juniper trees the best substitute. This, together with various gums dissolved in fluids of alcohol and turpentine and mixed with bitumens, produced the different varnishes Watin relied upon. His book gives detailed instruction in preparing the wood, covering it with cloth, varnishing this with from 8 to 20 coats, polishing the surface, drawing and painting the designs and making relief decorations. The best results of this process (*e.g.*, the commode attributed to René Dubois at the Wallace collection, London) were never as hard and brilliant as real oriental lacquer, but they provided an admirable substitute; on occasion it is not easy to distinguish them, especially when oriental designs were imitated.

The chief interest of European lacquer of the 18th century lies, however, in the fact that it was not a purely imitative art, as it had been at its beginning. Until 1720 European craftsmen sought to reproduce exactly the grave figures, the architectural settings, the stylized vegetable forms of the imported lacquers. Then in keeping with the playful spirit of the rococo, they modified these designs by introducing European figures, exotic animals like monkeys, draperies and arabesques, cartouches and ribbon compositions. Along with this transformation in place of the conventional black and gold of the oriental products, came a wide choice of background colours, including scarlet, yellow, white, blue and green, sometimes flecked with gold. In Venice particularly, where craftsmen followed the rules of Filippo Bonanni's treatise (1720), great originality was achieved by the informal spacing of bouquets of flowers around gracefully posed figures set against delicate hues of yellow and bluish green (furniture at Cà Rezzonico).

European lacquer reflects in the use to which it was put the changing tastes of the 17th and 18th centuries. In the late 17th century it was principally employed for decorating the cases of cabinets set upon carved baroque bases or for ornamenting leather wall coverings. In the 18th century bookcase desks, tall clocks and tea tables became the most fashionable articles of lacquered furniture in England and Germany, while in France and Italy the chest of drawers and corner cabinet were preferred. Whole sets of furniture with orientalizing lacquer decoration were made in England by Giles Grendey and the cabinetmakers of the Chippendale era (1750–65), some of whose masterpieces, like the Badminton and David Garrick furniture can be seen at the Victoria and Albert museum. Small lacquered boxes called "Bois de Spa" became a specialty of that Belgian town and the nearby centres of Lidge and Aachen, where a member of the Dagly family was active. Rooms with lacquered walls have survived at the palaces of Nymphenburg near Munich, Bamberg and other German cities. Lacquering of metal and paper, begun in the mid-18th century, flourished in England, France, Germany and Holland, and continued in the tole ware (Pontypool) and the papier mâché of Victorian times. (R. C. SM.)

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LACRETELLE, JEAN CHARLES DOMINIQUE DE, called LACRETELLE LE JEUNE (1766–1855), historian and journalist, was born at Metz on Sept. 3. 1766. He went to Paris in 1787 and, during the Revolution, belonged to the party of the *Feuillants*. He mas for some time secretary to the duc de la Rochefoucauld-Liancourt, the celebrated philanthropist, and afterward joined the staff of the *Journal de Paris*, then managed by Suard, where he had as colleagues André Chknier and Antoine Roucher. His monarchist sympathies brought him in peril of his life, so he enlisted in the army, but after Thermidor he returned to Paris and to his newspaper work. He was involved in the royalist movement of the 13th Vendémiaire, and condemned to deportation after the 18th Fructidor; but, thanks to powerful influence. he was left "forgotten" in prison until after the 18th Brumaire, when he was set at liberty by Fouché. Under the empire he became a professor of history in the *Faculté des lettres* of Paris (1809), and a member of the *Académie française* (1811). In 1827 he was prime mover in the protest made by the French Academy against the minister Peyronnet's law on the press, which led to the failure of that measure, but this step cost him, as it did Villemain, his post as *censeur royal*. Under Louis Philippe he devoted himself entirely to his teaching and literary work. In 1848 he retired to Mâcon; but there, as in Paris, he was the centre of a brilliant circle, for he was a wonderful *causeur*, and an equally good listener, and had many interesting experiences to recall. He died on March 26, 1855.

J C. Lacretelle's chief work is a series of histories of the 18th century, the Revolution and its sequel *Précis historique de la Révolution française*, appended to the history of Rabaut St Étienne, and partly arrtten in the prison of La Force, 5 vols. (1801–06); *Histoire de France pendant le XVIII^e siècle*, 6 vols. (1808); *Histoire de l'Assemblée Constituante* (1821); *L'Assemblée Législative* (1824); *La Convention Nationale* (1824–2j); *Histoire de France depuis la restauration* (1829–183j); *Histoire du consulat et de l'empire* (1846)

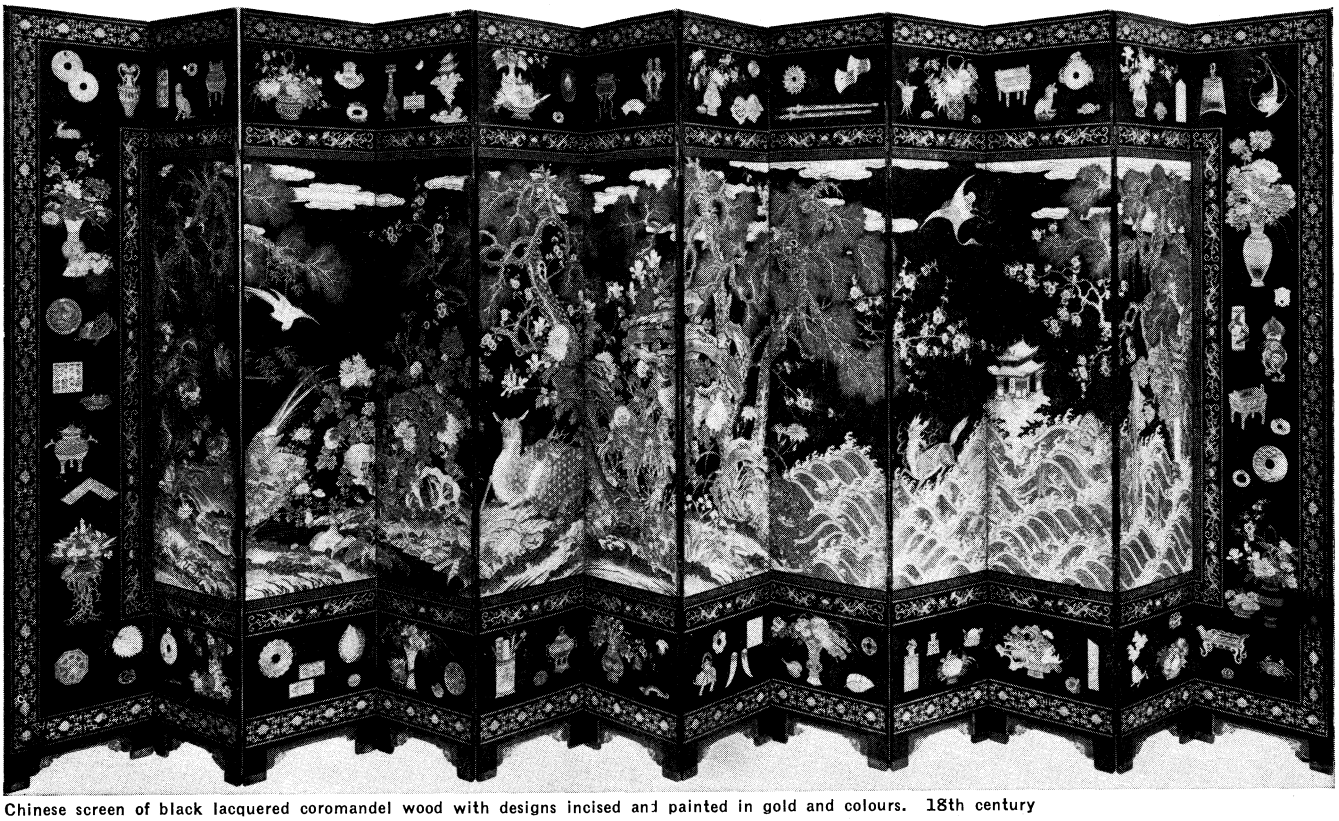
LACROIX, (FRANÇOIS ANTOINE) ALFRED (1863–1948), French mineralogist whose *Les Minéraux des Roches* (1888), nritten in collaboration with A. Michel-Lévy, was in the early days of microscopic petrography a pioneer study of the optical properties of rock-forming minerals. Born at Mâcon, on Feb. 4, 1863, Lacroix first of all studied pharmacy. In 1883, however, he went to Paris, where the influence of Alfred Descloizeaux, André Fouqué and Michel-Lévy soon led him to specialize in mineralogy instead. From 1893 until 1936 he was the successor of Des Cloiseaux as professor of mineralogy at the Muséum d'Histoire Naturelle in Paris. *Lacroix's Mine'ralogie de la France et de ses colonies*, 5 vol. (1893–1913) and later his *Minéralogie de Madagascar*, 3 vol. (1922–23) stand unique in the field of regional mineralogy for their wide scope and comprehensive treatment. In vulcanology he contributed greatly to knowledge by his study of the eruption of Mt. Pelée in Martinique (1902) and by his investigations of the 1906 eruption of Vesuvius in Italy. He became secrétaire perpétuel of the Académie des Sciences in 1920, and later wrote many biographies of great value to the history of science. Lacroix died in Paris on March 12, 1948. (C. E. T.)

LACROIX, PAUL (1806–1884), French author and journalist, was born in Paris, the son of a novelist. He is best known under his pseudonym of P. L. Jacob, *bibliophile*, or "Bibliophile Jacob." More than 20 historical romances alone came from his pen, and he also wrote some serious historical works. He was the joint author with Ferdinand Séré of *Le Moyen Âge et La Renaissance*, 5 volume (1847), a standard illustrated work on the manners. customs and dress of those times. In 1855 he was appointed librarian of the Arsenal library, Paris. He died in Paris on Oct. 16, 1884.

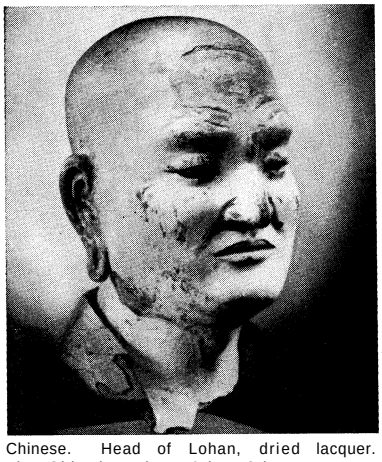
LACROMA (Serbo-Croatian LOKRUM), a small island in the Adriatic sea, belonging to Yugoslavia and lying less than ½ mi. S. of Dubrovnik. Though barely 1¼ mi. in length, Lacroma is remarkable for its beauty and its vegetation. It was a favourite resort of the archduke Maximilian, afterward emperor of Mexico (1832–67). It contains an 11th-century Benedictine monastery and the remains of a church associated with Richard I of England (1157–99).

The island was occupied by Italy in 1941.

LA CROSSE, a city of southwestern Wisconsin, U.S., lying at the point uhere the Black and La Crosse rivers enter the Missis-



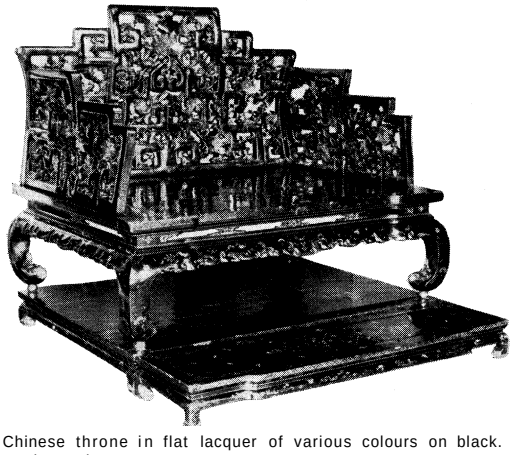
Chinese screen of black lacquered coromandel wood with designs incised and painted in gold and colours. 18th century



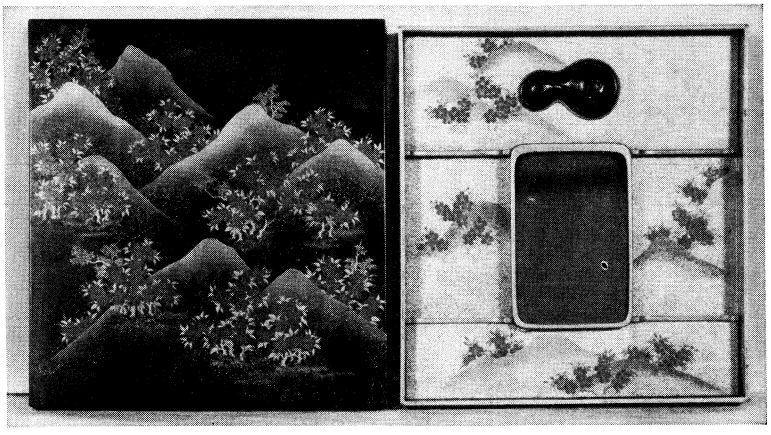
Chinese. Head of Lohan, dried lacquer. Liao-Chin dynasties, 10th– 13th century



Korean. Detail from painted lacquer basket. Han dynasty, 1st– 2nd century. In National museum, Seoul



Chinese throne in flat lacquer of various colours on black. Early 17th century

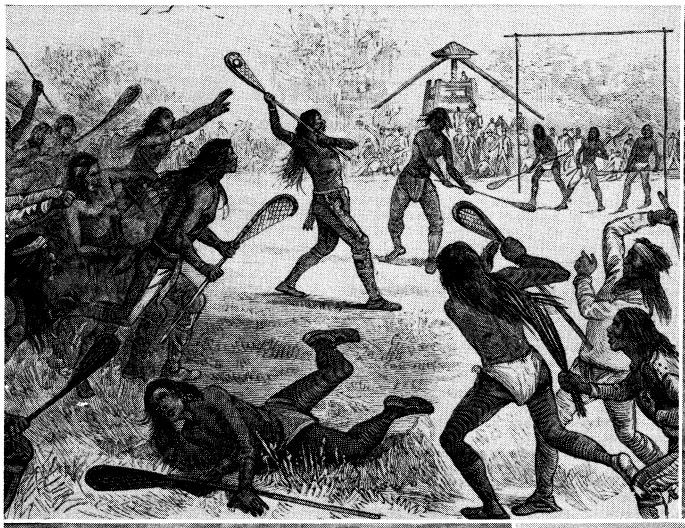


Japanese writing box and cover with ink stone and water container. Early 19th century

ORIENTAL LACQUER WORK

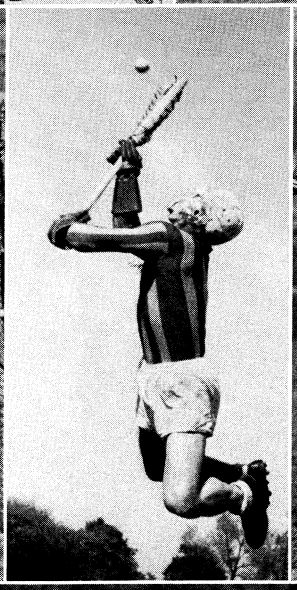
BY COURTESY OF (TOP, BOTTOM LEFT) VICTORIA AND ALBERT MUSEUM. (CENTRE LEFT) THE NELSON GALLERY OF ART— ATKINSMUSEUM, KANSAS CITY; NELSON FUND. (CENTRE RIGHT) FROM "RAKURO-SAIKYOZUKA," (BOTTOM RIGHT) THE ART INSTITUTE OF CHICAGO. NICKERSON COLLECTION

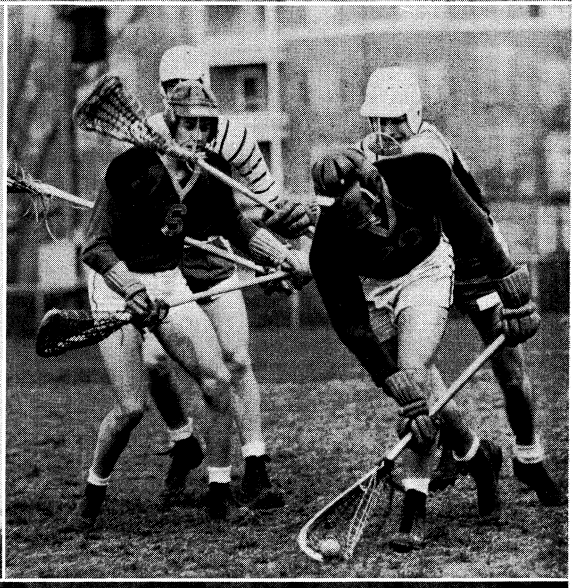
LACROSSE













BY COURTESY OF (TOP RIGHT. BOTTOM) THE SUN PAPERS. BALTIMORE, MD., (CENTRE LEFT) UNIVERSITY OF MARYLAND. COLLEGE PARK MD ., (CENTRE) CARL ZEISS, INC., (CENTRE RIGHT) PENNSYLVANIA STATE COLLEGE. STATE COLLEGE, PA.: PHOTOGRAPHS. (TOP LEFT) BETTMANN ARCHIVE, (TOP RIGHT. BOTTOM) EDWARD NOLAN

INDIAN LACROSSE AND SOME PHOTOGRAPHS FROM U.S. COLLEGE GAMES

Top left: Engraving of a game played between the Caddo and Choctaw tribes

Top right: Action on the crease. The ball may be seen on the ground near the foot of the white-shirted defender

Centre ieft: Goalie attempting to make a save in front of the net

Centre: Catch of the ball in mid-air

Centre right: Attack man picking up the ball

Bottom: A score. The ball has eluded the goalie and has been driven deep into the net

sippi and where the bordering bluffs recede nearly three miles from the riverbank. It is the seat of La Crosse county. The town owes its character to its geographical situation. The flat prairie, a gathering place of Indians, about **1840** became the site of a trading post and settlement which was chartered as a city in **1856.** A railroad reached it in **1858** through a natural break in the bluffs.

With its river port, the city became an important transportation and manufacturing centre. It depended upon lumbering for its early prosperity but by **1900** had developed diversified industry. It attracted immigrants from New England and from Europe, particularly Germany and Norway.

Viterbo college, a Roman Catholic liberal arts college for women, founded in **1931,** and the Wisconsin State college, chartered in **1909,** are located there.

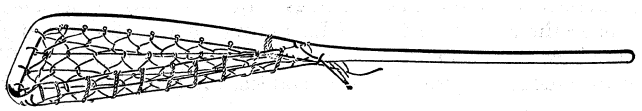
For comparative population figures ***see*** table in WISCONSIN: Population. (R. F. F.)

LACROSSE. Lacrosse was the name given by the French settlers of Canada to the old Indian game of "baggataway" (because the implement used, the curved netted stick, resembled a bishop's crozier). It is the oldest organized sport in America. It was played by the Six Nations of the Iroquois throughout the territory of upper New York state and lower Ontario before Columbus landed in the new world in 1492. The Iroquois confederation adopted the sport as a training measure for war. It is still played by the Indians at many government reservations in the United States and Canada.

The game was taken up by white men about **1840.** It has become the national summer sport in Canada and is popular also in the British Isles and Australia. In the United States the game is played by many preparatory schools, high schools, colleges and clubs in the eastern and southern parts of the country. The game because of its great speed is regarded as an excellent body conditioner.

The United States Intercollegiate Lacrosse association actively organized and promoted the game. Membership in the association was made unlimited, and most of the colleges playing the game are members. An all-American team is picked annually by the association from the member colleges participating in the sport. The Wingate trophy, emblematic of the college lacrosse championship. is awarded each year by the association to the outstanding team in intercollegiate competition.

International series have been held periodically with England and Ireland since 1884, and competition has taken place frequently between the United States and Canada since 1885. For several years prior to the outbreak of World War II, all-American teams



THE "CROSSE," MADE OF BENT HICKORY WOOD. THE NETWORK OVAL TRIANGLE SERVES FOR CATCHING. CARRYING OR THROWING THE BALL

sponsored by the U.S. Intercollegiate Lacrosse association played a series of games each year with the champions of Canada or England. When it was no longer possible to hold international games because of World War II. the association sponsored an all-star north-south game, starting in 1940. These games. held each year in early June, became a traditional part of lacrosse and a popular feature in United States sports.

Women's lacrosse was started in England about 1900 and later was introduced in the United States by Englishwomen. In 1934 an all-English women's team played in the United States, and the following year a U S. team visited the British Isles. In addition to England and Wales and the United States, the game is played by women in other countries such as Ireland, Australia, New Zealand, Canada, and South Africa. The sport was organized by the United States Women's Lacrosse association in the U.S.

Implements of the Game and Players' Equipment. — The crosse is formed of a light staff of hickory wood, the top being bent to form a kind of hook, from the tip of which a thong is drawn and made fast to the shaft, usually about two or three feet from the other end. The oval triangle thus formed is woven with a loose network of gut or rawhide. The length strings of this network are woven within two inches of their termination, so that the ball cannot catch in the meshes. The crosse should not be longer than **6** ft. nor shorter than **33** ft. (except that of the goalkeeper, which may be of any length). The width must not exceed 12 in. nor be less than 7 in. Metal of any kind is not allowed upon the crosse, and the use of one in which the pocket of the mesh has been permitted to sag to a depth which would make it unreasonably difficult for an opponent to dislodge the ball is prohibited. The ball is made of India rubber sponge, weighs 5 oz. to $5\frac{1}{4}$ oz. and measures from $7\frac{3}{4}$ in. to **8** in. in circumference.

The goals are set up **80** yd. from each other, the goal posts being six feet high and the same distance apart, joined at the top by a rigid crossbar. The posts are fitted with a pyramid-shaped cord netting which is fastened at a point seven feet behind the goal, made so as to prevent passage of the ball put through from the front. The goals are set in the middle of the goal crease, a clearly marked circular area of nine-foot radius.

There are 15 yd. of clear space behind each goal. The width of the field is between **60** and 70 yd. The field boundaries are marked with white lines. It is also divided by a white line drawn through the centre, perpendicular to the side lines.

The players' equipment in addition to the crosse is designed to afford the maximum of protection but is very light because of the need for speed and agility. Shoes with rubber cleats are usually worn. Each player wears a helmet with a heavy steel wire face guard to give sufficient protection to the face and head. Light pads are worn under the jersey to protect the shoulders and arms. The gloves are very similar to those used in ice hockey.

The Game. — The object of the game is to send the ball through the opponent's goal posts as many times as possible during the playing periods. While there are minor variations in the rules of the game in different countries, they are fundamentally similar to those prevailing in the United States. There are ten players on each side: a goalkeeper, three defense players, three midfield players and three attack players. They are designated as follows: goalkeeper; point; cover point; first defense; right wing; centre; left wing; first attack; inside home; and outside home. Games are officiated over by two officials, a referee and judge of play. One point is awarded a team for each goal scored.

The game is divided into four periods of 1j minutes each, with intervals of one minute between the first and second and the third and fourth periods and a ten-minute rest period between the second and third periods (half time). Play is started at the beginning of each quarter, and after each goal is scored, by facing at the centre of the field. This is done by placing the ball between the reverse surfaces of the crosses of the two centres, each with his back to his own goal, their crosses being held with the wood downward on the ground. At the referee's signal, the centres draw their crosses sharply apart in order to gain possession of the ball. When the ball is being faced at the centre of the field, each team must confine the goalkeeper and three other players in the defense goal area, three players in the attack goal area and one player in each of the wing areas. As soon as the referee's whistle sounds, starting play, these players are immediately released from their respective areas.

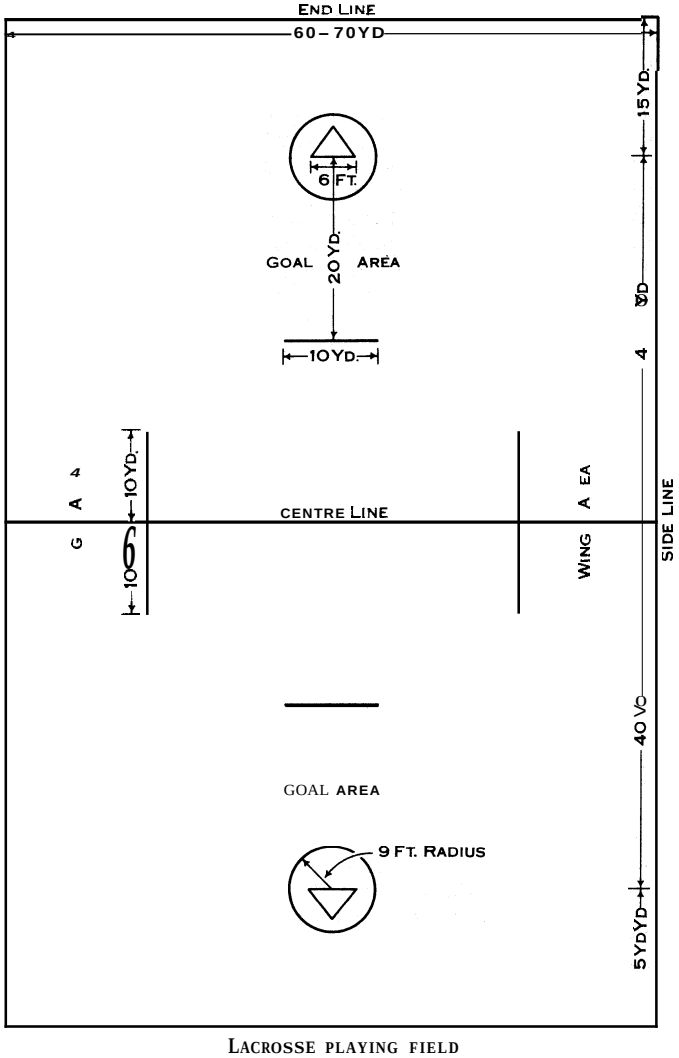
The game is extremely fast, since the ball can be passed and caught at terrific speed, and various kinds of plays are developed by a well-coached team, as in basketball and hockey. A good player must be adept in handling his crosse, an ability which requires considerable practice and skill. He must also be in good physical condition and be an alert "team" player.

Either team may request time out for a period not to exceed one minute, once during each period of the game, without penalty. Thereafter, unless the team calls time for the purpose of removing an injured player, the request is granted but a technical foul penalty is exacted. Requests for time out may be made by the captain only on a dead ball or when his team has possession of the ball in its attacking half of the field.

Substitution of players may be made during the match on the

referee's whistle. At all times during the game each team must have at least three men on the attack, between the centre of the field and the boundary of the field behind the goal; and at least four players on the defense, between the centre of the field and the boundary behind its own goal. Any violation of this rule is known as an off-side play. The ball may be passed in any direction, forward, backward or sideways.

Although the ball may be thrown with the crosse a long distance (the entire length of the field by many players), long throws are seldom tried, it being generally more advantageous for a player to run with the ball in his crosse until he can pass it to a member of his side who is better placed to start an attack or to shoot at the goal. An opposing player may attempt to dislodge



LACROSSE PLAYING FIELD

the ball by hitting the opponent's crosse with his own or by body checking. No player may interfere with another unless the latter has the ball or is about to catch it.

A player in possession of the ball who steps on or over a boundary line loses the ball, and a free throw is given to the player on the opposite side at the point where the first player stepped out. A free throw means that the ball is given to the player in his crosse and play is started again at the referee's whistle. A free throw is not made within 20 yd. of the goal, nor is the ball ever faced within this area. A ball crossing a boundary line (except on a shot) is given as a free throw at the point where it crosses the line to a player on the side opposite that of the player who last touched it. A ball crossing a boundary line as a result of a shot is given to the player closest to the ball when it went out of bounds. No player is allowed to catch or throw the ball with other than his crosse, and if any player loses his crosse during the match he is considered out of play until he recovers it. No attacking player is permitted within the goal crease while the ball is in his team's attack half of the field, nor can he at any time interfere with the goal tender while the latter is within the crease.

Infractions of the rules of the game are called fouls. They fall in two major classes, technical and personal. For technical fouls the penalty is either suspension from the game for 30 seconds or an exchange of the ball. These fouls are generally of a minor nature, such as moving after the whistle, interfering with another player, illegal equipment, throwing the crosse, entering the centre circle and off-side play. For personal fouls the penalty is suspension from the game for from'one to three minutes. These fouls are of a more serious nature, including tripping, pushing, slashing, illegal body check and unnecessary roughness.

In case of a tie game at the end of the regulation periods, play is continued after a brief intermission for two five-minute periods, with the teams changing goals preceding each overtime period. In the event of a tie at the end of these overtime periods, the game is declared a tie. (J. H. PE.; W. K. ML.)

BIBLIOGRAPHY.—Margaret Boyd (ed.), ***Playing Lacrosse by a Team of Internationals*** (1950); ***W.*** Kelso Morrill, ***Lacrosse*** (1952); National Collegiate Athletic Association, ***The Official Lacrosse Guide*** (1955); Tad Stanwick, ***Lacrosse*** (1940). (S. J. R.)

LA CRUZ, RAMON DE: *see* CRUZ, RAMON DE LA.

LACTANTIUS FIRMIANUS (c. 260–*c.* 340), also called Lucius Caelius (or Caecilius) Lactantius Firmianus, Christian writer, called the "Christian Cicero." His history is very obscure. He was born of heathen parents in Africa, and became a pupil of Arnobius, whom he far excelled in style though his knowledge of the Scriptures was equally slight. About 290 he went to Nicomedia in Bithynia to teach rhetoric. In middle age he became a convert to Christianity, and about 306 he went to Gaul (Trèves) on the invitation of Constantine the Great, and became tutor to his eldest son, Crispus. He probably died about 340. Lactantius' chief work, ***Divinarum institutionum libri septem,*** seems to have been begun in Nicomedia about 304 and finished in Gaul before 311. Jerome states that Lactantius wrote an epitome of these ***Institutions,*** and such a work, which may well be authentic, was discovered in manuscript in the royal library at Turin in 1711 by C. M. Pfaff. Besides the ***Institutions*** Lactantius wrote several treatises: (1) ***De ira Dei,*** addressed to one Donatus and directed against the Epicurean philosophy. (2) ***De opificio Dei sive de formatione horninis,*** his earliest work, and one which reveals very little Christian influence. (3) A celebrated treatise, ***De mortibus persecutorurn,*** which describes God's judgments on the persecutors of His church from Nero to Diocletian, has served as a model for numberless writings. ***De mortibus persecutorum*** is not in the earlier editions of Lactantius; it was discovered and printed by Baluze in 1679, and its authorship is doubtful. The poems sometimes attributed to Lactantius are probably from other hands.

Editions: O. F. Fritzsche in E. G. Gersdorf, ***Bibl. Patr. Eccl.,*** *x,* xi (1842–44); Migne, ***Patr. Lat.,*** vi, vii; S. Brandt and ***G.*** Laubmann in the Vienna ***Corpus Script. Eccles. Lat.,*** xix, xxvii, 1 and 2 (1890–97). ***Translation:*** W. Fletcher in ***Ante-Nicene Fathers,*** vii. ***Literature:*** The German histories of early Christian literature, by A. Harnack, O. Bardenhewer, A. Ebert, A. Ehrhard, G. Kruger's ***Early Chr. Lit.,*** p. 307, and Hauck-Herzog's ***Realencyk.,*** vol. xi, give guides to the copious literature on the subject.

LACTIC ACID (ALPHA HYDROXYPROPIONIC ACID, $CH_3—CHOH—COOH$), exists in nature in certain plant juices, in the blood and muscles of animals and in the soil. It is the commonest acidic constituent of fermented milk products such as sour milk, cheese and buttermilk. As such it has been of importance to man since prehistoric times; however, it was not isolated and identified as the principal acid of sour milk until 1780 by K. W. Scheele. In 1881 it was first made successfully on a commercial scale by C. E. Avery. The acid exists in three forms, the optically active dextrorotatory and levorotatory forms and the optically inactive racemic form. The distinction between these forms is of little interest commercially, since all three modifications are similar in their chemical and physical properties. As shown by its chemical structure, lactic acid has the properties of an alcohol as well as

those of an acid. This chemical complexity and ease of reaction as an acid and as an alcohol makes difficult the obtaining of the pure substance. Lactic acid is readily dehydrated to the anhydride. It will react with itself to form the self-ester. Refined lactic acid of commerce is essentially a water solution of the acid and the anhydride. Pure racemic lactic acid was prepared by Krafft and Dyes in 1895 by distillation at a pressure of 0.5–1 mm. of mercury. Its boiling point at this pressure was 82°–86° C. It was a white crystalline solid which melted at 18° C. and rapidly absorbed water from the air to form the viscous solution. Pure lactic acid solutions are colourless, at most only faintly acidic in odour, and have the characteristic acid taste.

The acid can be isolated from sources of natural origin or it can be synthesized by the usual techniques of organic chemistry from acetaldehyde and carbon monoxide or hydrocyanic acid. It can be prepared by decomposing sugars with hot alkalies. All the commercial acid is prepared by the fermentation of inexpensive carbohydrate raw materials, such as sugar in the form of molasses, starch and milk whey, in the presence of alkaline materials, such as lime or calcium carbonate, which neutralize the acid as it forms. Such neutralization is required because the fermentation bacteria become inactive under acidic conditions. Starches are first converted to sugars by hydrolysis prior to fermentation. Starches from corn, potatoes, tapioca and various grains may be used.

The lactic acids of commerce are available as technical, edible and medicinal grades. The technical grades are the products obtained when fermentation liquors, from which the calcium has been precipitated with sulfuric acid and separated as the insoluble sulfate, are concentrated. These grades are available at 22%, 44% and 50% strength. They are generally amber-coloured liquids having a caramellike odour and are contaminated with unfermented sugar, dextrins, mineral salts and small amounts of volatile acids such as acetic.

The edible and medicinal grades of lactic acid are made from fermentation liquors by complicated purification processes. These processes may involve formation and successive crystallization of calcium lactate to yield the pure salt, from which pure dilute acid is obtained by treatment with sulfuric acid and decolorizing carbon. The pure dilute acid is concentrated to a strength between 50% and 85%, as required by the market. Because of more desirable crystallization properties, a similar process based on zinc lactate is preferred by some operators. In this process hydrogen sulfide is used to precipitate the zinc. Concentration and decolorization of the dilute acid are required. In another commercial method the extraction of lactic acid from the concentrated crude acid employs a different technique of purification wherein isopropyl ether, which is immiscible with crude acid or water, is used to extract lactic acid from the crude acid. Pure water is then used to extract the lactic acid from the separated, ether phase. This process is operated continuously. It yields a high-quality acid. Concentration and treatment for colour removal are required as in the other processes. Esterification processes are also utilized as a means of obtaining pure lactic acid from the crude fermentation products. In these processes alcohols are made to react with the lactic acid to yield the volatile esters which are distilled from the crude residues. These volatile esters are then decomposed by heating with water or dilute sulfuric acid to yield lactic acid and the corresponding alcohol, which is recovered for reuse.

If sulfuric acid is used in the decomposition (hydrolysis) it must be removed. The removal requires a treatment with calcium hydroxide or barium hydroxide; the calcium or barium sulfate thus formed then separates as the insoluble solid. The resulting pure lactic acid requires concentration to the required strength.

High-quality lactic acid of medicinal grade is produced by an esterification process or by distillation of pure, relatively low-strength acid under reduced pressure.

Lactic acid is used in the tanning industry for controlling the acidity of vegetable tanning liquors, for deliming hides and as a plumping and drenching agent. It is used in the acid dyeing and printing of wool and as a flavouring agent and preservative in processed cheese, salad dressing, pickles, olives and carbonated beverages. Other uses include the preparation of lactates, organic solvents, pharmaceuticals and cosmetics. the softening of waters used in brewing and other processes, and fermentation control in the drying of egg white and in the purification and processing of gelatins and pectin from apple pomace. For some needs lactic acid may be used alternately with other acids such as tartaric. citric and hydroxyacetic. It has been used to produce plastics and synthetic elastomers by conversion to the acrylates and subsequent polymerization of the latter. These uses, largely experimental, illustrate the versatility of the material. It is used as a catalyst and acidifying agent in some processes of manufacturing synthetic resins of the phenol-formaldehyde type.

Lactic acid is a common and widely used product, but the total volume consumed is relatively small in comparison with some organic acids such as formic and acetic. (C. A. R.)

LACTONES, in chemistry, are cyclic esters (*q.v.*) formed by the loss of water from hydroxy acids, or of hydrogen halides from halogenated acids. The γ- and δ-hydroxy acids frequently lose water spontaneously, even in aqueous solution, to form the corresponding γ- and δ-lactones with five- and six-membered rings, respectively; γ- and δ-halogenated acids usually lose a molecule of hydrogen halide on being heated, with formation of the same γ- and δ-lactones as before. Some β-lactones, with four-membered rings, have been made by the action of silver nitrate upon the sodium salts of β-iodoacids. Lactones with from 7 to 24 atoms in the ring have been prepared by slow distillation of the corresponding hydroxy acids under greatly reduced pressure, or by heating very dilute solutions of the hydroxy acids with benzene sulfonic acid. In the presence of water, lactones are hydrolyzed partially or completely to the hydroxy acids from which they are derived.

In alkaline solution, the hydrolysis is more rapid and goes to completion with formation of the salts of the acids. Lactones with six or more atoms in the ring tend to polymerize spontaneously, or on heating.

The simplest lactones are liquids that are soluble in water, alcohol and ether. γ-Butyrolactone, $CH_2.CH_2.CH_2.C{:}O$ (with O bridging the γ-carbon), is a colourless liquid boiling at 206° C. and volatile with steam. (G. W. WD.)

LA CUEVA, JUAN DE: *see* CUEVA, JUAN DE LA.

LACY, FRANZ MORITZ, COUNT (1725–1801), field marshal of the Holy Roman empire, was born at St. Petersburg on Oct. 21, 1725. His father, Peter, Count Lacy. who belonged to an old Anglo-Irish family, had followed the exiled James II to France and later distinguished himself in the Russian army. Franz Moritz was educated in Germany for a military career and was commissioned as an ensign in the Austrian service in 1743. During the War of the Austrian Succession he served in Italy, in Bohemia and in the Netherlands and was twice wounded. At the age of 25 he became full colonel and commandant of an infantry regiment. In the Seven Years' War, during which he received three more wounds, he was early promoted to the rank of *Feldmarschall*-Lieutenant and appointed chief of staff to Field Marshal Count von Daun; next he was awarded the grand cross of the Order of Maria Theresa; and at the end of 1759 he was promoted *Feldzeugmeister*.

After some early victories, however, Lacy developed an extreme caution; though he showed tenacity and courage in pursuing Fabian tactics, he failed to win the requisite successes and fell into some disfavour, even Daun doubting his capacity for supreme command.

In 1766, after Daun's death, Lacy, now with the rank of field marshal (1765), was given the task of completing the reorganization of the army, which he carried out efficiently. He not only enjoyed the empress Maria Theresa's confidence but also became a close friend of her son and coregent, the emperor Joseph II (sole ruler from 1780), with whose reforming projects he was in sympathy. In the War of the Bavarian Succession (1778) he commanded against the Prussians on the Silesian frontier; and in 1788, old and ailing, he fought an unsuccessful cam-

paign against the Turks. Thereafter his active career was over, though he took an interest in state and military affairs throughout Leopold II's reign. His last years were spent in retirement at Neuwaldegg, near Vienna. He died in Vienna. Nov. 24, 1801.

LACYDES (d. 216/215 B.C.), Greek philosopher, a native of Cyrene, was the successor of Arcesilaus as head of the Greek Academy (see ACADEMY. GREEK). The few of his opinions known to us—for example his emphasis on the undependability of memory —are so similar to those of his predecessor (see ARCESILAUS) that we cannot explain why some ancient writers said that he gave a new turn to the doctrines of the Academy. He is the hero of a witty story in which his slaves force him to admit that his scepticism makes sense in school discussions only and does not work in life. Euander and Telecles succeeded him. (PP. M.)

LADAKH (LADAK; also LADAG), a valley of the upper Indus. and a range at the northwestern end of the Himalayas, that give their name to the large eastern district of Kashmir and to one of its three tehsils (subdivisions). The. district includes as its northwestern part Baltistan or Little Tibet; its limits are between lat. 32° 40' and 36° 15' N. and between long. 74° 60' and 80° 30' E. It extends northward to eastern Gilgit and to a frontier with Sinkiang. undefined but roughly indicated by the Kunlun (Kuen-lun) range. and eastward to a border with Tibet (Ngari and Rudok provinces), again undefined. It is bounded west by the settled districts of Kashmir and south by the Kangra district of Punjab, India. The eastern end of the 1948 cease-fire line crossed the Ladakh valley and bisected the Ladakh range, leaving Baltistan to the north and Leh, the capital, and southern Ladakh on the southern or Indian-controlled side. The whole region lies very high. the valleys of Rupshu in the southeast being 15,000 ft. and the Indus near Leh 11,000 ft., while the average height of the surrounding ranges is 19.000 ft. Baltistan contains the Karakorum range, with K2 (Godwin Austen) (28,250 ft.), first climbed by an Italian expedition in 1954. The proportion of arable and even possible pasture land to barren rock and gravel is very small. Area of Ladakh district 45,762 sq.mi.; pop. (1941) 195,431, including Baltistan, of whom about one-fifth. in Ladakh proper, are Buddhists, whereas the Baltis have adopted the Shiah form of Islam. Ladakh tehsil (29,848 sq.mi.) had a population in 1941 of 36,307.

The natural features of the country may be best explained by reference to two native terms. under one or other of which every part is included; viz.. *changtang* (*i.e.,* "northern" or "high plain"), where the amount of level ground is considerable, and *rong* (*i.e.,* "deep valley"), where the contrary condition prevails. The former predominates in the east, diminishing gradually westward. There, although the vast alluvial deposits that once filled the valley to a remarkably uniform height of about 15,000 ft. have left their traces on the mountainsides, they have undergone immense denudation, and their debris now forms secondary deposits, flat bottoms or shelving slopes, the only spots available for cultivation or pasture. These masses of alluvium are often either metamorphosed to a subcrystalline rock still showing the composition of the strata, or simply consolidated by lime.

The Ladakh range divides the Indus valley. there 4 to 8 mi. wide, from that of its northern branch, the Shyok, which with its fertile tributary valley 'of Nubra is again bounded on the north by the Karakorum. This central ridge is mostly syenitic gneiss, and northeast from it are found, successively, Silurian slates. Carboniferous shales and Triassic limestones, the gneiss recurring at the Sinkiang frontier. The Indus lies along the line which separates the crystalline rocks from the Eocene sandstones and shales of the lower range of hills on the left bank, the lofty mountains behind them consisting of parallel bands of rocks from Silurian to Cretaceous. Several lakes in the east districts at about 14,000 ft. have been of much greater extent, and connected with the river systems of the country. but they are now mostly without outlet, saline and in process of desiccation.

Leh (pop., 1941, 3,372), an important trade centre, 160 mi. E. of Srinagar, is the capital of Ladakh, and the road to Leh from Srinagar (482 mi.) lies up the lovely Sind valley to the sources of the river at the Zoji La pass (11,578 ft.) in the Zaskar range. This is the range which. skirting the southern edge of the upland plains of Deosai in Baltistan, divides them from the valley of Kashmir. and then continues to Nanga Parbat (26.660 ft.) and beyond that mountain stretches to the north of Swat and on into Dir. To the southeast it is an unbroken chain till it merges into the line of snowy peaks seen from Simla and the plains of India— the range which reaches past Chini to the famous peaks of Gangotri. Kamet. Nandadevi and Trisul. It is the most central and conspicuous range in the Himalayas. The Zoji La, which curves from the head of the Sind valley on to the bleak uplands of Dras (where lies the road to the trough of the Indus and Leh). is, despite its altitude, a pass on which little snow lies. From the Zoji La the road continues by easy gradients, following the line of the Dras drainage, to the Indus, when it turns up the valley to Leh. From Leh there are several routes into Tibet and Sinkiang: (1) via the Karakorum and Sugat passes into Sinkiang; (2) via the Shyok and the salt lakes to Rudok and beyond; and (3) up the Indus and Gartang valleys to Gartok, giving access along the Tsangpo (Brahmaputra) to Lhasa.

The observatory at Leh is the most elevated observatory in Asia. The atmosphere of the Indus valley is remarkably clear. There is generally a difference of more than 60° between the reading of the exposed sun thermometer in *vacuo* and the air temperature in the shade The mean annual temperature at Leh is 40° F., that of the coldest months (January and February) only 17° and 19°, but it rises rapidly from February to July, in which months it reaches 63° with a mean daytime maximum of 80° in July and August and an average difference of 29° or 30° between early morning and afternoon. The mean highest temperature of the year is go°. On the other hand, in the winter the thermometer occasionally falls below o°. The extreme range of recorded temperature is not less than 110°.

The average rain (and snow) fall is only 2.7 in. in the year. In January and February the air is generally calm, and April and May are the windiest months of the year.

Vegetation is confined to valleys and sheltered spots, where a stunted growth of tamarisk and *Myricaria*, *Hippophae* and Elaeagnus, furze and the roots of burtsi, a salsolaceous plant, supply the traveller with much-needed firewood. The trees are the pencil cedar (Juniperus excelsa), the poplar and willow (both extensively planted, the latter sometimes wild), apple, mulberry, apricot and walnut Irrigation is skilfully managed, the principal products being wheat. a beardless variety of barley called grim, millet, buckwheat, peas, beans and turnips. Lucerne and *prangos* (an umbelliferous plant) are used as fodder.

Among domestic animals are the famous shawl goat, two kinds of sheep, of which the larger (huniya) is used for carrying burdens and is a principal source of wealth, the yak and the dso, a valuable hybrid between the yak and common cow. Among wild animals are the kiang or wild ass, ibex, several kinds of wild sheep, antelope (*Pantholops*), marmot, hare and other Tibetan fauna.

Baltistan forms the west extremity of Tibet, whose natural limits there are the Indus from its abrupt southward bend in 74° 45' E., and the mountains to the north and west, separating a comparatively peaceful Tibetan population from the fiercer Aryan tribes beyond. It is a mass of lofty mountains, the prevailing formation being gneiss. In the north is the Baltoro glacier, the largest out of the arctic regions, 35 mi. long, contained between two ridges whose highest peaks to the south rise above 25,000 ft. and to the north above 28.000 ft. The Indus, as in lower Ladakh, runs in a narrow gorge, widening for nearly 20 mi. after receiving the Shyok. The capital, Skardu (pop., 1941, 2,537), is 95 m i N.E. of Srinagar. A scattered collection of houses, it is perched on a rock 7,250 ft. above the sea. The rapid slope westward is seen generally in the vegetation. Birch, plane, spruce and *Pinus* excelsa appear; the fruits are finer, including pomegranate, pear, peach, vine and melon, and where irrigation is available, as in the north Shigar, and at the deltas of the tributary valleys, the crops are more luxuriant and varied.

History.— The earliest notice of Ladakh is by the Chinese pilgrim Fa-hien, A.D. 400, who, travelling in search of a purer faith, found Buddhism flourishing there. Ladakh formed part of the Tibetan empire until its disruption in the 10th century, and since

then has continued ecclesiastically subject, and sometimes tributary. to Lhasa.

Its inaccessibility saved it from any Mohammedan invasion until 1531, when Sultan Said of Kashgar marched an army across the Karakoram, one division fighting its way into Kashmir and wintering there.

Next year they invaded eastern Tibet, where nearly all perished from the effects of the climate.

Early in the 17th century Ladakh proper was invaded by its Mohammedan neighbours of Baltistan, who plundered and destroyed the temples and monasteries; and again, in 1685–88, by the Sokpa. who were expelled only by the aid of the lieutenant of Aurangzeb in Kashmir, Ladakh theteafter becoming tributary. The *gyalpo* or king then made a nominal profession of Islam. and allowed a mosque to be founded at Leh, and the Kashmiris have ever since addressed his successors by a Mohammedan title. When the Sikhs took Kashmir, Ladakh was, however, conquered and annexed in 1834–41 by Gulab Singh of Jammu, the unwarlike Ladakhis being no match for the Dogra troops. These next turned their arms successfully against the Baltis (who in the 18th century were subject to the Moguls) and mere then tempted to revive the claims of Ladakh to the Tibetan provinces of Rudok and Ngari. This, however, brought down an army from Lhasa, and after a three days' fight the Indian force was almost annihilated—chiefly indeed by frostbite and other sufferings, for the battle was fought in midwinter, 15,000 ft. above the sea. The Chinese then marched on Leh.

They were soon driven out again, however, and peace was finally made on the basis of the old frontier.

See G. E Hutchinson, *The Clear Mirror* (1933).

LADD, GEORGE TRUMBULL (1842–1921), **U.S.** philosopher and experimental psychologist, was born in Painesville, Ohio, on Jan. 19, 1842. He graduated at Western Reserve college in 1864 and at Xndover theological seminary in 1869; preached for a decade in Ohio and Milwaukee, Wis.; was professor of philosophy at Bowdoin college, Brunswick, Me., in 1879–81 and Clark professor of metaphysics and moral philosophy at Yale university, New Haven. Conn., from 1881 till 1901, when he took charge of the graduate department of philosophy and psychology; he became professor emeritus in 1905. He died in New Haven on Aug. 8, 1921.

Ladd was much influenced by Lotze, whose *Outlines of Philosophy* he translated (1877), and was one of the first to introduce (1879) the study of experimental psychology into the U.S., the Vale psychological laboratory being founded by him. He was the author of books on religion, education and the orient, as well as of numerous important works on psychology and philosophy, including *Elements of Physiological Psychology* (1887, new ed. with R. S. Woodworth, 1911); *Psychology, Descriptive and Explanatory* (1894); *Philosophy of Knowledge* (1897); *Philosophy of Religion* (1905); and *The Secret of Personalzty* (1918).

LADIN: *see* RAETO-ROMANCE DIALECTS.

LADING, BILL OF: *see* AFFREIGHTMENT.

LADISLAUS I, SAINT (1040–1095), king of Hungary, the son of Bela I, king of Hungary, and the Polish princess Richeza, was born in Poland, where his father had sought refuge. Returning to Hungary. Ladislaus and his brother Geza refused to contest the throne against their cousin Salomon, whom they served in his campaigns against the Cumans (1070) and Pechenegs (1072).

In 1073, however, the brothers quarreled with and expelled Salomon. Geza taking his throne (1074), and on Geza's death Ladislaus succeeding him (1077). His reign was peculiarly eventful He defeated an alliance between Salomon and the Cumans, and after crushing a second Cuman invasion by alleged divine aid (1091), extended Hungary's frontier in Transylvania, founding, amongst other cities, Gyula Fehérvár, of which he became the patron saint. He supported the pope against the emperor Henry IV; married the daughter of Welf, duke of Bavaria, and is said to have refused the German crown for himself.

By supporting the widow of Prince Stephen II of Croatia against his enemies he secured Croatia for Hungary (1091) and introduced Catholicism into that country, founding the bishopric of Agram (Zagreb). He extirpated heathendom in his dominions with great severity, and also introduced an elaborate legal code. Ladislaus died suddenly on July 29, 1095, when about to take part in the first crusade.

No other Hungarian king was so generally beloved. The whole nation mourned for him for three years, and regarded him as a saint long before his canonization in 1192. A whole cycle of legends is associated with his name.

His daughter Piriska married the Byzantine emperor John Comnenus.

See Gyorgy Pray, *Dissertatio de St. Ladislao* (1774); Antal Ganoczy, *Diss., hist. crit. de St. Ladislao* (1775); J. Babik, *Life of St. Ladislaus* (Hung) (1892).

LADISLAUS IV, THE CUMANIAN (1262–1290), king of Hungary, was born in 1262 and succeeded his father, Stephen V, in 1272. His minority, 1272–77, was an alternation of palace revolutions and civil wars, in the course of which his Cuman mother Elizabeth was engaged in a continuous struggle with rebellious vassals supported by Ottokar of Bohemia. Rudolph of Habsburg, however, on becoming emperor, sought Ladislaus' help and the young king at the battle of Diirnkrut (Aug. 12, 1278) destroyed the Bohemian power. This danger removed, Ladislaus, a talented man, but wild and reckless, was at once involved in a further struggle with his own magnates. He had married for political reasons, Elizabeth of Anjou; but neglected her for Cuman mistresses, and was accused by his enemies of undermining Christianity by preferring the Cumans to the Magyars. After an inquiry by a papal legate into his conduct, he was forced to take up arms against the Cumans whom he defeated at Hodmezövásárhely (May 1282); but soon relapsed, adopted Cuman dress, passed his time exclusively with Cumans, and ill-treated his legitimate wife. At last the pope, Nicholas IV, decided to supersede him by his Angevin kinsfolk, and on Aug. 8, 1288, proclaimed a crusade against him. For the next two years all Hungary was convulsed by a horrible civil war; Ladislaus, who fought to the last with desperate valour, was driven from one end of the kingdom to the other like a hunted beast. On Dec. 2j, 1289, he issued a manifesto to the lesser gentry, many of whom sided with him, urging them to continue the struggle against the magnates and their foreign supporters; but on July 10, 1290, he was murdered in his camp at Korosszeg by the Cumans, who never forgave him for deserting them in 1282.

See Karoly Szabo, *Ladislaus the Cumanian* (Hung.) (1886); and Acsády, *History of the Hungarian Realm,* i:2 (1903). The latter is, however, too favourable to Ladislaus.

LADISLAUS V (1440–57), king of Hungary and Bohemia, the only son of Albert, king of Hungary, and Elizabeth, daughter of the emperor Sigismund, was born at Komárom on Feb. 22, 1440, four months after his father's death, and was hence called Ladislaus Posthumus. The estates of Hungary had already elected Wladislaus III of Poland their king. but Ladislaus's mother caused the holy crown to be stolen from its guardians at Visegrád, and compelled the primate to crown the infant king at Székesfehérvár on May 15, 1440; whereupon, for safety's sake, she placed the child beneath the guardianship of his uncle the emperor Frederick III. On the death of Wladislaus (Nov. 10, 1444), the Hungarian estates elected Ladislaus king; but Frederick, despite many representations, retained him and the crown till 1452. The child was then transferred to the guardianship of his maternal grandfather Ulrich Cilli, who inspired him with a jealous hatred of the Hunyadis. On Oct. 28, 1453 he was crowned king of Bohemia, and henceforth spent most of his time at Prague and Vienna, actually trying to hinder John Hunyadi's attempts to defend Hungary against the Turk. His judicial murder of László Hunyadi (*q.v.*) finally raised such a storm in Hungary that the king fled to Prague, where he died suddenly on Nov. 23, 1457, while making preparations for his marriage aith Magdalena, daughter of Charles VII of France.

He is supposed to have been poisoned by his political opponents in Bohemia.

See F. Palacky, *Zeugenverhor uber den Tod König Ladislaus von*

Ungarn u. Bohmen (Prague, *1856)*; Ignacz Acsády, *History of the Hungarian State* (Hung.), vol. i (Budapest, 1903).

LADO ENCLAVE, a former region west of the upper Nile reaching southward to Lake Albert that was at one time leased to the former Belgian Congo. It had an area of about 15,000 sq.mi., and a population estimated at 250.000 and consisting of Bari, Madi. Kuku and other Nilotic Negroes. The boundary between Sudan and the Republic of The Congo now runs far north of Lake Albert, which forms part of the frontier between the Republic of The Congo and Uganda.

The country is a moderately elevated plateau sloping northward from the higher ground marking the Congo-Nile watershed. The plains are mostly covered with bush, with stretches of forest in the northern districts. Traversing the plateau are two parallel mountainous chains having a general north to south direction. One chain, the Kuku Mountains (average height 2.000 ft.), approaches close to the Nile and presents, as seen from the river, several apparently isolated peaks. Below the Bedden Rapids rises the conical hill of Rejaf, and north of that point the Nile valley becomes flat. Ranges of hill, however, are visible farther westwards, and a little north of 5° N. is Jebel Lado, 3,301 ft. high and some 12 mi. distant from the Nile. It has given its name to the district, being the first hill seen from the Nile in the ascent of some 1,000 m. from Khartum.

The northern part of the district was first visited by Europeans in 1841–1842, when the Nile was ascended by an expedition despatched by Mehemet Ali to the foot of the rapids at Bedden. The neighbouring posts of Gondokoro, on the east bank of the Nile, and Lado, soon became stations of the Khartum ivory and slave traders. After the discovery of Albert Nyanza by Sir Samuel Baker in 1864, the whole country was overrun by Arabs, Levantines, Turks and others, whose chief occupation was slave raiding. The region was claimed as part of the Egyptian Sudan, but it was not until the arrival of Sir Samuel Baker at Gondokoro in 1870 as governor of the equatorial provinces, that any effective control of the slave traders was attempted Baker was succeeded by General C. G. Gordon, who established a separate administration for the Bahr-el-Ghazal. In 1878 Emin Pasha became governor of the Equatorial Province. and made his headquarters at Lado, whence he was driven in 1885 by the Mahdists. He then removed to Wadelai, a station farther south, but in 1889 the pasha, to whose aid H M. Stanley had conducted an expedition from the Congo, evacuated the country and with Stanley made his way to the east coast. In February 1894 the Union Jack was hoisted at Wadelai, while in May of the same year Great Britain granted to Leopold II. as sovereign of the Congo State. a lease of large areas lying west of the upper Nile inclusive of the Bahr-el-Ghazal and Fashoda. Pressed however by France, Leopold II agreed to occupy only that part of the leased area east of 30° E. and south of 5° 30′ N., and in this manner the actual limits of the Lado Enclave, as it was thereafter called, were fixed. After the withdrawal of the French from Fashoda. Leopold II revived (1899) his claim to the whole of the area. leased to him in 1894. In this claim he was unsuccessful. and the lease, by a new agreement made with Great Britain in 1906, mas annulled. The king however retained the enclave, with the stipulation that six months after the termination of his reign it should be handed over to the Anglo-Sudanese government.

LADOGA (formerly Nevo), a lake of northern U.S.S.R., which lies between 59° 56' and 61° 46' N., and 29° 53′ and 32° 50' E. It has the form of a quadrilateral. elongated from northwest to southeast. Its eastern and southern shores are flat and marshy, the northwestern craggy and fringed by numerous small rocky islands, the largest of which are Valamo and Konnevitz, together having an area of 14 sq.mi. Ladoga is 7,000 sq.mi. in area, that is, 31 times as large as the Lake of Geneva; but, its depth being less, it contains only 19 times as much water as the Swiss lake.

The greatest depth, 738 ft., is in a trough in the northwestern part, the average depth is about 167 ft. The level of Lake Ladoga is 55 ft. above that of the Gulf of Finland, but it rises and falls about 7 ft., according to atmospheric conditions, a phenomenon very similar to the *seiches* of the Lake of Geneva being observed in connection with this. The western and eastern shores, as well as a narrow strip on the southern shore, consist of boulder clay, south of which runs a ridge of crags of Silurian sandstones. The hills of the northwestern shore afford a variety of granites and crystalline slates of the Laurentian system, while Valamo Island is made up of a rack which Russian geologists describe as orthoclastic hypersthenite.

No fewer than 70 rivers enter Ladoga, pouring into it the waters of numberless smaller lakes which lie at higher levels round it. The Volkhov, which conveys the waters of Lake Ilmen, is the largest; a hydroelectric station on the Volkhov was opened in 1926 with a capacity of 56,000 kw. Lake Onega discharges its waters by the Svir; and the Saima system of lakes of eastern Finland contributes the Vuoxen and Taipale rivers; the Syas brings the waters from the smaller lakes and marshes of the Valdai plateau. Ladoga discharges its surplus water by means of the Neva, which flows from its southwestern corner into the Gulf of Finland, rolling down its broad channel 104,000 cu.ft. of water per second. The water of Ladoga is very pure and cold; in May the surface temperature does not exceed 36°, and even in August it reaches only jo° and 53°, the average yearly temperature of the air at Valamo being 36.8". The lake begins to freeze in October, but it is only about the end of December that it is frozen in its deeper parts; and it remains icebound until the end of March, though broad ice fields continue to float in the middle of the lake until broken up by gales. Only a small part of the Ladoga ice is discharged by the Neva, but it is enough to produce in the middle of June a return of cold in Leningrad. The thickness of the ice does not exceed 3 or 4 ft.; but during the alternations of cold and warmer weather, with strong gales, in winter, stacks of ice 70 to 80 ft. high are raised on the shores and on the ice fields. The water is in continuous rotatory motion: being carried along the western shore from north to south and along the eastern from south to north. The vegetation on the shores is poor; immense forests, which formerly covered them, are now mostly destroyed. But the fauna of the lake is somewhat rich; a species of seal which inhabits its waters, as well as several species of arctic crustaceans: recall its former connection with the Arctic ocean. The fresh-water Diatomaceae which are. found in great variety in the ooze of the deepest parts of the lake also have an arctic character.

Fishing is very extensively carried on. Navigation, which is practicable for only 180 days in the year, is rather difficult because of fogs and gales, which are often accompanied, even in April and September, with snowstorms. The prevailing winds blow from northwest and southwest; northeast winds cause the water to rise in the southwestern part, sometimes 3 to 5 ft. Steamers ply regularly from Leningrad to the mouth of the Svir, whence they go up that river to Lake Onega and Petrozavodsk: and small vessels transport timber, firewood, planks, iron. kaolin, granite, marble, fish, hay and various small wares from the northern shore to Schlüsselburg, and thence to Leningrad. Navigation on the lake being too dangerous for small craft, canals with an aggregate length of 104 mi. were dug in 1718–31, and others in 1861–86 having an aggregate length of 101 mi. along its southern shore. uniting with the Neva at Schliisselburg the mouths of the rivers Volkhov, Syas and Svir. all links in the elaborate system of canals which connect the upper Volga with the Gulf of Finland.

LADYBANK, a small burgh of Fifeshire. Scot.. 7 mi. S.W. of Cupar by road in the fertile Eden valley called the Howe of Fife. Pop. (1961) 1,207. It is a recent town, founded as a railway junction on the main line to Dundee, and is also connected with Perth and Kinross. It has considerable railway workshops and maltings, tar distillation works and an agricultural implement factory.

Kettle. 1 mi. S., has prehistoric barrows and a fort.

LADYBIRD or LADYBUG, the popular name given to beetles of the family Coccinellidae of the order Coleoptera (see BEETLE).

LADYBRAND, town in the Orange Free State, South Africa, 80 mi. E. of Bloemfontein and about 4 mi. if'. of the Caledon river which separates the Orange Free State from Basutoland. Pop. (1960) 7,015. Situated at an altitude of 5,289 ft. in the centre

of a well-cultivated area, the town has a wheat market. The climate is genial and particularly bracing in the summer. Many of the buildings are of light cream-coloured sandstone. Caves in the neighbourhood, which were occupied in prehistoric times, were being investigated in the second half of the 20th century.

LADY CHAPEL, a chapel attached to a large church and dedicated to the Blessed Virgin. As the development of the chevet (*q.v.*), or system of radiating chapels. progressed during the 12th and 13th centuries, it became customary to give the one dedicated to the Blessed Virgin the most important position. directly behind the high altar of the church. It was frequently made larger than the others. No standard usage in building Lady chapels ever developed. however. In some French cathedrals they were emphasized (*e.g.*, Reims; Le Mans; Amiens), while in others no difference was made between them and other chapels (Notre Dame, Paris; Bourges). In England, where the common plan of a square east end lent itself to the elaboration of the Lady chapel, it was more consistently emphasized, but there was considerable variation in location. In Spain and Italy the finest Lady chapels date from Renaissance times. (AN. G.)

LADY'S-MANTLE (Alchemilla), a genus of herbaceous plants of the family Rosaceae (*q.v.*). The plants are mostly natives of temperate regions. The flowers are small and numerous, with an eight-cleft calyx and no corolla. The leaves—from which the name, meaning mantle of Our Lady, is derived—are large, serrated and many lobed. In the British Isles there are three species: the mountain lady's-mantle (A. *alpina*), the field lady's-mantle (A. arvensis) and the common lady's-mantle (A. vulgaris). The last named is the most abundant; it grows in pastures, and bears yellow flowers. A. *arvensis* is widely naturalized in North America from Nova Scotia to California; A. *vulgaris* has become sparingly established near the coast from Nova Scotia to Labrador.

LADYSMITH, a town in Natal, U. of S.Af., in latitude 28° 32′ S., longitude 29° 40′ E.; altitude 3.284 ft. Pop. (1951) 16,413, including 5,503 Europeans. The town is built on the Klip river and is 201 mi. by rail from Durban and about 30 mi. from the Drakensberg. There the main railway line of Natal bifurcates, one branch going to the Transvaal, the other to the Orange Free State, and the town is thus an important junction for the Free State gold fields, with big railway workshops and marshaling yards. It is also an industrial centre, producing textiles, clothing, butter and cheese.

Ladysmith was founded in 1851 and was named after the wife of Sir Harry Smith, then governor of the Cape. It is chiefly remembered for its four months' siege during the South African War, and the church contains stained glass aindows and tablets commemorating the 3,000 men who died in its defense. Monuments in their honour have also been built on the surrounding hills.

Siege of Ladysmith.—In the first and most critical stage of the South African War of 1899–1902 (*q.v.*) Ladysmith was the centre of the struggle. During the British concentration on the town there were fought the actions of Talana (or Dundee) on Oct. 20, 1899, Elandslaagte on Oct. 21 and Rietfontein on Oct. 24. On Oct. 30 the British sustained a serious defeat in the general action of Lombard's Kop or Farquhar's farm, and Sir George White decided to hold the town, which had been fortified, against investment and siege until he was relieved directly or indirectly by Sir Redvers Buller's advance. The greater portion of Buller's available troops were dispatched to Natal in November, with a view to the direct relief of Ladysmith, which meantime the Boers had closely invested. Buller's first attempt was repelled on Dec. 15 in the battle of Colenso, his second on Jan. 24, 1900, by the successful Boer counterstroke against Spion Kop, and his third was abandoned without serious fighting (Vaalkranz. Feb. 5). But two or three days after Vaalkranz, almost simultaneously with Lord Roberts' advance on Bloemfontein, Buller resumed the offensive in the hills to the east of Colenso, which he gradually cleared of the enemy, and although he was checked after reaching the Tugela below Colenso (Feb. 24) he was finally successful in carrying the Boer positions (Pieter's hill) on Feb. 27 and relieving Ladysmith, which during those long and anxious months (Nov. 1–Feb. 28) had suffered very severely from want of food, and on one occasion (Caesar's camp, Jan. 6, 1900) had only with heavy losses and great difficulty repelled a powerful Boer assault. The garrison displayed its unbroken resolution on the last day of the investment by setting on foot a mobile column, composed of all men who were not too enfeebled to march out, in order to harass the Boer retreat. This expedition was, however, countermanded by Buller.

LADY'S-SLIPPER, the common name of the plants of the botanical genus *Cypripedium,* belonging to the orchid family (Orchidaceae). The genus comprises about 30 species, native to north temperate and subtropical regions. They are leafy-stemmed herbs. usually ½ ft. to 2½ ft. high, with broad, many-nerved leaves and showy flowers. The lower petal is developed into a large, inflated, slipperlike sac.

LADY'S-TRESSES (Spiranthes autumnalis), a plant of the orchid family, found in pastures and on hillsides in Europe (including Great Britain) and north Africa. The white, scented flowers appear in August and are succeeded by a rosette of oval leaves. Below ground are several tubers. An allied species, the hooded lady's-tresses (S. *romanzoffiana*), which inhabits North America and Kamchatka, occurs also at Bantry bay in Ireland. Several other species occur in the eastern and southern United States and Canada, and one on the Pacific coast.

LAELIUS, the name of a Roman plebeian family, probably settled at Tibur (Tivoli). The chief members were:

GAIUS LAELIUS, general and statesman, was a friend of the elder Scipio, whom he accompanied on his Spanish campaign (210–206 B.C.). In Scipio's consulship (205), Laelius went with him to Sicily, whence he conducted an expedition to Africa. In 203 he defeated the Massaesylian prince Syphax, who, breaking his alliance with Scipio, had joined the Carthaginians, and at Zama (202) was in command of the cavalry. In 197 he was plebeian aedile and in 196 praetor of Sicily. As consul in 190 he was employed in organizing the recently conquered territory in Cisalpine Gaul. Placentia and Cremona were repeopled, and a new colony founded at Bononia. He is last heard of in 170 as ambassador to Transalpine Gaul. Silius Italicus describes him as a man of great endowments and an eloquent orator.

See Index to Livy; Polybius x, 3, 9, 39; xi, 32; xiv, 4, 8; xv, g, 12, 14; Appian, Hisp., 25–29; Cicero, *Philippica,* xi, 7.

His son, GAIUS LAELIUS, is known chiefly as the friend of the younger Scipio and as one of the speakers in Cicero's De *senectute,* De amicitia (or Laelius) and De *Republica.* He was surnamed Sapiens ("the Wise"), either from his scholarly tastes or because, when tribune, he withdrew his proposal (151 B.C.) for the relief of the farmers by distributions of land, when he saw that it was likely to bring about disturbances. In the third Punic War (147) he accompanied Scipio to Africa, and distinguished himself at the capture of the Cothon, the military harbour of Carthage. In 145 he carried on operations with moderate success against Viriathus in Spain; in 140 he was elected consul. During the Gracchan period he supported Scipio and the aristocrats. He assisted to prosecute the supporters of Tiberius Gracchus, and in 131 opposed the bill brought forward by C. Papirius Carbo to render legal the election of a tribune to a second year of office. A member of the "Scipionic circle," he was a student of philosophy and a poet, and was one of those mainly instrumental in introducing Greek culture to Rome. As an orator, he was more at home in the senate than in the forum.

See Index to Cicero; Plutarch, Tib. Gracchus, 8; Appian, Punica, 126; Horace, Sat., ii, 1, 72; Quintilian, *Instit.,* xii, 10, 10; Suetonius, Vita Terentii; Terence, *Adelphi, Prol.,* 15, with the commentators.

LAENAS, the name of a plebeian family in ancient Rome, notorious for cruelty and arrogance. The two most famous are:

GAIUS POPILLIUS LAENAS, consul in 172 B.C. He was sent to Greece in 174 and took part in the war against Perseus, king of Macedonia.

When Antiochus Epiphanes, king of Syria, invaded Egypt, Laenas was sent to stop him. Meeting him near Alexandria, he handed him the decree of the senate, demanding the evacuation of Egypt. Antiochus having asked time for consideration. Laenas dren a circle round him with his staff, and told him he must give an answer before he stepped out of it; Antiochus submitted.

PUBLIUS POPILLIUS LAENAS, son of the preceding. When consul in 132 B.C. he incurred the hatred of the democrats by his harsh measures as head of a special commission appointed to take measures against the accomplices of Tiberius Gracchus. In 123 Gaius Gracchus brought in a bill prohibiting such commissions which may have contained a retrospective clause. In any case. Laenas left Rome and was exiled from Italy. He was recalled on the restoration of the aristocracy in 121.

See Cicero, *Brutus,* 25, 34, and *De domo sua,* 31; Vell. Pat. ii, 7; Plutarch, C. *Gracchus,* 4.

LAËNNEC, RENÉ THÉOPHILE HYACINTHE (1781–1826). French physician inventor of the stethoscope (*q.v.*) and regarded as the father of chest medicine, was born at Quimper, Brittany, Feb. 17, 1781. He was sent at the age of 7 to live with his uncle, G. F. Laennec, rector of the University of Nantes. He left at the age of 20 to study in Paris. Paris was then a centre of the study of morbid anatomy (*i.e.,* of the changes wrought by disease and revealed by post-mortem examination). J. N. Corvisart (Napoleon's personal physician), G. Dupuytren, M. F. Bichat and G. L. Bayle were the leaders of this school.

Laennec's classical contribution to the establishment of links between disease in the living and in the dead body was his study of the sounds heard in the chest, healthy and diseased. He invented the stethoscope in order to listen to these sounds. His stethoscope was a wooden cylinder 1 ft. long, the idea of which he gained from seeing children scratching one end of a wooden beam with a pin and listening to the transmitted sound at the other end. Through his "cylinder" the lungs and the heart spoke in various sounds (wheezes, rattling and whistling noises and so on), but until he could correlate these sounds with the changes made by disease, they spoke in an unknown tongue. Over the next three years, he gathered evidence (by noting the various sounds heard in living patients and the type of disease seen after they had died) which enabled him to say what caused these sounds. Laennec's methods and findings were described in one of the great books of medicine, *De l'auscultation médiate* (1819), and much of its teaching remains part of the daily currency of medical practice.

Apart from this discovery, he also described and illuminated vast tracts of respiratory and heart disease—bronchitis, pneumonia, pleurisy, emphysema, tuberculosis and many others—in fresh and vivid clinical writing.

Laennec gained his doctor of medicine degree in 1804. In 1816 he became physician to the Hôpital Necker, in 1822 he was made a professor at the Collège de France and in 1823 he succeeded Corvisart as physician at the Charité. He produced a second edition of his book in the summer of 1826. though at that time he was dying with a grave chest ailment which was probably the result of tuberculosis. In May 1826 Laennec left Paris for his Breton home at Kerlouarnec, in the hope of recovering his health, but died on Aug. 13. He had lived through the disturbed and violent years of Napoleon's soldiering and its aftermath, a frail but great little man, devoted to quiet thought and observation and the calm pursuit of medical knowledge.

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LAETUS, JULIUS POMPONIUS (GIULIO POMPONIO LETO) (1428–1498), Italian humanist and founder of the Academia Romana, was born at Teggiano, in the Cilento. He decided to dedicate his life to the study of the ancient world, so went to Rome *c.* 1450, and in 1457 succeeded Laurentius Valla, his former teacher, as professor of eloquence in the Gymnasium Romanurn. From the outset he gathered round him a number of humanists in a semisecret society, the Academia Romana. The members, who changed their Christian names to pagan ones, met not only to discuss their antiquarian and archaeological interests, but to celebrate, under the direction of Laetus as Pontifex Maximus, rites and mysteries of pagan Rome, such as the birth of Romulus and the festival of the Palilia. Their admiration for the ancient world thus developed into a materialistic vision of life, in conscious opposition to Christian ideals, with the possible object of achieving revolutionary political reforms. Hence the Academia Romana fell under the suspicion of Pope Paul II, who in Feb. 1468 dissolved it and arrested its members. Laetus, who for about a year had been living in Venice, was brought to Rome and imprisoned, but by May 1469 he and many of his associates were set free by an act of clemency. They did not regain full liberty until Sixtus IV, who succeeded Paul II in 1471, not only restored Laetus' professorship but also allowed the reconstitution of the Academia Romana.

Between his release and his death (at Rome in 1498) Laetus pursued his scholastic studies with extraordinary zeal, interrupted only by two visits to northern Europe (1472–73, 1479–83). His works of this period include treatises concerning Roman antiquities, commentaries on Latin authors and, most important, some *editiones principes* among which are those of Curtius and Varro, Pliny's *Letters* and Sallust. Laetus is not regarded highly as a humanist: despite his erudition, the lack of rigour and absence of critical spirit in his method cause his philological achievements to be treated with reserve by modern scholars.

For a comprehensive study of Laetus *see* V. Zabughin, *Giulio Pomponio Leto,* vol. 1 (1909), vol. 2 (text, 1910; notes 1912). For a summary of his life and work, with bibliography, *see* V. Rossi, *Il Quattrocento,* 1th ed, pp 313–319 (1953). (G. P. *G.)*

LA FARGE, JOHN (1835–1910), U.S. painter and author, who was without an American peer as a muralist, was born in New York city, March 31, 1835, of French parents. From his maternal grandfather, Binsse de St. Victor, a miniaturist, he received his first art training. After graduating from college he studied law for a time, but in 1856 he went to Europe to study art. Except for a few weeks with Thomas Couture he worked independently, spending most of two years in the art galleries of Europe. Returning to America. La Farge went to Newport, R.I., where he came under the strong influence of William Morris Hunt. His work at this time, chiefly landscapes and flower studies, was remarkably advanced in its handling of light. After a serious illness in 1866 he was never very well, but his inquiring mind, which Henry Adams considered one of the most complex in America, led him into fresh fields.

In the 1870s he took up mural painting. His finest mural is in the Church of the Ascension, New York city. About the same time he became interested in stained glass. Through his invention of opalescent glass and his imaginative designing. he brought about a revival of the art and won for himself an international reputation. From the 1890s date a notable series of water colours done during a voyage in the South Pacific. Among his writings were *Considerations on Painting* (1895), *An Artist's Letters From Japan* (1897) and a study of the Japanese artist Hokusai (1897). He died in Providence, R.I., on Nov. 14, 1910.

See Royal Cortissoz, *John La Farge* (1911). (D. H. W.)

LA FARINA, GIUSEPPE (1815–1863), Italian author and politician, was born at Messina. Because of the part he took in the insurrection of 1837 he had to leave Sicily, but returning in 1839 he conducted various Liberal newspapers until his efforts were interdicted, when he moved to Florence. La Farina was in Sicily again during the revolution of 1848, and after its failure he fled to France. While in exile he wrote *Storia documentata della Rivoluzione Siciliana del 1848–1849* (1850) and *Storia d Italia dal 1815 al 1848* (6 vol., 1851–52). He returned to Italy in 1854 and settled at Turin, and in 1856 he founded the *Piccolo Corriere d'Italia,* an organ of the Società Nazionale Italiana, of which he ultimately was chosen president. With Daniele Manin (*q.v.*), one of the founders of that society, he advocated the unity of Italy under Victor Emmanuel even before Cavour, and organized the emigration of volunteers from all parts of Italy into the Piedmontese army. He negotiated an interview between Cavour and Garibaldi, with the result that the latter was appointed commander of the *cacciatori delle Alpi* in the war of 1859. Later he supported Garibaldi's expedition to Sicily. but he failed to bring about the immediate annexation of the island to Piedmont as Cavour wished. In 1860 he was chosen a member of the first Italian parliament and was subsequently made councilor of state. He died Sept. 5, 1863.

See A. Franchi, *Epistolario di Giuseppe La Farina,* 2 vol. (1869); L. Carpi. *Il Risorgimento Italiano,* vol. i (Milan, 1884); B. Croce, *Storia della storiografia italiana nel secolo decimonono* (1921).

LA FAYETTE, GILBERT MOTIER DE (1380–1462), marshal of France. born in Auvergne, served under Marshal Jean Bouçiquaut in Italy and on his return to France after the evacuation of Genoa in 1409 became seneschal of the Bourbonnais. In the English wars John I. 4th duke of Bourbon, made him lieutenant general in Languedoc and Guienne. He failed to defend Caen and Falaise in the interest of the dauphin (afterward Charles VII) against Henry V in 1417 and 1418, but in the latter year he held Lyons for some time against John the Fearless. duke of Burgundy. A series of successes over the English and Burgundians on the Loire was rewarded in 1420 with the government of Dauphiné and the office of marshal of France. La Fayette commanded the Franco-Scottish troops at the battle of Baugé (1421), though he did not, as has been sometimes stated, slay Thomas, duke of Clarence, with his own hand. He was taken prisoner by the English at Verneuil in 1424, but was released shortly afterward and fought with Joan of Arc at Orléans and Patay in 1429. A member of the grand council of Charles VII, he was a delegate at the conferences of Nevers and Arras (1435) which prepared the reconciliation of Charles VII with the duke of Burgundy; and he retained the royal favour all his life. He died on Feb. 23. 1462.

LA FAYETTE, MARIE JOSEPH PAUL YVES ROCH GILBERT DU MOTIER, MARQUIS DE (1757–1834), was born at the Château of Chavaniac in Auvergne, France, on Sept. 6, 1757. The family of La Fayette, to the cadet branch of which he belonged, received its name from an estate in Aix, Auvergne, which belonged in the 13th century to the Motier family. His father was killed at Minden in 1759, and at the age of thirteen he was left an orphan with a princely fortune. He married at sixteen Marie Adrienne Françoise de Noailles (d. 1807).

La Fayette entered the Guards, and was a captain of dragoons when the English colonies in America proclaimed their independence. "At the first news of this quarrel," he afterwards wrote in his memoirs, "my heart was enrolled in it." Through Silas Deane, American agent in Paris, an arrangement was concluded, on Dec. 7, 1776, by which La Fayette was to enter the American service as major-general. At this moment the news arrived of grave disasters to the American arms. La Fayette's friends urged him to abandon his purpose. Even the American envoys, Franklin and Arthur Lee, withheld further encouragement, and the king himself forbade his leaving. At the instance of the British ambassador at Versailles, orders were issued to seize the ship La Fayette was fitting out at Bordeaux, and La Fayette himself was arrested. But the ship was sent from Bordeaux to a neighbouring port in Spain, La Fayette escaped from custody in disguise, and before a second *lettre* de *cachet* could reach him he was afloat. He landed near Georgetown, S.C., and hastened to Philadelphia.

The lad of nineteen, with the command of only what little English he had been able to pick up on his voyage, presented himself to Congress with Deane's authority to demand a commission of the highest rank after the commander-in-chief. He perceived the difficulty immediately, and offered to serve as a simple volunteer, and Congress passed a resolution, on July 31, 1777, "that his services be accepted, and that, in consideration of his zeal, illustrious family and connections? he have the rank and commission of major-general of the United States." Next day La Fayette met Washington, whose lifelong friend he became. The question of giving him a command was left entirely to Washington's discretion. His first battle was Brandywine (*q.v.*) on Sept. 11, 1777, where he was wounded. Shortly afterwards he secured what he most desired, the command of a division—the immediate result of a communication from Washington to Congress of Nov. 1, 1777. Though the commander of a division, he never had many troops in his charge. In the first months of 1778 he commanded troops detailed for the projected expedition against Canada. His retreat from Barren Hill (May 28, 1778) was commended as masterly; and he fought at the battle of Monmouth (June 28), and received from Congress a formal recognition of his services.

The treaties of commerce and defensive alliance, signed by the insurgents and France on the 6th of February 1778, were promptly followed by a declaration of war by England against the latter, and La Fayette asked leave to revisit France and to consult his king as to the further direction of his services. This leave was readily granted. He embarked on Jan. 11, 1779, was received with enthusiasm, and was made a colonel in the French cavalry.

La Fayette was absent from America until April 1780, and his return was the occasion of a complimentary resolution of Congress. The battle of Yorktown terminated his military career in the United States. He immediately obtained leave to return to France, where it was supposed he might be useful in negotiations for a general peace. He was also occupied in the preparations for a combined French and Spanish expedition against some of the British West India Islands, of which he had been appointed chief of staff, and a formidable fleet assembled at Cadiz, but the armistice signed on Jan 20, 1783, between the belligerents put a stop to the expedition. He had been promoted (1781) to the rank of *maréchal de camp* (major-general) in the French army. He visited the United States again in 1784 and was the guest of the nation.

In 1787 La Fayette took his seat in the Assembly of Notables. He demanded, and he alone signed the demand, that the king convoke the states-general, thus becoming a leader in the French Revolution. In 1789 he was elected to the states-general. He was chosen vice-president of the National Assembly, and on July 11, 1789, presented a declaration of rights, modelled on Jefferson's Declaration of Independence in 1776. On July 15, the second day of the new régime, La Fayette was chosen by acclamation colonel-general of the new National Guard of Paris. He proposed the combination of the colours of Paris, red and blue, and the royal white, into the tricolour cockade of modern France (July 17). For the succeeding three years, until the end of the constitutional monarchy in 1792, his history is largely the history of France.

In the Constituent Assembly he pleaded for the abolition of arbitrary imprisonment, for religious tolerance, for popular representation, for the establishment of trial by jury, for the gradual emancipation of slaves, for the freedom of the press, for the abolition of titles of nobility, and the suppression of privileged orders. In February 1790 he refused the supreme command of the National Guard of the kingdom. In May he founded the "Society of 1789" which afterwards became the Feuillants Club. He took a prominent part in the celebration of July 14, 1790, the first anniversary of the destruction of the Bastille. After suppressing an *émeute* in April 1791 he again resigned his commission, and was again compelled to retain it. He was the friend of liberty as well as of order, and when Louis XVI. fled to Varennes he issued orders to stop him. Shortly afterwards he was made lieutenant-general in the army. He commanded the troops in the suppression of another *émeute,* on the occasion of the proclamation of the constitution (September 18, 1791), and then retired to private life.

When, in December 1791, three armies were formed to attack Austria, La Fayette was placed in command of one of them. But he definitely opposed himself to the further advance of the Jacobin party, intending eventually to use his army for the restoration of a limited monarchy. On Aug. 19, 1792 the Assembly declared him a traitor. He fled to Liége, whence as one of the prime movers in the Revolution he was taken and held as a prisoner of state for five years, first in Prussian and afterwards in Austrian prisons. Napoleon stipulated in the treaty of Campo Formio (1797) for La Fayette's release. He returned to France in 1799; in 1802 voted against the life consulate of Napoleon; and in 1804 he voted against the imperial title. He lived in retirement during the First Empire, but returned to public affairs under the First Restoration and took some part in the political events of the Hundred Days. From 1818 to 1824 he was deputy for the Sarthe, speaking and voting always on the Liberal side, and even becoming a *carbonaro.* He then revisited America (July 1824–September 1825), where he was overwhelmed with popular applause and voted the sum of $200,000 and a township of land. From 1825 to his death he sat in the Chamber of Deputies for Meaux. During the revolution of 1830 he again took command of the National Guard. In 1834 he made his last speech—on behalf of Polish political refugees.

He died at Paris on May 20, 1834.

His son, GEORGES WASHINGTON MOTIER DE LA FAYETTE (1779–1849), was aide-de-camp to Gen. Emmanuel de Grouchy through the Austrian, Prussian and Polish (1805–07) campaigns. He took an active part in the "campaign of the banquets," which led to the revolution of 1848.

His son OSCAR THOMAS GILBERT MOTIER DE LA FAYETTE (1815–81) received a post in the provisional government after the revolution of 1848, and as a member of the constituent assembly he became secretary of the war committee. After the dissolution of the legislative assembly in 1851, he retired from public life, but emerged on the establishment of the third republic, becoming a life senator in 1875.

His brother EDMOND MOTIER DE LA FAYETTE (1818–90) was one of the secretaries of the constituent assembly, and a member of the senate from 1876 to 1888.

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LA FAYETTE, MARIE MADELEINE PIOCHE DE LA VERGNE, COMTESSE DE (1634–1693), French writer whose masterpieces began a new era in the history of the novel, was born in Paris, where she was baptized March 18, 1634. Her father Marc Pioche de La Vergne died in 1649, and her mother in 1650 married Renaud de Sévigné, whose niece by marriage was the marquise de Sévigné (*q.v.*). In Paris during the period of the Fronde, young Mlle de La Vergne was in contact with Cardinal de Retz's circle, and Gilles Ménage paid his erudite attentions to her. She was married to François Motier, comte de La Fayette (1616–83), in 1655, and lived for some time with him on his estates in Auvergne, with occasional returns to Paris (mainly for litigation). She bore him two sons (1658 and 1659), but in 1661 it was decided that he would settle in Auvergne while she remained in Paris. Throughout the 1660s she was high in the favour of Henrietta of England, duchesse d'Orléans. About 1665, moreover, she began an intimacy with the duc de La Rochefoucauld that was to last until his death (1680), a liaison of remarkable constancy and affection on both sides. Their circle became a centre of literary taste in which such works as Racine's *Alexandre,* Corneille's *Pulchérie* and Boileau's Art *poétique* were read and discussed, and they may have formed a literary partnership, though the share of each in the other's writings cannot be determined. Mme de La Fayette's later years were much occupied by diplomatic correspondence as an intermediary between the French government and Jeanne de Nemours, duchesse de Savoie. She died in Paris on May 25, 1693.

Writings.—Mme de La Fayette's first novel, La Princesse de *Montpensier,* was published anonymously in 1662, her second, Zayde, under the name of J. Regnault de Segrais in 1670 and her third, La Princesse de *Clèves,* anonymously in 1678. Her last novel, La Comtesse de Tende, appeared posthumously in 1724. She also left two historical writings, *Histoire* de Madame Henriette *d'Angleterre* (1720), which includes material provided by the duchesse d'Orléans herself, and *Mémoires* de la *cour* de France pour *les années 1688* and *1689* (1731).

La Princesse de *Clèves* is Mme de La Fayette's masterpiece. Though many writers were reacting against the interminable length and unreality of the novels of such authors as Mlle de Scudery and were exploring the possibilities of the short novel of sentimental analysis, the perfection of La Princesse de *Clèves* has driven Mme de La Fayette's competitors into oblivion. Her story is taken from the memoirs of Brantôme (which La Rochefoucauld may have read to her on their publication in 1665), and the way in which she extracts from his vivid and licentious pages her own delicate theme, leaving on one side all that most readers found exciting to concentrate on a central moral problem, is a perfect example of modern classical art. Characters are idealized, background is conventional, events play little part, a few crucial conversations suffice to pinpoint the real subject, the tragedy of a happy marriage, the conflict between passion and principle. Her heroine never succumbs to her passion for the duc de Nemours, but avows her weakness to her husband, and this avowal ruins his happiness and her own: her scrupulous integrity is, ironically, their undoing. This problematic story aroused much controversy in which the author, being anonymous, could take no part.

La Comtesse de Tende, however, in which the heroine yields to love, may have been meant as an answer. Mme de La Fayette's letters (collected ed., 2 vol., 1942), show that her own experience was at times not far from the themes of her novels. In one of her last letters she admits that we pay heavily to learn wisdom, we pay with our youth (*"Il nous* coute cher pour *devenir raisonnable, il nous* coute la *jeunesse"*).

BIBLIOGRAPHY.—The most useful modern edition of ***La Princesse de ClBves*** is by ***E.*** Magne (1950), in the series ***Textes litttraires*** *français;* modern English versions include one by H. Ashton (1925) and one by N. Mitford (1950). ***See*** H. Chamard and G. Rudler, in ***Revue du XVI^e^*** *siècle* (1914 and 1917); H. Ashton, ***Madame de La Fayette*** (1922); ***E.*** Magne, ***Madame de Lafayette en*** *ménage* (1926) and ***Le Coeur et*** *l'esprit* ***de Mme de Lafayette*** (1927). ***(W. G.*** ME.)

LAFAYETTE, a city of Indiana, U.S., on the Wabash river. 64 mi. N.W. of Indianapolis; the seat of Tippecanoe county. It lies in a valley 560 ft. above sea level, bordered on either side by the walls of the Wabash basin. The city is a market for grain, hogs and cattle. Manufacturing industries include automotive products, machinery, electrical equipment, prefabricated houses, pharmaceuticals, food, feeds and rubber and aluminum products.

West Lafayette, across the Wabash, is the seat of Purdue university, a state institution and land-grant college, named for a Lafayette businessman, John Purdue, whose gift secured its establishment there by the state legislature in 1869. The university was formally opened on Sept. 16, 1874. Courses are offered in agriculture and forestry, veterinary science, engineering, science, education and humanities, industrial education, industrial management, pharmacy and home economics.

Lafayette is 4 mi. N.E. of the first white settlement in Indiana (Ft. Ouiatenon) built by the French in 1717 to exploit their fur trade with the Ouia (Wea) Indians on the Wabash river. Lost to the English in 1763 and then to the Americans in 1779, it was a centre of Indian agitation. The fort was destroyed by the Scott-Wilkinson expedition in 1791. On the site stands a replica of the 18th-century type of blockhouse common to the western frontier. The replica and surrounding site were presented to Tippecanoe county in 1930.

Lafayette was laid out by William Digby on May 24, 1825, and named in honour of the French general, the Marquis de La Fayette, whose last visit to America was in 1824–25. The city was incorporated in 1853. Tippecanoe county was named in memory of the battle fought Nov. 7, 1811, when Gov. William Henry Harrison and his small army defeated an Indian confederacy under the leadership of the Prophet, brother of Tecumseh. The site of the battleground, now a state park, is 7 mi. N. of the city.

For comparative population figures for both Lafayette and West Lafayette see table in INDIANA: Population. (P. E. MI.)

LAFAYETTE, a city in south-central Louisiana, U.S., 145 mi. W. of New Orleans, located on Vermilion bayou approximately 45 mi. N. of the Gulf of Mexico; the seat of Lafayette parish. The area was first settled by exiled Acadians from Nova Scotia in the late 18th century. The earliest village, Vermilionville, was established in 1824, but was renamed Lafayette in 1884.

Until World War II the economy of Lafayette was dependent upon the area's intensive and highly specialized agriculture, which included sugar cane, rice, cattle, cotton and sweet potatoes. After the war it became the office and supply centre for much of the booming oil and gas industry of south Louisiana. Approximately 125 oil companies and over 200 service and supply companies maintain offices in Lafayette; nearly 200 of the offices are located in a unique oil centre, with its own post office and shopping facilities.

Before the oil boom Lafayette was primarily a French town and the older culture is evident in the prevalence of the French lan-

guage, which is spoken by about one-half of the residents, in the predominance of Roman Catholicism (Lafayette is the diocese seat, with an imposing cathedral) and in many fascinating provincial customs, ranging from an unusual cuisine to local festivals. A growing population attracted by the oil industry has created a more cosmopolitan community, and has slowly changed many of the older, more provincial customs.

Educational and cultural activities centre on Southwestern Louisiana university, a state-supported coeducational institution, opened in 1901, and on a municipal auditorium. For comparative population figures see table in LOUISIANA: Population.

(P. K. C.)

LAFFITTE, JACQUES (1767–1844), French banker and politician, was born at Bayonne on Oct. 24, 1767, the son of a carpenter. He became clerk in the banking house of Perregaux in Paris, was made a partner in the business in 1800, and in 1804 succeeded Perregaux as head of the firm. The house of Perregaux, Laffitte et Cie. became one of the greatest in Europe, and Laffitte became regent (1809), then governor (1814) of the Bank of France and president of the chamber of commerce (1814). He raised large sums of money for the provisional government in 1814 and for Louis XVIII during the Hundred Days. He was returned by the department of the Seine to the chamber of deputies in 1816, and took his seat on the left.

In 1818 Laffitte saved Paris from a financial crisis by buying a large amount of stock, but next year, in consequence of his heated defense of the liberty of the press, and his political attitude, the governorship of the bank was taken from him. One of the earliest partisans of Louis Philippe, his house in Paris became the headquarters of the revolutionary party in 1830. When Charles X, after retracting the hated ordinances, sent the comte d'Argout to Laffitte to negotiate a change of ministry, the banker replied, "It is too late. There is no longer a Charles X," and it was he who secured the nomination of Louis Philippe as lieutenant general of the kingdom. On Aug. 3 he became president of the chamber of deputies, and six days later he received in this capacity Louis Philippe's oath to the new constitution.

The clamour of the Paris mob for the death of the imprisoned ministers of Charles X, which in October culminated in riots, induced the more moderate members of the government to hand over the administration to a ministry which, possessing the confidence of the revolutionary Parisians, should be in a better position to save the ministers from their fury. In Nov. 1830, accordingly, Laffitte became minister-president of a government pledged to progress (mouvement), holding at the same time the portfolio of finance. The government was torn between the necessity of preserving order and the no less pressing necessity (for the moment) of conciliating the Parisian populace, with the result that it succeeded in doing neither one nor the other. The impeached ministers were, indeed, saved by the courage of the chamber of peers and the attitude of the national guard; but their safety was bought at the price of Laffitte's popularity. His policy of French intervention in favour of the Italian revolutionists, by which he might have regained his popularity, was thwarted by the diplomatic policy of Louis Philippe. The resignation of La Fayette and Dupont de l'Eure (*qq.v.*) still further undermined the government, which, incapable even of keeping order in the streets of Paris, ended by being discredited with all parties. At length Louis Philippe, anxious to free himself from the hampering control of those who had helped him, thought it safe to manifest his lack of confidence in the man who had made him king. Thereupon, in March 1831, Laffitte resigned, filled with regret for the part he had played in raising Louis Philippe to the throne. He left office politically and financially a ruined man. He died in Paris on May 26, 1844.

LAFFITTE, PIERRE (1823–1903), French positivist philosopher who maintained Comte's system integrally, was born at Béguey, Gironde, Feb. 21, 1823, and educated in Bordeaux and Paris. Meeting Auguste Comte (*q.v.*) in 1844, he became his closest disciple and adopted his philosophical, political and religious ideas. On Comte's death in 1857, Laffitte, who was one of his executors, became head of the Comité Positiviste. Laffitte contributed to La Politique positive (1872) and founded La Revue occidentale (1878). He was appointed professor of the general history of science at the Collège de France in 1892. His economic and social theories were fully expressed as early as 1859 when, at the opening lecture of a course on philosophy, he stated that "the fundamental problem consists in the social integration of the proletariat" and "wealth, social in its origins, must also be social in its distribution." Laffitte died in Paris, Jan. 4, 1903.

His works include: *Leçons* de *cosmographie* (1853); *Cours philosophique sur* l'histoire *générale* de *l'humanité* (1859); *Considérations* gknkrales *sur l'ensemble* de la civilisation *chinoise* (1861); Les *Grands* Types de l'humanitk (1875); De la morale positive (1880); and Le "Faust" de Goethe (1899).

See E. Bréhier, *Histoire* de la *philosophie,* vol. 2, **pt. iii** (1932).

LAFFITTE, JEAN (1780–*c.* 1826), buccaneer, about whose earlier life nothing authentic is known, was the leader of a colony of pirates and smugglers located on the Baratarian coast south of New Orleans from 1810 to 1814. Holding privateer commissions from the republic of Carthagena, they preyed on Spanish commerce and illegally disposed of their plunder through merchant connections in New Orleans. All efforts to dislodge them were in vain, including an attempt by Commodore Patterson of the U.S. navy, who in June 1814, captured their ships, but did not destroy their business nor their power. The Baratarian gulf being an important approach to New Orleans, the British in their operations against that city in 1814 offered Lafitte £30,000 and a commission in the royal navy for his co-operation. But Lafitte sent the British papers to the U.S. authorities together with an offer to aid the Americans provided the United States would pardon him and his men. This offer, Gen. Andrew Jackson, badly in need of men, accepted, and in the battle of New Orleans, the Baratarians, in charge of the artillery, distinguished themselves. President Madison issued a public proclamation of pardon for them.

Lafitte might henceforth have followed an honourable career, but instead, in 1817, with nearly 1,000 followers, he occupied the island site of the future city of Galveston, Tex., and from this depot continued his privateering against the Spanish. He seemed to lose control somewhat and when pressure was brought to bear by the United States in 1821 because several of his lieutenants had attacked U.S. ships, Lafitte suddenly picked a crew to man his favourite vessel "The Pride" and sailed away into the legendary realms from which he had come.

LA FOLLETTE, ROBERT MARION (1855–1925), U.S. leader of the Progressive movement who as governor of Wisconsin and later U.S. senator was noted for his support of reform legislation, was born in Dane county, Wisconsin, June 14, 1855. La Follette graduated from the University of Wisconsin in 1879, studied law there, was admitted to the bar in 1880 and began practice in Madison. From 1885 to 1891 he was a Republican representative in congress and, as a member of the house ways and means committee, helped draft the McKinley Tariff act. Retiring briefly to the practice of law, he soon accused Sen. Philetus Sawyer of attempting to use him in bribing a judge and re-entered politics to campaign against the political bosses of Wisconsin. Advocating a reform program as a "progressive" Republican, he sought to wrest the party from the "stalwarts." In 1900 he won the governorship of Wisconsin, and was re-elected in 1902 and 1904.

As governor, La Follette enlisted the support of a number of professors of the University of Wisconsin in drafting reform legislation. The legislature enacted laws taxing railroads according to valuation (1903) and regulating them through a state commission (1905). It provided for direct primaries for nominating candidates for public office (1903), set up a state civil service, created a legislative reference library which soon became a "bill-drafting factory," and established a state board of forestry. In 1906 La Follette resigned the governorship to enter the United States senate. He was three times re-elected.

In the senate, La Follette quickly became a leader of the "insurgents" who opposed higher tariffs and advocated various progressive reform measures which had been experimented with in Wisconsin and the middle west. In 1911 he helped form the

National Progressive league to promote progressive legislation and progressive candidates. The league grew into a new party movement *(see* PROGRESSIVE PARTY, U.S.), and for a time La Follette hoped to be its presidential candidate. He suffered a physical breakdown early in 1912, and Theodore Roosevelt seized leadership of the progressive forces that formed the Progressive party of 1912. La Follette refused to support Roosevelt. He cooperated with most of Woodrow Wilson's policy of domestic social reform but opposed taking the United States into World War I. Denounced at home and censored in the senate, as the result of a false newspaper report, La Follette criticized the conduct of the war and at its end helped defeat the covenant of the League of Nations. In 1920 he declined to be a candidate of the Farmer-Labor Convention. In 1924 he campaigned for president, selecting Progressive as the name of his party. He had the endorsement of the Conference for Progressive and Political Action and of the American Federation of Labor. He received nearly 5,000,000 votes (about one-sixth) the total number cast, but won only the 13 electoral votes of Wisconsin. He supported much progressive legislation, but only a seaman's act (1915), improving working conditions on U.S. ships, bore his name. He founded *La Follette's Magazine* (later the *Progressive)* in 1909, and published his *Autobiography, a Personal Narrative of Political Experiences,* in 1913. He died at Washington, D.C. June 18, 1925.

His son ROBERT M. LA FOLLETTE, JR. (1895–1953) was elected by a large plurality on Sept. 29, 1925, to fill his father's unexpired senate term. He was re-elected three times, his last term expiring on Jan. 3, 1947.

Another son, PHILIP F. LA FOLLETTE (1897–), was governor of Wisconsin, 1931–33 and 1935–39.

He and his brother led the Progressives into a separate party, which returned to the Republican ranks in 1946.

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LAFONTAINE, MLLE. (1655–1738), the first woman professional ballet dancer, made her debut at the Paris Opéra as *première danseuse* in Jean Baptiste Lully's ballet *Le Triomphe de l'Amour,* in 1681. Girls' roles had previously been taken by young men. Although hampered by the long, confining costumes and limited ballet technique of the time, Lafontaine's grace and charm were such that she was called queen of the dance.

After dancing at the Opéra for about a decade, in such works as *Perske, Amadis, Didon* and *Le Temple de la Paix,* Lafontaine is generally believed to have retired to a convent, where she died. (LN. ME.)

LAFONTAINE, HENRI MARIE (1854–1943), Belgian international lawyer, who was president of the International Peace bureau from 1907 onward and received the Nobel peace prize in 1913, was born at Brussels, Belg., April 22, 1854. After studying law at Brussels university, he became a member of the bar in 1877, and established a reputation as an authority on international law, of which he was in 1893 appointed professor at Université Nouvelle in Brussels. He entered the Belgian senate as a representative of the Socialist party in 1895 and was vice-chairman, 1919–32.

Lafontaine's interest in international arbitration led to an early association with the International Peace bureau, founded in 1882. He played an active part in its work in bringing about The Hague conferences of 1899 and 1907. On several occasions he acted as *rapporteur* for the ratification of international agreements. He was a member of the Belgian delegation to the Paris Peace conference in 1919 and to the League of Nations assembly in 1920 and 1921. One of his projects for increasing international understanding was the Centre Intellectuel Mondial, which he founded in Brussels and which later became merged in the League of Nations Institute for Intellectual Co-operation. He also proposed the creation of such organizations as a world school and university, a universal library, an international auxiliary language, international offices for labour, trade, statistics and immigration and emigration, an international parliament and court of justice and a central monetary office. He was director of the International Institute of Bibliography and secretary-general of the Union of International associations.

As well as legal handbooks on the rights and obligations of contractors of public works, and on the law of counterfeit, and a documentary history of international arbitration, he published *Bibliographie de la paix et de l'arbitrage international* (1904); *Bibliographia bibliographica universalis* (1898–1904); *The Great Solution* (1916); and was founder of the review *La Vie Internationale.* He died at Brussels, May 14, 1943. (M. H. ST.)

LA FONTAINE, JEAN DE (1621–1695), French poet, was born at Chateau Thierry in Champagne, probably on July 8, 1621. His father was Charles de La Fontaine, *maître des eaux et forêts*—a kind of deputy ranger—of the duchy of Chbteau Thierry; his mother was Françoise Pidoux. On both sides his family was of the highest provincial middle class, but was not noble. Jean, the eldest child, was educated at the *collège* of Reims. He entered the Oratory in May 1641, and the seminary of Saint-Magloire in October; but he had no religious vocation. He is said to have been admitted as *avocat.* In 1647 his father resigned his rangership in his favour, and arranged a marriage for him with Marie Héricart, a girl of 16, who brought him 20,000 livres, and expectations. The marriage was unhappy, and a *séparation de biens* was arranged in 1658. For the greater part of the last 40 years of La Fontaine's life he lived in Paris and his wife at Chateau Thierry, which, however, he frequently visited. One son was born to them in 1653.

Even in the earlier years of his marriage La Fontaine seems to have been much at Paris; about 1656 he became a regular visitor to the capital. He was past 30 when his literary career began. At first he wrote trifles in the fashion of the time--epigrams, ballades, rondeaux, etc. His first serious work was a translation or adaptation of the *Eunuchus* of Terence (1654). He was introduced to Fouquet by Jacques Jannart, and he soon received a pension of 1,000 livres (1659), on the easy terms of a copy of verses for each quarter's receipt. After the fall of Fouquet, La Fontaine found a new protector in the duke and still more in the duchess of Bouillon, his feudal superiors at Chbteau Thierry. Some of La Fontaine's liveliest verses are addressed to the duchess, Anne Mancini, the youngest of Mazarin's nieces; it is probable that the taste of the duke and duchess for Ariosto had something to do with the writing of his first work of real importance, the first book of the *Contes,* which appeared in 1664.

About this time the famous literary quartette of the Rue du Vieux Colombier was formed. It consisted of La Fontaine, Racine, Boileau and Molikre, the last of whom was almost of the same age as La Fontaine, the other two considerably younger. Chapelle was also a kind of outsider in the coterie. Of the many anecdotes about these meetings the most characteristic is perhaps that which asserts that a copy of Chapelain's unlucky *Pucelle* always lay on the table, a certain number of lines of which was the appointed punishment for offenses against the company. The coterie furnished under feigned names the personages of La Fontaine's version of the Cupid and Psyche story, which with *Adonis,* was not printed till 1669.

In 1664 La Fontaine was regularly commissioned and sworn in as gentleman to the duchess dowager of Orleans, and was installed in the Luxembourg. He still retained his rangership, and in 1666 we have something like a reprimand from Colbert suggesting that he should look into some malpractices at Chbteau Thierry. In the same year appeared the second book of the *Contes,* and in 1668 the first six books of the *Fables,* with more of both kinds in 1671. In 1672 he edited, at the instance of the Port Royalists, a volume of sacred poetry dedicated to the prince de Conti. A year later his situation changed. The duchess of Orleans died, and he apparently had to give up his rangership, probably selling it to pay debts. Madame de la Sablikre, however, invited him to make his home in her house, where he lived for some 20 years.

By 1682 he was recognized as one of the first men of letters of France. Madame de Sévigné had spoken of his second collection of *Fables* published in the winter of 1678 as divine. He presented himself for election to the Academy, and, though the subjects of his *Contes* were scarcely calculated to propitiate that decorous

assembly, while his continued attachment to Fouquet and to more than one representative of the old Frondeur party made him suspect to Colbert and the king, most of the members were his personal friends. He was first proposed in 1682, but was rejected for Dangeau. The next year Colbert died and La Fontaine was again nominated. Boileau was also a candidate, but the first ballot gave the fabulist 16 votes against 7 only for the critic. The king, whose assent was necessary, was ill-pleased, and the election was left pending. Another vacancy occurred, however, some months later, and Boileau was elected. The king hastened to approve the choice.

His admission was indirectly the cause of the only serious literary quarrel of his life. A dispute took place between the Academy and one of its members, Antoine Furetière (*q.v.*), on the subject of the latter's French dictionary, which was decided to be a breach of the Academy's corporate privileges. Furetière bitterly assailed those whom he considered to be his enemies, and among them La Fontaine, whose unlucky *Contes* made him peculiarly vulnerable, his second collection of these tales having been the subject of a police condemnation. Shortly afterward La Fontaine had a share in a still more famous affair, the celebrated Ancient-and-Modern squabble in which Boileau and Perrault were the chiefs, and in which La Fontaine (though he had been specially singled out by Perrault for favourable comparison with Aesop and Phaedrus) took the Ancient side. About the same time (1685–87) he met the last of his many hosts and protectors, Monsieur and Madame d'Hervart, and fell in love with a certain Madame Ulrich. This acquaintance was accompanied by a great familiarity with Vendôme, Chaulieu and the rest of the libertine coterie of the Temple; but, though Madame de la Sablière had long given herself up almost entirely to good works and religious exercises, La Fontaine continued to live in her house until her death in 1693. What followed is told in one of the best known of the many stories bearing on his childlike nature. Hervart on hearing of the death, had set out at once to find La Fontaine. He met him in the street in great sorrow, and begged him to make his home at his house. "J'y allais" was La Fontaine's answer. He did not survive Madame de la Sablière much more than two years, dying on April 13, 1695, at the age of 73. He was buried in the cemetery of the Holy Innocents.

The curious personal character of La Fontaine, like that of some other men of letters, has been enshrined in a kind of legend by literary tradition. At an early age his absence of mind and indifference to business gave a subject to Tallemant des Réaux. His later contemporaries helped to swell the tale, and the 18th century finally accepted it, including the anecdotes of his meeting his son, being told who he was, and remarking, "Ah, yes, I thought I had seen him somewhere!"; of his insisting on fighting a duel with a supposed admirer of his wife, and then imploring him to visit at his house just as before; of his going into company with his stockings wrong side out; with, for a contrast, those of his awkwardness and silence, if not positive rudeness, in company. An authority for these anecdotes is Louis Racine, who received them from his father. La Fontaine's friend for more than 30 years.

Works.—His works, the total bulk of which is considerable, fall no less naturally than traditionally into three divisions, the *Fables*, the *Contes* and the miscellaneous works. Of these the first may be said to be known universally, the second to be known to all lovers of French literature, the third to be with a few exceptions practically forgotten. Although there are excellent things in the *Oeuvres Diverses*, their excellence is only occasional. and it is not at the best equal to that of the *Fables* or the *Contes*. The best dramatic pieces usually published under his *name — Ragotin, Le Florentin, La Coupe enchantée*, were originally fathered not by him but by Champmeslé, the husband of the famous actress who captivated Racine and Charles de Sévigné. His avowed work was chiefly in the form of opera. *Psyche'* has all the advantages of its charming story and of La Fontaine's style.

In the *Contes* La Fontaine takes his stories (varying them, it is true, in detail not a little) from Boccaccio, from Marguerite, from the *Cent Nouvelles Nouvelles*, etc. He applies to them his marvelous power of easy sparkling narration, and his hardly less marvelous faculty of saying more or less outrageous things in the most polite and gentlemanly manner. These *Contes* are emphatically *contes pour rire*, a genuine expression of the *esprit gaulois* of the fabliau writers and of Rabelais, destitute of the grossness of envelope which had formerly covered that spirit.

The *Fables*, with hardly less animation and narrative art than the *Contes*, best exhibit the versatility and fecundity of the author's talent. Perhaps the best criticism ever passed upon La Fontaine's *Fables* is that of Silvestre de Sacy, to the effect that they supply three several delights to three several ages: the child in the freshness and vividness of the story, the student of literature in the consummate art with which it is told, the man of the world in the subtle reflections on character and life which it conveys.

La Fontaine did not during his life issue any complete edition of his works, nor even of the two greatest and most important divisions of them. Other works published in his lifetime which have not been mentioned are: *Poeme de* la *captivitk de St. Malc* (1673), one of the pieces inspired by the Port Royalists, the *Poeme du Quinquina* (1692), and a number of pieces published either in small pamphlets or with the works of other men. Among the latter may be singled out the pieces published by the poet with the works of his friend Maucroix (1685). The year after his death some posthumous works appeared, and some years after his son's death the scattered poems, letters, etc., with the addition of some unpublished work bought from the family in manuscript, were carefully edited and published as *Oeuvres diverses* (1729).

See E. Faguet, *Jean de La Fontaine* (1900; new ed. 1913); H. Taine, *La Fontaine et ses Fables* (16th ed. 1903); *A.* Hallays, *Jean de la Fontaine* (1922); *E.* H. Marsh, *Forty-two Fables of La Fontaine* (1924) and *More Fables of La Fontaine* (1925).

LAFONTAINE, SIR LOUIS HIPPOLYTE, BART. (1807–1864), Canadian statesman and judge, was born at Boucherville, Que., on Oct. 4. 1807. LaFontaine was educated at the Collège de Montréal under the direction of the Sulpicians, and was called to the bar of the province of Lower Canada on Aug. 18, 1829. In 1830 he was elected a member of the house of assembly for the county of Terrebonne, and became a supporter of Papineau in opposing the administration of the governor in chief, which led to the rebellion of 1837. But he disapproved of Papineau's methods. The rebellion broke out afresh in the autumn of 1838; the constitution of 1791 was suspended; LaFontaine was imprisoned for a brief period; and Papineau, who favoured annexation by the United States, was in exile. At this crisis in Lower Canada the French Canadians turned to LaFontaine as their leader, and under his direction maintained their opposition to the special council, composed of nominees of the crown. In 1839 Lord Sydenham, the governor general, offered the solicitor generalship to LaFontaine, which he refused.

Defeated in the county of Terrebonne LaFontaine obtained a seat in the assembly of the province of Canada, and on the death of Sydenham he was called by Sir Charles Bagot to form an administration with Robert Baldwin. The ministry resigned in Nov. 1843, as a protest against the actions of Lord Metcalfe, who had succeeded Bagot. In 1848 LaFontaine formed a new administration with Baldwin, and remained in office until 1851, when he retired from public life. During the ministry of LaFontaine-Baldwin the Amnesty bill was passed, which occasioned grave riots in Montreal, personal violence to Lord Elgin and the destruction of the parliament buildings. After the death of Sir James Stuart in 1853 LaFontaine was appointed chief justice of Lower Canada and president of the seigneurial court, which settled the vexed question of land tenure in Canada; and in 1854 he was created a baronet. He died at Montreal on Feb. 26, 1864.

LAFORGUE, JULES (1860–1887), French poet, was born at Montevideo on Aug. 22, 1860, of a Breton family. His childhood was passed at Tarbes. and while still a boy he went to Paris. For several years he held the post of reader to the empress Augusta in Berlin, but returned to Paris in 1886. In the following year he married, but died shortly afterward, on Aug. 20, 1887, at the age of 27. Laforgue's place in the history of French poetry is important rather for the influence which he exercised over some of his contemporaries than for his own achievements, and the tragic circumstance of his early death appears to have exaggerated his real merits. Laforgue is seen at his best in those

of his poems which have been compared to "aquarelles en cinq minutes" *(L'hiver qui vient Dimanche),* and his longer and more ambitious poems tend to become monotonous. The note of despair which runs through all his work was no doubt the result in part of his continual ill-health; it is often expressed with a simplicity which has a charm in itself. He tries to express his consciousness of the relative unimportance of everyday life and at the same time the inability of the individual to see it in its true perspective, and in this attempt gives play to a certain grim humour.

Laforgue's *Poésies complktes* were published in 1894; and his *Oeuvres complktes* in 1903–17 *(3* vols.).

LAFOSSE, CHARLES DE (1636–1716), French historical painter who, together with his teacher Charles LeBrun, shared in the creation of the great decorative works undertaken during the reign of Louis XIV, was born in Paris on June 15, 1636. Stylistically his work represents a transition between the art of LeBrun and that of the rococo period. LaFosse was especially influenced by the work of Rubens and Van Dyck, as well as by that of the Italians Francesco Primaticcio, Titian and Veronese whom he studied during his five-year stay in Rome and Venice (from 1658). In 1689–91 LaFosse decorated Montague house in London. He became a member of the Royal Academy in 1673 and was named chancellor in 1715. LaFosse died in Paris on Dec. 13, 1716.

LA FRESNAYE, ROGER DE (1885–1925), French Cubist painter, was born at Le Mans. He studied at the École des Beaux Arts and at the Académie Ranson in Paris. His work up to 1909 betrays the influence of the symbolism of Maurice Denis. During the next few years (1910–13) he developed an interest in Cubism. He became a member of the Cubist association known as the Section d'Or that met regularly at the studio of Jacques Villon. Even at this early point, La Fresnaye's native sensitivity gave his Cubism an unorthodox quality. After being invalided out of the army in 1917 he went to the south of France for his health. There he produced a number of fine Cubist water colours and drawings, quite different in spirit and form from Picasso and Braque, stressing joyous colour, compositional relationships and even romantic feeling rather than the more typical simultaneist Cubist effects. They veer away from the increasingly contrived and often static orthodox Cubist works. La Fresnaye died in Grasse on Nov. 27, 192j.

See Germain Seligman, *Roger de La Fresnaye* (1945); Raymond Cogniat and Waldemar George, *Oeuvre complète de Roger de la Fresnaye* (1948). (B. S. Ms.)

LAGAN: *see* FLOTSAM, JETSAM AND LAGAN.

LAGARDE, PAUL ANTON DE (1827–1891), German biblical scholar and orientalist. was born at Berlin on Nov. 2. 1827. His real name was Botticher, Lagarde being his mother's name. He studied at Berlin, Halle, London and Paris. In 1854 he became a teacher at a Berlin public school, but this did not interrupt his biblical studies. He edited the *Didascalia apostolorum syriace* (1854), the Aramaic translation (the Targum) of the Prophets according to the Codex Reuchlinianus preserved at Carlsruhe, *Prophetae chaldaice* (1872), the *Hagiographa chaldaice* (1874), an Arabic translation of the Gospels, *Die vier Evangelien, arabisch aus der Wiener Handschrift herausgegeben* (1864), a Syriac translation of the Old Testament Apocrypha, *Libri V. T. apocryphi syriace* (1861), a Coptic translation of the Pentateuch, *Der Pentateuch koptisch* (1867), and a part of the Lucianic text of the Septuagint, which he was able to reconstruct from manuscripts for nearly half the Old Testament. Lagarde was a Conservative and an anti-Semite. He died at Gottingen on Dec. 22, 1891.

See the article in Herzog-Hauck, *Realencyklopädie;* and Anna de Lagarde, Paul *de Lagarde* (1894).

LAGASH, one of the oldest and most important of the ancient Sumerian cities of Mesopotamia. It is now known as Telloh and consists of a long line of mounds along a dry canal, three miles east of the Shatt al Hai in 31° 30' N. 46° E about ten miles from the modern town of Shatra. The mounds occupy a great oval running north and south, about $2\frac{1}{2}$ miles long and $1\frac{1}{4}$ miles broad. The old canal, which rendered the site possible for a city, lies just east of the mounds. Inscriptions suggest that in ancient times there were numerous canals. The most northerly mound which rises to a height of 46 feet covers the site of the great temple of Ningursu, the god of Lagash. This temple is comparatively late and belongs to the time of Ur-Bau, about the middle of the third millenium B.C. In the centre lies the oldest part of the city, the pre-historic site of Girsu. A short distance south-east of this mound is a mound called by the excavators "tablet hill," from the number of temple records which were found there. The ancient city was surrounded by a thick wall, of which part, including the fortified west gate has been excavated. This old wall encompassed not only the later temple and ziggurat (stage tower), but also the more ancient buildings Girsu covers the remains of the oldest buildings of Sumer. Twelve feet below the pavement of Ur-nina, the earliest historical ruler of Lagash, there was found a building 26×20 ft. oriented to the points of the compass. The walls which are intact to nine feet high are built of plano-convex bricks. The building is divided into two unequal compartments by a solid wall, and there is no communication.

The city was of considerable importance in early Sumerian times and its eastern position rendered it a frontier city against the men of Elam on the east, while it also seems to have engaged in struggles with the dominant city of Kish in the north. In Sargonic times it ceased to lead an independent existence but remained a city of importance, especially as an artistic centre and the French excavators found abundant evidence of its products. Lagash however ceased to be inhabited after the time of Hammurabi, and the mounds appear to have been deserted until the time of the Seleucid kingdom in the second century B C.

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LAGER BEER: *see* BEER.

LAGERKVIST, PÄR FABIAN (1891–), Swedish poet, dramatist and novelist, who was elected to the Swedish academy in 1940 and awarded the Nobel prize for literature in 1951, was born on May 23, 1891, in Vaxjo, Småland. His grandparents were peasants, his father a railway workman, but he went to a high school and studied for a short time at the University of Uppsala. The most important influences in his early development were: the religious faith in which he was brought up, contrasted with the Darwinist view of man as a brute; the extreme individualism of the turn of the century; and the collectivism of the social democratic movement. In a manifesto entitled *Ordkonst och bildkonst* ("Literary and Pictorial Art," 1913), written after a visit to Paris, he tried to work out a literary parallel to Cubist art. The prose poems *Motiv* (1914) attempt to express modern man's split conceptions of the world in decorative patterns of bold contrasts.

Lagerkvist felt the tragedy of World War I deeply; collections of poems from this period are *Angest* ("Anguish," 1916) and *Kaos* (1919). In his plays, too, for instance, *Sista manniskan* ("The Last Man," 1917), there is a presentiment of the imminent destruction of the world. Influenced technically by the form of Strindberg's dream plays, and probably by contemporary Expressionism, he stressed the symbolic nature of stage scenery.

In the early 1920s a more serene note is heard in Lagerkvist's writing, a longing for reconciliation with the human condition. A central work is *Det eviga leendet* (1920; Eng. trans., *The Eternal Smile,* 1934), a series of tales and conversations among the dead about the lot of man. The poems *Den lyckliges vag* ("The Happy Man's Way," 1921) express a sense of human fellowship. and the autobiographical novel *Gäst hos verkligheten* (1925; Eng. trans., *Guest of Reality,* 1936) describes with tenderness the secure world of his childhood and his inner struggles; it combines intimate realism with stylistic simplicity. *Hjartats singer* ("Songs of the Heart," 1926) are sincere, moving love poems.

Lagerkvist soon realized the danger of the new creeds of violence proclaimed in the early 1930s: there is a dark tone in the visionary poems *Vid lagereld* ("By the Camp Fire," 1932). His prose work *Bodeln* (1933; Eng. trans., *The Hangman,* 1936), later

dramatized, is a brutal protest against the everlasting brutality in the world, and his essay Den *knutna näven* ("The Clenched Fist," 1934) is an appeal to militant humanism.

In 1944 he published Dvargen (Eng. trans., The Dwarf, 1945) a novel in a Renaissance setting; its protagonist represents absolute wickedness, which originates from his sense of inferiority. The remarkable novel Barabbas (1950; Eng, trans., 1952) deals with the unbelieving malefactor, bound forever to the God he denies, and Sibyllan (1956; Eng. trans., The Sibyl, 1957), set in the 1st century A.D., analyzes poetic inspiration in a grandiose symbolic form and also reviews his own development. (L. G. G. T.)

LAGERLÖF, SELMA (1858–1940), Swedish author, was born on Nov. 20, 1858, at Mårbacke in Vermland where she grew up in a province rich in local tradition, and became a teacher in Landskrona. In a literary competition in a weekly paper she won the highest prize for some chapters of her first work Gosta Berlings Saga (Eng. trans., 1898), which was published in two volumes in 1891 and attracted great attention. The book is a collection of stories of Vermland life in the year 1830, related with vivid imagination and lyric style. In 1894 she published Osynliga Lankur (Invisible Links) and from 1895 onwards was able to devote herself entirely to writing. After visiting Italy for the purpose of extending her studies, she published in 1897 *Antikrists Mirakler* (Eng. trans., 1898) depicting life in Sicily. In 1899 appeared *Drottningar* i *Kungahälla* (Eng. trans., 1917), historical legends, as well as En *Herrgårdssägen* (Eng. trans.! The Legend of the *Manor,* 1922). After a journey to Palestine and the East in 1900 she published Jerusalem (2 vol., 1901–02, Eng. trans., 1903), describing a religious movement in the Swedish province of Dalarne, which led to an emigration to Palestine. She also wrote Kristuslegender (1904); *Nils Holgerssons* underbara resa (2 vol., 1906–07, Eng. trans., 1908), a book for children; *Liljecronas* Hertz (1911. Eng. trans., 1913); *Korkarlen* (1912); *Dunungen* (1914), a dramatized novel; Kejseren af *Portugalien* (1914, Eng. trans., 1916); Troll *och Manniskor* (Demons and Men) (2 vol., 1915, 1921) and *Charlotte* Lofvenskold (1925). In 1909 she won the Nobel prize for literature, and in 1914 was elected the first woman member of the Swedish Academy. Most of her books have been translated into other languages.

See J Mortensen, *Literary Biography* (1908); André Bellesort, *La Suède* (1910); also works with title *Selnta Lagerlöf* by O. *I.* Levertin (1904); M Jepson (1913); M. Kristensen (1917).

LAGHMAN, a district of Afghanistan. in the province of Jalalabad. between Jalalabad and Kabul. on the northern side of the Peshawar road, one of the richest and most fertile tracts in Afghanistan. It is the valley of the Kabul river between the Tagao and the Kunar and merges on the north into Kafiristan. The inhabitants. Ghilzais and Tajiks, are supposed to be the cleverest business people in the country. Sugar, cotton and rice are exported to Kabul. The Laghman route between Kabul and India crossing the Kunar river into the Mohmand country is the route followed by Alexander the Great and Baber.

LAGOS, the federal capital of the Federation of Nigeria, of uhich country it is the chief seaport and the second largest city; in a narrower sense, the Island of Lagos, nucleus of the capital territory. in the lagoon from which the name is derived, opposite the mouth of the Ogun river; and in a wider sense obsolete since 1906, the whole of the British territory in southwestern Nigeria, namely the colony and protectorate of Lagos, as distinct from the Niger Coast protectorate and from the territory of the Royal Niger company, or from the protectorate of Southern Nigeria formed by the amalgamation of the two latter areas in 1900.

The city of Lagos stands on lat. 6° 31' N. and on long. 3° 21' E. The climate is hot and humid. There is an annual rainfall of 72 in., of which jo fall in the three months May, June and July. The federal territory has an area of 27 sq.mi., comprising Lagos and Iddo Islands and adjacent territory on the mainland.

History. — Portuguese navigators discovered the island in the 15th century and gave it the name of Lagos because of the extensive lagoons or lakes (Lagos) on this part of the Guinea coast, where there is a nearly continuous offshore bar between the mainland and the Bight of Benin. The lagoons afforded a natural protection against attack from the mainland, and African villages were in existence both on Lagos Island and on Iddo as early as the 1650s. By the end of the 18th century Lagos was a major entrepdt of the slave trade: the Guinea littoral from Benin westward to the farther ports of Dahomey came to be known as the Slave coast.

In the 1840s, when the European powers were already concerting their measures against the traffic in slaves, British merchants in other commodities were visiting Lagos; and in 1849 a British consulate for the Bights of Benin and of Biafra was set up at Fernando Po to protect legitimate trade. In 1851, in consequence of a dispute with Kosoko, the slave-dealing king of Lagos Island, a British naval force attacked Lagos and deposed the king, setting up in his place his cousin Akitoye, who undertook to collaborate with the British in their efforts against the slave traders and consented to the appointment of a consul. Akitoye's successor Dosumu, however, proved to be incapable of repressing the slave trade or even of maintaining order; and in 1861 he ceded to the British the "port and island of Lagos . . . with all territories thereunto belonging" in return for a pension (which he drew till his death in 1885). In recognition of this cession, the Union Jack was hoisted at a spot near Dosumu's house, the Iga Idungaran, which remained the residence of the head of his dynasty and, because of its historical associations, a source of considerable pride to the people of Lagos. With the suppression of the slave trade and the encouragement of lawful commerce. people began to immigrate from the mainland, and a flourishing to n grew up.

Lagos was constituted as a separate government in 1862. In 1866 the colony was made part of the West African Settlements administered by the governor of Sierra Leone, from which however it was detached in 1874, together with the Gold Coast. to form a single unit with the latter. By this time its territory on the coast stretched from Odi to Badagry, together with a hinterland varying in depth from 5 to 20 mi. Thereafter no more territory was added to the colony, but between 1883 and 1886 protectorates were established over some of the adjacent tribal areas. In 1886 the connection with the Gold Coast was severed and the Colony and Protectorate of Lagos reconstituted as a separate government.

The protectorate area was further expanded in the remaining years of the 19th century (the railway from Lagos to the northern hinterland was begun in 1898), and by 1899 the whole of the Toruba country had been included. Meanwhile, however, the Niger Coast protectorate and the territory of the Royal Niger company. to the east of Lagos, had been likewise expanded (see NIGERIA); and the amalgamation of these two areas to form the Protectorate of Southern Nigeria in 1900 was followed in 1906 by a new amalgamation, whereby this protectorate and the Colony and Protectorate of Lagos were united to form the Colony and Protectorate of Southern Nigeria. In 1914, when Southern and Northern Nigeria were united, the former Lagos colony became the Colony (1,381 sq.mi.) as distinct from the Protectorate (337,788 sq.mi.) of Nigeria; but in 1954, with the introduction of a federal constitution. the greater part of the colony (1,354 sq mi.) was for administrative purposes merged in the Western region as the Colony province. The township of Lagos then became the federal capital territory. returning two members to the federal house of representatives.

The Federal Capital Territory. — The capital territory—islands. bar and mainland—surrounds the harbour and contains Nigeria's principal port. On Lagos Island are the house of representatives. the federal supreme court, the Anglican and Roman Catholic cathedrals and also the head offices of most of the commercial houses; the first merchants' settlement was at the western tip of this island, facing the anchorage. A long road-bridge connects Lagos Island with Iddo, on which stands the original railway terminus, with a wharf adjoining. Apapa. on the mainland. is connected with Lagcs by a ferry and with Iddo by a motor road carried on a causeway. The quays at Apapa, built to a length of 1,800 ft. in the 1930s, were considerably developed from 1951, so as to provide more than double the original berthing space: by 1955 there were 2.500 ft. of deep-water berths at Apapa. in addi-

tion to seven berths in the pool served by lighters, one bulk-oil berth and three berths at the customs wharf of Lagos. By constant dredging between the bar and the pool, a channel is kept open which can take ships drawing 25 ft.

The population of the federal capital territory was estimated in 1915 at 300,000, of whom 10.000 were non-Nigerians (including about 6.000 Europeans); at the census of 1953 that of the Lagos municipal area had been returned as 267,407 (African pop.). The majority of the Africans live either on Lagos Island or in the mainland suburbs Ebute Metta and Yaba. (P. H. G. S.)

LAGRANGE, JOSEPH LOUIS (1736–1813), French-Italian mathematician, who made great contributions to the theory of numbers and to celestial mechanics, was born at Turin, Italy, on Jan. 25, 1736.

Lagrange was educated at Turin college and his early tastes were more classical than scientific. His interest in mathematics was aroused by the chance reading of a memoir by Halley. He then began unaided a course of study, pursued with such effect that at about the age of 16 he was appointed professor of geometry at the artillery academy. When he was 19 he sent to L. Euler a method of dealing with the isoperimetrical problems out of which grew the calculus of variations. In 1758 Lagrange, aided by the marquis of Saluces and G. F. Cigna, founded the society which was later incorporated as the Turin Academy of Sciences. To the five volumes of its memoirs, *Miscellanea Taurinensia,* he contributed many papers.

By 1761 Lagrange was recognized as the greatest living mathematician; but his health broke down, and he never recovered completely. In 1764 he was awarded the prize offered by the Paris Academy of Sciences for an essay on the libration of the moon, in which he used his now well-known equations. This success encouraged the academy to propose, in 1766, as a problem the theory of the Jovian system. The prize was again awarded to Lagrange; and he won the same distinction in 1772, 1774 and 1778. In 1776 Lagrange, on the recommendation of Euler and D'Alembert, went to Berlin to fill the post at the academy vacated by Euler, at the invitation of Frederick the Great, who expressed the wish of "the greatest king in Europe" to have "the greatest mathematician in Europe" at his court. Lagrange lived in Berlin for 20 years, during which time he communicated many memoirs to the Berlin Academy dealing with algebra, mechanics and astronomy, and produced his great work *Mécanique analytique* (1788), which testifies to his genius for generalization and analysis.

After the death of Frederick the Great, Lagrange accepted Louis XVI's invitation to Paris. There he was given apartments in the Louvre, was continually honoured and was treated with respect throughout the Revolution. In 1792 he married the daughter of the astronomer Lemonnier. In 1793 he was made president of the commission for the reform of weights and measures which introduced the metric system; and in 1795 was appointed professor in the École Normale. Paris; the school, however, was closed after a few months. In 1797 he became a professor in the newly founded École Polytechnique, and his lectures were as elegant and original as his writings. The same year he published *Théorie des fonctions analytiques,* which followed the lines of his lectures given on differential calculus, Napoleon was a particular admirer of Lagrange and heaped distinctions upon him, making him a count, senator and high official of the Legion of Honour. In 1810 he began the revision of his *Mécanique analytique,* but died on April 10, 1813, before it was completed. He was buried in the Pantheon, the funeral oration being given by Laplace and Lacépède. Lagrange was a very modest man, and had a great dislike of controversy.

His complete works were edited by Serret and Darboux, *Oeuvres de Lagrange,* 14 vol. (1867–92). Delambre's notice of his life, extracted from the *Mém. de l'Institute* (1812), is given in vol, i. *See* also G. Julia, "La vie et l'oeuvre de J. L. Lagrange," *Enseignement mathematique,* vol. 39 (1951). (O. Oe.; X.)

LA GRANGE, a city of western Georgia, U.S., 41 mi. N. of Columbus; the seat of Troup county. Incorporated in 1828, it soon became an important trade centre in an expanding plantation area; its oldest houses were built in classic style. Poultry, livestock and pulpwood have replaced cottnn production in agricultural importance. Textile workers comprise the largest single occupational group; the factories produce carpets, towels, garments and natural and synthetic fabrics. Lumber products are second in importance. The city has a council-manager form of government, in effect from 1950. Near La Grange are Warm Springs (*q.v.*) and the Callaway gardens, privately operated, with a lake, a golf course and other facilities, the most noted recreation attraction in western Georgia. La Grange college, chartered in 1831 as an academy for women, is a coeducational liberal arts institution having the longest continuous history of any private college in Georgia. La Grange was named for the estate of the Marquis de La Fayette, who visited the area in 1825 as a guest of the governor of Georgia. For comparative population figures *see* table in GEORGIA: *Population.* (Js. C. B.)

LA GRANJA (SAN ILDEFONSO), former summer palace of the kings of Spain, on the southeastern border of the province of Segovia, and on the western slopes of the Sierra de Guadarrama, 7 mi. S.E. of the city of Segovia. Above the palace rise the wooded summits of the Guadarrama.

The village of San Ildefonso, population (1950) 4,046, the oldest part of the estate, was founded in 1450 by Henry IV, who built a hunting lodge and chapel there. In 1477 the chapel mas presented by Ferdinand and Isabella to the monks of the Parral, a neighbouring Hieronymite monastery.

The original *granja* (*i.e.,* grange or farm). established by the monks, was purchased in 1719 by Philip V, after the destruction of his summer palace at Valsain, the ancient *Vallis Sapinorum,* 2 mi. south. Philip determined to convert the estate into a second Versailles.

LA GUAIRA, Venezuela's most important seaport city, lies on the Caribbean coast at the foot of the central highlands and in the federal district; it serves the capital, Caracas (10 mi. south over the mountains), and the entire central part of the republic. Its climate is more tropical, and hence more trying, than that of Caracas. which is about 3,000 ft. above sea level. Although founded in 1577, La Guaira grew slowly because of its climate and the limited area for expansion: it is built on a narrow beach under massive cliffs. Three highways connect La Guaira with Caracas; on one of these, completed during the early 1950s at a cost of $60,000,000, the 10-mi. trip can be made in 20 minutes. A railway built by British interests, but now operated by the national government. also connects La Guaira with Caracas. winding through the mountains for a distance of 23 mi. On La Guaira's western edge. Maiquetía, literally wrested from the mountains and the sea by blasting and filling in, is a major port of entry by air for goods of high value, mail and passengers. Macuto, to the east, is a fashionable seaside resort.

The seaport of La Guaira handles about 48% of Venezuela's exports and imports, the principal exports being coffee and cacao. A British company developed the harbour late in the 19th century, but in 1940 it became nationalized, as are all Venezuelan ports except certain oil ports. During the 1950s the port was much improved nith new warehouses, a quay and breakwaters. Its piers can accommodate simultaneously 22 ships of any size. Pop. (1950) 16,271. (L. WE.)

LAGUNA, Philippine province in southern Luzon, bordering the southern shores of Laguna de Bay. Area 465 sq.mi. Pop. (1959) 393,540. The province is comprised of a series of quiescent volcanoes alternating with level to gently rolling plains areas. Rainfall averages 70–90 in., with a dry season from November to May. Tao rice crops are raised yearly with irrigation. Large volumes of copra are produced.

Santa Cruz, pop. (1959 est.) 27,605, is the provincial capital but the largest city is San Pablo (*q.v.*). Biiian and Calamba are important market and fishing towns on Laguna de Bay, while Pagsanjan has a hydroelectric station and a waterfall which attracts tourists. (R. E. HE.)

LAGUNA or LA LAGUNA, an episcopal city and formerly the capital of the island of Tenerife, in the Spanish archipelago of the Canary Islands. Pop. (1950) 40,291 (mun.). Laguna is 4 mi N. by W. of Santa Cruz. in a plain 1,800 ft. above sea level, surrounded by mountains. Snow is unknown and the mean annual

temperature exceeds 63° F.; but the rainfall is very heavy.

The humidity of the atmosphere, combined with the warm climate and rich volcanic soil, renders the district exceptionally fertile. Wheat, wine and tobacco, oranges and other fruits, are produced in abundance.

LA HABANA, Cuba: *see* HAVANA.

LA HARPE, JEAN FRANÇOIS DE (1739–1803), influential French critic, was born in Paris. Nov. 20, 1739. Of several uninspired plays, the best are perhaps *Warwick* (1763), a successful tragedy, and *Mélanie* (publ. 1778), a pathetic drama never performed. Befriended by Voltaire. he lived for some time at Ferney. Returning to Paris in 1768, he wrote for the *Mercure de France* and acquired a reputation as a severe and provocative critic. He was elected to the Académie Française in 1776. In 1786 he began to lecture at the newly-established Lycée. His lectures published as the *Cours de litte'rature,* 16 vol. (1799–1805), show La Harpe at his best: his standpoint was independent of contemporary polemics and, though inexact on earlier writers, he was sound in his analysis of 17th-century literature, in particular in his *Commentaire sur Racine* (1807).

Although an extreme revolutionary, La Harpe was imprisoned in April 1794. He underwent a spiritual crisis in prison and, having become an ardent Catholic and reactionary, attacked his former friends when he returned to the Lycée. He died Feb. 11, 1803, in Paris.

His *Œuvres* were published in 16 volumes in 1821.

(W. D. HH.)

LA HIRE (LA HYRE), **LAURENT DE** (1606–1656), French painter and etcher of the transitional period preceding the classicism of Nicolas Poussin and Claude Lorrain, was born at Paris on Feb. 27, 1606. A pupil of his father, Étienne, and later of G. Lallemand. he was influenced by the works of Francesco Primaticcio at Fontainebleau as well as by those of Simon Vouet. His picture of Nicolas V opening the crypt (Louvre) was executed in 1630 for the Capuchins of the Marais; it shows a gravity and sobriety of character which marked La Hire's best work, and seems to have been of some influence on Le Sueur.

La Hire's drawings are treated as seriously as his paintings, and always show simplicity and dignity of effect. The example of the Capuchins, for whom he executed several other works in Paris, Rouen and Fécamp, was followed by the goldsmiths' company, for whom he produced in 1635 "St. Peter Healing the Sick" (Louvre) and the "Conversion of St. Paul" in 1637. In 1648, with 11 other artists, he founded the French Royal Academy of Painting and Sculpture.

Richelieu called La Hire to the Palais Royal around 1640, to decorate the Salle des Gardes with mythological scenes. Chancellor Séguier, Tallemant de Reaux and many others also entrusted him with important works of decoration. For the Gobelins he designed a series of large compositions for tapestries. La Hire painted portraits, and etched about 40 plates of religious, mythological, portrait and landscape subjects.

He died in Paris, Dec. 28, 1656.

LAHN, a river of Germany, a right-bank tributary of the Rhine. Its source is on the Oberste Henne (Jagdberg) (2,218 ft.), a summit of the Rothaar mountains. It flows at first eastward and then southward to Giessen. then turns south-westward and with a winding course reaches the Rhine between the towns of Oberlahnstein and Niederlahnstein. Its valley, the lower part of which divides the Taunus hills from the Westerwald, is often very narrow as it lies along a line of structural weakness. Among the towns and sites of interest on its banks are Marburg and Giessen with their universities, Wetzlar with its cathedral, Runkel with its castle, Limburg with its cathedral, the castles of Schaumburg, Balduinstein, Laurenburg. Langenau, Burgstein and Nassau, and the health resort of Ems. The Lahn is 152 mi. long; it is navigable from its mouth to Giessen, and is partly canalized.

LAMNDA LANGUAGE (Western Panjābī) is the Indo-Aryan language (*q* v.) of west Punjab (Pakistan), adjoining linguistic areas of Panjābī and Kāshmīrī to the east and north, Rajasthānī and Sindhi to the south and southnest and Balōchī and Paṣḥtō to the west. Of the three main dialects of Lahndā, the southern, spoken in the doab of the Shahpur district, is the standard. A peculiarity of Multānī, a subdialect of the Multān and neighbouring districts, is the presence of recursive consonants, a feature also found in Sindhi (*q.v.*). A large number of Persian and Arabic words entered the vocabulary during the 1,000 years of Moslem rule.

Phonology. — The Lahndii phonological system corresponds in general to that of other Indo-Aryan languages. Whereas in other languages of the family short final vowels were lost after single consonants, in Lahndii the old final vowel affected the vowel of the preceding syllable, *e.g.,* from the Indic nom. sing. masc. *kukkaṛ-u* ("fowl") was formed Lahndā *kukkuṛ* (with replacement of *a* by u). Kāshmīrī (*q.v.*) shares this peculiarity. Another feature is h pronounced like Arabic *'ain* when initial or medial after an accented syllable. In other positions the pitch of a preceding vowel is raised.

Morphology.—Lahndā has two genders. masculine and feminine. and two numbers, singular and plural. Case relationship is usually indicated by postpositions which are appended to the oblique form. There are some instances of suffixes for the locative, ablative and instrumental cases. An adjective agrees in gender, number and case with its noun; the comparative form has the suffix *ērā.* As in other Indo-Aryan languages, comparison is expressed by a postposition meaning "from" or "than" (here *thṍ or nāḷṍ*) added to the noun with which the comparison is made. Lahndii shares with Sindhi. and partly with Kāshmīrī, the use of pronominal suffixes attached to nouns and participles by means of certain junction vowels.

Verbs fall into two classes — transitive and intransitive. The passive verbal stem is made by adding i to the root, and at the same time shortening the root vowel; the causal stem, by adding ā to the root. The subjunctive is made by attaching the appropriate personal endings to the verbal root; the future stem, by adding *ēs* to transitive roots, *s* to intransitives. Compound tenses are created from participles plus auxiliary tenses. (For a sketch of Lahndā, *see* the *Linguistic Survey of India,* vol. viii, part i [1919].)

Literature. — There is little recorded literature in Lahndii. In writing, Moslems use a variety of Persian script, and Hindus, the Landa script (related to Mahājanī of Māṛwāṛ and Śāradā of Kiishmir).

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LA HOGUE, BATTLE OF, a clumsy name given to the naval operations between the English, Dutch and French fleets off the Normandy coast, May 19–23, 1692. Louis XIV had assembled near La Hogue, for the invasion of England, a mixed French and Irish army, together with transports, under the command of Marshal Bellefonds and the exiled king James II. Adm. A. Tourville (*q.v.*) was bringing the Brest fleet of 44 of the line up the channel, his orders being to protect the crossing of the invading army, which implied a possible action with the English and Dutch fleets then concentrated off Spithead. These comprised 63 English and 36 Dutch ships of the line, under the supreme command of Adm. Edward Russell, assisted by Adm. Philippus van Almonde (Dutch) and Adm. Sir John Ashby.

The French hopes that Jacobite intrigues would cause disaffection in the English fleet were entirely shattered by Russell's vigorous assertion of his own and his officers' complete loyalty, in response to a personal appeal by the queen. Tourville was sighted off Portland on May 1j, and Russell at once took the allied fleet across the channel, and early on the 19th sighted Tourville westward, off Cape Barfleur. At that very moment dispatch

boats from Louis XIV. were trying to find Tourville, with last-minute instructions, permitting him to avoid battle against such superior forces. But the vessels never reached him, and, stung by the king's previous aspersions, he determined to fight.

The wind being south-west, Russell formed the allies in line ahead on the starboard tack, heading south-east towards the French coast, and at about 9 A.M. Tourville bore down to attack, keeping his van at long range and disposing his inferior force equally along the whole allied line. For some time the French held their own, the Dutch ships in the allied van being unable to double them, owing to the wind dropping; but about 2 P.M. it began to blow north-west by west and Rear-admiral Clowdisley Shovel was able to break through the French line with the leading division of the allied centre. Rear-admiral Richard Carter had meanwhile doubled the French rear with the sternmost division of the allied rear, and the French were in a most critical position. However, the wind again dropped and both fleets anchored on the flowing tide at 3 P.M. The English ships which had weathered the enemy's fleet were now cut off, and as they tried to drift back through the French line on the tide they received heavy damage, Carter being killed.

At 5 P.M. Tourville who had put up a most courageous fight against very superior forces began to withdraw, having so far not lost a single ship. But from this moment he was completely overwhelmed, though fogs and changing winds for some time held up the allied chase. This was continued intermittently throughout the next day. On May 21 both fleets were off Cape La Hogue, and d'Amfreville led 20 of the French to St. Malo through the treacherous Race of Alderney. The remainder being unable to round the Cape doubled back eastwards on the tide. Tourville's flagship, the "Royal Sun," which was too damaged for further use, ran into Cherbourg bay with two other three-deckers, all being burnt later by Vice-admiral Sir Ralph Delavall. Meanwhile, Tourville, with 12 of the ships which had turned back to the east, rounded Cape Barfleur and anchored in the bay of La Hogue where the army for the invasion was encamped. Tourville warped six ships under the guns of Fort Lisset, and the other six under the guns of Fort St. Vaast, thinking himself fairly secure. But on the night of May 23 Russell sent in a strong force of 200 boats supported by shallow draft frigates, all under the command of Admiral George Rooke, who succeeded in burning the six ships under Fort Lisset, despite the fire from the fort's guns and the small arms of the troops. Next morning, May 24, Rooke again entered the bay and destroyed the ships under St. Vaast as well as the transports for the army. The remaining nine ships escaped to other harbours. This disaster forced Louis to make offers for peace.

See Sir W. L. Clowes, *The Royal Navy*, vol. ii. (1898); **O. Troude**, *Batailles navales de la France* (1867). (G. A. R. C.; W. C. B. T.)

LAHORE, the capital of West Pakistan and an ancient city which gives its name to a district and a division, lies near the left bank of the Ravi river, about 1000 ft. above sea level and 758 mi by rail N.E. from Karachi. The population of the city, including the cantonment, nas 849.476 at the 1951 census. Owing to its inland position it is very hot in summer but pleasantly cool in minter. The old city was formerly surrounded by a brick wall, 30 ft. high, and a moat, but these have been replaced, except on the north, by a garden. A circular road around the rampart gives access to the city by 13 gates. The site has been occupied from early times and much of it stands high above the surrounding country, raised on the remains of a succession of former habitations. The name appears in history under about 15 forms, one of which, Lohawar, means the fort of Loh. Hindu tradition traces the origin of Lahore to Loh or Lava, son of Rama. hero of the *Ramayana*. Hiouen Tsang (Hsüan Tsang, *q.v.*), the Chinese Buddhist traveler, notices the city in his *Itinerary*, and it seems probable that it was founded at the end of the 1st or beginning of the 2nd century A.D. Lahore fell successively under the dominion of the Ghazni and Ghori sultans, who made it the capital of their Indian conquests and adorned it with numerous buildings, almost all now in ruins. But it was under the Mogul empire that Lahore reached its greatest magnificence when it became a place of royal residence. The reigns of Humayun, Xkbar. Jahangir. Shah Jahan and Aurangzeb form the golden period in the annals and architecture of the city, but from the accession of Bahadur Shah I till the establishment of the rule of Ranjit Singh in 1799, its history is of successive invasions and conquests. The Sikhs ruled over Lahore from 1768 to 1849 when, at the end of the second Sikh War, with the rest of the Punjab, it came under British domination. Ranjit Singh made it the capital of his kingdom. Under British rule it became the capital of the province of Punjab and remained so till the partition of the subcontinent in 1947, when it became the capital of West Punjab in West Pakistan. In Oct. 1955, it became the capital of the unified province of West Pakistan.

The architecture of Lahore cannot compare with that of Delhi although there are some beautiful buildings in the fort dating from the time of Jahangir and Shah Jahan. The mosque of Wazir Khan (1634) and the northern wall of the fort display magnificent examples of kashi or encaustic tile work. Aurangzeb's Badshahi Masjid is a lofty structure of red sandstone ornamented with marble tracing. The buildings of Ranjit Singh and his mausoleum are common and meretricious in style. He was, moreover, responsible for much of the despoiling of the earlier buildings, having stripped the Moslem tombs of their ornaments and sent them to Amritsar. Two of the chief features of Lahore lie outside its walls, at Shahdara and Shalamar gardens, respectively. Shahdara, which contains the tomb of the emperor Jahangir, lies across the Ravi, about 3 mi. N. of the city. It consists of a splendid marble cenotaph surrounded by a garden. The principal material is red sandstone but there is a profusion of marble ornaments arranged in elegant mosaics representing flowers, and inscriptions in Arabic and Persian. The Shalamar gardens, which were laid out in 1641 by Shah Jahan. 6 mi. E. of the city. are some of the most magnificent in the world. Originally planned in seven parts, there are now three terraces, rising one above the other, and 427 fountains, in an area of 39 ac.

The modern city of Lahore, which covers 128 sq.mi., may be divided into four parts: the native city already described; the civil station; the cantonment of Mian Mir. 3 mi. beyond, where the garrison is stationed; and the suburbs. Model Town, Gulberg. Shadbagh, Choburji gardens, Wahdal Colony and Samnabad are the chief suburbs. Lahore is an important junction on the North-Western railway system with connections to Karachi, Peshawar. Quetta and India through Wagah. It is an important commercial and banking city and the centre of one of the principal industrial regions where cotton, silk, shoes, rubber, etc., are made. It is also noted for gold and silver lace. Lahore is the chief educational and cultural centre of West Pakistan, being the seat of the University of the Panjab, which is the oldest and the biggest in Pakistan, with its numerous colleges and technical institutes. It is also the headquarters of the new board of secondary education.

Besides this principal city, there is a Lahore in Afghanistan, one near Attock in Pakistan and one in Hindustan proper.

The DISTRICT OF LAHORE has an area of 2,429 sq.mi. and a population (1951) of 1,895,228. It lies between the Sutlej and the Ravi in the Bari Doab. The old course of the Beas passes through the middle from northeast to southwest. The Manjha plateau. between the Ravi and the Beas. has been rendered fertile by the Upper Bari Doab canal. The principal crops are wheat, barley, millet, maize, oilseed and cotton. There are numerous factories for ginning and pressing cotton. Lahore, Kasur, Chunian and Raiwind are the chief trade centres. (K. S. AD.)

LAHTI, second largest inland town of Finland, is favourably located on the southern end of the Lake Paijanne waterway and on the Helsinki-Viipuri railroad. Pop. (1950) 44,652. Founded in 1905, Lahti is important as an industrial town (sawmills and glass) and as a winter sports centre.

LAI, a term, probably Celtic in origin, having two meanings in French: (1) A 12th-century narrative poem in octosyllabic couplets relating a sentimental adventure from Celtic sources, best exemplified by Marie de France (*q.v.*). (2) A lyric composition which developed from the late 12th to the 16th centuries (when it passed out of use) as a poem of 12 stanzas, each bipartite, usually quadripartite, and with its own melodies, all of which differ in metrical and rhyme pattern except the first and last, which are

identical in these respects, but not in words. From this *grand lai* there derived in the late 13th century the *petit lai*, a single 2- or 4-part stanza of 12 lines, and the *double lai* or *lai renforcé* of 16 or 20 lines.

See G. Lote, *Histoire du vers français,* II, pp. 219–226 and 253–259 (1951). (F. J. WE.)

LAIBACH, CONGRESS or CONFERENCE **OF.** Before the break-up of the conference at Troppau (*q.v.*), which had been summoned to take counsel on the situation created by the military revolution in Naples, the powers had decided to adjourn the meeting until the following January, and to invite the king of Naples to attend, Laibach being chosen as the place of assembly. There the adjourned conference opened on Jan. 26, 1821; the emperors of Austria and Russia were present in person, together with Ferdinand of Naples and the duke of Modena.

Almost the first act of Ferdinand on his arrival was to repudiate his oath to the constitution. Naples thereupon declared war and was soon occupied by Austrian troops, who also invaded Piedmont and suppressed the military revolt which had broken out on March 10. This was approved by the conference; but a serious difference arose between Great Britain and the autocratic powers as to the principle justifying these interventions. The former held that it was solely the affair of Austria (justified in the case of Naples by the terms of the treaty of 1813 with King Ferdinand, and in that of Piedmont by the right of vicinage). Russia, Austria and Prussia issued a declaration which in effect repeated the claim (formulated in the Troppau protocol) of the European alliance to intervene anywhere in order to suppress revolution.

The consequent protest of Lord Stewart, on behalf of Great Britain, marked the first beginnings of the cleavage between the autocratic powers and France and England.

It was at Laibach that, on March 19. the emperor Alexander received the news of Ypsilanti's invasion of the Danubian principalities, nhich heralded the outbreak of the War of the Greek Independence and from Laibach Capo d'Istria addressed to the Greek leader the tsar's repudiation of his action.

The conference closed on May 12.

See W. Alison Phillips, *Confederation of Europe,* 2nd ed. (1919).

LAIDONER, JOHAN (1884–), Estonian soldier, was born in the Viljandi district. He completed his military studies at the Vilna cadet school and the Petrograd (Leningrad) military academy. In 1914 he served in the Russian army on the Caucasian front, and in 1915 became divisional chief of the staff of the Russian western front. In 1917 he commanded the Caucasian grenadier division, and was chief of staff to the 62nd division. On the formation of the Estonian national army he commanded the first Estonian division.

During the German occupation (1918) Laidoner negotiated with Soviet Russia to prevent German annexation. He organized the transport of the Estonian army, via Archangel and hiurmansk, to the Allied front. He commanded the Estonian army in the War of Independence, and then abandoned the army for politics. He sat as an agrarian in the diet from 1920 onward. He became president of the commission for foreign affairs and state defense of the diet. and Estonian delegate to the League of Nations.

In 1925 he presided over the League of Nations commission appointed to inquire into the Mosul frontier dispute between Great Britain and Turkey. *See* MOSUL.

LAING, ALEXANDER GORDON (1793–1826), Scottish explorer of Africa and the first European to reach Timbuktu. u-as born at Edinburgh on Dec. 27, 1793. He was educated at Edinburgh university and visited Barbados in 1811. He was promoted to a company of the Royal Africa corps and in 1822, when serving in Sierra Leone, was sent by the governor, Sir Charles MacCarthy, to Mandingo country to attempt to develop trade and to abolish slaving. That year he visited Falaba, the capital of Sulima country, and discovered the source of the Rokell. He was prevented by the natives from reaching the source of the Niger. Laing fought in the Ashanti War (1823–24) and carried home the dispatches with the news of MacCarthy's death in action.

Lord Bathurst, secretary for the colonies, then instructed Laing to travel to Timbuktu and to explore the Niger basin. He left Tripoli on July 16, and began his journey across the Sahara. He reached Ghadames by September and in December was well received in Tuareg country. From there in Jan. 1826 he set out for Timbuktu across the Tanezroft desert and arrived on Aug. 18 after having to fight to protect himself and being severely wounded. He left Timbuktu on Sept. 24 and was murdered two days later. His papers were never recovered though it is believed that they were brought secretly to Tripoli in 1828.

The journal of Laing's earlier travels, *Travels in the Timannee, Kooranko and Soolzma Countries, in Western Africa* was published in 1825. (R. M. P.)

LAING, MALCOLM (1762–ISIS), Scottish historian, son of Robert Laing, and elder brother of Samuel Laing the elder, was born on his paternal estate on the mainland of Orkney. He was called to the Scottish bar in 1785. In 1793 he completed the sixth and last volume of Robert Henry's *History of Great Britain,* the portion which he wrote being in its strongly liberal tone at variance with the preceding part of the work; and in 1802 he published his *History of Scotland from the Union of the Crowns to the Union of the Kingdoms.*

In a dissertation, prefixed to a second and corrected edition of the *History* published in 1804. Laing endeavoured to prove that Mary. queen of Scots, wrote the Casket letters, and was partly responsible for the murder of Lord Darnley. Laing, who was a friend of C. J. Fox, was M.P. for Orkney and Shetland from 1807 to 1812.

He died on Nov. 6, 1818.

His other works include editions of the *Life and Historie of King James VI* (1804) and of Ossian (1805).

LAING, SAMUEL (1810–1897), British author and railway administrator, was born at Edinburgh on Dec. 12, 1810. In 1848 he became chairman of the London, Brighton and South Coast railway, and in 1852 chairman of the Crystal Palace company. On retiring from both posts in 1855, he commenced a political career, being appointed financial secretary to the treasury (1859), and finance minister in India (1860).

From 1852 to 1873 he sat as Liberal member for Wick, with two short intervals, and from 1873 to 1884 he was member for Orkney and Shetland. He was also chairman of the Railway Debenture Trust and the Railway Share Trust. He died at Sydenham on Aug. 6. 1897.

His most important works are *Modern Science and Modern Thought* (1885), *Problems of the Future* (1889) and *Human Origins* (1892).

LAING'S (or LANG'S) **NEK,** a pass in the Union of South Africa by which the ascent of the Drakensberg from Natal to the Transvaal is made. It lies immediately north of Majuba and is the lowest part of a ridge which slopes from Majuba to the Buffalo river. It is the main artery of communication between Durban and Pretoria. The railway at 5.399 ft. enters a tunnel 2,213 ft. long.

Fighting took place there in 1881, when the pass was occupied by a Boer force to oppose the entry of British reinforcements into the Transvaal.

LAIRD, MACGREGOR (1808–1861), Scottish pioneer of legitimate commerce on the Niger river, largely undertaken as a means of undermining the influence of the slave trade, was born at Greenock in 1808. As the lower course of the Niger had been made known in 1831 by Richard and John Lander, Laird formed a company of Liverpool merchants to take advantage of this discovery. In 1832 the company dispatched a brig and two small steamers to the Niger; one, the "Alburkah," a paddle-wheel vessel of 55 tons designed by Laird. was the first iron vessel to make an ocean voyage. The expedition proved that the lower Niger could be navigated by ocean-going ships, but of its original 48 Europeans all but nine died from fever or from wounds.

Laird ascended the Benue as far as Fundah, being the first white man to do so, and formed an accurate idea of the river's course and source. On this journey he underwent many hardships from which he never fully recovered.

On his return to Liverpool in 1834, Laird published, with R. A. K. Oldfield in 1837, the *Narrative of an Expedition into the Interior of Africa by the River Niger.* . . . Later, he mainly de-

voted himself to the opening up of the Niger territory, and to the founding of the African Steam Ship company. In 1854, a second Niger expedition, promoted by him and led by W. B. Blaikie, penetrated 150 mi. beyond any place previously reached and, as a result of good organization and the use of quinine, not a life was lost. The success of this venture, a landmark in the development of west Africa, led to expeditions by other traders. Laird's pamphlet on the price of sugar, published in 1844, shows concern both for the welfare of the English poor and of the Negro peoples and. with his *Narrative,* points to humanitarianism rather than personal advantage as the mainspring of his trading activities. Laird was one of the promoters of a company formed in 1837 to run steamships between England and New York, and the "Sirius," sent out by this company in 1838, was the first ship to cross the Atlantic from Europe entirely under steam.

Macgregor Laird, who was the brother of John Laird, pioneer of iron shipbuilding and first M.P. for Birkenhead, died in London, Jan. 9, 1861, while preparing another Niger expedition. (J. E. A.)

LAIS, the name of three celebrated Greek courtesans.

1. A Corinthian of the 5th century B.C. See Athenaeus 544 B *seq.,* 570 B *seq.* Her best-known lover was Aristippus the Cyrenaic philosopher. From her Athenaeus (574 E) distinguishes—

2. Lais, the younger daughter of Timandra or Damasandra, the mistress of Alcibiades. She was born in Hyccara in Sicily, but went to Corinth at the time of the Sicilian expedition, being then seven years old (Athen., 588 B, citing Polemon; schol. Aristoph., Plut., 179); hence she was born about 420 B.C. But Apelles (contemporary of Alexander the Great) knew a Lais still a little girl, about 100 years later than this, Athen. 588 C; therefore there must also have been—

3. A third Lais, contemporary with Alexander. Ancient authorities confuse the three. The usual type of stories are told of them. See Geyer in Pauly-Wissowa-Kroll, Realenc. *s.v.*

LAISSEZ-FAIRE. Laissez-faire may be defined as the doctrine which demands the minimum interference by government in economic and political affairs. The maxim itself was long attributed to Vincent de Gournay, a French economist of the 18th century; but Oncken has shown that this was an error. The most probable origin of the phrase is the well-known reply of the manufacturer Legendre to Colbert who asked what he could do for industry; *Laissez-nous faire* (Let us alone). Others attribute its popularity to the remark of D'Argenson, the ex-minister of Louiv XV., whose insistence on the theory of free trade earlier and even more completely than with the Physiocrats makes the attribution not improbable. Whatever the actual origin of the phrase, the doctrine arose naturally at the end of the 17th and the beginning of the 18th century, as a protest against the excessive regulation of industry by government action. A number of causes explain this protest. In both England and France, government interference with religious belief meant interference with commerce since, in both countries, tradt was largely in the hands of dissenters from the orthodox faith of the state. Government interference, moreover, meant only too often monopoly; and as early as the treatises of Sir Josiah Child the danger to commercial well-being of closed corporations is insisted upon. "No one," says Child, "ought to be able to buy immunity and monopoly to the prejudice of the country." In France, particularly, the restrictions imposed upon production both by the immense number of local customs-systems and by the jealous regulation of the different *maîtrises* necessarily aroused dissatisfaction with the existing state of affairs.

It is curious to note how early the doctrine of laissez-faire assumed its characteristic modern form. In the Physiocrats, and especially in Mercier de la Rivière *(Ordre Essentiel,* ed Daire, ch. xliv. p. 444), there is little absent which remained to be added by later speculation. The ideal society for him is one characterised by the competition of individuals armed with equal rights who freely search for their interests in the interaction of economic relationships. It is assumed that they are naturally led to take thought for social well-being by their need to exchange their products freely, and that production naturally adapts itself to that need. Distribution is, further, naturally built upon the basis of equivalent utilities. Each individual, in the process of exchange, seeks the product which, by its utility, recompenses him for the labour he has expended upon the production of his own commodity. Under the beneficent aegis of competition, the continuous effort of producers to increase their profit leads to improvements in technique for the sake of economy, and these, as they are widely adopted, lead in their turn to lower prices. "Personal interest," says Mercier de la Rivière, "compels each man vigorously and continuously to perfect and to multiply the things he seeks to sell. He thus enlarges the mass of pleasures he can produce for other men in order to increase the mass of pleasures other men can produce for him in exchange. The world thus advances of itself." Laissez-faire is, thus, from its beginnings marked by an optimistic faith in the power of uncontrolled individual action to produce social good. This is the "natural order" which, for Adam Smith, underlay the appearance made wasteful and confused by governmental regulation, a "natural liberty," which in its operation naturally results in benefit to the community. In addition to Adam Smith and the physiocrats, the outstanding names in the history of laissez-faire as an economic doctrine are Say, Dunoyer and Bastiat in France, Ricardo, McCulloch and, though in a less degree, Nassau Senior in England.

Broadly speaking, the economic thesis of laissez-faire may be summarized in three propositions. 1. *As* a *theory of exchange* laissez-faire leads to such a stabilization of prices as results, in a given market, in the maximum possible satisfaction to all participating therein. 2. *As* a *theory of production,* laissez-faire results in such a disposition of the productive forces as will secure the maximum benefit from their employment. 3. *As* a *theory* of *distribution,* laissez-faire creates the maximum harmony between capital and labour by securing to each such a part of the common product as is equivalent to the share it has created.

But laissez-faire is a political, as well as an economical, doctrine. In the former field it assumed the garb of individualism. Here, perhaps, its outstanding exponent was Jeremy Bentham, and its essential basis the hedonistic calculus. Since every person, it argued, is the best judge of his own happiness, the more free he is left in his search for its attainment, the more certain he is to reach it; and since each man is equally entitled to happiness, all artificial barriers imposed by government in the way of its realization are necessarily evil. Armed with this creed, Benthamism became the main agent in the nineteenth century of political democracy. It may claim to have been the chief doctrinal factor in securing the enlargement of the parliamentary franchise, the improvement of judicial procedure, the promotion of liberty of contract (including the right of combination), and the abolition of religious inequality. Its underlying assumption was a purely mechanical conception of society as an aggregate of individual atoms each of which would secure the best results for itself in the absence of contravening circumstances. It regarded the State as essentially the promoter of order and security, and viewed with distrust its assumption of larger functions on the ground that this tended to a paternalism which decreased the initiative and responsibility of the individual. Since no government could know the interests of its individual citizens as well as they knew these themselves, it was, a *priori,* doctrinal error for government to embark upon any social experiment destined to limit the sphere of individual action.

The political leaders of the individualist school were, in England, Bentham himself and the two Mills; though the younger Mill, especially after 1848, moved slowly but definitely towards socialism. In France, men like Tocqueville, Prevost-Paradol, and, in a special sense, Tarde, may be regarded as outstanding exponents of this attitude. Towards the close of the nineteenth century Herbert Spencer lent the weight of his then enormous prestige to the support of an individualism perhaps more far-reaching than in any other expression; but it should be said that his outlook was in fundamental contradiction with the general principles of his own philosophy. It is important, also, to note that, through its hostility to state action laissez-faire has, on its political side, close affiliations with anarchist doctrine. Logically,

the border-line between such thinkers as Spencer and Bastiat, on the one side, and anarchists so different as Godwin and Max Stirner upon the other, is very narrow, though the differences in temper and object are, of course, outstanding. (See ANARCHISM.)

As an influence in affairs, laissez-faire may be said to have reached its apogee about 1870; after that time the current of events moved steadily and increasingly in the direction of collectivism. It was discovered that competition logically resulted in combination; and it was found that liberty of contract only begins where equality of bargaining power begins. To secure the latter, or some approximation thereto governmental interference was adjudged necessary by thinkers of the most various schools. The development of systems of national education and social insurance, the growth of municipal trading, the need to protect the consumer from, particularly, the angle of public health, the necessity of responding to the wants of an electorate increasingly proletarian in character, these and things like these all softened the sharpness of the original doctrine. By the end of the century, the thinkers who maintained it in its pristine rigour were but a handful.

See the article ECONOMICS and also L. Stephen, *The English Utilitarians* (1900); E. Halévy, *La Formation du radicalisme philosophique* (1901); E. Cannan, *Theories of Production* (2nd ed., 1903); A. Schatz, *L'Individualisme* (1907); C. Gide and C. Rist, *History of Economic Doctrines* (1915); H. J. Laski, *Political Thought from Locke to Bentham* (1920); J. M. Keynes, *The End of Laissez-Faire* (1926).

(H. J. L.)

LAJPAT RAI, LALA (1865–1928), a Nationalist politician, who played an influential part in the development of Indian political extremism. He was born in 1865 at Jagron, a small town in the Ludhiana district, Punjab, the son of Munshi Radha Krishen Lala, the author of numerous Urdu books and pamphlets, who, when his son was twelve years old was converted to the reformed Hindu cult, the Arya Samaj, founded by Swami Dayanand Sarasavathi. Graduating in law from the Government college, Lahore, in 1885, Lajpat Rai practised first at Hissar, and then at Lahore, where he took an active part in founding the Dayanand Anglo-Vedic college. Joining the Indian National Congress, he was one of the originators of the view that the Nationalists should rely on their own exertions for Indian political progress and should form no sort of alliance with British parties. In the spring of 1907 agitation broke out among the settlers in the newly formed Chenab Canal and Bari Doab irrigation colonies, and in consequence Lajpat Rai and Ajit Singh were deported to Mandalay under Regulation 3 of 1818 without trial. Spurred by radical critics in the House of Commons, John Morley, then secretary of state for India, was very uneasy about the use of this "rusty sword," and in the autumn persuaded the viceroy, Lord Minto, to release the deportees. Thereafter Lajpat Rai, a man of great energy, combined with his legal practice political, philanthropic and educational activities, edited a vernacular magazine and a vernacular weekly journal.

For some time before and during the World War Lajpat Rai was in the United States, where he wrote *The Arya Samaj* (1915), *Young India* (1917) and *National Education in India* (1920). Obtaining permission in the latter year to return to India, he went back when political feeling was running very high. He was president of the special session of the National Congress which in September 1920 launched the non-cooperation programme, but his own attitude was halting. Imprisoned for seditious activities in 1921 he was released in August 1923 and at the end of the year was elected to the legislative assembly, where for some time his tendency was to draw away from a policy of mere negation. He accepted a Government nomination to represent the Indian trade unions at the International Labour Conference at Geneva in 1926, but in 1928 he moved the resolution in the Legislative Assembly carried by a small majority for boycott of the Statutory Commission under Sir John Simon. His active share in promoting various Hindu movements and his proselytizing zeal tended to encourage communal disturbances. His *Unhappy India* (1928) was a voluminous reply to Katharine Mayo's *Mother India*. He died in the autumn of 1928 of heart failure though his death was stated to be the result of injuries received during a baton charge at Lahore. This was disproved at the subsequent enquiry.

(F. H. BR.)

LAKANAL, JOSEPH (1762–1845), French politician, was born at Serres (Arikge) on July 14, 1762. His name, originally Lacanal, was altered to distinguish him from his Royalist brothers. In 1792 he was acting as vicar to his uncle Bernard Font (1723–1800), the constitutional bishop of Pamiers, when he was elected to the convention, where he held apart from the various party sections.

Lakanal became a member of the committee of public instruction (1793), and brought forward on June 26 his *Projet d'éducation nationale* which proposed to lay the burden of primary education on the public funds. but to leave secondary education to private enterprise. The scheme, in the main the work of Sieyès, was refused by the convention. Lakanal began to work for the organization of higher education, and abandoning the principle of his *Projet* advocated the establishment of state aided schools for primary, secondary and university education. After the revolution of Thermidor, he became president of the education committee and drew up various educational schemes: continuing his reports, in spite of the supersession of his system, after his election to the council of the Five Hundred.

In 1799 Lakanal mas sent by the directory to organize the defense of the four departments on the left bank of the Rhine threatened by invasion. Under the consulate he resumed his professional work, and after Waterloo retired to America, where he became president of the college of Orleans. He returned to France in 1834, and died in Paris on Feb. 14, 1845. Lakanal was an original member of the Institute of France.

He published in 1838 an *Expose' sommaire des travaux de Joseph Lakanal.*

His *éloge* at the Academy of Moral and Political Sciences was pronounced by the comte de Rémusat (Feb. 16, 1845) and a *Notice historique* by F. A. M. Mignet was read on May 2, 1857. *See* also notices by Émile Darnaud (1874), "Marcus" (1879), P. Legendre in *Hommes de la révolution* (1882), E. Guillon, *Lakanal et l'instruction publique* (1881). For details of the reports submitted by him to the government *see* M. Tourneux, "Histoire de l'instruction publique, actes et délibérations de la convention, etc." in *Bibliog. de l'hist. de Paris,* vol. iii (1900); also A. Robert and G. Cougny, *Dictionnaire des parlementaires,* vol. ii (1890).

LAKE, GERARD LAKE, 1ST VISCOUNT, created 1807 (1744–1808), British general, was born on July 27, 1744. He entered the foot guards in 1758. By 1792 he was a general officer in the army. He served with his regiment in Germany in 1760–1762 and with a composite battalion in the Yorktown campaign of 1781. After this he was equerry to the prince of Wales (afterward George IV). In 1793 he was appointed to command the guards brigade in the duke of York's army in Flanders. He was in command at Lincelles, on Aug. 18, 1793, and served on the continent until April 1794. In 1797 he was promoted to lieutenant-general.

In the following year the Irish rebellion broke out. Lake succeeded Sir Ralph Abercromby in command of the troops in April 1798, issued a proclamation ordering the surrender of all arms by the civil population of Ulster and, on June 21. routed the rebels at Vinegar Hill (near Enniscorthy, County Wexford). He exercised great severity toward all rebels found in arms. Lord Cornwallis then assumed the chief command in Ireland, and in August sent Lake to oppose the French expedition which landed at Killala Bay.

On Aug. 29 Lake arrived at Castlebar, but only in time to witness the rout of the troops under General Hely-Hutchinson, He retrieved this disaster by compelling the surrender of the French at Ballinamuck, near Cloone, on Sept. 8. In 1799 Lake returned to England, and in 1800 obtained the command in chief in India.

He took over his duties at Calcutta in July 1801, and applied himself to the improvement of the Indian army, especially in the direction of making all arms, infantry, cavalry and artillery. more mobile and more manageable. In 1802 he was made a full general.

On the outbreak of war with the Mahratta confederacy in 1803 General Lake took the field against Sindhia, and within two months defeated the Mahrattas at Coel, stormed Aligahr,

took Delhi and Agra, and won the great victory of Laswari (Nov. 1, 1803), where the power of Sindhia was completely broken. This defeat, followed a few days later by Wellesley's victory at Argaum, compelled Sindhia to come to terms, and a treaty with him was signed in December 1803. Operations were, however, continued against his confederate, Holkar, who, on Nov. 17, 1804, was defeated by Lake at Farrukhabad.

Lake was superseded as commander in chief by Cornwallis in July 1805. But after the death of Cornwallis in October of the same year, Lake pursued Holkar into the Punjab and compelled him to surrender at Amritsar in Dec. 1805. For his services Lake received the thanks of parliament, and a peerage. He represented Aylesbury in the house of commons from 1790 to 1802, and he sat in the Irish parliament as member for Armagh in 1799 to vote for the Union.

He died in London on Feb. 20, 1808.

See H. Pearse, *Memoir of the Life and Services of Viscount Lake* (1908); and a short memoir in *From Cromwell to Wellington,* ed. Spenser Wilkinson.

LAKE, a mass of still water situated in a depression of the ground, without direct communication with the sea. The name is also applied, however, to widened parts of rivers and to bodies of water which lie along sea coasts and in direct communication with the sea. The terms pond, tarn, loch and mere are applied to smaller lakes according to size and position. Lakes are nearly universally distributed, but are most abundant in high latitudes and in mountain regions, especially those which have been recently glaciated. They are common along rivers which have low gradients and wide flats, being clearly connected with the changing channel of the river. Lowlands in close proximity to the sea, especially in wet climates, have numerous lakes (*e.g.,* Florida). The primary source of lake water is atmospheric precipitation, which may reach the lake by rain, melting ice and snow, springs, rivers and immediate runoff from the land surfaces. Because of their isolation from the great oceans, lakes have peculiar physical, chemical and biologic features.

Lakes may be either fresh or salt water, some being more salt than the sea itself. They occur at all altitudes: *e.g.,* Lake Titicaca (South America) is 12,497 ft. and Yellowstone lake (U.S.) is 7,731 ft. above sea level; and on the other hand, the surface of the Caspian sea is 92 ft., that of the Sea of Galilee 696 ft. and that of the Dead sea 1,286 ft. below the level of the Mediterranean.

Lakes vary notably in size also. The Great Lakes (*q.v.*) of the United States and Canada constitute the world's greatest array of large lakes. Lake Superior has the greatest surface area (31,820 sq.mi.), but by volume it is not the largest lake in the world. That distinction goes to Lake Baikal in southern Siberia, which has a considerably smaller surface area (12,162 sq.mi.) but which is so deep that its total volume is greater than that of Lake Superior. Scattered in a great arc across North America are at least eight lakes with areas larger than 7,000 sq.mi.—lakes Ontario, Erie, Huron, Michigan, Superior, Winnipeg, Great Slave and Great Bear.

Several hundred miles west of Lake Baikal in southwestern Siberia is another large lake, Lake Balkash. Another very large one, Lake Ladoga, is near the Soviet-Finnish border. East Africa contains a series of great lakes: Lake Victoria, with a surface area second only to Superior, and lakes Rudolph, Tanganyika and Nyasa. South America contains only one true large lake, Lake Titicaca, on the Peru-Bolivian border; but Lake Maracaibo, a shallow arm of the sea in northern Venezuela, also is a major inland body of water.

Origins.— Lakes may form in any undrained depression or in any depression that has an outlet somewhat above the lowest parts of the depression, and where there is an adequate supply of water to keep the depression filled. Unquestionably more of the world's present lakes were produced by glacial action than by any other single agent.

The continental glaciers that covered Canada, the extreme northern United States, Finland and parts of Sweden gouged out undrained depressions in the bedrock of these areas, thereby producing tens of thousands of rock-shored lakes. Many of these lakes are interconnected by narrow inlets or short streams; they have numerous sprawling bays and may be filled with islands. Many of them are comparatively shallow. Where they are particularly abundant they may occupy as much as 75% of the total surface, as in the Quetico canoe country of northeastern Minnesota and adjacent parts of Canada.

Continental glaciers also create lakes by depositing across pre-existing drainage patterns rock debris that dams up the streams and creeks, lakes being formed behind the debris dams. Oftentimes also glacial debris spread indiscriminantly over the landscape will leave scattered small shallow swales or depressions, and these will contain shallow lakes with sand or gravel banks and bottoms. When glaciers melt they sometimes leave deep pits called kettle holes (see GIANT'S KETTLE) which fill with water and become lakes; such lakes are extremely numerous in some areas. Mountain glaciers also produce lakes in mountain valleys by the same processes of erosion and deposition. Most, though not all, mountain lakes are glacial in origin.

There are other mountain lakes which are formed by dams thrown across streams by landslides or mudflows. Ordinarily such a lake is relatively short lived because the outlet at the lower end is quickly cut down through the relatively unresistant material in the dam. Lakes so formed by lava flows, however, are likely to be permanently established.

Other barriers to pre-existing drainage resulting in lake formation are sand dunes deposited across a small stream, beach deposits across the mouth of a river or the alluvium laid down by a large stream across the course of a smaller tributary. Deltaic deposits that are laid down in a sluggish stream by a silt-laden, more swiftly flowing stream may dam the former and produce a lake upstream.

The flood plains of large streams contain lakes formed in former channels of the river, called oxbow lakes. Also, undulations in the surface of the flood plain may cause shallow lakes to form.

The craters of extinct or dormant volcanoes commonly contain lakes; Crater lake in Oregon is one of the best-known examples. At various places the earth's crust has been warped or broken into depressed blocks which fill with water. Lake Michigan may be attributable partly to downwarping. Several of the large African lakes (Nyasa, Tanganyika) lie in the Great Rift valley, a huge, long, down-dropped block of the earth's crust. Lake Superior is partly the result of such forces also.

Regions underlain by highly soluble limestones (see KARST) develop depressions called sinkholes which under some circumstances may fill with water and become lakes. The lake region of north-central Florida is of this type.

Shallow lakes develop on glacial ice. So-called organic lakes are formed in great numbers in the tundra regions bordering the Arctic ocean.

One class of lake occurs in any arid region where there is insufficient water to form an integrated drainage system. In such a region a lake basin may contain a permanent lake if the inflow is great enough to maintain a water body throughout the year, or it may contain an ephemeral lake forming during the rainy season and drying up during the dry season.

Life History.——Viewed on the geological time scale, lakes are short-lived features of the earth's crust. They are formed in the various ways reviewed above, but as soon as they are formed three processes start their eventual destruction. All inflowing streams bring sediment into the lake and deposit it in the lake's still waters, thereby starting the process of filling the depression. If the lake fills its basin sufficiently so that it overflows, the outflowing stream will tend to erode a notch through the lip of the basin and thereby drain the depression. Last, the accumulation of organic deposits from vegetation may cause shallow lakes to change to bogs or swamps, and eventually they may become dry land. Relatively long-lived lakes are those located in deep basins or in arid regions where the drainage will integrate only very slowly.

Properties.— The composition of lake water can vary from almost pure water to lakes so extremely salty that they are really a salt slush. In general, the lakes of arid regions are rich in saline

and alkaline compounds because all the salts derived from the surrounding rocks and brought into the lake in solution remain, there being no outlet, and evaporation causes the proportion of salt to increase steadily.

However, extremely salty lakes (*e.g.*, the Dead sea and Great Salt lake) are found in areas where the climate has changed from humid to arid.

The science that deals with the physical, chemical and biological properties of lakes is called limnology. Lakes are extraordinarily interesting environments, because they constitute the major areas of quiet fresh water found on the surface of the globe, and thus form a highly specialized type of environment for both plants and animals.

Because lakes are relatively shallow, in high latitudes with cold winters and warm summers a lake may experience a complete double turnover of the water each year. Many lakes during the warm season develop sharp vertical stratification, which may be a critical factor in the distribution of plant and animal life. Lakes also display currents of various kinds. One particularly interesting type of current allows some of the material brought into a lake to be carried through the standing water and out at the outlet. (W. C. C.)

LAKE CHARLES, a city of southwestern Louisiana, U.S., on the Calcasieu river and Lake Charles, 37 mi. from the Gulf of Mexico; the seat of Calcasieu parish. It is a port of entry with a 35-ft. channel to the gulf, which was opened in 1926. Jacob Ryan laid out, the city in 1852, named it for Charles Sallier, an early settler; and promoted the exploitation of the heavily timbered pinelands to the north and west. The building of railroads increased the timber industry and brought an influx of grain farmers from the midwest, who developed nearby the principal rice-growing area of the U.S.

Development of mineral deposits in the 20th century—first sulfur, then oil and gas—made Lake Charles one of the nation's leading petrochemical production centres. Fur trapping and offshore oil drilling make the nearby coastal marshes productive. Educational facilities include a modern city school system, McNeese State college, established in 1939, and a state trade school.

Lake Charles is a shallow, fresh-water, cypress-bordered reach of the Calcasieu river. about 3 mi. in diameter. and a recreation centre. Many other nearby bodies of water provide excellent fresh- and salt-water fishing and duck hunting. Pop. (1960) 63,-392. For comparative population figures *see* table in LOUISIANA: *Population.* (W. M. Lo.)

LAKE DISTRICT lies in the English counties of Cumberland. Lancashire (Furness) and Westmorland. It contains the principal English lakes. including Windermere, the largest. 10½ mi. long, and the highest English mountains, of which Scafell pike (3,210 ft.) is the chief. These combine to form a series of distinctive landscapes varying from the wild mountain scenery round Wastwater to the attractive peacefulness of that round such lakes as Bassenthn-aite and Esthwaite waters. This diversity of scenic types lies within a circle of 30 mi. in diameter centring on Easedale tarn near Grasmere. It consists of ridges and dales radiating from the central mountains. There are as a result few easy "through" routes, although the largest town, Keswick, on Derwentwater, lies at the crossing of a T where an east-\vest route across the north of the district (from Penrith in the Eden valley to Cockermouth and the Irish sea) joins a route going south to Windermere and Kendal over a low pass, Dunmail Raise (780 ft.). The district is best appreciated by using road transport to go up the dales and then by walking. The short distances between one valley and the next over the hills. the numerous good ridge walks and the varied scenery to be encountered in a single day. make the district especially attractive to walkers. who can reach the summits of all the lsrger hills with reasonable care against bad weather or mist. There is also good rock climbing. particularly from Wasdale head. As in most British hill districts, the rainfall is at times heavy and averages more than 100 in. a year in the central mountains.

The diversity of landscape is partly due to geological structure and partly to historical influences. The structure is basically a dome; the central mountains are the hard lavas and volcanic sediments of the Borrowdale series (Ordovician), outcropping in numerous bold crags and forming most of the principal summits. Scafell pike (3,210 ft.), Scafell (3,162 ft.), Great Gable (2,949 ft.) and Helvellyn (3,118 ft.) farther east, as well as the striking but smaller Langdale pikes. To the north of these lie rather softer sedimentary rocks. slates and grits, culminatirig in Skiddaw (3,053 ft.) and Saddleback (2,847 ft.) and generally giving more conical or rounded hills. The resulting scenic contrasts are well illustrated on going south toward the head of Ullswater or on comparing the surroundings of Bassenthwaite water with the head of Derwentwater and Borrowdale in the same drainage system or with Wastwater farther west. The southern lakes. Windermere, Esthwaite water and Coniston water, lie mainly on the Bannisdale slates and grits. softer rocks giving much lower and more rounded hills, their outlines often still further softened by layers of glacial drift. Their pleasant pastoral or wooded shores contrast effectively with the mountains around the heads of the lakes and are strikingly different from the wild scenery of the western lakes, Wastwater and Ennerdale water. Much of the recent moulding of the district is due to the ice sheets of the glacial periods terminating some 10.000 years ago. The lakes themselves generally lie in glacial rock basins. deepest toward the dale-head and with steep more or less parallel valley sides; *e.g.*, Wastwater and Coniston water. The characteristic points (*ees*) on Esthwaite water and some of the islands in Derwentwater are ground moraines although most of the material eroded by ice was deposited outside the Lake district. By deepening the existing main lines of water movement the ice sheet also left many lateral hanging valleys, from which the streams often emerge as attractive waterfalls; *e.g.*, Lodore, Dungeon gill and Piers gill. These should be visited after rain as the runoff is rapid.

Historically the district was for long isolated from the south and east by Windermere, the Shap moorlands and the great peat bogs (now drained) of the Kent and Winster valleys. The district was originally wooded to 2,000 ft. A series of stone circles, *e.g.*, Swinside in the Duddon valley and Castleriggs near Keswick, record the presence of Neolithic man. Later, the district was part of the northwest frontier of the Roman world. A strategic road ran along High street (2,718 ft.) to Penrith and the Great Wall, with a lateral route over the Wrynose (1,270 ft.) and Hardknott passes to a naval base at Ravenglass. The main period of forest clearance followed the Norse invasions of the 10th century. These occupied and cleared the valleys, as is shown by the characteristic place names: *thwaite*, a clearing; *satter* = *saeter*, a summer holding; *grise-* or *swin*-dale, where pigs ran through the remaining woods. *Fell*, the local name for a hill, derives from the Norse *fjeld*. The district early came under the sway of the great Cistercian abbeys, Furness and Byland, and was exploited for wool production while the remaining woods were used to provide charcoal for smelting, at first of iron ore carried in on pack animals, later of lead and copper. Thus by Elizabethan times the native forests had almost disappeared. The measures enjoined by the crown at that time apparently preserved large areas of woodland for charcoal production, a local industry which continued into the 20th century when the product was also used for making gunpowder and the small timber for cotton bobbins. Ore smelting diminished when lead and copper mining became uneconomic after the 1870s, the labour being diverted into slate and building-stone quarries.

The typical Lake district. scene thus remained from Tudor times, meadows along the lake or stream sides yielding winter keep for stock, oakwoods along the steeper valley sides and extensive sheepwalks over the "fells" above. The advent of \\-ealthy rcsidcnts in the early 19th century led to the development of amenity woodlands and much landscape planting as well as to the growth of a literary and artistic society.

The Lake district became a national park in 1951. Greatly increased motor traffic raised the problem of how to reconcile increasing numbers of visitors and facilities for tourists with the modes of life and rural industries which originally gave the district its character. The development of modern large-scale for-

estry and the increasing need for water in industry make additional demands on the district which have not always been easily reconciled with the existing amenities. (W. H. PL.)

Literary Associations.— The Lake district first caught the notice of English readers in the work of two early travellers. Celia Fiennes (1698) and Daniel Defoe (1724), but it was two later travellers, Thomas Gray (1769) and William Gilpin (1772), who were able first to rouse wide interest in the area. The work of all four of these, together with that of other visitors, including Thomas Pennant (1769 and 1772) and Anne Radcliffe (1794), has an honourable place in the literature of travel.

It was William Wordsworth, however, who made the Lake district into one of England's most important centres of creative writing. Born at Cockermouth and educated at Hawkshead, he settled at Grasmere in 1799 with his sister Dorothy, and lived either there or at Rydal until his death in 18jo. He is buried, beside his sister and his wife, in Grasmere churchyard, as also is Hartley Coleridge, whose father, S. T. Coleridge, had been attracted to the Lake district in the first place by the presence of the Wordsworths. Coleridge, in his turn, drew thither Robert Southey, who occupied Greta hall, Keswick, from 1803–43. Among those in the early part of the 19th century who settled to at least partial residence were Thomas de Quincey at Grasmere and John Wilson ("Christopher North") at Windermere. Ambleside was the home of Thomas Arnold (of Rugby) at Fox Howe and of Harriet Martineau at "The Knoll": F. W. Faber, the hymn-writer, assisted the vicar of Ambleside during 1837–42. John Ruskin went to Brantwood, on Coniston water, in 1871, remaining there until his death, and among the many literary figures who visited the region were Scott, Lamb, Samuel Rogers, Shelley, Keats, Crabb Robinson, Felicia Hemans, A. H. Clough, Tennyson, Matthew Arnold and Charlotte and Branwell Bronte. In the 20th century two popular novelists made their homes in the district, Hugh Walpole near Keswick and Constance Holme at Kirkby Lonsdale and Milnthorpe. Beatrix Potter lived for many years at High Sawrey near Esthwaite water. (N. C. N.)

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LAKE DRUMMOND CANAL, in the United States, connects Chesapeake bay with Albemarle sound. It was constructed to bring out lumber of the Dismal Swamp and surrounding country. In the War of 1812 it afforded water communication for the transportation of military stores and products. It has seven locks. The canal is 22 mi. long, 70 ft. wide and 9 ft. in depth.

LAKE DWELLINGS, the usual name given in English to what German-speaking archaeologists more comprehensively call *Pfahlbauten,* that is. PILE STRUCTURES. The theory of the *Pfahlbauten* was advanced by the Swiss Ferdinand Keller in the middle years of the 19th century. It states that there were in prehistoric times buildings erected not on firm ground but on platforms supported by piles above the water surface. This theory is founded on the proved existence of remainders of settlements within what is today the margin of lakes, discoveries from the vicinity of the south German, Swiss, French and Italian lakes providing the primary evidence. The large number of well-preserved remains of piles in connection with objects of organic substance served to corroborate Keller's theory; and acquaintanceship with recent pile structures, particularly in the southern Pacific region, was supposed to prove it. It thus became rooted so firmly that for more than 70 years nobody doubted the existence of prehistoric lake dwellings.

Doubts arose, however, as the technique of excavating became more exact. H. Reinerth can be cited as the field archaeologist who first denied the existence of lake dwellings; and O. Paret undertook the fundamental refutation of Keller's theory. The various opinions put forward since then cannot here be evaluated severally: for the Swiss points of view see the article by E. Vogt (1954) cited in the bibliography below; for the Italian, those by R Battaglia (1943) and by E. Ghislanzoni (1955). In all their discussion, however, the material taken into account was restricted to a comparatively small territory, so that the question of settlements on water was dealt with from one angle only, equally relevant evidence from other territories being neglected. While research continued, certainty was nevertheless reached on three points. In the first place, for reasons of method, evidence of recent pile structures outside Europe must not be adduced to prove the existence of prehistoric pile structures, as the geographical conditions of settlement are different in every case. Moreover, the previously current term *Pfahlbaukultur* ("Culture of the Pile Structures, or Lake Dwellings"), based on Keller's theory, has to be rejected as the cultural objects found in connection with the settlements cited to support it turned out to be of various orientations, both chronologically and chorologically. Secondly, research has shonn that there were some settlements on peat bogs and on marshy land adjacent to ordinary settlements on dry ground: the formulation of a new term "bog structure" (*Moorbau*) for such settlements as these facilitated discussion by narrowing the field. Thirdly, it has become clear that every site has to be treated as a separate question. Altogether, the difficulty of judging the question of pile structures can be seen from Vogt's summarizing account: while carefully pointing out the problems, Vogt avoids clearly defining his own position regarding important questions. This accounts for the ready acceptance of the supposedly noncommittal term *Seeufersiedlung* ("lakeshore dwellings'!), through which the primarily technical conception represented by the term *Pfahlbau* ("pile structure") was replaced by one emphasizing geographical position without regard to the different possibilities of structures within the margin of a lake, whether on firm ground, on marshy land or on piles above the water surface. But, whereas the term "lake dwelling" is associated, in English, with Keller's theory, the term "lakeshore dwelling" is devoid of any reference to it: and at the same time the conceptions "bog dwelling" and "lakeshore dwelling" do not admit of comparisons. It would therefore be advisable to discard this new conception from professional terminology and to retain the alternatives of "land dwelling" (*i.e.*, a dwelling on dry ground), "bog dwelling" and "pile-structure dwelling."

It is an established fact that settlements on dry ground generally disfavour absolutely any preservation of organic substances: they preserve, if anything, mere traces of the previous dwellings (postholes, stone foundations, baked clay daub), with no objects other than those made of stone, pottery or metal. Yet the sites on which Keller's theory was founded yielded considerable parts of the house structure itself and were moreover conspicuous for their wealth of wooden implements.

Such wooden objects can only be preserved when, from the moment in which they are deposited in the relic bed, they are subject to conditions excluding the access of air, thus preventing oxidization. As there is not a single important site relevant for the problem of the "pile structures" that shows the conditions of preservation characteristic for land dwellings, we must deduce that the relic beds of these sites were permanently sealed from air by sufficient humidity of the soil. This is not surprising in the case of the bog dwellings proper, but is of great significance in that of so-called lakeshore dwellings, as being by itself enough to show that the relic beds of these sites were deposited in a period when the place of their deposition was by nature humid. As, however, the deposition of relic layers is only possible underneath the level of the settlement (except in the case of ditch dwellings), the level of such settlements must have been situated above the humid layer of deposition. In other words, the relic beds from lakeshore dwellings presuppose a dry level of settlement above the humid level of deposition, which was attainable only by artificial supporting on piles. A humid level of deposition, then piles, then a raised platform of settlement — these three form therefore an architectural and stratigraphical unity, in regard to which it is fundamentally irrelevant nhether the humid level was marshy or the bottom of some stagnant water at the margin of a lake. The only decisive fact is that of the preservation of objects made from

organic substance, which must have been kept more or less hermetically sealed against air from the moment of their deposition. Only the difference in altitude between the two levels, therefore, is essential for the pile structure — never the question as to whether there were water or land pile structures or neither.

This differentiation of levels is confirmed by the only recorded information that we have from the ancient world referring to the problem of pile structures. Herodotus (v, 16) tells us that in the 5th century B.C. dwelling platforms were erected at Lake Prasias in just the same way as has been deduced from prehistoric source material. This statement, though still unverified by evidence from the site, supplies the theoretical base for an approach to prehistoric source material, especially if one takes into account that both the river pile structures of the 5th–3rd centuries B.C. on the Save near Donja Dolina and the slightly older pile structures of Ripač, near Bihač, within the river and inundation margin of the Una in Bosnia were erected in conformity with the passage in Herodotus. Excavations at Donja Dolina made it possible to trace without any doubt the houses and stables arranged in rows on wooden platforms — even with a succession of two inhabited platforms one above the other. Likewise the remains of a platform of wooden boards discovered east of the Lago di Ledro in northern Italy can be interpreted only in this sense, as the platform lies immediately on top of the relic bed, onto which it was forced by the pressure of the layer of peat above it.

Hence it follows that Keller's theory can be accepted as valid in its fundamental principles. But it is no longer possible to interpret in the same way all the sites previously quoted by scholars in this connection; nor is it any longer possible, in view of what has been ascertained since Keller's day about climatic changes in postglacial times, to take the present level of the lake surface as a basis for the height of the artificially constructed level of settlement. More particularly, the postglacial climatic optimum, comprising the whole Neolithic as well as the Bronze Age, is held responsible for an appreciable falling of the lake level (E. Ghislanzoni), while it is argued that the deterioration during the Urnfield period contributed decisively to the abandonment of the settlements on humid ground, followed by an inundation of the layers of depositions. The catastrophic character of the climatic deterioration during and after the Urn-field period must not however be overestimated: it should be borne in mind that investigations into the chronology of the Alpine copper mining have supplied no evidence for a really fundamental deterioration.

It appears, then, that the form of settlement which is characterized by construction on an artificially raised level is common to several periods and consequently to different cultures, belonging no less to the Neolithic period than to the Bronze Ages and occurring also, according to local necessity, throughout the Iron Ages. The reasons for such building could thus have been different on different sites, and no generalization can safely be made about them. Finally, a settlement discovered in an area of humid soil represents in itself only a small fraction of the whole source material available for the study of its particular cultural affinities; and this consideration alone should be enough to make us discard the old generalizing conceptions and treat every cultural phenomenon as historically unique.

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LAKE EYRE, a salt lake or playa of South Australia about 400 mi. N.N.W. of Adelaide. It has a shoreline enclosing about 3,430 sq.mi. Generally dry, it was flooded in 1949–50 but dried again by 1953 (see *Geog. Jour.*, cxix. London. 1953). Under the surface, which is mainly below sea level, salt deposits about 17 in. deep overlie gypseous clay.

LAKELAND, an inland city of south-central Florida. U.S., 32 mi. E. of Tampa, amid the rolling hills and fresh-water lakes of Polk county. It is the shipping centre for the county, which produces a large portion of the pebble phosphate mined in the U.S. and is the centre of the citrus industry of the state. It is the headquarters for the Florida Citrus commission, Florida Citrus Mutual, whose members own most of the state's citrus, the state frost-warning service, the Florida Tangerine co-operative and the Grower's Administrative committee.

Because of its central location, Lakeland also serves as the home of the Florida Federation of Women's clubs, the Florida State Junior Chamber of Commerce, the Florida Life Underwriters association and the United Brotherhood of Carpenters and Joiners of America.

Florida Southern college, a Methodist-related coeducational institution established in 1885, is located in the city. Its campus has the largest concentration in the United States of buildings designed by the internationally famous architect, Frank Lloyd Wright. The city is a popular winter resort and has a well-developed recreational program as well as excellent medical facilities. Lakeland began to develop in 1884, when the Florida Southern railway reached there. It was incorporated as a city in 1885 and has had a council-manager form of government since 1914. For comparative population figures see table in FLORIDA: *Population*. (J. E. Jo.)

LAKE OF THE WOODS, a lake in the southwest of the province of Ontario, Can., bordering west on the province of Manitoba, and south on the state of Minnesota. It is of extremely irregular shape, and contains thousands of islands. Its length is 72 mi., breadth 10 to 50 mi., area 1,485 sq.mi. It lies in the centre of the Laurentian region between Lakes Winnipeg and Superior and collects the waters of many rivers, the chief being Rainy river from the east, draining Rainy lake. By the Winnipeg river on the northeast it discharges into Lake Winnipeg. At its source Winnipeg river is 1,057 ft. above the sea, and drops 347 ft. in its course of 158 mi., supplying hydroelectric power for the city of Winnipeg. The scenery both on and around the lake is exceedingly beautiful, and the islands are largely occupied by summer residences. Kenora, a flourishing town at the source of the Winnipeg river, is the centre of numerous lumber and flour mills.

LAKE PLACID, a village of Essex county in northeastern New York, U.S., about 145 mi. N. of Albany, is located on both Mirror lake and Lake Placid in the Adirondack mountains. It is one of the outstanding resort communities in the eastern United States, having extensively developed the natural resources of the local setting for both summer and winter recreational activities. Adjacent to the village are golf courses, ski centres and towns, bobsled runs and miles of bridle paths and hiking trails. The famous Lake Placid club (private), was founded in 1895 by Melvil Dewey, inventor of the Dewey Decimal system for libraries. The Olympic arena, first used for the 1932 Winter Olympics, provides space for indoor ice skating and convention meetings. Located at an altitude of 1,864 ft., the village lies at the foot of Whiteface mountain (4,872 ft.), and is within a few miles of Mt. Marcy (5,344 ft.), the highest mountain in the state. A rnodern highway

reaches the summit of Whiteface. John Brown, the abolitionist. is buried 3 mi. E. of the village. The village was incorporated in 1900; the resident population in the latter part of the 20th century was about 3.000. (D. E. A.)

LAKE PROVINCE, the northernmost province of Tanganyika, eastern Africa, extends over the southern part of the Lake Victoria depression. Area 37,000 sq.mi.; land area 27.600 sq.mi. Peneplained granites, basement complex and volcanic rocks, overlain in parts by volcanic ash and recent sediments, form a flat or gently undulating landscape between 3.800 and 4,500 ft. which is broken only by lines of hills of banded ironstones and granite tors and rises slowly eastward to more than 5,000 ft. on the Serengeti plains. West of the lake are the Bukobian sandstones and shales and in the northwest the metamorphosed rocks of Karagne, where hilly country, over 5,000 ft., is deeply dissected.

The Kagera river, which is partly navigable, the Mara river and other streams flow into Lake Victoria and thence to the Nile, but 12 mi. from the lake a low watershed separates streams flowing south to the Malagarari river and Lake Tanganyika. Drainage to the Eastern Rift is also separated by a low ill-defined divide on uhich n-ater is sometimes stagnant. Downwarping has drowned the coastline of Lake Victoria forming numerous inlets, the largest of which are Speke gulf and Smith sound.

Most of the province receives a mean annual rainfall of 30–40 in. Rainfall and humidity are everywhere greater near the lake, but easterly winds drive storms away from the east and south toward the wetter west shore, where over 80 in. may fall in a year at Bukoba. The main rainy season is from November to April, mith a short dry season in January and February. Soils are mostly derived from granite. There are African names for a range from the gray and brown loams on the granite hills and slopes to the hardpan soils on the valley margins and the black calcareous clays of the interlacing netnork of *ntbuga* flats, areas of poor drainage occurring south of the lake. Small areas of rain forest occur with moist forest savanna in the west of the province, miombo (*Brachystegia)* vegetation is characteristic south of the lake and *dccacia-Commiphore* steppe farther east. Natural grassland occurs in the *mbugas,* but destruction of trees for cultivation and grazing has modified the natural vegetation, leaving wide rolling grasslands over much of the area. *See* also VICTORIA, LAKE. (J. M KE.)

Population **and** Economy. — The population at the 1937 census was 2,246,225 (including 2,228,485 Africans and 17,740 non-Africans).

Provincial headquarters is at Mwanza on the lake, and mith 19.877 inhabitants in 1957 this was the only town with a population of more than 5,000. The province contains more than one-fourth of Tanganyika's population and, after the Eastern province, the next largest number of non-Africans. The largest tribe, the Sukuma, predominate in the Mwanza. Kwimba and Shinyanga districts and numbered 1,011,800 in 1957. They are agriculturists, whose main economic crop is cotton gronn on the "cultivation steppe," a vast plain studded uith hillocks of granite. The Haya, who live in the Bukoba district west of Lake Victoria. are the fourth largest trihe in the country, numbering 320,900 in 1957. They. too, are agriculturists, but their economy is diiferent, being based on bananas as the staple food crop (unlike the Sukuma's maize [corn] and millet), and coffee is the main economic crop. The coffee plant was brought by tribal leaders nhen they emigrated, in the distant past, from lands in the far north and the variety grown is mostly *C. robusta,* not *C. arabica.* Other tribes are the Jita (86,393), Kuria (82,600), Luo (78,800) and Kwaya (41,100) in the Musoma and North Mara districts, the Nyamwezi (70,300) mostly in Shinyanga, the Hangaza (59,700) in the Ngara, the Subi (55,500), Zinza' (52,800) and Rongo (49,200) in Geita and Biharamulo.

Peanuts, rice, sesame, tobacco, sorghum and sunflower are also grown. There are large co-operative organizations for the cultivation, processing and marketing of coffee, cotton and tobacco, and a number of rice mills and sawmills. Clarified butter is a product of some importance. The annual sale of cattle, sheep and goats amounts to about £1,000,000 ($2,800,000), and there is a considerable trade in hides and skins. Parts of the province are tsetse-infested. In the east, the boundary encloses a large portion of the Serengeti plains, where the poaching of game is a serious problem.

The famous Williamson diamond mine, potentially one of the richest in the world, is in the Shinyanga district. Geita gold mine, in the district of that name, is the largest in eastern Africa. There are other gold mines in Geita, Musoma and North Mara districts and tin mines in Karagwe district (formerly the northwestern portion of Bukoba). Copper, wolfram and diatomite also occur. (J. P. MT.)

LAKEWOOD, a city of Cuyahoga county in northeastern Ohio, U.S., adjacent to Cleveland (*q.v.*) on the west and a part of the Cleveland standard metropolitan statistical area. Pop. (1960) 66,154; for comparative population figures *see* table in OHIO: *Population.* Its population density of more than 12,000 per square mile is one of the highest in the state. Lakewood is a residential suburb of Cleveland. Its industrial activity is confined to a small area and includes among its products conveying equipment, tools and dies, hardware, boxes, molds, carbon products, cosmetics and plastics.

In the early years of settlement of the western reserve, the area that was to become Lakewood was under the jurisdiction first of Trumbull and later of Cuyahoga county. The organization of the hamlet of Lakewood in 1889 aas quickly folloned by its incorporation as a village in 1903 and full city status in 1911. The name originated because of the wooded areas along the shore of Lake Erie. (W. G. K.)

LAKHIMPUR, a district in the east of Assam, India. Area 4.927 sq mi.; pop. (1951) 1.078.157. It is bis'ected by the Brahmaputra. nhich flows through it from northeast to southwest. The Brahmaputra is navigable for steamers in all seasons as far as Dibrugarh; its navigable tributaries within the district are the Subansiri, Dibru and Buri Dihing. Dibrugarh (37,991), the district headquarters, is at the terminus of a branch of the North-Eastern railway, 210 mi. N.E. of Gauhati. There are an undergraduate college and the medical college of Gauhati university. The most important of the tribes on the district's eastern border are the Miris, Abors, Mishmis, Khamtis, Kachins and Nagas. There are two subdivisions: Dibrugarh, which contains most of the tea gardens in the district and the majority of the coal mines and oil wells working in the state; and North Lakhimpur, where the land lies at a lower level and is not so suitable for tea. The tea gardens employ more than 170.000 persons. The Makum coal field lies within the district; more than 450,000 tons are raised annually at the mines near Margherita. The coal is geologically of recent origin (Tertiary) and is mainly used by the tea gardens and the railnays. Oil is also found in the Makum field and refined at Digboi (pop. 23,691). There are sawmills to provide lumber for the manufacture of tea chests. Reserved forests cover 627 sq.mi. (1955). LAKHIMPUR is also the name of the largest municipality (pop, 1951. 25,055) of Kheri district (*q.v.*), Uttar Pradesh.

LAKSHMI (Skt. *laksha,* "prize" at dicing; *lakshana,* "brand" on cattle). In the Epic Hindu mythology, Shri ("Fortune") Lakshmi, who rose from the milk-ocean clad in white and for whom gods and demons contended, is Damodara's (Vishnu's) wife, norshipped as goddess of prosperity, beauty and love. She is also described as wife of Dharma. She has many later titles; *e.g., Padma,* "lotus." *Padmalaya,* "lotus-dwelling," and *Jaladhija,* "water-born"; and Kubera. She is depicted as golden in colour.

LALANDE, JOSEPH JÉRÔME LEFRANÇAIS DE (1732–1807), French astronomer, was born at Bourg, on July 11, 1732. His parents sent him to Paris to study law; but the accident of lodging in the Hôtel Cluny, where J. N. Delisle had his observatory, drew him to astronomy, and he became the zealous and favoured pupil of both Delisle and Lemonnier. He completed his legal studies, and then went to Berlin to make observations on the lunar parallax in concert with those of N. L. Lacaille at the Cape of Good Hope. The successful execution of his task procured for him, before he was 21, admission to the Academy of Berlin, and the post of adjunct astronomer to that of Paris. He now devoted himself to the improvement of the planetary theory, publishing in 1759 a corrected edition of Halley's tables, with a

history of the celebrated comet whose return in that year he had aided Clairault to calculate. In 1762 J. N. Delisle resigned in his favour the chair of astronomy in the Collège de France. the duties of nhich were discharged by Lalande for 46 years. His house became an astronomical seminary, and among his pupils were J. B. J. Delambre, G. Piazzi, P. Mechain and his own nephew Michel Lalande. His planetary tables were the best available up to the end of the 18th century, and by his publications in connection with the transit of 1769 he won great fame. He is best known, however, as a popularizer of astronomy. The Lalande prize. instituted by him in 1802 for the chief astronomical performance of each year. still testifies to his enthusiasm for his favourite pursuit. Lalande died on April 4. 1807.

Among his voluminous works are *Trait4 d'astronomie* (2 vol., 1764; enlarged edition, 4 vol., 1771–81; 3rd ed., 3 vol., 1792); *Histoire céleste française* (1801), giving the places of 50,000 stars; *Bibliographie astronomique* (1803), with a history of astronomy from 1781 to 1802; *Astronomie des dames* (1785); *Abrégé de navigatiorz* (1793); *Voyage d'un françois en Italie* (1769), a valuable record of his travels in 1765–66. He communicated papers to the Paris Academy of Sciences, edited the *Connoissance des temps* (1759–74), and (1794–1807) wrote the concluding 2 vol. of the 2nd ed. of Montucla's *Histoire des mathématiques* (1802).

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LALIBELA (ROHA-LALIBELA), a small town in the Lasta district of Wollo province. Ethiopia, 35 mi. N.W. of Waldia (3–4 days over rough country by mule). Roha, for some 300 years the capital of the Zagwe dynasty whose most important monarch was Lalibela (1181–1221), is now inhabited by more than 1,000 Coptic priests attached to the 11 ancient rock churches. One group of these churches: surrounded by a trench 36 ft. deep in the red volcanic tuff which isolates a small hill, includes Beit (house of) Emmanuel, Beit Mercurios, Abba Libanos and Gabriel-Rufael. All of them are carved from the solid rock of the hill. The second group, also with a deep trench surrounding it, includes Beit Golgotha-Mikael, Beit Marcam and Medhane Alem ("The Saviour of the Ji'orld"). The last is 109 ft. long and 35 ft. deep in the rock, roof level with the ground and is the largest and most impressive. Beit Giorgis, cruciform in shape, is carved from a sloping rock terrace a short distance to the west. Beit Emmanuel, Beit Mariam and Medhane Xlem are completely isolated from the surrounding rock; the others are tunneled into the rock, having the front elevation open to the trenches. The date of these structures is uncertain; they have Xxumite elements in construction as well as later decorative features, and work may well have begun before the Christian era.

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(G. C. L.)

LA LIBERTAD, a department and port of the small Central American republic of El Salvador. The department of La Libertad extends from the Pacific ocean across a volcanic mountain zone to Lempa valley. Area. 642 sq.mi. Population (1950) 144,004. The department ranks first in the country in production of beans, second in sugar and coffee and third in fruits, vegetables and corn.

The coastal plain supplies 41% of the national output of balsam, important for medicinal preparations. Industries include sugar, alcohol, leather, woodworking: textiles and food processing.

La Libertad (population 2,841 in 1950), an open roadstead port, 24 mi. S. of San Salvador by modern highway, handles nearly one-third of the nation's foreign commerce, and its beautiful beaches are a popular seaside resort. (C. F. J.)

LA LINEA or LA LINEA DE LA CONCEPCION, a town of Spain, in the province of Cadiz, between Gibraltar and San Roque. Pop. (1950) 54,720 (mun.). La Linea, which derives its name from the *line* or boundary dividing Spanish territory from the district of Gibraltar, is a town of modern date and was formerly looked upon as a suburb of San Roque. It is now a distinct frontier post and headquarters of the Spanish commandant of the lines of Gibraltar. The fortifications erected there in the 16th century were dismantled by the British in 1810, to prevent the landing of French invaders.

LALIQUE, RENÉ (1860–1945), French jeweler and glassmaker. was born at Ay (Marne) on April 6, 1860, and died in Paris on May 5, 1945. His brooches and combs in *art nouveau* style attracted great attention at the Paris international exhibition in 1900. In 1908 he acquired his own glass factory. Stimulated by an order for perfume bottles, he developed that style of molded glass which is generally associated with his name; it is characterized by iced surfaces; elaborate: partly realistic, patterns in relief and occasionally applied or inlaid colour. Used for luxury articles, Lalique glass was the height of fashion during the 1920s and continued to be made in quantity until World War II. (A. B. Po.)

LALLY, THOMAS ARTHUR, COMTE DE, Baron de Tollendal (1702–1766), French general. was born at Romans (Drôme), on Jan. 1, 1702, being the son of Sir Gerard O'Lally, an Irish Jacobite who married a French lady of noble family, from whom the son inherited his titles. Entering the French army in 1721 he served in the war of 1734 against Austria; he was present at Dettingen (1743), and commanded the regiment de Lally in the famous Irish brigade at Foutenoy (May 1745). He was made a brigadier on the field by Louis XV. He had previously been mixed up in several Jacobite plots, and in 1745 accompanied Charles Edward to Scotland, serving as aide-de-camp at the battle of Falkirk (January 1746). Escaping to France, he served with Marshal Saxe in the Low Countries, and at the capture of Rlaestricht (1748) was made a *maréchal de camp.* When war broke out with England in 1756 Lally was given the command of a French expedition to India. He reached Pondicherry in April 1758, and at the outset met with some trifling military success. He was a man of courage and a capable general; but his pride and ferocity made him disliked by his officers and hated by his soldiers, while he regarded the natives as slaves, despised their assistance. and trampled on their traditions of caste. In consequence everything went wrong with him.

He was unsuccessful in an attack on Tanjore, and had to retire from the siege of Madras (1758) owing to the timely arrival of the British fleet. He was defeated by Sir Eyre Coote at Wandiwash (1760), and besieged in Pondicherry and forced to capitulate (1761). He was sent as a prisoner of war to England. While in London, he heard that he was accused in France of treachery, and insisted, against advice, on returning on parole to stand his trial. He was kept prisoner for nearly two years before the trial began; then, after many painful delays, he was sentenced to death (blay 6, 1766), and three days later beheaded.

BIBLIOGRAPHY.—G. B. Malleson, *The Career of Count Lally* (1865); "Z's" (the marquis de Lally-Tollendal) article in the *Biographie Michaud;* and Voltaire's *Oeuvres complètes.* The legal documents are preserved in the Bibliothèque Nationale.

LALLY-TOLLENDAL, TROPHIME GÉRARD, MARQUIS DE (1751–1830), was born at Paris on March 5. 1751. He was the legitimized son of the comte de Lally (*see* LALLY, THOMAS ARTHUR, COMTE DE), and only discovered the secret of his birth on the day of his father's execution, when he began a long series of vain efforts to secure the rehabilitation of his parent's memory. Elected a deputy to the states-general for the noblesse of Paris, in 1789 Lally-Tollendal played some part in the early stages of the Revolution, but threw himself into opposition to the "tyranny" of Mirabeau. and condemned the epidemic of renunciation which in the session of Xug. 4, 1789, destroyed the traditional institutions of France. Later in the year he emigrated to England. During the trial of Louis XVI by the National convention (1793) he offered to defend the king, but was not allowed to return to France. He did not return till the time of the consulate. Louis XVIII created him a peer of France, and in 1816 he became a member of the French Academy. From that time until his death, on March 11, 1830, he devoted himself to philanthropic work, especially prison reform.

BIBLIOGRAPHY.—T. G. Lally-Tollendal, *Plaidoyer pour Louis XVI* (1793); he was also in part responsible for the *Mémoires,* attributed

to Joseph Weber, concerning Marie Antoinette (1804); *see* also Arnault, *Discours prononcé aux funerailles de M. le marquis de Lally-Tollendal le 13 mars 1630;* G. de Brecy, *Nécrologie de M. le marquis de Lally-Tollendal* (undated); Voltaire, *Oeuvres complètes* (1889), in which *see* the analytical table of contents, vol. ii.

LALO, (VICTOR ANTOINE) ÉDOUARD (1823–1892). French composer who helped found the 19th-century school of French chamber music. and who is known for the clarity of his orchestration. Born at Lille. Jan. 27, 1823, of a military family of Spanish origin, he went to Paris in 1839 where he studied the violin with François Habeneck at the conservatory. He published his first songs in 1848. In 1855 he joined the Armingaud quartet as viola player. His chamber works, which show an affinity with Weber and Schumann, include three trios and two piano and violin sonatas. His opera *Fiesque* (1866) was not performed. but he won success with his *Syntphonie espagnole* for violin and orchestra, first performed by Pablo de Sarasate in 1875. In this, in his cello concerto (1876) and in the ballet. *Namouna* (1882) he showed his gift for orchestration in the clarity of his texture, his imaginative use of wood wind and in his characteristic fanfare effects on the brass. *Namouna,* which reacted against the ballet traditions of Adolphe Adam and A. L. Minkus. was a precursor of the early ballets of Diaghilev in that it claimed attention more for its musical score than for its choreography. In 1837 Lalo produced his Symphony in G minor. and in the following year the second version of his opera. *Le Roi d'Ys.* (He had destroyed the first version because it mas too reminiscent of \1'agner.) *Le Roi d'Ys* resembles the operas of Weber in its development of the main themes in the dramatic overture.

Lalo died in Paris. April 22. 1892. leaving unfinished the opera *La Jacquerie,* which was completed by Arthur Coquard and produced in 1895. His son. Pierre Lalo (1866–1943), was music critic of *Le Temps* and the *Journal des Débats.*

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LA MADDALENA, an island 2½ mi. from the northeast coast of Sardinia. Pop. (1951) 10,175. Napoleon bombarded it in 1793 without success, and Nelson made it his headquarters for some time. An important naval station of the Italian fleet, it was bombed by the Allies in World War II. A bridge and an embankment connect it with Caprera.

LAMAISM: *see* TIBETAN BUDDHISM.

LAMAR, LUCIUS QUINTUS CINCINNATUS (1825–1893). U.S. statesman and supreme court justice, was born in Putnam county. Ga., Sept. 17, 1825. His father. Lucius Q. C. Lamar (1797–1834), a judge of the superior court of Georgia. was the compiler of the *Laws* of *Georgia From 1810 to 1819* (1821). In 1845 young Lamar graduated from Emory college, Oxford, Ga., and in 1847 was admitted to the bar. In 1850–52 he was adjunct professor of mathematics at the Cniversity of Mississippi. In 1852 he moved to Covington, Ga.. to practise law, and in 1853 was elected a member of the Georgia house of representatives. In 1355 he returned to hfississippi and in 1857 became a member of the U.S. house of representatives. where he served until Dec. 1860. He was elected to the "secession" convention of hlississippi and drafted for it the Mississippi ordinance of secession. He was appointed a lieutenant colonel in the Confederate army in the spring of 1861 and a colonel in May 1862, but in October he resigned from the army. In Nov. 1862 Pres. Jefferson Davis appointed him special commissioner of the Confederacy to Russia; but hc did not proceed farther than Paris before his mission was terminated by the refusal of the Confederate senate to confirm his appointment.

From 1873 to 1877 Lamar was again a Democratic representative in congress; from 1877 to 1885 he was a U.S. senator; from 1885 to Jan. 1888 he was secretary of the interior; and from 1888 until his death at Macon, Ga., on Jan. 23, 1893, he was an associate justice of the supreme court of the United States.

While Lamar is perhaps chiefly remembered for his service in the senate and for the part he took after the American Civil War in helping to effect a reconciliation between the North and the South, he was probably best fitted by temperament and training for a distinguished judicial career. as evidenced by his famous dissenting opinion in the Neagle case and other of his opinions. Ill health and the shortness of his period of service on the bench, however, prevented him from realizing his full potential as a judge.

See Edward Mayes, *Lucius* Q. *C. Lamar: His Life, Times and Speeches* (1896); Wirt Armistead Catc, *Lucius* Q. C. *Lamar: Secession and Reunion* (1935). (W. A. Ca.)

LAMARCK, JEAN BAPTISTE PIERRE ANTOINE DE MONET, CHEVALIER DE (1744–1829), French naturalist! best known for his theory of evolution and for his distinction of vertebrate from invertebrate animals, was born at Bazantin, Picardy, on Aug. 1, 1744. While studying medicine in Paris. he became interested in meteorology and in chemical speculations, but especially in botany. In 1778 he published *Flore française,* in which he used and developed dichotomous keys that helped identification by stressing the opposing characters of species. This work won him admission to the Académie des Sciences and attracted the attention of G. Buffon.

With Buffon's assistance he traveled across Europe in 1781 under the title of botanist to the king and on his return wrote the *Dictionnaire de Botanique* and the *Illustrations* de *Genres,* works contributed to the *Encyclopédie Méthodique* (1785). In 1788 Lamarck took up a botanical appointment at the Jardin du Roi, but in 1793 he was made a professor of zoology and called to lecture on the *Insecta* and *Vermes* of Linnaeus, the animals for which he introduced the term Invertebrata. His views on evolution, introduced in his *Système des Animaux sans Vertèbres* (1801) and *Recherches sur l'Organisation des Corps Vivans* (1802), were elaborated in his *Philosophic Zoologiqzie* (1809); and, in spite of impaired sight, he published the *Histoire naturelle de animaux sans vertèbres* (1815–22) with the help. in the last two volumes, of his eldest daughter and of P. A. Latreille (1762–1833). Lamarck died, blind and in great poverty, in Paris on Dec. 18. 1829.

His most important contribution was his detailed investigation of living and fossil Invertebrata. He was the first to distinguish vertebrate from invertebrate animals by the presence of a vertebral column, and among the Invertebrata to found the groups Crustacea, Arachnida and Annelida. In 1785 he pointed out the necessity of natural orders in botany by an attempt at the classification of plants.

The idea, favoured by Buffon before him, that species were not unalterable and that the more complex were developed from preexistent simpler forms was widely propagated by Lamarck. He explained the whole organization of animals and formation of different organs by four laws (introduction to his *Histoire naturelle des animaux sans vertèbres,* 1815):

1. Life by its proper forces tends continually to increase the volume oi every body possessing it and to enlarge its parts, up to a limit which it brings about.
2. The production of a new organ in an animal body results from the super\-ention of a new want continuing to make itself felt and a new movement n-hich this want gives birth to and encourages.
3. The development of organs and their force of action are constantly in ratio to the employment of these organs.
4. All that has been acquired, laid down, or changed in the organization of individuals in the course of their life is conserved by generation and transmitted to the new individuals that proceed from those which have undergone these changes.

The second law is often referred to as Lamarck's hypothesis of the evolution of organs in animals by appetence or longing. although he does not teach that the animal's desires affect its conformation directly, but that altered wants lead to altered habits, which result in the formation of new organs as well as in modification. *(See* LAMARCKISM.) The fourth law expresses the inheritance of acquired characteristics. *See* EVOLUTION; ORGANIC.

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LAMARCKISM. The doctrine often spoken of as Lamarckism is only a part of Lamarck's teaching concerning the transformation of lower into higher forms of life, and probably not the most important part. Lamarck incorporated into his theory of

transformation (organic evolution) a belief that had been current in many lands as long as we have records, written and oral, and that is still ardently adhered to by many animal breeders. In the folklore of primitive peoples there are stories that take for granted that acquired characteristics are inherited. These stories, which now appeal to our sense of humour, would have been forgotten or disregarded long ago by scientists were it not that in every generation new illustrations are continually brought forward. Much of this evidence rests on hearsay. and much of it arises from a succession of events that is merely fortuitous.

Acquired Characteristics. — As used by professional biologists, "inheritance of acquired characteristics" has a precise but limited meaning — one that does not include all that the words. taken literally, might imply *(see* ZOOLOGY: *Inheritance of Acquired Characters).* Actually, all characteristics not present at birth but which develop later in life are acquired; to deny the inheritance of these characteristics would be to deny heredity itself. Thus some confusion has arisen through the technical use of the phrase that is now synonymous nith Lamarckism. Biologists define an acquired characteristic as one that has developed in the course of the life of an individual in the somatic or body cells, usually as a direct response to some external change in the environment or through the use or disuse of a part. The inheritance of such a characteristic means its reappearance in one or more individuals in the next or in succeeding generations. For example, the skin of many Caucasian peoples turns brown on exposure to sunlight. If this acquired characteristic were transmissible, the children from two tanned persons (or even from one of them, perhaps) should have a darker skin than that typical of the white race to which the parents belonged. Whether it is to be expected that the children should be as dark as their sun-tanned parents, or only somewhat darker than the average of the white race, as some Lamarckians suggest, is a matter of choice. There is no evidence that such transmission occurs even though it is evident that the darker-skinned races of man are found in tropical and subtropical parts of the earth. A somewhat different example would be found in the supposed inheritance of a change brought about by the use and disuse of a special organ. The blacksmith's arm (or any other set of muscles) enlarges when used continually against an external resistance, such as the weight of the hammer. If the effect were inherited, his children at birth would have unusually large arms; if not at birth, then when they became adults, even though they had not used their arms excessively. There is no evidence supporting this case. A more subtle illustration is found in the supposed inheritance of an increased dexterity of the hands of a musician through practice; the skill acquired, although causing no visible increase in size of the fingers, might be imagined to be inherited by his children. and they might then be expected to play skillfully on the piano without practice; or if this seems too ridiculous. they might be imagined to learn more rapidly than did one of their parents. Just how the intricate interplay of cerebral sequences that has given the dexterity to the musician's fingers could ever be transferred to the musician's sex cells (spermatozoa), and through them to his children, has never been brought within the range of biological possibilities. It is clear that the case of a musician's children playing the piano exceptionally well might be due to parent and offspring both inheriting unusual musical aptitude, quite apart from practice.

Lamarck recognized several mays in which the environment brings about changes in plants and animals, and it is significant to note that his attention was directed more particularly to the adaptive character of the response, nhich. as Henri Bergson points out, implies the teleological, or purposeful, nature of the result. In plants the response is direct and immediate; *i.e.*, not through the mediation of a central nervous reaction system, since this is absent in plants. In animals the adaptive changes are supposed to be more indirect. According to Lamarck. new needs (*besoins*) arise in animals as a result of a change in the environment. This leads to new types of behaviour involving new uses of pre-existing organs Their use leads to an increase in size or to other methods of functioning. Conversely. the disuse of other parts leads to their decline. It is the resulting material alterations that are inherited.

The examples that Lamarck gives to illustrate his doctrine are illuminating. In animals, as stated above, a new environment calls forth new needs, and the animal seeks to satisfy them by making some effort. Thus new needs engender new habits which modify the parts. The effects are inherited. For example, the giraffe, seeking to browse higher and higher on the leaves of trees on which it feeds, stretches its neck; as a result of this habit, continued for a long time in all the individuals of the species, the giraffe's front limbs and neck have gradually grown longer. Birds that need to rest on the water, *i.e.,* to find their food, spread out their feet when they wish to swim. The skin becomes accustomed to being stretched and forms the web between the toes. The horns of ruminants have resulted from the ruminants' butting their heads together during combats. These naïve examples constitute some of the evidence on which Lamarck rested his theory.

The Influence of **Lamarckism.**—In his *Origin of Species,* Darwin accepted the principle of the inheritance of acquired characteristics as one of the factors contributory to evolution; this endorsement of Lamarckism has resulted in some confusion in terminology. In the Soviet Union, for example, where the inheritance of acquired characteristics is accepted and where it has an official standing, it is presented as a part of the Darwinian theory and is referred to generally as "creative Soviet Darwinism," as distinct from the "reactionary Darwinism" of capitalistic countries. In his later book on *Animals and Plants Under Domestication,* Darwin elaborated his view and proposed a "provisional hypothesis" to explain the transmission. This hypothesis he called pangenesis. Each part of the body is imagined to throw off invisible particles called gemmules, which, getting into the blood stream, are supposed to collect in the germ cells and there combine with like units already present, modifying them in accordance with the changes that have taken place in the peripheral organs from where they came. Thus the next generation arising from the germ cells is a photograph, as it were, of the parent at the particular stage when the germ cells were formed. It is, perhaps, almost needless to point out that this vague conception of the mode of development of the germ cells is totally at variance with modern knowledge concerning the origin of eggs and spermatozoa, which in many cases are present and often developed before the adult stages are reached. The most that might be claimed would be that the units of heredity already present might be modified by late contributions from other parts of the body.

August Weismann's challenge of the entire theory of the transmission of acquired characteristics marks a turning point from the older credulous attitude to the modern demand for more critical evidence. Weismann's challenge, based on a few questionable experiments, can scarcely be regarded as convincing. For example, Weismann cut off the tails of mice for many consecutive generations without creating a tailless type; this he felt was evidence against the theory of inheritance of acquired characteristics. Darwin had, in fact, already pointed out that the loss of a part is not inherited because; he added, the germ material already contains the inherited units for the development of each part. Nevertheless, the admission weakens the argument that organs become rudimentary through disuse. Weismann succeeded in showing the complete inadequacy of much of the evidence generally accepted by Lamarckians in support of their views, and he pointed out that the continuity of the germ plasm suffices to account for the inheritance of the great majority of characteristics common to all individuals of a species without the need of postulating contributions from the body cells.

In more recent times the discussion was carried on by several paleontologists, Alpheus Hyatt. Edward D. Cope and, at one time, Henry F. Osborn *(see* PALAEONTOLOGY: *Theories of Evolution).* In fact, as early as 1833 Sir Charles Lyell had reported Lamarck's views and reprinted them in later editions of his famous *Principles,* treating the evidence, however, with great caution and scepticism. The doctrine has also appealed to some psychologists and popular writers, owing to a fancied resemblance of heredity to memory (Ewald Hering and Samuel Butler. *q.v.*). Others. impressed by the difficulty of explaining co-ordinated reactions and

instincts unless nervous reactions are inherited, have resorted to Lamarck's doctrine. The inheritance of acquired characteristics was also maintained by the English philosopher Herbert Spencer, (*q.v.*).

Experimental Evidence: Pro and Con.—In still more recent times, experimental evidence for and against Lamarckism has come conspicuously to the front on several occasions. This evidence covers a great diversity of subjects and a variety of methods, opening up new possibilities, some of which are far removed from the original contention. One line of evidence goes back to the extraordinary results of Charles E. Brown-Séquard with guinea pigs. He believed that injury—localized or even more general—to one of the parents caused in the offspring epilepsy or deformation and sloughing off of a limb or toes; these effects were, he thought, sometimes transmitted to a few of the descendants. The results have not been confirmed by subsequent work. It became obvious that, unless work of this sort is done with inbred and pedigreed material, any conclusion is venturesome in the extreme; for, unless it can be demonstrated first that some of these peculiarities were not present in the stock from the beginning, the results may be caused by germinal inheritance of recessive characters, or to indirect injury to the germ cells themselves.

Charles C. Guthrie exchanged the ovaries of black and white fowls and concluded that a change was brought about in them, but Charles B. Davenport's later experiments have shown that no such effects are produced. Guthrie's results were probably caused either by impurity in the birds or by regeneration of the original ovary. William E. Castle and J. C. Phillips transplanted the ovaries of a black guinea pig into a white one. When inated to a white male, black offspring resulted.

W. Heslop Harrison has described the appearance of melanic (darkened) forms in the moth *Selenia* after feeding on leaves treated with lead nitrate or manganese sulfate. The evidence points to the conclusion that the treatment brought about the change and that the change was directly on the germ cells. The melanic types that appeared—one a dominant, the others recessive—were shown to give Mendelian inheritance when crossed to the type forms.

Beginning in 1907 Paul Kammerer brought forward case after case supporting the doctrine of the inheritance of acquired characteristics. He studied the effect of coloured surroundings on the skin colour of the spotted salamander (*S. maculosa*). When placed on a yellow background, the young salamander develops a greater amount of yellow colouring as it reaches the adult stage; when on a black background, it develops more black. Offspring from the former develop on a yellow background even more yellow than their parents and on a dark background more yellow than does the ordinary salamander when so treated. Similarly the offspring of artificially produced black salamanders become blacker than did their parents on a black background.

Kammerer's experiments when repeated by others (Secerov, Herbst, von Frisch, Przibram-Dembowski, Boulenger) have shown that the background does affect the relative amount of yellow or of black in an individual, but it has never been shown that the effects are transmitted. Kammerer's claim and the resultant publicity actually helped to bring the Lamarckian doctrine into disrepute. William Bateson (1919–23) questioned the validity of Kammerer's work in a number of papers and demanded that Kammerer allow him to examine the preserved specimens of salamanders and midwife toads (Alytes) that Kammerer claimed had proved that acquired characteristics were inherited. Bateson never saw the specimens, but finally, in 1926, they were examined by G. K. Noble and Hans Przibram, who reported that the preserved salamanders and toads had been doctored with India ink. In a letter to the Communist Academy in Moscow—the same letter in which he announced his impending suicide (Science 64:493, 1926)—Kammerer admitted the facts but denied having any personal knowledge of the fraud. This affair received great publicity, with the very natural result that other claims supporting the inheritance of acquired characteristics were questioned.

The announcement of Pavlov (1923) that a conditioned reflex established in mice is inherited and shows marked advances in each generation was withdrawn by Pavlov as an error. The results as announced were, moreover, in direct contradiction to somewhat similar experiments by Halsey J. Bagg, E. Carleton MacDowell and Emilia Vicari.

An elaborate series of experiments with rats was carried out by the psychologist William McDougall (1927–30). The young rats were given a choice of two escape passages from a tank of water into nhich they nere plunged. One passage was illuminated, and the rat escaping by it received a strong electric shock. The other passagenay was only dimly lighted, and a rat escaping by it did not receive a shock. In time the rats learned to take the less-illuminated passage. The test was brought to an end when each rat made 12 successive escapes by the dim passage. These rats became the parents of another generation, which, in turn, received the same training. McDougall's records show that the time taken by the rats to learn to take the passageway that gave no shock decreased gradually in successive generations; this was a result, he claimed, of the experience of their ancestors. The same experiment nas later repeated by F. A. E. Crew (1932), who found no evidence of improvement in 18 successive generations.

Several biologists have drawn attention to certain similarities betneen the hereditary element, the gene, and virus particles. Both have the property of multiplying indefinitely within living cells. In 1944 Sterling Emerson and A. H. Sturtevant proposed tentatively that antibodies produced against specific cellular antigens might unite with and modify specific genes in chromosomes and thereby be carried to subsequent generations. Critical evidence has not yet been produced to support this interpretation. There is a remote possibility that this line of research might result in a method of securing specific or directed mutations. Such induced hereditary changes, however, would in no nay be instances of the Lamarckian inheritance of acquired characteristics.

There was another class of experiments carried out in later years that has also opened up a wide field for discussion, namely, the direct and indirect effect of the external environment on the germ cells themselves. There are two distinct possibilities involved in the situation: (1) It has been claimed that the same kind of effect produced in the body cells by an external agent may simultaneously affect the germ cells (egg or sperm) in such a way that they produce a new individual showing the same trait (parallel induction). (2) The external agent may produce a change only in the germ cells, which change appears in the individuals of the next generation developing from such germ cells (direct induction). The same effects may then appear in later generations, because the affected germ material itself is handed on.

The first supposition, however plausible it may sound, may rest on a false analogy. The response of the body cells to an external agent is presumably a reaction depending on their specific differentiation. This view is supported by the absence of a similar response in other kinds of organs or tissues. What grounds, then, are there for supposing that the undifferentiated germ cells should be affected specifically but not show their response until the definite organ in question develops? There can be given no rational explanation for such an expectation, which obviously rests on an assumption at variance with what is known to physiology. There is no positive evidence to appeal to in support of this supposition, although there are a few cases which may at first sight seem to come under this heading. For example, Michael F Guyer injected crushed lenses from the eye of a rabbit into fowls, with the intention of producing in the blood of the fowl an antibody to rabbit lens tissue. Later some of the blood of the fowl was injected into a pregnant rabbit. In rare instances one or more of the young rabbits that were born showed abnormalities of some kind in their eyes. From a few of those affected individuals, offspring were produced which sometimes had abnormal eyes, but it was not claimed that the same specific abnormalities always appeared in parent and offspring. Several explanations may be offered. It is knonn that occasionally rabbits are born with defective eyes but the absence of abnormal eyes in the control, unoperated relatives of those used. was supposed to meet this argument. Until the frequency of the occurrence is known, the reply is not entirely adequate. Nevertheless, the facts as re-

ported appear to make it improbable that the connection was accidental. Julian S. Huxley and A. M. Carr-Saunders repeated Guyer's experiments and failed to produce inherited defects in the eyes of the offspring: and other failures in mice and other species have been reported by other workers.

Hermann J. Muller's experiments with *Drosophila* (1927) treated with X-rays, in which defects, and even mutant types of a specific kind, mere produced and inherited, appear to have been due to the direct action of the X-rays on the germ cells. Some of the mutant types thus produced were identical with those which had occurred "spontaneously" in earlier experiments. Radiation, heat and certain chemicals are known to induce gene mutations. The effect is a direct one on the germ cells and not by may of somatic cells.

Finally, the most complete disproof of the inheritance of somatic influence is demonstrated in almost every experiment in genetics. When an individual with a dominant character is mated to one with a recessive character, all the offspring show the dominant character, in some cases in full force, in others less completely. When the hybrid is bred back to the recessive stock, half of the offspring show the dominant character. half the recessive. This is the expected ratio if half the ripe germ cells of the hybrid carry the dominant, half the recessive element. This result could not happen if the bodily characteristics (dominant) of the hybrid produced a sympathetic effect on the germ cells. Furthermore, it is possible to breed continuously from hybrid forms only—a common procedure in certain Mendelian work—yet when after many generations the stock has been tested, the dominant character has never been found to have affected the recessive elements in the germ material. It is surprising that this critical evidence is seldom referred to by the advocates of the inheritance of acquired characteristics. Here, then: in the only field of heredity where we have really scientific evidence, the facts are positive and unquestioned, and contradict thoroughly the claim that the germ cells are affected specifically by the bodily characteristics of the individual.

Persistence of **Lamarckism.**—By the 19jos the inheritance of acquired characteristics had been rejected by most students of heredity, though belief in it persisted in popular and in some literary circles. Indeed, as late as 1955 C. D. Darlington called the belief the "evergreen superstition." Lamarckism seems to be able to last indefinitely on the folklore level, but as a serious scientific hypothesis it has been abandoned. In about 1948 Lamarckism was revived rather violently by the Communist authorities in the U.S.S.R.,and it became a part of the official biology.

In Politics.—Both Karl Marx and Friedrich Engels mere staunch Lamarckians and assumed that this type of inheritance would guarantee the future improvement of the human race. Thus any Soviet biologist who endorsed the doctrine was in a strong tactical position in the socialist competition for status. From 1936 to 1948 a prolonged and bitter scientific controversy raged in the Soviet Union: the final ruling on the dispute was a boon to the communist theoreticians—the Lamarckians were completely victorious. At the famous meeting of the Lenin Agricultural Academy in 1948, the party line in genetics and evolution was drawn, and Lamarckism. as part of the Soviet or Michurinist school, became official. Mendelism mas denounced. and T. D. Lysenko, the proponent of Michurinism, became the dictator of Soviet biology. A number of the communists in western Europe followed the Soviet directives and sought to rehabilitate Lamarckism.

During the next decade the discussions of Lamarckism were political rather than scientific. and a great deal of confusion was naturally introduced into the subject, some of it perhaps intentionally. A number of the published polemics are clearly dishonest. and the situation grew so bad that the American Institute of Biological Sciences had to protest against the widespread misquoting of western biologists (1949). But over and beyond the political misrepresentations. some confusion has always existed in the field because of the ambiguity of the phrase "the inheritance of acquired characteristics."

In Science.—Lamarck had pictured the bodily characteristics. modified by an animal's activities: as being passed on to future generations. Weismann, as stated earlier, showed that in animals the body (soma) and germ cells are separate, that only the germ cells produce the next generation and that, consequently, all such modi·ications in the higher animals have to be transmitted from the soma of one generation to its germ plasm and then on to the soma of the succeeding generation. In the lower unicellular organisms. where there is no separation of soma and germ plasm, Lamarckism, as it is understood in the higher forms, cannot apply. Induced changes in the germ plasm are knonn to be inheritable; thus in bacteria and protozoa we nould expect a number of the modifications that they acquire to be inherited. These induced hereditary alterations are of several different types. It was perhaps inevitable that this kind of inheritance would be cited by some as evidence of the inheritance of acquired characteristics. In the 1950s spectacular advances in the genetics of bacteria and protozoa—the discovery of the importance of deoxyribosenucleic acid(DNA) in the machinery of heredity, and intensification of uork on cytoplasmic inheritance—have made it essential that Lamarckism be understood accurately and precisely.

In a number of papers (1913–34) V. Jollos shoned that environmentally produced changes in *Paramecium* (a "one-celled" animal; see PROTOZOA) could continue through several cell generations even in the absence of the causative agent, but that under certain conditions they nould disappear by stages or even in a single generation. These induced alterations were called *dauermodifikations*. M. Demerec (1948), by subjecting bacteria to several antibiotics, discovered resistant strains that owe their viability to specific gene mutations. Some of the mutants actually became dependent upon the antibiotic that destroyed their nonmutant competitors. If these mutants were produced by the antibiotic itself, this nould approach very closely to directed mutations; however, analyses of similar cases (virus sensitivity and virus resistance in bacteria) by Salvador E. Luria and M. Delbruck (1943) showed that this nas probably not the case Demerec also concluded that in his experiment mutations conferring resistance were present before the treatment. M Cohen (1958) induced changes in the enzyme system of the colon bacillus (*Escherichia coli*) that seemed to last indefinitely (150 cell generations) even though there appeared to have been no change in the nuclear apparatus The work of T. M Sonneborn (1947), John R. Preer (1948, 1950) and others has shonn that changes in the cytoplasm of a protozoan (*Paramecium*) can be transmitted through a number of generations.

The proof of a sexual process in certain bacteria was given by E. L. Tatum and Joshua Lederberg (1947), and the discovery of the role of DNA in the mechanism of heredity has clarified a number of puzzles in the induced and transmissible alterations in bacteria A. D Hershey and R. Rotman (1949) showed that even virus particles which attack bacteria (bacteriophages) can exchange segregate and recombine their hereditary factors and can act as carriers of hereditary material (genes) from one strain of bacteria to another. The fact that characteristics can be shifted from one bacterial strain to another via the bacteriophages—and nithout the usual fusion of gametes that had always been considered the essential of sexual reproduction—has been cited as an instance of the inheritance of acquired characteristics. But no transmission of a purely bodily modification in a higher animal or plant has ever been verified.

The social evolution of man has obviously come about by the transmission of the experience of one generation to the next by means of oral and written instruction. Our thinking has been so saturated with this point of view that it was natural to extend it to the bodily structures and behaviour of lower animals Instincts have. in fact, been sometimes defined as inherited habits, which implies the Lamarckian theory. Experience has shown, however. that it is unwise to apply the evidence from one domain to another where an entirely different set of relations is known to exist.

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LA MARGHERITA, CLEMENTE SOLARO, Count del (1792–1869), Piedmontese statesman, was born at Mondovi. He studied law at Siena and Turin. In 1816 he entered the diplomatic service. Later he returned to Turin and gained the confidence of King Charles Albert, who in 1835 appointed him minister of foreign affairs. When the agitation for constitutional reform broke out, the king dismissed La Margherita. His apologia for his administration, *Memorandum storico-politico* (1851), documents the conditions of Piedmont and Italy at that time. In 1853 he was elected deputy for San Quirico; as leader of the clerical right, he opposed Cavour's policy, and on the establishment of the kingdom of Italy, he retired.

LA MARMORA, ALFONSO FERRERO (1804–1878), Italian general and statesman, was born at Turin on Nov. 18, 1804. He entered the Sardinian army in 1823 and distinguished himself at the siege of Peschiera. He liberated Charles Albert, king of Sardinia, from the Milan revolutionaries on Aug. 5, 1848, and in October was promoted general and appointed minister of war. After suppressing the revolt of Genoa in 1849, he again became minister of war. Having reconstructed the Piedmontese army, he took part in the war of 1859 against Austria and in July of that year succeeded Cavour in the premiership. In 1860 he was sent to Berlin and St. Petersburg to arrange for the recognition of the kingdom of Italy, and subsequently he held the offices of governor of Milan and royal lieutenant at Naples, until, in September 1864, he succeeded Minghetti as premier. He modified the scope of the September convention by a note in which he claimed for Italy full freedom of action in respect of Rome, a document of which Visconti-Venosta afterward took advantage when justifying the Italian occupation of Rome in 1870.

In April 1866 La Marmora concluded an alliance with Prussia against Austria, and, on the outbreak of war in June, took command of an army corps but was defeated at Custozza on June 23. Accused of treason by his fellow countrymen and of duplicity by the Prussians, he eventually published (1873), in defense of his tactics, a series of documents entitled *Un po' più di luce sugli eventi dell' anno 1866.* Meanwhile, he had been sent to Paris in 1867 to oppose the French expedition to Rome and in 1870, after the occupation of Rome by the Italians, had been appointed lieutenant royal of the new capital. He died at Florence on Jan. 5, 1878.

See G. Massari, *Il generale Alfonso La Marmora* (1880).

LAMARTINE, ALPHONSE DE (1790–1869), French poet, statesman and man of letters, was born at Mâcon on Oct. 21, 1790. The eldest of six children, the only son of a noble family, he was brought up mainly in the country, from which the inspiration of his graceful and meditative verse is chiefly derived. At 20 he went to Italy for his health and there fell in love with the Graziella of his verse. He entered the *garde du corps* at the Bourbon restoration, taking refuge during the Hundred Days in Switzerland and at Aix. His first book, *Méditations, poétiques et religieuses,* appeared in 1820, followed by *Nouvelles Méditations* (1823). This philosophic, harmonious verse won the public by its freshness and grace. In 1830 came *Harmonies,* described by its author as an intimate and involuntary revelation of his everyday impressions. The poems were less lyrical and more reflective. *Chute d'un ange* and *Jocelyn* both appeared in 1837 and his last volume of poetry, *Recueillements,* in 1839.

Jocelyn has been compared with *Hermann und Dorothea.* It describes his old friend and tutor, the *abbé* Dumont, and the common things of everyday life in simple language, but the whole is seen with a poet's eyes.

Lamartine was a precursor of the romantic revival. The reviving interest in legitimism and Catholicism as represented by Bonald and Joseph de Maistre, the nature worship of Rousseau and Bernardin de Saint-Pierre, the sentimentalism of Madame de Staël, the medievalism of Chateaubriand and Scott, and the *maladie du siècle* of Chateaubriand and Byron were all at hand. Perhaps it will be found that he added little of his own. But if the parts were like other things, the mixture was not. It seemed to his own generation so original that tradition has it that the *Méditations* were refused by a publisher because they were in none of the accepted styles. The best of them, and the best poem Lamartine ever wrote, is the *Lac,* describing his return to the little mountain tarn of le Bourget after the death of his mistress, with whom he had visited it. The verse is exquisitely harmonious, the sentiments conventional but refined and delicate and the imagery well chosen and gracefully expressed. As a prose writer Lamartine was very fertile. His prose fiction has characteristics not very different from his poetry. He is always and everywhere sentimental, though very frequently, as in his shorter tales, *e.g., The Stone Mason of Saint-Point,* he is graceful as well. His late poetic reputation suffered many changes, but remains greater at home than abroad.

Lamartine took an active part in the administration and politics of his country. He entered the diplomatic service and in 1823 became secretary of the embassy at Naples. In that year he married an Englishwoman of some fortune, Marianne Birch. The years 1824–29 were spent at Florence, and in 1829 he went on a mission to Prince Leopold of Saxe-Coburg. He declined any appointment under the July monarchy and traveled in the near east (1832–34). Elected during his absence to the chamber of deputies, he spoke with increasing frequency and gradually moved to the left. He published *Histoire des Girondins* in 1847. At the February revolution of 1848 he declared for a provisional government and was chosen one of the five members of the executive committee. But he lacked the decision and the force both needed, though his eloquence served to pacify the Parisians. After the fighting in June, his influence disappeared before that of Cavaignac and when he was nominated for the presidency in Jan. 1849, he received a handful of votes. He was not elected to the legislative assembly.

His term of office left him a poor man, and he then wrote continuously for a living. He published a series of "Confidences," wrote many historical and biographical works and in 1860 began to edit his works (41 vol.). His wife died in 1863. At length, in 1867, the government of the empire came to his aid with a vote of £20,000, which he accepted despite the reproaches of his more intransigent friends. He died on Feb. 28, 1869.

Bibliography.—Paul Hazard, *Lamartine* (1925); H. Guillemin, *Lamartine, l'homme et l'oeuvre* (1940); L. Barthou, *Lamartine, orateur* (1916). After Lamartine's death his *Mémoires inédits* were published and two volumes of letters. *See* also C. B. Jussieu de Senevier, *En marge de la vie de Lamartine. Lettres* (1925).

LAMB, **CHARLES** (1775–1834), English essayist and critic, was born in Crown Office Row, Inner Temple, London, on Feb. 10, 1775. His father, John Lamb, a Lincolnshire man, who filled the situation of clerk and servant-companion to Samuel Salt, a member of parliament and one of the benchers of the Inner Temple, was successful in obtaining for Charles, the youngest of three surviving children, a presentation to Christ's hospital, where the boy remained from his eighth to his 1jth year (1782–1789). Here he had for a schoolfellow Samuel Taylor Coleridge, his senior by rather more than two years, and a close and tender friendship began which lasted for the rest of the lives of both. When the time came for leaving school, where he had learned some Greek and acquired considerable facility in Latin composition, Lamb, after a brief stay at home (probably spent, as his school holidays had often been, over old English authors in Salt's library) was condemned to the labours of the desk—"an inconquerable impediment" in his speech disqualifying him for the clerical profession, which, as the school exhibitions were usually only given to those preparing for the church, thus deprived him of the only means by which he could have obtained a university education. For a short time he was in the office of Joseph Paice, a London merchant, and then for 23 weeks, until Feb. 8, 1792, he held a small post in the Examiner's Office of the South Sea House, where his brother John was established, a period which, although his age was but 16, was to provide him nearly 30 years later with materials for the first of the *Essays of Elia.* On April j, 1792, he entered the Accountant's Office in the East India House, where during the next 33 years the 100 official folios of what he used to call his true "works" were produced.

Of the years 1792–1795 we know little. At the end of 1794 he saw much of Coleridge and joined him in writing sonnets in the *Morning Post,* addressed to eminent persons: early in 1795 he met Southey and was much in the company of James White, whom he probably helped in the composition of the *Original Letters of Sir John Falstaff;* and at the end of the year for a short time he became so unhinged mentally as to necessitate confinement in an asylum. The cause, it is probable, was an unsuccessful love affair with Ann Simmons, the Hertfordshire maiden to whom his first sonnets are addressed, whom he would have seen when on his visits as a youth to Blakesware House, near Widford, the country home of the Plumer family, of which Lamb's grandmother, Mary Field, was for many years, until her death in 1792, sole custodian.

It was in the late summer of 1796 that a dreadful calamity came upon the Lambs, which seemed to blight all Lamb's prospects in the very morning of life. On Sept. 22, his sister Mary, "worn down to a state of extreme nervous misery by attention to needlework by day and to her mother at night," was suddenly seized with acute mania, in which she stabbed her mother to the heart. The calm self-mastery and loving self-renunciation which Charles Lamb, by constitution excitable, nervous and self-mistrustful, displayed at this crisis in his own history and in that of those nearest him, will ever give him an imperishable claim to the reverence and affection of all who are capable of appreciating the heroisms of common life. With the help of friends he succeeded in obtaining his sister's release from the life-long restraint to which she would otherwise have been doomed, on the express condition that he himself should undertake the responsibility for her safe-keeping. It proved no light charge: for though no one was capable of affording a more intelligent or affectionate companionship than Mary Lamb during her periods of health, there was ever present the apprehension of the recurrence of her malady; and when from time to time the premonitory symptoms had become unmistakable, there was no alternative but her removal, which took place in quietness and tears. How deeply the whole course of Lamb's domestic life must have been affected by his singular loyalty as a brother needs not to be pointed out.

EARLY WORKS

Lamb's first appearance as an author was made in the year of the great tragedy of his life (1796), when there were published in the volume of *Poems* on *Various Subjects* by Coleridge fsur sonnets by "Mr. Charles Lamb of the India House." In the following year he contributed, with Charles Lloyd, a pupil of Coleridge, some pieces in blank verse to the second edition of Coleridge's *Poems.* In 1797 his short summer holiday was spent with Coleridge at Nether Stowey, where he met the Wordswarths, William and Dorothy, and established a friendship with both which only his own death terminated. In 1798, under the influence of Henry Mackenzie's novel *Julie de Roubigné,* he published a short and pathetic prose tale entitled *Rosamund Gray,* in which it is possible to trace beneath disguised conditions references to the misfortunes of the author's own family, and many personal touches; and in the same year he joined Lloyd in a volume of *Blank Verse,* to which Lamb contributed poems occasioned by the death of his mother and his aunt Sarah Lamb, ainong them being his best-known lyric, "The Old Familiar Faces." In this year, 1798, he achieved the ucexpected publicity of an attack by the *Anti-Jncobin* upon him as an associate of Coleridge and Southey (to whose *Annual Anthology* he had contributed) in their Jacobin machinations. In 1799, on the death of her father, Mary Lamb came to live again with her brother, their home then being in Pentonville; but it was not until 1800 that they really settled together, their first independent joint home being at Mitre Court Buildings in the Temple, where they lived until 1809. At the end of 1801, or beginning of 1802, appeared Lamb's first play, *John Woodvil,* on which he set great store, a slight dramatic piece written in the style of the earlier Elizabethan period and containing some genuine poetry and happy delineation of the gentler emotions, but as a whole deficient in plot, vigour and character; it was held up to ridicule by the *Edinburgh Review* as a specimen of the rudest condition of the drama, a work by "a man of the age of Thespis." The dramatic spirit, however, was not thus easily quenched in Lamb, arid his next effort was a farce, *Mr. H———,* the point of which lay in the hero's anxiety to conceal his name "Hogsflesh"; but it did not survive the first night of its appearance at Drury Lane, in Dec. 1806. Its author bore the failure with rare equanimity and good humour—even to joining in the hissing—and soon struck into new and more successful fields of literary exertion. Before, however, passing to these it should be mentioned that he made various efforts to earn money by journalism, partly by humorous articles, partly as dramatic critic, but chiefly as a contributor of sarcastic or funny paragraphs, "sparing neither man nor woman," in the *Morning Post,* principally in 1803.

In 1807 appeared *Tales founded on the Plays* of *Shakespeare,* written by Charles and Mary Lamb, in which Charles was responsible for tne tragedies and Mary for the comedies; and in 1808, *Specimens of English Dramatic Poets who lived abozrt the time of Shakéspeare,* with short but felicitous critical notes. It was this work which laid the foundation of Lamb's reputation as a critic, for it was filled with imaginative understanding of the old playwrights, and a warm, discerning and novel appreciation of their great merits. In the same year, 1808, Mary Lamb, assisted by her brother, published *Poetry for Children,* and *a* collection of short school-girl tales under the title *Mrs. Leicester's School;* and to the same date belongs *The Adventures of Ulysses,* designed by Lamb as a companion to *The Adventures of Telemachus.* In 1810 began to appear Leigh Hunt's quarterly periodical, *The Reflector,* ic which Lamb published much (including the fine essays on the tragedies of Shakespeare and on Hogarth) that subsequently appeared in the first collected edition of his *Works,* which he put forth in 1818.

Between 1811, when *Tize Reflector* ceased, and 1820, he wrote almost nothing. In these years we may imagine him at his most social period, playing much whist and entertaining his friends on Wednesday or Thursday nights; meanwhile gathering that reputation as a conversationalist or inspirer of conversation in others, which Hazlitt, who was at one time one of Lamb's closest friends, has done so much to celebrate. When in 1818 appeared the *Works* in two volumes, it may be that Lamb considered his literary career over. Eefore coming to 1820, and an event which was in reality to be the beginning of that career as it is generally known—the establishment of the *London Magazine*—*it* should

be recorded that in the summer of 1819 Lamb, with his sister's full consent. proposed marriage to Fanny Kelly, an actress, who was then 30 years of age. Miss Kelly could not accept, giving as one reason her devotion to her mother. Lamb bore the rebuff with characteristic humour and fortitude.

The establishment of the *London Magazine* in 1820 stimulated Lamb to the production of a series of new essays (the *Essays of Elia)* which may be said to form the chief cornerstone in the small but classic temple of his fame. The first of these. as it turned out, was a description of the old South Sea house. with which Lamb happened to have associated the name of a "gay light-hearted foreigner" called Elia. who was a clerk in the days of his service there. The pseudonym adopted on this occasion was retained for the subsequent contributions, which appeared collectively in a volume of essays called *Elia* in 1823. After a career of five years the *London Magazine* came to an end; and about the same period Lamb's long connection with the India house terminated, a pension of £450 (£441 net) having been assigned to him.

The increased leisure, however, for which he had long sighed, did not prove favourable to literary production, which henceforth was limited to a few trifling contributions to the *New Monthly* and other serials, and the excavation of gems from the mass of dramatic literature bequeathed to the British Museum by David Garrick, which Lamb laboriously read through in 1827, an occupation which supplied him for a time with the regular hours of work he missed so much. The malady of his sister, which continued to increase with ever shortening intervals of relief, broke in painfully on his lettered ease and comfort; and it is impossible to ignore the deteriorating effects of an overfree indulgence in the use of alcohol.

His removal on account of his sister to the quiet of the country at Enfield, by tending to withdraw him from the stimulating society of the large circle of literary friends who had helped to make his weekly or monthly "at-homes" so remarkable, doubtless also tended to intensify his listlessness and helplessness. One of the brightest elements in the closing years of his life was the friendship and companionship of Emma Isola, whom he and his sister had adopted, and whose marriage in 1833 to Edward Moxon, a publisher, though a source of unselfish joy to Lamb, left him more than ever alone. While living at Edmonton, whither he had moved in 1833 so that his sister might have the continual care of Mr. and Mrs. Walden, who were accustomed to patients of weak intellect, Lamb was overtaken by an attack of erysipelas brought on by an accidental fall as he was walking on the London road. After a few days' illness he died on Dec. 27, 1834. The sudden death of one so widely known, admired and beloved fell on the public as well as on his own attached circle with all the poignancy of a personal calamity and a private grief. His memory wanted no tribute that affection could bestow, and Wordsworth commemorated in simple and solemn verse the genius, virtues and fraternal devotion of his early friend.

Charles Lamb is entitled to a place as an essayist beside Montaigne, Sir Thomas Browne, Steele and Addison. He unites many of the characteristics of each of these writers — refined and exquisite humour, a genuine and cordial vein of pleasantry and heart-touching pathos. His fancy is distinguished by great delicacy and tenderness; and even his conceits are imbued with human feeling and passion. He had an extreme and almost exclusive partiality for earlier prose writers, particularly for Fuller, Browne and Burton, as well as for the dramatists of Shakespeare's time; and the care with which he studied them is apparent in all he ever wrote. It shines out conspicuously in his style, which has an antique air and is redolent of the peculiarities of the 17th century. Its quaintness has subjected the author to the charge of affectation, but there is nothing really affected in his writings. His style is not so much an imitation as a reflection of the older writers, for in spirit he made himself their contemporary. A confirmed habit of studying them in preference to modern literature had made something of their style natural to him, and long experience had rendered it not only easy and familiar but habitual. It was not a masquerade dress he wore, but the costume which showed the man to most advantage. With thought and meaning often profound, though clothed in simple language, every sentence of his essays is pregnant.

He played a considerable part in reviving the dramatic writers of the Shakespearian age, for he preceded Gifford and others in wiping the dust of ages from their works. In his brief comments on each specimen he displays exquisite powers of discrimination; his discernment of the true meaning of his author is almost infallible. His work was a departure in criticism. Former editors had supplied textual criticism and alternative readings; Lamb's object was to show how our ancestors felt when they placed themselves by the power of imagination in trying situations, in the conflicts of duty or passion or the strife of contending duties; what sorts of loves and enmities theirs were.

As a poet Lamb is not entitled to so high a place as that which can be claimed for him as essayist and critic. His dependence on Elizabethan models here also is manifest, but in such a way as to bring into all the greater prominence his native deficiency in "the accomplishment of verse." Yet it is impossible, once having read, ever to forget the tenderness and grace of such poems as "Hester," "The Old Familiar Faces," and the lines "On an infant dying as soon as born" or the quaint humour of "A Farewell to Tobacco." As a letter writer Lamb ranks very high, and when in his frequent nonsensical mood there is none to touch him. (A. Ai.; E. V. L.)

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LAMB, SIR HORACE (1849–1934), English mathematician who contributed to the field of mathematical physics, was born at Stockport on Nov. 27, 1849. He was educated at Owens and Trinity colleges, Cambridge, where he was second wrangler and second Smith's prizeman. In 1872 he was made a fellow and assistant tutor of Trinity college; in 1875, professor of mathematics in Adelaide university; and in 1885, professor of mathematics in Manchester university, from where he retired in 1920. He became the recognized authority on hydrodynamics, publishing the *Mathematical Theory of the Motion of Fluids* (1878) and *Hydrodynamics* (1895; 6th ed., rev., 1945), the standard work on this subject, to successive editions of which Lamb added results of his further researches. He wrote many papers, principally on applied mathematics, his researches including, besides hydrodynamics. wave propagation, the elastic deformation of plates and shells and electrical induction.

On questions concerning the motions of the air involved by aircraft, he gave valuable assistance to the Aeronautical Research committee. Lamb was made fellow of the Royal society in 1884, and vice-president in 1909 and 1920–22. He was awarded the Royal medal in 1902 for his researches in mathematical physics, and the Copley medal in 1923. He was knighted in 1931.

His other publications include: *Infinitesimal Calculus* (1897; 3rd ed., rev., 1949); *Dynamical Theory of Sound* (1910; 2nd ed., 1925); *Statics: Including Hydrostatics and Elements of the Theory of Elasticity* (1912; 3rd ed., 1929); *Dynamics* (1914; 2nd ed., 1923); and *Higher Mechanics* (1920).

LAMB, WILLIS EUGENE, JR. (1913–), U.S. physicist and joint recipient of the 1955 Nobel prize for physics, was born at Los Angeles, Calif., July 12, 1913, and was educated at the University of California from which he received the Ph.D. degree in 1938. He joined the faculty of Columbia university and worked there in the radiation laboratory during World War II.

In 1947 Lamb and a student, Robert Retherford, observed a small displacement later called the "Lamb shift" of the $2^2S_{\frac{1}{2}}$ energy level in atomic hydrogen from the $2^2P_{\frac{1}{2}}$ level with which it had been supposed to coincide on the basis of the theory of P. A. M. Dirac. These measurements and experiments of P. Kusch,

with whom Lamb shared the Nobel prize, spurred theoretical physicists to examine the effect of the electron on its own radiation field. with the result that a small correction to the magnitude of the electron's magnetic moment was found. The shift predicted theoretically for hydrogen. based upon this correction, is within 0.05% of the measured $1057.77 \pm 0.10 \times 10^6$ cycles/second.

As professor of physics at Stanford university (1951–56), Lamb devised and applied microwave techniques for examining helium excited states of short lifetimes. He was the principal author of an important series of papers in the Physical *Review* on the fine structure of the hydrogen atom. In 1956 he accepted the appointment to the chair of theoretical physics at Oxford university in England. (G. E. PE.)

LAMB, the young of sheep. The Paschal Lamb or Agnus Dei is used as a symbol of Jesus Christ, the Lamb of God (John i, 29), and "lamb," like "flock," is often used figuratively of the members of a Christian church or community, with an allusion to Jesus' charge to Peter (John xxi, 15).

The "lamb and flag" is a heraldic emblem, the dexter foreleg of the lamb supporting a staff bearing a banner charged with the St. George's cross.

LAMBALLE, MARIE THÉRÈSE LOUISE OF SAVOY-CARIGNANO, PRINCESSE DE (1749–1792), fourth daughter of Louis Victor of Carignano (d. 1774), was born at Turin on Sept. 8, 1749. In 1767 she was married to the prince de Lamballe. son of the duke of Penthièvre. Her husband dying the following year, she retired with her father-in-law to Rambouillet until she returned to court on the marriage of the dauphin. Marie Antoinette singled her out for a companion and confidante, and after her accession, in spite of the king's opposition: had her appointed superintendent of the royal household. Between 1776 and 1785 the Comtesse de Polignac succeeded in supplanting her, but when the queen became tired of the avarice of the Polignacs she turned again to Madame de Lamballe. From 178j to the Revolution she was Marie Antoinette's closest friend and the instrument of her caprices. She went with the queen to the Tuileries and as her salon served as a meeting place for the queen and the members of the assembly whom she wished to gain over. the people believed her to be the soul of all the intrigues. After a visit to England in 1791 to appeal for help for the royal family she returned to the Tuileries and shared the queen's imprisonment in the Temple on Aug. 10. On Aug. 19 she was transferred to La Force. and having refused to take the oath against the monarchy, she was on Sept. 3 delivered over to the fury of the populace, after which her head was placed on a pike and carried before the windows of the queen.

See George Bertin, *Madame de Lamballe* (1888); Austin Dobson, *Four Frenchwomen* (1890); B. C. Hardy, *Princesse de Lamballe* (1908); Comte de Lescure, *La Princesse de Lamballe . . . d'après des documents inédits* (1864); some letters of the princess published by Ch. Schmidt in *La Re'volution française,* vol. xxxix. (1900); L. Lambeau, *Essais sur la mort de madanze la princesse de Lamballe* (1902); Sir F. Montefiore, *The Princesse de Lamballe* (1896); Docteur Cabanès, *La Princesse de Lamballe intime d'après les Confidences de son Médicin* (1912). *The Secret Memoirs of the Royal Family of France . . . now first published from the Journal, Letters and Conversations of the Princesse de Lamballe,* 2 vol. (1826) appeared in editions in English and in French. They are attributed to Catherine Hyde, Marchioness Govion-Broglio-Solari, and are apocryphal.

LAMBALLE, a town of northwestern France in the *département* of Côtes-du-Nord, on the Gouessant 13 mi. E.S.E. of St. Brieuc by rail. Pop. (1954) 4.748 The Gothic church of Kotre Dame (13th and 14th centuries) was once the chapel of the castle of the counts ,of Penthièvre, Lamballe being their capital. The church of St. Martin has work of the 11th. 15th and 16th centuries. Lamballe has an important *haras* ("depot for stallions") and carries on trade in grain. tanning and leather dressing. It manufactures wax candles and shoes.

LAMB AND MUTTON. The flesh and carcass of a young sheep is called lamb and that of the mature animal, mutton. Certain breeds of domestic sheep are pre-eminently wool producers, while others produce high-quality flesh. The flesh of sheep is eaten universally, there being no objection to its use on religious grounds. The United Kingdom is the only country in the northern hemisphere consuming any quantity of mutton and lamb — about 22 lb per capita annually. compared with 1 Ib. in the German Federal Republic and 4 Ib. in the United States. The highest consumption is in New Zealand and Australia, where it is 76 lb. and 74 Ib. respectively.

Lamb is an ancient symbol of spring and its flesh is popular at religious festivals. especially the Christian Easter and the Jewish Passover.

Cuts and Cooking. — Lamb lends itself to a wide range of cooking techniques from the elaborate curries of the East Indies to the shish kebabs of the near east. Great Britain's double mutton cutlet with kidney. the mutton and barley broths of Scotland and the barbecues of the U S. The leg is used as a roast or for cutlets. The loins may be used for roasting or chops, uhile a pair of loins (saddle) may be roasted for double cutlets. The rack (ribs), or best end neck, may be roasted whole or cut into chops or prepared for "French chops" by clearing the fat and muscle from the tops of the rib bones and covering the end of the bone with a paper frill (chop holder). The shoulder is normally roasted. The middle neck and scrag are usually stewed but may be braised; the breast is frequently deboned. stuffed and baked or made into patties; the shank usually is stened. (See also FOOD PREPARATION: *Meat.*)

Food Value. — On the basis of 100 g. of raw edible meat, leg of lamb compares very favourably in food energy, mineral and vitamin content with beef (round steak). The higher percentage (usually) of fat in leg of lamb results in a higher caloric value and a lower protein and water percentage (see Table).

Composition of Leg of Lamb and Beef (Round Steak)
(100 g. of raw edible portion)

Component	Lamb	Beef
Water	63.7%	69.0%
Protein	18.0 g.	19.5 g.
Fat	17.5 g.	11.0 g.
Calcium	10.0 mg.	11.0 mg.
Phosphorus	213.0 mg.	180.0 mg.
Iron	2.7 mg.	2.9 mg.
Thiamine	0.16 mg.	0.08 mg.
Riboflavin	0.22 mg.	0.17 mg.
Niacin	5.2 mg.	4.7 mg.
Caloric value (food energy)	235 cal.	182 cal.

Production. — Most sheep are slaughtered for consumption directly from pasture or the open range (with the exception of some milk-fed lambs). There is a considerable export trade in frozen mutton and lamb from New Zealand, Australia and South America. Many million head (chiefly lamb) are fattened each year, particularly in the U.K. and the U.S., by being fed hay, grain, sugar-beet pulp, silage, etc.. to increase weight rapidly and to improve condition. After slaughter, sheep may be round dressed or plain dressed; *i.e.,* the pelt, head. viscera and shanks are removed. With some types of fancy dressing the shanks and head may be left on and with some lambs the caul fat (omentum) may be draped over the carcass. Dressing percentages vary considerably with different breeds and crossbreeds and are greatly influenced by the quantity and the condition of the wool and the intestinal content (fill). The carcass weight in relation to live weight will approximate 50% for good average mutton breeds. Although mutton and lamb are considered to account for only 8% of the total meat output in principal countries exclusive of the far east, it has been estimated that for the world as a whole about 10,000.000 tons of mutton and lamb are consumed annually.

Trade. — In the mid-20th century New Zealand, Australia, Argentina, the U.K., western Europe and the U.S. placed considerable emphasis on meat production in sheep. In the case of Australia, New Zealand and South America, the development of refrigerated transport made possible the export of frozen carcasses. rather than wool, skins and tallow. International trade in frozen mutton and lamb prior to World War II averaged about 350,000 metric tons per year; in the postwar period the average rose to about 440,000 tons. Exports from particular sources vary from year to year but come chiefly from the following countries in the following approximate amounts: New Zealand, 260.000 tons; .Argentina, 100.000 tons; Australia, 60,000 tons; Uruguay,

less than 10,000 tons.

The major importer is the U.K., which receives about 400,000 tons per year, most of it from New Zealand. As the killing season in the southern hemisphere is opposite to that of the U.K., such imports fit conveniently into the U.K. economy.

Grades of Carcasses.—Age is an important factor in carcass grades, although some variation is produced by differences in the rate of maturity; *e.g.*, in down as compared with hill lambs. Small milk lambs are a luxury article: demanding a relatively high price. Many of the smaller lambs (about 32 lb.) are killed at about three to four months. Some lambs may be marketed at 6 to 12 months old, directly from pastures or after special fattening. Yearling mutton is from 12 to about 20 months old. Sex differentiation is less important than in the case of beef, except in the case of breeding stock when the flock consists predominantly of ewes and relatively few rams, tups or bucks (uncastrated mature males). The practice of running on wethers (*i.e.*, putting them out to graze) for two to three years to produce a full-flavoured product was at one time common in Scotland but is now rare.

Conformation, finish. quality and, in many cases, weight may enter into methods of grading. New Zealand has established a high export standard for mutton and lamb carcasses. Conformation relates to the form; *i.e.*, to the proportion of meat to bone. The more valuable cuts—legs, loins, ribs and shoulders—have a high percentage of meat by weight. Conformation is much affected by breeding, age, sex, the plane of nutrition and general environment. Finish. or the quantity, quality and distribution of fat, is somewhat related to breed type but is largely dependent on feed. For satisfactory flavour and possibly tenderness. there must be a certain amount of surface fat, the optimum thickness for modern demands being about $\frac{1}{4}$ in. Quality is related to texture, the colour of the lean meat and the fat, and the colour and porosity of the bone, which indicates the age of the animal. U.S. government grades are prime. choice, good, utility and cull. Only a small percentage of mature mutton carcasses in the U.S. are graded as high as "good." (F. GE.)

LAMBAYEQUE, a coast department of northern Peru, bounded north by Piura, east and south by Cajamarca and Libertad, southwest by the Pacific ocean. Area 8,973 sq.mi.; pop. (1958 est.) 276.547. In the desert coast zone, only irrigated river valleys are cultivated (about 150,000 ac.). Lambayeque is the centre of rice production, grown on small holdings, and second only to Libertad in sugar cane, grown on large estates. Cotton, maize, vegetables and fruits are also cultivated. Cattle are raised in the upper valleys. Five railways connect agricultural areas with the departmental capital (Chiclayo) and ports (Pimentel, Eten). The chief industry of Chiclayo, pop. (1958 est.) 54,390, is rice milling. (P. E. J.)

LAMBEAUX, JEF (JOSEF MARIE THOMAS) (1852–1908), Belgian sculptor, born at Antwerp, studied at the Antwerp Academy of Fine Arts, and was a pupil of Jean Geefs. His first work, "War," was exhibited in 1871, and was followed by a long series of humorous groups. He then went to Paris, where he executed for the Belgian salons "The Beggar" and "The Blind Pauper," and produced "The Kiss" (1881), generally regarded as his masterpiece. Other notable works are his fountain at Antwerp (1886), "The Triumph of Woman," "The Bitten Faun" (which created a great stir at the Exposition Universelle at Liége in 1905), and "The Human Passions," a colossal marble bas-relief, elaborated from a sketch exhibited in 1889. Of his numerous busts may be mentioned those of Hendrik Conscience and of Charles Bals. Brussels burgomaster. He died on June 6, 1908.

LAMBERMONT, AUGUSTE, BARON (1819–1905), Belgian statesman, mas born at Limelette (Brabant) on March 25, 1819. He entered the seminary of Floreffe, but soon left the monastery for Louvain university, where he studied law, and prepared himself for the military examinations. On the outbreak of the Carlist War, Lambermont was entrusted with the command of two small cannon, and he also acted as A.D.C. to Colonel Durando. For his services he was decorated with the cross of the highest military Order of St. Ferdinand. Returning to Belgium, he entered the ministry for foreign affairs in 1842, where he served for 63 years. He was one of the first Belgians to see the importance of developing the trade of their country, and at his own request he was attached to the commercial branch of the foreign office. The tolls imposed by the Dutch on navigation of the Scheldt strangled Belgian trade, for Antwerp was the only port of the country. The Dutch had the right to make the levy under treaties going back to the treaty of bliinster in 1645. They clung to it still more tenaciously after Belgium separated itself in 1830–31 from the united kingdom of the Netherlands—the London conference in 1839 fixing the toll payable to Holland at 1.50 florins (3s.) a sou. From 1856 to 1863 Lambermont devoted himself to the removal of the levy. In 1856 he drew up a plan of action, and prosecuted it with untiring perseverance until he saw it embodied in an international convention at Brussels in 1863, and on July 15 the treaty freeing the Scheldt mas signed. For that achievement Lambermont was made a baron, and a monument was erected by the city of Antwerp to his memory. He died on March 6, 1905.

LAMBERT, DANIEL (1770–1809), an Englishman famous for his great size. was born in Leicester on March 13, 1770, the son of the keeper of the jail, to which post he succeeded *c.* 1791. Though he had led an active and athletic life he weighed in 1793 32 stone (448 Ib.). He died on June 21, 1809, and at the time measured j ft. 11 in. in height and weighed $52\frac{3}{4}$ stone (739 lb.). His waistcoat, now in the Leicester museum, measures 102 in. around the waist. His coffin contained 112 ft. of elm and was built on wheels. His name has been used as a synonym for immensity. , George Meredith describes London as the "Daniel Lambert of cities," and Herbert Spencer used the phrase "a Daniel Lambert of learning." The best portrait of him, a large mezzotint, is preserved at the British museum in D. Lysons' *Collectanea.*

LAMBERT, FRANCIS (c. 1486–1530), Protestant reformer, was the son of a papal official at Avignon. where, at 15, he entered the Franciscan monastery. After 1517 he was an itinerant friar, travelling through France, Italy and Switzerland. His study of the Scriptures shook his faith in Roman Catholic theology and by 1522 he had abandoned his order. He did not, however, identify himself either with Zwinglianism or Lutheranism; he disputed with Zwingli at Zurich in 1522 and then made his way to Eisenach and Wittenberg, where he married in 1523. He returned to Strasbourg in 1524 to preach among the French-speaking population of the neighbourhood. By the Germans he was distrusted and in 1526 his activities were prohibited by the city of Strasbourg. He was befriended by Jacob Sturm. who recommended him to the Landgraf Philip of Hesse, with whose encouragement he drafted his scheme of ecclesiastical reform. Its basis was essentially democratic and congregational, though it provided for the government of the whole church by means of a synod. Pastors were to be elected by the congregation and the whole system of canon law was repudiated. This scheme was far too democratic to commend itself to the Lutherans, who had by this time bound the Lutheran cause to the support of princes rather than to that of the people. Philip abandoned the scheme, but by his influence Lambert was appointed professor and head of the theological faculty in the Landgraf's new university of Marburg. Patrick Hamilton (*q.v.*), the Scottish martyr, was one of his pupils; and it was at Lambert's instigation that Hamilton composed his Loci *communes* or Patrick's Pleas as they were popularly called in Scotland. Lambert took part in 1529 in the conference of Marburg when he definitely adopted the Zwinglian view of the Eucharist.

He died of the plague on April 18, 1530, and was buried at Marburg.

A catalogue of Lamhert's writings is given in Haag's *La France protestante. See* also lives of Lambert by Baum (Strasbourg. 1840); F. W. Hessencamp (Elberfeld, 1860), Stieve (Breslau, 1867) and Louis Ruffet (Paris. 1873); Lorimer, *Life of Patrick Hamilton* (1857); *A. L.* Richter, *Die evangelischen Kirchenordnungen des 16. Jahrh.* (Weimar, 1846); Hessencamp, *Hessische Kirchenordnungen im Zeitalter der Reformation;* Philip of Hesse's *Correspondence with Bucer,* ed. *M.* Lenz; Lindsay, *Hist. Reformation.*

LAMBERT, JOHANN HEINRICH (1728–1777), Swiss-German mathematician, astronomer, physicist and philosopher.

who was an unusually productive scholar with wide interests. was born at Mulhouse. Alsace. on Aug. 26. 1728, the son of a tailor. He was mainly self-educated and early began geometric and astronomical investigations by means of instruments constructed by himself. In 1748 he became tutor to a noble Swiss family in Chur and later for several years accompanied his pupils on European travel. His first paper (1755) was on the theory of heat; then followed publications on pure mathematics, the orbits of comets, map construction and theory of light.

Among his most important works should be mentioned *Pyrometrie* (1779) and *Photometria* (1760). The *Neues Organon* (1763), his principal philosophical work, contains an analysis of a great variety of questions. among them formal logic, probability and the principles of science.

In 1764 he was made a member of the Berlin Academy, and in 1765 *Oberbaurat* (government surveyor), a position which he held until his death on Sept. 27, 1777.

See J. H. Lambert, *Opera Mathematica,* 2 vol. (1946, 1948); M. Steck, *Bibliographia Lambertiana* (1943). (O. Oe.)

LAMBERT, JOHN (1619–1683), English general in the Great Rebellion. was born at Calton Hall. Kirkby Malham, in the West Riding of Yorkshire. where his family had long settled. At the beginning of the civil war he became a captain of horse in the parliamentary army raised in Yorkshire by Lord Fairfax and his son Sir Thomas Fairfax. As a colonel he distinguished himself at a sortie from Hull in Oct. 1643, and in 1644 at the battle of Nantwich, in defense of Bradford, and at the battle of Marston Moor.

When Sir Thomas Fairfax left the north to command the new model army. Lambert was temporarily left in command but in Jan. 1646 was given a foot regiment in the new model and helped subdue the west. During the quarrel between parliament and the army in 1647, he took the side of the soldiers and compiled a statement of their grievances. With Henry Ireton he drew up "The Heads of the Proposals." When the northern forces threw in their lot with the new model and seized their commander, he was sent to restore order, which he achieved by his fairness and modcration.

When the second civil war started in 1648 he was at first successful against the local royalists, but when the Scots invaded England he was forced to retreat before superior numbers. He joined Cromwell and took part in the defeat of the Scots at Preston and in their pursuit. He was still engaged in Yorkshire during the trial of Charles I but gave no sign that he disapproved of it. Because the Scots recognized Charles II, Cromwell crossed the border with Lambert as his second in command. At the battle of Dunbar (Sept. 3. 1650) one account attributes to him hoth the decision to attack the Scots (and not to embark on the fleet) and the tactics adopted. It is certain that he led the cavalry which crushed the Scots' right wing and ensured a decisive victory. When Cromwell was unable to dislodge the Scots near Stirling. he sent Lambert into Fife, where he won the battle of Inverkeithing in July 1651. The threat to their rear caused the Scots to march into England, hotly pursued by Cromwell with Lambert in charge of the cavalry in the van. At the battle of Worcester he again distinguished himself.

He played a leading part in many of the political events from 1652 to 1660. In the former year he expected to be appointed lord deputy of Ireland, hut to his chagrin parliament abolished the position and he declined the less dignified post of commander in chief there. At the time he blamed the parliament and was anxious to help dissolve it, but later he regarded himself as a victim of Cromwell's intrigue with the parliamentary leaders. He eagerly supported Cromwell in ejecting the Long parliament in 1653. sat in the nominated (Praise-God Barebones') parliament and. after its disappearance. was a leading member of the small group of officers who drew up the constitution known as the Instrument of Government. He was then willing that Cromwell should be king and not merely protector. As a member of the council he opposed the expedition to the West Indies which started the war against Spain. but otherwise supported the protector. He was largely responsible for the appointment of the major generals in 1655 and defended them in parliament. When parliament met in the autumn of 1656 he was thought to be the author of the plan to exclude 100 members. He strongly opposed the proposal to make Cromwell king and was suspected of a design to start a mutiny in the army if the proffered dignity was accepted. He declined to smear to be faithful to the protector, whereupon he lost all his commissions. His sudden fall from second in influence to the protector to the status of a private individual was due to his opposition to the new constitution, the Humble Petition and Advice. It increased the protector's power and authorized him to name his successor, thereby decreasing Lambert's importance and depriving him of any hope of the protectorship. He stood for domination by the soldiery. whereas the trend seemed to favour civilian control of the state.

After Oliver Cromwell's death he did not take a prominent part in the army movement which forced Richard Cromwell to resign the protectorship. Afterward he was one of the most important men in England for the rest of 1659. He received back his two regiments but soon lost patience with the restored Long parliament. He quickly subdued Sir George Booth's rising in August but was angered when parliament declined to give him back his former commission as major general. In its turn parliament was irritated by an army petition demanding among other things Lambert's promotion and cashiered Lambert and other officers. Lamhert's reply was to close the doors of parliament. When Gen. George Monk with his forces in Scotland declined to acquiesce in this coup d'état, Lambert headed the army to oppose him. Soon the almost universal dislike of military rule permeated his army and. when threatened in front by Monk's marching southward and in the rear by Fairfax's raising Yorkshire, it dissolved and left its general hopeless. In March 1660 the new council of state committed him to the Tower. He escaped a month later and tried to rally the republicans in order to oppose the return of Charles II. But he was easily recaptured near Daventry and again lodged in the Tower. After the Restoration he was imprisoned until his death in 1683. An able and popular soldier, he was a rash. inconsistent and shortsighted politician. Much of his ambition is said to have been due to his wife, Frances. daughter of Sir William Lister. whom he married in 1639,

Bibliography.—William Harbutt Dawson, *Cromwell's Understudy: General John Lambert* (London. Toronto. 1938); and for background, S. R. Gardiner, *Great Civil War* (London, New York, 1893) and *Commonwealth and Protectorate* (London, 1903); C. H. Firth. *Last Years of the Protectorate* (London, 1909); G. Davies, *The Restoration of Charles II* (San Marino, Calif. 1955). (G. Ds.)

LAMBERT (Nicholson), **JOHN** id. 1538), English Protestant martyr. was born at Norwich and educated at Cambridge. He took orders, but fell under suspicion of heresy and escaped to Antmerp. where he met Frith and Tyndale. He returned to England in 1531, and lived quietly in London teaching Greek and Latin until 1538 when he challenged John Taylor on Roman Catholic doctrine. Archbishop Crannier condemned his opinions. but Henry VIII, to whom Lamhert appealed. heard his case in person (Nov. 16. 1538). As he denied the doctrine of transubstantiation he was condemned by Cromwell. and was burned at the stake at Smithfield on Nov. 22. 1538.

LAMBERT OF HERSFELD (d. *c.* 1088), German chronicler, was probably a Thuringian by birth and became a Benedictine at Hersfeld in 1058. As he was ordained priest at Aschaffenburg. he is sometimes called Lambert of Aschaffenburg or Schafnaburg. His *Annales* for the period from 1040 to their conclusion in 1077 are interesting for the history of Germany and the papacy. Their tone is hostile to Henry IV and friendly to the papacy: their Latin style is excellent. The *Annales* are printed in the *Monumenta Germaniae historica,* vols. iii and v (Hanover and Berlin, 1826 fol.).

Lambert is also regarded as the author of the *Historia Hersfeldensis*, the extant fragments of which are published in Band v of the *Monumenta* of a *Vita Lulli,* Lullus, archbishop of Mainz, being the founder of the abbey of Hersfeld; and of a *Carmen* de *bello Saxonico.* His *Opera* were edited with an introduction by O. Holder-Egger (Hanover. 1894).

See H. Delbrück, *Über die Glaubwürdigkeit Lamberts von Hersfeld*

(Bonn, 1873); A. Eiyenbrodt, *Lampert von Hersjeld und die neuere Quellenforschung* (Cassel, 1896); L. von Ranke, *Zur Kritik frankisch-deutscher Reichsannalisten* (Berlin, 1854); W. Wattenbach, *Deutschlands Geschichtsquellen* Band ii (Berlin, 1906); and A. Potthast, *Bibliotheca Historica* (Berlin, 1896).

LAMBESSA (LAMBÈSE), the ancient Lambaesis, a village of Algeria, in the *arrondissement* and *département* of Batna, 7 mi. S.E. of Batna and 17 mi. W. of Timgad. Pop. (1954) 2,226. The modern village, centre of an agricultural colony founded in 1848, has a great convict establishment (built about 1850). The remains of the Roman town, and more especially of the Roman camp, are among the most interesting ruins in northern Africa. They were preserved by the *Service des Monuments historiques* and excavations resulted in many interesting discoveries. The ruins are situated on the lower terraces of the Jebel Aures. and consist of triumphal arches (one to Septimius Severus, another to Commodus), temples, aqueducts, vestiges of an amphitheatre, baths and an immense quantity of masonry belonging to private houses. To the north and east lie extensive cemeteries with the stones standing in their original alignments; to the west is a similar trea, from which the stones were largely removed for building the modern village. Of the temple of Aesculapius only one column still stood in modern times, though in the middle of the 19th century its façade was entire. The capitol or temple dedicated to Jupiter, Juno and Minerva, which was cleared of debris, has a portico with eight columns.

On level ground about two-third!: of a mile from the centre of the ancient town stands the camp, its site in modern times partly occupied by the penitentiary and its gardens. It measures 1.640 ft. north to south by 1.476 ft. east to west, and in the middle rise the ruins of a building commonly called, but incorrectly. the praetorium, which dates from A.D. 268 (92 ft. long by 66 ft. broad and 49 ft. high), its southern façade has a splendid peristyle half the height of the wall, consisting of a front row of massive Ionic columns and an engaged row of Corinthian pilasters. Behind this building (which was roofed) is a large court giving access to the arsenal and other buildings.

In it were found many thousands of projectiles. To the south-east remains of the baths survived. The ruins of both city and camp yielded many inscriptions (Renier edited 1,500, and there are 4,185 in the *Corpus Inscr. Lat.*, vol. viii); and. though a large proportion are epitaphs of the barest kind, the more important pieces supply an outline of the history of the place.

More than 2.500 inscriptions relating to the camp were deciphered. In a museum in the village were preserved inscriptions and statues and fine mosaics found in 1905 near the arch of Septimius Severus.

Lambaesis was a military foundation. The camp of the third legion (Legio III Augusta), to which it owes its origin, appears to have been established between A.D. 123 and 129, in the time of Hadrian, whose address to his soldiers was found inscribed on a pillar in a second camp to the west of the great camp still extant. By 166 mention is made of the decurions of a *vicus*, 10 curiae of which are known by name; and the *vicus* became a municipium probably at the time when it was made the capital of the newly founded province of Numidia. The legion was removed by Gordianus, but restored by Valerianus and Gallienus; and its final departure did not take place till after 392. The town soon afterward declined. It never became the seat of a bishop, and no Christian inscriptions were found among the ruins.

About 2 mi. S. of Lambessa ruins of Markuna, the ancient Verecunda, including two triumphal arches; survived.

See S. Gsell, *Les Monuments antiques de l'Algérie* (Paris, 1901) and *L'Algérie dans l'antiquité* (Algiers, 1903); L. Renier, *Inscriptions romaines de l'Algérie* (Paris, 1855); Gustav Wilmann, "Die röm. Lagerstadt Afrikas," in *Commentationes phil. in honorem Th. Mommseni* (Berlin, 1877); Sir L. Playfair, *Travels in the Footsteps of Bruce* (London, 1877); A. Graham, *Roman Africa* (London, 1902).

LAMBETH, a metropolitan and parliamentary borough of London, Eng. Pop. (1961) 223,162. Area 6.4 sq.mi. It is the only metropolitan borough extending from the centre of the county to its boundary. In the north it has a common boundary—down the middle of the Thames—with the City of Westminster and the City of London, and in the south extends to Croydon and Penge. The principal districts included in the borough are Kennington and Vauxhall, Brixton and part of Norwood. The street names. Lower Marsh and its continuation The Cut (two of London's best known street markets). are reminders that Lambeth was at one time marshland. In the 17th and early 18th centuries Vauxhall gardens was a fashionable recreation ground. Lambeth was also notorious for drunkenness and crime in the 19th centurv.

Early records present the name *Lamb-hythe* in various forms. The suffix is common along the river in the meaning of a haven, but the prefix is less clear; a Saxon word signifying mud is suggested.

The *Saxon Chronicle* records the death of King Harthacnute at a wedding feast in Lambeth. and Brixton and Kennington are both mentioned in Domesday Book. In Vauxhall is concealed the name of Falkes de Breauté, an unscrupulous adventurer of the time of John and Henry III, exiled in 1225. The manor of Lambeth, given to the bishopric of Rochester in the time of Edward the Confessor, was seized by Harold who lost it to William the Conqueror. His son, Rufus, restored it to the church. In 1197 the see of Rochester completed an exchange of land with the see of Canterbury and in *c.* 1220 the foundations of the present Lambeth palace were laid by Stephen Langton. It became the residence of the archbishops of Canterbury. Lollard's tower, the chapel and Morton's gateway were built during the 15th century. In 1648 the buildings were confiscated and a Commonwealth garrison billeted there; part of the palace being used as a prison for royalists. It was rebuilt after the Restoration. Six archbishops of Canterbury are buried in the nearby parish church of St. Mary rebuilt *c.* 1850. Within the borough are Waterloo station (1848, rebuilt 1922): the Oval cricket ground; the Old Vic theatre (first opened in 1818); the headquarters of the London fire brigade (1937); and, fronting the Thames, County hall, the administrative headquarters of the London County council, during the building of which (begun in 1912) a Roman galley was found in the bed of the Thames; the Royal Festival hall, built in 1951 when the south bank of the Thames was cleared and laid out with gardens, etc.; and St. Thomas's hospital. founded in the 12th century in Southwark, and transferred to Lambeth in 1871. Four road bridges cross the Thames within the borough limits: Waterloo, Westminster, Lambeth and Vauxhall. Doulton house is the headquarters of the Doulton pottery company which worked in Lambeth for four centuries until 1952. In the middle 19jos there was a large influx of West Indian immigrants. The borough returns three members to parliament.

LAMBETH CONFERENCES, an important organ of united Anglican opinion, are gatherings of bishops of the Anglican communion held from time to time at Lambeth palace, the London house of the archbishop of Canterbury, who convenes and presides over them. The first conference was held in 1867 as a result of a request from the Church of England in Canada. The archbishop, C. T. Longley, was careful to explain the limited scope of their deliberations: "We merely purpose to discuss matters of practical interest, and pronounce what we deem expedient in resolutions which may serve as safe guides to future action." He later emphatically stated that it was not proposed "that questions of doctrine should be submitted for interpretation in any iuture Lambeth Conference. . . ." In spite of this cautious approach, only 76 of the 144 bishops of the Anglican communion accepted the invitation. The archbishop of York, among others, declined to attend, and A. P. Stanley, dean of Westminster, refused the use of the abbey for the closing service, because of doubts as to the status and wisdom of the gathering. The first conference lasted only four days; that of 1958 lasted five weeks. Ten years is regarded as the normal interval between conferences. By 1958 the number of bishops had so increased that it was found desirable to limit invitations to diocesan bishops and to certain other bishops who were invited for special reasons: 310 attended.

Lambeth conferences are recognized as indispensable to the life of the Anglican communion; indeed they are the only means of joint consultation for Anglican leaders on a broad scale. The conferences normally issue an encyclical letter and a series of resolutions, and also publish the reports prepared by committees,

on which the resolutions are based. The decisions of the conference have no power over Anglican churches, which must adopt them by synodical or other constitutional means to make them legally binding. But the fact that all diocesan bishops are invited to the conferences gives their decisions great influence.

In the agenda of the conferences a prominent place is given to relations with other Christian churches. Internal Anglican matters naturally also have a regular place, and in 1958 the bishops also considered the role of the Bible, the reconciling of conflicts between and within nations, and the family in contemporary society; in connection with the last subject public attention was attracted by the approval given by the conference to the use of artificial methods of birth control within a Christian outlook on marriage. The conferences have grown steadily in importance and influence. Following a resolution in 1958 a bishop has been appointed as "executive officer" of the Anglican communion to coordinate the work and plans of its various churches. Since 1897 a permanent consultative body exists to advise about preparation of the agenda.

See S. C. Neill, *Anglicanism* (1958). (H. M. W.)

LAMBILLOTTE, LOUIS (1796–1855), Belgian composer, teacher and specialist in Gregorian music, was born at La Hamaide, near Charleroi. Hainault. on March 27, 1796. He was church organist of Charleroi and of Dinan-sur-Meuse, Fr., and in 1820 he became organist and choirmaster at the Jesuit College of Saint-Acheul in Amiens, Fr. After five years of study at the college, he became a Jesuit and subsequently lived in various monasteries.

He was a teacher and musical director at the colleges of Saint-Acheul and Vaugirard (Fr.), Fribourg and Estavayer (Switz.), and Brugelette (Belg.). He composed many works, including French hymns, motets; oratorios, masses and cantatas.

The major portion of his life, Father Lambillotte studied and collected manuscripts on Gregorian music. He tried to restore Gregorian music to its original character, corrupted through the centuries. In Switzerland he found a transcription from one of St. Gregory's writings which recorded the theory and history of the liturgical chant. He completed editions of liturgical chant books and wrote many essays on Gregorian music.

Lambillotte died in Vaugirard, a district of Paris, on Feb. 22, 1855.

He edited *Musée des Organistes*, 2 vol. (1842–44), and wrote *Clef des Mélodies Grégoriennes* (1851).

LAMBINUS, DIONYSIUS, the Latinized name of DENIS LAMBIN (1520–1572), French classical scholar. born at Montreuil-sur-mer in Picardy. He was professor of Latin, and afterward of Greek, in the College de France, and his death (Sept. 1572) is said to have been caused by his apprehension that he might share the fate of his friend Peter Ramus (Pierre de la Ramée), who had been killed in the massacre of St. Bartholomew. Lambinus was one of the greatest scholars of his age, and his editions of classical authors are still useful. In textual criticism he was a conservative. but by no means a slavish one; his chief defect is a vagueness in specifying the sources of his readings. But his commentaries. with their wealth of illustration and parallel passages. are a mine of information, although his countrymen have coined the word *lambiner* to express trifling and diffuseness.

His chief editions are Horace (1561); Lucretius (1564), on which *see* H. A. J. Munro's preface to his edition; Cicero (1566); Cornelius Nepos (1569); Demosthenes (1570), completing the unfinished work of Guillaume Morel; Plautus (1576).

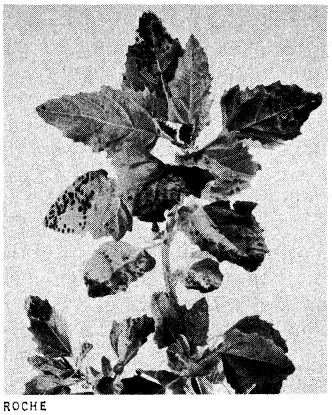
See Peter Lazer, *De Dionysio Lambino narratio*, printed in Orelli's *Onomasticon Tullianum* (i, 1836), and *Trium disertissimorum virorum praefationes ac epistolae familiares aliquot: Mureti, Lambini, Regii* (Paris, 1579); also Sandys, *Hist. of Classical Scholarship* (1908, ii, 188); and A. Horamitz in Ersch and Gruber's *Allgemeine Encyclopädie*.

LAMBOURN, a village in Berkshire, Eng.. 8 mi. N. of Hungerford, in which rural district it lies, and 13 mi. N.W. of Newbury by road. Pop. (1951) 2.684. It lies high up the valley of the Lambourn, a tributary of the Kennet, among the Berkshire downs.

Lambourn was a royal manor bequeathed by Alfred to his widow, and the town received a charter from Canute. The parish church of St. Michael dates from the 12th century but has been greatly restored

A Perpendicular market cross stands in the market place where, when the tonn was called Chipping Lambourn, a weekly market and tno annual fairs were held. Its present prosperity depends on its racehorse training stables, the horses being trained on the Downs.

LAMB'S QUARTERS, one of the names commonly given to the cosmopolitan meed *Chenopodium album*, of the goosefoot family (Chenopodiaceae), growing in moist soil throughout all agricultural regions, except in the extreme north. It is an erect, usually slender, much branched, pale green annual. one to ten feet high. nith somewhat lance-shaped. more or less lobed or toothed leaves, one to four inches long, commonly white-mealy beneath. The numerous small green flowers are borne in dense terminal or axillary clusters.



ROCHE

LAMB'S QUARTERS (CHENOPODIUM ALBUM)

The seeds, which are usually matured in great profusion, are very small, black and some hat glossy. While exceedingly abundant and of rapid growth, this weed is readily controlled in fields in which the growing crop iswfrequently cultivated, and, because of its later germination, does not usually become injurious in fields of growing grain.

The young shoots of this plant are sometimes used as potherb, like spinach.

Lamb's quarters and also *Amaranthus retroflexus* and *A. hybridus*, likewise of wide distribution, are also called pigweed. *See* CHENOPODIUM.

LAMBUTH, WALTER RUSSELL (1854–1921), U.S. missionary and Methodist Episcopal bishop, dedicated his life to medical work in the orient, principally in China. Born in Shanghai on Nov. 10, 1854, he spent his childhood shuttling between China and the U.S. In 187j he was graduated from Emory and Henry college. Washington county. Va.

For two years he studied theology and medicine at Vanderbilt university Nashville, Tenn., and in 1877 he received his medical degree and also was ordained an elder in the Methodist Episcopal Church. South. He worked in the Shanghai area for four years, and later studied in New York city, Edinburgh and London. In 1882 he returned to China and worked at hospitals in Shanghai, Soochow and Peking. From 1886 to 1891 he worked in Kobe, Jap., where he founded a college and theological school.

He edited the *Methodist Review of Missions* for 10 years; in 1910 he was elected a bishop.

Lambuth established other missions in Brazil. Africa and Siberia. He served as a delegate to various world conventions of his church until his death in Yokohama. Jap., on Sept. 26, 1921. He wrote *Side Lights on the Orient; Winning the World for Christ;* and *Medical Missions.*

LAMÉ, GABRIEL (1795–1870), French mathematician, was born at Tours on July 22, 1795, and educated at the Polytechnic school: Paris. He went to Russia as an engineer: returned to France in 1832, and was appointed professor of physics in the Polytechnic school. He contributed many memoirs to *Liouville's Journal*, mostly dealing with theories of elasticity and heat. He solves the problem concerning the equilibrium of temperature in an ellipsoid by introducing functions now known as Lamb's functions *(Liouville's Journal*, 1836). He died in Paris on May 1, 1870.

His works include: *Cours de physique (3* vols., Paris, 1st ed., 1837); *Leçons sur la théorie mathématique de l'élasticité* (1852, 1st ed.); *Les fonctions inverses des transcendantes et les surfaces isothermes* (1857); *Les co-ordonnées curvilignes* (1859); *La théorie analytique de la chaleur* (1861).

LAMECH appears in the genealogy of Gen. iv. 17–24 as a descendant of Cain, in that of Gen. v. as a descendant of Seth. Unsuccessful attempts have been made to identify Lamech with a name in the Babylonian lists of ante-diluvians. According to the story of Gen. iv. Lamech had two wives, Adah and Zillah, that is, "Dawn" and "Shadow." His three sons are Jabal, Jubal and Tubal, such assonances being a regular feature of legendary genealogies. As the story now stands Tubal appears as Tubal-cain, but, as the break away from the assonance suggests, the double name is probably due to an attempt to identify two different figures. To these three brothers are attributed the development of pastoral civilization, music and metal work, respectively. The sister Naamah—the name may be also that of a deity—is probably a later addition to the legend. The song ascribed to Lamech is often called a "sword-song," and is supposed to express Lamech's joy at possessing the new weapon forged by Tubal. but really the song is quite independent of its context. It is a jubilation over the practice of blood-revenge. The way in which the sevenfold revenge of Cain is depreciated is quite unlikely if Cain were an ancestor of Lamech, and mould be much more likely if the Cain referred to were a contemporary. The song may well be based on some actual incident. (W. L. W.)

LAMEGO, a city of northern Portugal 6 mi. by road S. of the river Douro and 42 mi. E. of Oporto. Pop. (1960) 37,620 (mun.). Lamego is an ancient and picturesque city, in the midst of a beautiful mountain region. Its principal buildings are the 14th-century Gothic cathedral, Moorish citadel, Roman baths and a church which occupies the site of a mosque, and, though intrinsically commonplace, is celebrated in Portugal as the seat of the legendary cortes of 1143 or 1144. The principal industries are viticulture and the rearing of swine, mhich furnish the so-called "Lisbon hams." Lamego was captured from the Moors in 1057 by Ferdinand I of Castile and Leon.

LAMELLIBRANCHIA (BIVALVIA), a group of aquatic invertebrate animals the most familiar examples of which are the oyster, mussel and clam. See BIVALVE; CLAM; MUSSEL; OYSTER.

LAMENNAIS, HUGUES FELICITÉ ROBERT DE (1782–1854), French priest and philosophical and political writer, was born at St. Malo, in Brittany, on June 19, 1782. He was the son of a shipowner of St. Malo ennobled by Louis XVI for public services. Of a sickly and sensitive nature, and impressed by the horrors of the French Revolution, his mind was early seized with a morbid view of life. and this temper characterized him throughout all his changes of opinion and circumstance. He was at first inclined toward rationalistic views, but his philosophical and historical studies convinced him that belief was indispensable to action and religion the most powerful leaven of the community. His *Réflexions sur l'état de l'église en France pendant le 18ième siècle et sur sa situation actuelle* (1808) was seized by Napoleon's police as dangerously ideological, with its eager recommendation of religious revival and active clerical organization. It awoke the ultramontane spirit which was to play so great a part in politics.

Lamennais devoted most of 1809 to a translation, in exquisite French, of the *Speculum Monachorum* of Ludovicus Blosius (Louis de Blois) which he entitled *Le Guide spirituel* (1809). In 1811 he received the tonsure and became professor of mathematics in an ecclesiastical college founded by his brother at St. Malo. After the conclusion of the concordat he published, with his brother, *De la tradition de l'église sur l'institution des évêques* (1814). The book was occasioned by the emperor's nomination of Cardinal Maury to the archbishopric of Paris. During the Hundred Days he escaped to London. where he taught French in a school founded by the abbé Jules Carron for French *émigrés;* he also became tutor at the house of Lady Jerningham. In 1815 he returned to Paris, and in 1816 he was ordained priest by the bishop of Rennes.

The first volume of his great work, *Essai sur l'indifférence en matière de religion* (1817; Eng. trans. by Lord Stanley of Alderley, 1898), made him a power in Catholic Europe. Lamennais denounced toleration and advocated a Catholic restoration to belief. The right of private judgment, introduced by Descartes and Leibnitz into philosophy and science; by Luther into religion and by Rousseau and the encyclopaedists into politics and society, had, he contended, terminated in practical atheism and spiritual death. The sole hope of regenerating the European communities lay in the acceptance of ecclesiastical authority. Three more volumes (1818–24) followed. and met with a mixed reception from the Gallican bishops and monarchists, but with the enthusiastic adhesion of the younger clergy. The work received the formal approval of Leo XII. Lamennais visited Rome at the pope's request. and was offered a place in the Sacred College, which he refused. On his return to France he took part in political work and in ultramontane journalism.

He retired to La Chênaie and gathered round him a group of brilliant disciples, including C. de Montalembert, Lacordaire and Maurice de Guérin, his object being to form an organized body of opinion to persuade the French clergy and laity to throw off the yoke of the state connection. He denounced the liberties of the Gallican church. His health broke down and he went to the Pyrenees to recruit. After his recovery from a second dangerous illness, he believed that he had only been dragged back to life to be the instrument of Providence. *Les Progrès de la révolution et de la guerre contre l'église* (1828) marked Lamennais's complete renunciation of royalist principles, and henceforward he dreamed of the advent of a theocratic democracy. He now founded *L'Avenir,* the first number of which appeared on Oct. 16, 1830, with the motto "God and Liberty." The paper combined extreme democratic views on civil questions with a demand for complete liberty for the church from civil domination. With the help of Montalembert, he founded the Agence Générale pour la Défense de la Liberté Religieuse, which noted any violations of religious freedom and reported them to headquarters. The opposition of the conservative bishops checked the success of *L'Avenir,* and Lamennais, blontalembert and Lacordaire resolved to suspend it for a while. They set out for Rome in Nov. 1831 to obtain the approval of Gregory XVI. The "pilgrims of liberty" were received in audience by the pope on condition that the object of their visit was not mentioned. A few days after the audience, Cardinal Pacca advised their departure from Rome and suggested that the Holy See. while admitting the justice of their intentions, would like the matter left open. Lacordaire and Montalembert obeyed; Lamennais remained in Rome, but after the issue of Gregory's letter to the Polish bishops, in mhich the Polish patriots were reproved and the tsar was affirmed to be their lawful sovereign, he "shook the dust of Rome from off his feet." At Munich, in 1832, he received the encyclical *Mirari vos,* condemning his policy; as a result *L'Avenir* ceased and the Agence was dissolved.

Lamennais, with his two lieutenants, submitted, and, deeply wounded. retired to La Chênaie. The famous *Paroles d'un croyant* (1834) marks Lamennais's severance from the church. "A book, small in size, but immense in its perversity," was Gregory's criticism in a new encyclical letter. The work had an extraordinary circulation and was translated into many European languages. Henceforth Lamennais was the apostle of the people alone. *Le Livre du peuple* (1837), *De l'esclavage moderne* (1839), *Politique à l'usage du peuple* (1839), three volumes of articles from the journal of the extreme democracy, *Le Monde,* reveal him as a missionary of liberty, equality and fraternity. *Le Pays et le gouvernement* (1840) caused him a year's imprisonment. He struggled through diificulties of lost friendships, limited means and personal illnesses, faithful to the last to his hardly won dogma of the sovereignty of the people, and, to judge by his contribution to Louis Blanc's *Revue du progrès,* was ready for something like communism. He was named president of the Société de la Solidarité Républicaine, which counted 500,000 adherents in 15 days. The revolution of 1848 had his sympathies, and he started the short-lived *Peuple constituant* and the equally short-lived *Révolution démocratique et sociale.* In the constituent assembly he sat on the left till the coup d'état of 1851 ended all hopes of popular freedom. While deputy he drew up a constitution, but it was rejected as too radical. A translation of Dante chiefly occupied him till his death (Feb. 27, 1854), in

Paris. He refused to be reconciled to the church. and was buried according to his own directions at Père la Chaise without funeral rites being mourned by a countless concourse of democratic and literary admirers.

During the most difficult time of his republican period he found solace for his intellect in the composition of *Une voix de prison* (1846), written during his imprisonment in a strain similar to that of *Les Paroles d'un croyant*. He also wrote *Esquisse de philosophie (1840)*. Of the four volumes of this work the third. mhich is an exposition of art as a development from the aspirations and necessities of the temple, remains the best evidence of his thinking power and brilliant style.

There are two so-called *Oeuvres complètes de Lamennais* (1836; 1844). The most noteworthy of his writings subsequently published are: *Amschaspands et Darvands* (1843), *Lr Deuil dc la Pologne* (1846), *Mélanges philosophiques et politiques* (1856). *Les Évangiles* (1846) and *La Divine comédie*—translations of the Gospels and of Dante.

Part of his voluminous correspondence has also appeared. The most interesting volumes are the following: *Correspondance de F. de Lamennais,* ed. by E. D. Forgues, 2 vol. (1855–58), *Oeuvres inédites de F. Lamennais,* ed. *by* Anpe Blaize, 2 vol. (1866); *Correspondance inédite entre Lamennais et le baron de Vitrolles,* ed. by E. D. Forgues (1819–53); *Confidences de Lamennais, lettres inédites de 1821 à 1848,* ed. by A. du Bois de la Villerabel (1886); *Lamennais d'après des documents inédits,* by Alfred Roussel. 2 vol. (Rennes, 1892); *Lamennais intime, d'après une correspondance inédite* by *A.* Roussel 1897); and letters published in the *Revue bleue, Revue britannique,* etc.

LAMENTATIONS (LAMENTATIONS OF JEREMIAH). A book of the Old Testament, placed in the Hebrew Bible amongst the five "Megilloth" or "Rolls" in the third canon (Hagiographa), and in the LXX, Vulgate and most modern Bibles, after the Book of Jeremiah.

Structure and Form.—The book consists of five "dirges," or poetical elegies. Such poems were properly composed on the death of individuals, but all these deal with the fall and desolation of Jerusalem. Hebrew metres are scanned by the number of strongly accented syllables that the lines contain; and as the phonetic principles of the language require that each independent and significant word should carry one such accent, it is the thought as much as the sound which gives to each form of metre its peculiar character. Each line is divided into two (or, occasionally, three) parts, which frequently correspond to one another in general sense, the second half being a repetition or an echo of the first. The two commonest metres are *(a)* those in which a line contains six significant terms —six "word-accents," each part having three, though sometimes, especially in prophetic poetry, we find 2:2:2; *(b)* the so-called "Qinah," in which each line has either five or four word-accents, divided as 3:2, 2:2 or (somewhat rarely) 2:3. This last was commonly used for dirges, and is the metre of the first four poems in Lamentations; the fifth is written in 3:3.

There is another striking difference between Lam. i.–iv. and Lam. v. The former are "alphabetic acrostics," that is to say they are divided into short "stanzas," or equal groups of lines, and each group begins with a characteristic letter, the whole being arranged in twenty-two groups in the order of the Hebrew alphabet. The peculiarities may be illustrated by the following rough attempt at a translation of the first few verses of Lam. i.:

o. 1.	Ah! Lonely she sitteth	—the populous town;
	Mighty 'mid nations	—a widow is she;
	Queen among cities	—a subject is turned.
v. 2.	By night doth she weep—weep!	—with her tears on her cheeks;
	None doth console her	—of all that did love her;
	All her comrades have played her false	—foes have they turned.
v. 3.	Captive is Judah for sorrow	—for weight of slave-toil;
	Among heathen sitteth she	—she findeth no rest;
	All that hunt her have caught her	—in midst of sore straits.
o. 4.	Drear are the ways to Zion	—no pilgrims keep feast;
	All her gates are wasted	—her priests do moan;
	Grief-stricken her virgins	—and bitter her lot.
o. 5.	Exalted on high are her rivals	—her lovers are stilled;
	For Yahweh hath grieved her	—for her many transgressions;
	Exiles her babes are gone	—in front of her foes.

(In the above the order of the English alphabet is followed; the Hebrew is rather different.)

Lam. iii. differs from i., ii. and iv., in that each of the three lines of the "stanza" begins with the appropriate letter, instead of the first only as in the example quoted. Ch. iv., again, is peculiar, in that it has two lines to the "stanza" instead of three. Chs. ii., iii. and iv. are also peculiar in their arrangement of the alphabet. In the normal Hebrew reckoning of the letters the sixteenth is "Pe" and the seventeenth "Ayin," and this is the order now found in Lam. i., but in the next three poems these two letters are transposed. Finally Lam. v., though it contains twenty-two verses (the Hebrew alphabet has twenty-two letters), is written in 3:3 metre and has little trace of the acrostic.

Date and Authorship.—The traditional ascription of these poems to Jeremiah seems to rest on a misunderstanding of II Chron. xxxv. 25, which states that Jeremiah sang a dirge over Josiah, and that this was included with a number of others on the same king, all being preserved in a book of dirges. But none of these poems deals with Josiah, and while "dirges" over the kings of Judah from Jehoahaz onwards are preserved in Jer. xxii., none of them in the least resembles any of the poems in Lamentations.

It seems to be clear that all five were composed in the period during which the walls of Jerusalem lay in ruins, *i.e.*, between the time of Zedekiah and that of Nehemiah. The artificial form suggests that the first pangs of the agony inflicted by the fall of the city had given place to a steady grief, and the poems vary among themselves alike in the keenness of the sorrow which they express and in their poetic quality. There is no certainty that they were the work of the same author; on the contrary, they were more probably from different hands, though there is enough similarity between Lam. ii. and iv. to suggest to some students that both are to be attributed to the same poet. In any case these are probably the two earliest of the five; next in order, alike of merit and of time, stands Lam. i. Lam. iii. may come from the end of the exile or even from a time after the return, while Lam. v. is not strictly a dirge at all, but a prayer for deliverance from the government of a foreign oppressor, and would suit any period between the destruction of the city and the rebuilding of the walls in 444 B.C. (T. H. R.)

LA MESA, a city of San Diego county in southern California, U.S., 8 mi. E. of San Diego bay and adjoining the eastern boundary of the city of San Diego (*q.v.*). Originally known as Allison's Springs. La Mesa occupies the site of a sheep ranch purchased in 1869 by Robert and Josiah Allison. The city enjoys a dry and even climate and is primarily a family residential centre; the majority of its working population is employed in the industry, commerce and naval activity of neighbouring San Diego. The city is the centre of a district specializing in the production of avocados. Incorporated in 1912. the city has a council-manager form of government. in effect since 1953. For comparative population figures *see* table in CALIFORNIA: *Population.* (K. J. *R.*)

LAMETH, ALEXANDRE THEODORE VICTOR, COMTE DE (1760–1829), French soldier and politician, was born in Paris on Oct. 20, 1760. He served in the American War of Independence, and in 1789 was elected to the States General. In the Constituent Assembly he formed with Barnave and Adrien Duport an association called the "Triumvirate," which controlled a group of about forty deputies forming the advanced left of the Assembly. He presented a famous report in the Constituent Assembly on the organization of the army, but is better known by his speech on Feb. 28, 1791, at the Jacobin Club, against his personal enemy, Mirabeau. whose relations with the court were beginning to be suspected, After the flight of the king to Varennes, Lameth became reconciled with the court. He served in the army as *maréchal-de-camp* under Luckner and Lafayette, but was accused of

treason on Aug. 15, 1792, fled the country, and was imprisoned by the Austrians. Returning to France under the Empire he was made prefect successively in several departments and created a baron (1810). In 1814 he attached himself to the Bourbons, and under the Restoration was appointed prefect of Somme, deputy for Seine-Inférieure and finally led the Liberal opposition as deputy for Seine-et-Oise. He died in Paris on March 18, 1829. He was the author of an important *History of the Constituent Assembly* (2 vols., 1828–1829).

Of his two brothers, THÉODORE LAMETH (1756–1854) served in the American war, sat in the Legislative Assembly as deputy from the department of Jura, and became *maréchal-de-camp;* and CHARLES MALO FRANCOIS LAMETH (1757–1832), who also served in America, was deputy to the States General of 1789, but emigrated early in the Revolution, returned to France under the Consulate, and was appointed governor of Würzburg under the Empire. Like Alexandre, Charles joined the Bourbons, succeeding Alexandre as deputy in 1829.

See F. A. Aulard, *Les Orateurs de l'Assemblée Constituante* (1905); also M. Tourneux, *Bibliog. de Phistoire de Paris* (vol. iv., 1906, *s.v.* "Lameth").

LAMETTRIE, JULIEN OFFRAY DE (1709–1751), French physician and philosopher, was born at St. Malo on Dec. 25, 1709. After studying theology in the Jansenist schools for several years, he went (1733) to Leyden to study under Boerhaave, and in 1742 returned to Paris, where he obtained the appointment of surgeon to the guards. During an attack of fever he made observations on himself with reference to the action of quickened circulation upon thought, which led him to the conclusion that psychical phenomena were to be accounted for as the effects of organic changes in the brain and nervous system. This conclusion he worked out in his earliest philosophical work, the *Histoire naturelle de l'âme* (*c.* 1745). The outcry caused by its publication drove Lamettrie back to Leyden, where he developed his doctrines still more boldly and completely, and with great originality, in *L'Homme machine* (Eng. trans., 1750; ed. with introd. and notes, J. Assezat, 1865), and *L'Homme plante,* treatises based upon principles of the most consistently materialistic character. The ethics of these principles were worked out in *Discours sur le bonheur, La Volupté,* and *L'Art de jouir,* in which the end of life is found in the pleasures of the senses, and virtue is reduced to self-love. Atheism is the only means of ensuring the happiness of the world, which has been rendered impossible by the wars brought about by theologians. The soul is only the thinking part of the body, and with the body it passes away. When death comes, the farce is over *(la farce est joude),* therefore let us take our pleasure while we can. Lamettrie has been called "the Aristippus of modern materialism." In 1748 he was compelled to leave Holland for Berlin, where Frederick the Great appointed him court reader. He died on Nov. 11, 1751. His collected *Oeuvres philosophiques* appeared after his death in several editions.

LAMIA, a female demon who devoured children. According to late myths she was a queen of Libya, beloved by Zeus. When Hera robbed her of her children, out of jealousy, she killed every child she could get into her power; a similar story was told of a queen of the Laestrygonians by the historian Diodorus Siculus.

She was also known as a sort of fiend who, in the form of a beautiful woman, enticed young men to her embraces in order that she might devour them. The nature of Lamia's tower (mentioned by Tertullian in his *Adversus Valentinianos)* is unknown. In Keats's poem "Lamia," derived through Burton from Philostratus' *Life of Apollonius of Tyana* (2nd–3rd century A.D.), Lamia is a witch, beloved by Lycius, who is destroyed by the sage Apollonius.

LAMMAS, the festival of the wheat harvest, originally celebrated in England on Aug. 1, O.S. (O. Eng. *hlafmaesse,* from *hlaf,* loaf, and *maesse,* mass. "loaf-mass"). It was one of the old quarter-days, being equivalent to midsummer, the others being Martinmas, equivalent to Michaelmas, Candlemas (Christmas) and Whitsuntide (Easter). The name is derived from the custom of each worshipper presenting in the church a loaf made of the new wheat. as an offering of the first-fruits.

LAMMASCH, HEINRICH (1853–1920), Austrian jurist, was born at Seitenstetten. Lower Austria. May 21, 1853. He was appointed professor of criminal and international law at the University of Vienna in 1889. He drafted a new Austrian criminal code (1906–12) and was Austrian representative at the Hague Peace conferences (1899, 1907). From 1900 a member of the Permanent Court of Arbitration at the Hague. he presided over arbitration courts settling, among other cases, the North Atlantic fisheries dispute betneen Great Britain and the U S in 1910. As an opponent of the German alliance and advocate of the transformation of Austria-Hungary into a federation and during World War I, of a League of Nations and a compromise peace. he incurred bitter hostility in the Austrian *Herrenhaus,* the appointive upper chamber of parliament, to which he had belonged since 1899. He presided over the last cabinet of the Austrian-Hungarian monarchy, Oct. 27 through Nov. 13, 1918. He died at Salzburg on Jan. 6. 1920.

His works include *Auslieferungspflicht und Asylrecht* (1887); *Die Lehre von der Schzedsgerichtsbarkeit* (1914); *Grundrzss des Strafrechts* (1899, 5th ed, 1926). *See* M. Lammasch and H. Sperl, *Heinrich Lammasch* (Vienna, 1919). (H J. Mu)

LAMMAS LANDS. A relic of the old "open-field" system of agriculture survives in the so-called "Lammas Lands." These were lands enclosed and held in severalty during the growing of grain and grass and thrown open to pasturage during the rest of the year for those who had common rights. The opening of the fields by throwing down the fences took place on Lammas day (Aug. 1) for grain lands and on Old Midsummer day (July 5) for grass. They remained open until the following Lady day.

See also AGRICULTURE: *British Commonwealth.*

See F. Seebohm, *The English Village Community; C. I.* Elton, *Commons and Waste Lands; P.* Vinogradoff, *Villainage in England.*

LAMMERGEIER (BEARDED VULTURE), also spelled lammergeyer or lammergeir, is the largest old-world bird of prey. intermediate between vultures (*q.v.*) and eagles (*q.v.*). This bird is placed by some in the old-world vulture subfamily Aegypiinae. family Accipitridae, and by others held to constitute the subfamily Gypaetinae in the same family. It has a tuft of long bristly hairs on the chin, and stiff bristles hide the nostrils. It is blackish-gray above, otherwise pale tawny; the white cap is bordered black; the iris is light orange; the "white" of the eye, scarlet. The common bearded vulture *(Gypaetus barbatus aureus),* 40 to 46 in. long, has a wingspread of nearly 10 ft. It is confined to high mountain ranges of southern Europe (practically extinct in Pyrenees and Alps), the Mediterranean islands, and central Asia east to northern China and south to southern Arabia and the Himalayas. Despite the name lammergeier (lamb-vulture), it is not known to attack or carry off live animals. It feeds on carrion and is said to drop from great heights to break bones, which it is said to be able to digest with ease. The nest is a huge mass of sticks, lined with sheep's wool and goat's hair, placed on a ledge or in a cave in a cliff. The one or two whitish eggs, stained or mottled rusty, are nearly 4 by 3 in. The young are covered with dirty white down. An allied race (G. b. *barbatus*) inhabits the Atlas mountains of northwest Africa; another (G. *b. meridionalis*) is found in the mountains of Ethiopia and eastern and southern Africa. (G. F. Ss.)



ERIC HOSKING

LAMMERGEIER, OR BEARDED VULTURE (GYPAETUS BARBATUS AUREUS)

LAMMERMUIR HILLS, a range of round-backed hills forming the northern boundary of Berwickshire, Scot. The average height is about 1,000 ft., highest summit Meikle Says Law, 1,750 ft. The name is also given to the upland district, northwest

of Duns, in which the hills are situated. (*See* BERWICKSHIRE.)

LAMOIGNON, a French family, which takes its name from Lamoignon, a place said to have been in its possession since the 13th century. One of its several branches is that of Larnoignon de Malesherbes. GUILLAUME DE LAMOIGNON (1617–1677), attained eminence as a lawyer and became president of the parlement of Paris in 1658. He presided at the earlier sittings of the trial of Fouquet. whom he regarded as innocent. Lamoignon tried to simplify the laws of France. Guillaume's second son, NICOLAS DE LAMOIGNON (1648–1724), took the surname of Basville. He was intendent of Montauban, of Pau, of Poitiers and of Languedoc before his retirement in 1718. In Languedoc he took strong measures against the Camisards and other Protestants. Following the example of Colbert, he encouraged agriculture and industry and improved communication. CHRÉTIEN-FRANÇOIS DE LAMOIGNON (1735–1789) was one of the assistants of Loménie de Brienne. whose unpopularity and fall he shared.

LAMONT, JOHANN VON (1805–1879), Scottish-German astronomer and magnetician. was born at Braemar, Aberdeenshire. on Dec. 13, 1805. He was sent at the age of 12 to be educated at the Scottish monastery in Regensburg. His strong bent for scientific studies was recognized by the head of the monastery, P. Deasson. on whose recommendation he was admitted in 1827 to the then new observatory of Bogenhausen (near Munich), where he worked under J. Soldner. After the death of his chief in 1835 he was appointed director of the observatory. In 1852 he became professor of astronomy at the university of Munich, and held both these posts till his death on Aug. 6. 1879. Lamont was a member of many learned corporations. Xmong his contributions to astronomy may be noted his eleven zone-catalogues of 34.674 stars, his measurements, in 1836–37, of nebulae and clusters. and his determination of the mass of Uranus from observations of its satellites (*Mem. Astron. Soc.* xi. 51, 1838). A magnetic observatory was equipped at Bogenhausen in 1840 through his initiative; he executed comprehensive magnetic surveys 1849–58; announced the magnetic decennial period in 1850, and his discovery of earth-currents in 1862. His *Handbuch des Erdmagnetisntus* (Berlin, 1849) is a standard work.

See *Allgemeine Drutsche Biographie* (S. Giinther); V. J. Schriit, *Astr. Gesellschaft,* xv, 60; *Monthly Notices Roy. Astr. Society,* xl, 203; *Nature,* xx, 42j; *Quart. Journal Meteor. Society,* vi, 72; *Proceedings Roy. Society of Edinburgh,* x, 358; *Thr Times* (Aug. 12, *1879);* Sir F. Ronalds' *Cat. of Books relating to Electricity and Magnetism,* pp. 281–283; *Royal Society's Cat. of Scientific Papers,* vols. iii, vii.

LAMONT, THOMAS WILLIAM (1870–1948), U.S. banker. was born at Claverack, N.Y.. on Sept. 30. 1870. He was educated at Phillips Exeter academy. Exeter. N.H., and at Harvard, where he graduated in 1892. He worked as a reporter for two years with the *Sew York Tribune.* Entering banking in 1903. he was associated with the Bankers' Trust company in New York as secretary and treasurer and. after 1905, as vice-president. In 1909 he mas elected vice-president of the First National bank of New York city, serving for two years. On Jan. 1. 1911, he entered the firm of J. P. Morgan and company. He took part in the work of the firm in floating British. French and other Allied loans in the U.S. during and after World War I. From 1918 to 1922 he was proprietor of the *New York Evening Post.* In 1919 he was one of the financial and economic advisers to the U.S. delegation to the peace conference in Paris. After selling the *Post* he financed the founding of the *Saturday Review of Literature* in 1924. He worked on the Dawes plan for German reparations in 1924 and on the establishment of the Bank for International Settlements in 1931. and was a delegate to the World Economic conference in London in 1933. In 1943 he was elected chairman of the board of J. P. Morgan and Company, Inc. He died on Feb. 2, 1948, at Boca Grande, Fla.

In 1946 Lamont published *My Boyhood in a Parsonage* and five years later brought out *Across World Frontiers;*

LAMORICIÈRE, CHRISTOPHE LEON LOUIS JUCHAULT DE (1806–1865), French general. born at Santes on Sept. 11, 1806, was one of the most distinguished and efficient of Bugeaud's generals in Algeria, rendered special service at Isly (August 14, 1844), acted temporarily as overn nor-general of Algeria, and finally effected the capture of Abd el-Kader in 1847. Lamoricière was a member of the chamber of deputies in 1848. Under the régime of General Cavaignac he was for a time minister of war. From 1848 to 1851 Lamoricière was one of the most conspicuous opponents of the policy of Louis Napoleon, and at the *coup d'état* he was arrested and exiled. In 1860 he accepted the command of the papal army, which he led in the Italian campaign of 1860. On Sept. 18, 1860. he was defeated by the Italian army at Castelfidardo. He died at Prouzel (Somme) on Sept. 11, 1865.

Ser E. Keller, *Le Général de Lamoricière* (Paris, 1873).

LA MOTHE LE VAYER, FRANÇOIS DE (1588–1672), French writer. born in I'aris of a noble family of Maine, was an *avocat* at the parlement of Paris. His *Considérations sur l'éloquence française* (1638) admitted him to the academy, and *De l'instruction de Mgr. le Dauphin* (1640) attracted the attention of Richelieu. In 1649 Anne of Austria entrusted him with the education of her second son and subsequently with the completion of Louis XIV's education. The king rewarded his tutor by appointing him historiographer of France and councillor of state. His other works include: *Jugement sur les anciens et principaux historiens grecs et latins* (1646); a treatise entitled *Du peu de certitude qu'il y a en histoire* (1668), which in a sense marks the beginning of historical criticism in France; and *Dialogues,* published posthumously under the pseudonym of Orosius Tubero.

See Bayle, *Dictionnaire critique, s.v.* "Vayer"; *L.* Étienne, *Essai sur La Mothe Le Vayer* (Paris, 1849).

LA MOTTE, ANTOINE HOUDAR DE (1672–1731), French critic and dramatist, was born in Paris on Jan. 17, 1672, and educated by the Jesuits. Achieving success in a variety of minor literary genres, he was elected to the Académie Française in 1710. Essentially an innovator, he took a leading part, distinguished by his kindly handling of opponents, in the revival of controversy between the Ancients and the Moderns: he produced in 1714 a banal arrangement of Homer's *Iliad,* based on Mme Dacier's translation (La Motte knew no Greek): accompanied by a "Discours sur Homère." in which he attacked the beauties of the original. He also defended the Moderns in his *Réflexions sur la critique* (1715; 2nd ed., 1716). His first tragedy, *Les Macchabées* (1721; printed 1722), was followed by three others: *Romulus* (1722). *Inès de Castro* (1723) and *Oedipe* (1726; printed 1730). *Inks de Castro,* which reflects above all the contemporary taste for the pathetic in tragedy, was one of the outstanding theatrical successes of the 18th century. In 1730. in a series of "Discours sur la tragkdie." La Motte advocated startling innovations in the tragic drama, including the rejection of the classical "unities" and the abandonment of verse, which he represented as a mere mechanical arrangement of prose. Affected by blindness in the latter part of his life, La Motte died in Paris on Dec. 26. 1731. His collected works, ten volumes, were published in 1754.

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LAMOUREUX, CHARLES (1834–1899), French conductor and violinist. was born at Bordeaux on Sept. 28. 1834. He studied at the Pau conservatory, was engaged as violinist at the Opkra. and in 1864 organized a series of concerts devoted to chamber music. A visit to a Handel festival in England led him to found the "Société de l'Harmonie Sacrée," and in 1873 he conducted the first performance in Paris of Handel's *Messiah.* He also gave performances of Bach's *St. Matthew Passion,* Handel's *Judas Maccabaeus,* Gounod's *Gallia,* and Massenet's *Eve.* He became *chef d'orchestre* at the Opéra Comique in 1876. In 1881 he founded the Lamoureux concerts, at which he gave performances of Wagner's music, then little known in Paris. He then took the Eden Theatre, and on May 3. 1887, conducted the first performance of *Lohengrin* in the French capital. Chauvinist opposition prevented the repetition of the performance, but the taboo was broken. Lamoureux was successively second *chef d'orchestre* at the Conservatoire, first *chef d'orchestre* at the Opkra Comique, and twice first *chef d'orchestre* at the Opéra. He conducted in London on several occasions. He died in Paris on Dec. 21, 1899.

LAMP, in the strictest sense, is a vessel with a wick in which oil or other combustible substance used for illumination is held. The term was also employed for the apparatus that burned gas for lighting and came to be applied to electrical lighting appliances.

Ancient Times.—The earliest-known lamps, dating from the Paleolithic period, were made of sandstone, hollowed out to provide a container for oil, and with a spout at the front that held the wick. By the 4th century B.C. the lamp had come into general use for domestic purposes in Greece, and no doubt had been employed long before in temples and other places where a permanent light was required. Herodotus saw nothing strange in the festival of lamps which was held at Sais in Egypt, though he did comment on the vast number used.

The usual type of domestic lamp was made of terra cotta. shaped somewhat like a shallow cup, with a spout or nozzle in which the wick burned, a circular hole in the top for filling, and a carrying handle. Some lamps had two or more spouts and a third type had a large number of open spouts in each of which a wick could be placed. Decoration was confined to the front of the handle and the circular space on the top around the filling hole. The latter mas decorated with a subject in relief, taken from classical mythology, from scenes of the hunt, from daily life or from displays of gladiators or chariot races. Alternatively the lamp might be shaped like an animal, a monster or even a human foot. Terra-cotta lamps were covered with a heat-resisting red or black glaze; the stamped signature of the maker is often found under the foot. The typical classical hand lamp was a combination of the flat form necessary for steadiness when being carried or set down and the round shape characteristic of vessels produced on the potter's wheel.

A more expensive type of lamp was produced in bronze. This followed the form of terra-cotta lamps though the material permitted a greater fantasy in design and ornament. The standard form had a handle with a ring for the forefinger and a palmette or crescent above it as a support for the thumb. With bronze lamps a cover could be provided to protect the flame from the wind, and such covered lamps were used in Athens in the open air. Hanging lamps were usually made of bronze, with most of the decoration on the under part. The finest example of these is a lamp found at Cortona. Italy. in 1840. It is round with 16 nozzles. ornamented alternately with a siren and a satyr playing on double flute; between each pair of nozzles is the head of a river god and on the bottom is a large mask of Medusa surrounded by bands of animals. The lamp seems to date from the beginning of the 5th century B.C. and the workmanship explains the high esteem in which Etruscan lamps were held in antiquity.

A bronze lamp in the British museum, found in the baths of Julian in Paris and of later date, is also of excellent design. The suspension chain was attached to the tails of two dolphins, while lions' bodies emerge from the sides of the lamp.

The Erechtheum on the Acropolis of Athens had a gold lamp nhich burned night and day. It was the work of the sculptor Callimachus and was apparently made for the newly rebuilt temple shortly before 400 B.C One filling of oil is said to have been sufficient to keep it alight for a year The wick was made from the least combustible fibre known, now thought to have been a kind of cotton A bronze palm tree rose above the lamp, its leaves serving as reflectors while its hollowed stem carried the fumes through the roof. This lamp was refilled on exactly the same day each year, so that there may have been some idea of measuring time by it; this was presumably also the case in regard to the lamp stand capable of holding as many lamps as there were days of the year, which the Si tyrant Dionysius placed in th Prytaneum at Tarentum (mod. Taranto).



BY COURTESY OF VICTORIA AND ALBERT MU SEUM

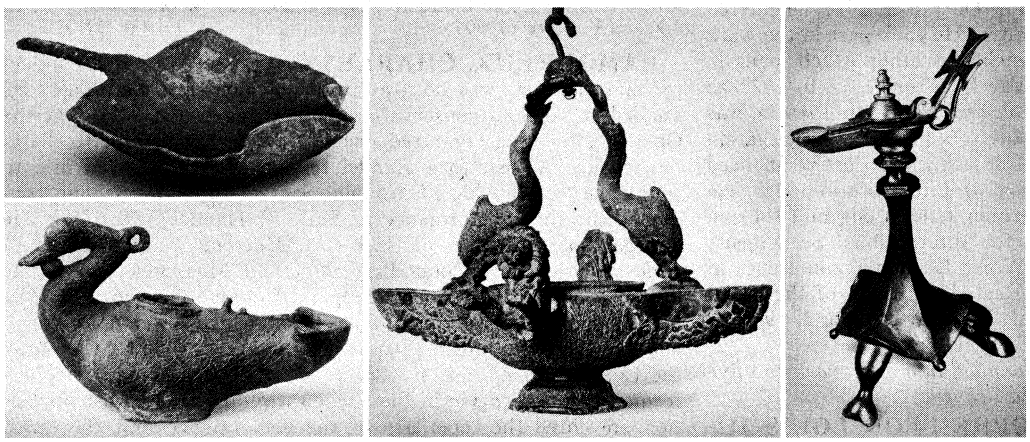
FIG. 2.—ITALIAN RENAISSANCE LAMP, BRONZE, EARLY 16TH CENTURY

In the l e t Pharae in Achaea there was an oracular statue oi Hermes with a mar altar before it, to which bronze lamps were attached; whoever desired to consult the statue went there in the evening and filled and lit the lamps, placing a bronze coin on the altar. A similar custom prevailed at the oracle of Apis in Egypt, and Pausanias speaks of a chasm at Argos into which it was still the custom in his time to let down burning lamps, presumably in honour of the goddess of the lower world. Persephone. At Cnidus many terra-cotta lamps were found crowded together and buried a little distance underground, and it has been conjectured that there must have been a statue or altar at which lamps were left burning at night. Among the Romans a deceased person might bequeath money to provide for the placing of a lighted lamp with incense on it at his tomb at certain specified times. Terra-cotta lamps were also used as birthday presents, ornamented with two figures of Victory holding a disk inscribed with a good wish for the new year.

As the lamp superseded the torch in fact, so also did it in mythology. In the early myth of Demeter, the goddess goes forth with a torch in search of her daughter; in the late myth of Cupid and Psyche. Psyche carries an oil lamp, from which a drop of hot oil falls on Cupid. Bronze lamps of classical form were still produced in Byzantium and the eastern Mediterranean for ecclesiastical use during the early Christian period. They are immediately recognized by the handle in the form of a cross. These lamps were sometimes set on tall tripod stands with spreading bases.

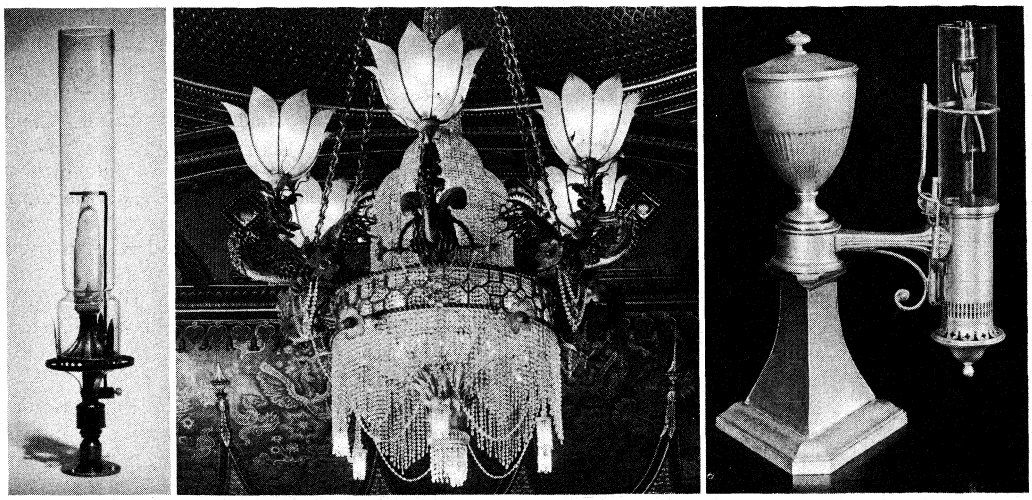
Middle Ages.—The oil lamp was not improved in Europe during the middle ages, and a form similar to that of classical antiquity continued in use. To the end of the 17th century lamps comprising only a wick laid in an open vessel continued to be used, sometimes in preference to candles as they would burn for a considerable time and not require snuffing. Lamps made of precious metal enriched with jewels were frequently entered in the French royal inventories. In general, however. candles were in wider use than lamps.

Renaissance.—In Italy the Renaissance brought a revival of the classical lamp, and artists such as the Paduan bronze-founder Riccio produced small bronze lamps modeled as fauns or human beings in gross postures. In the notebooks of Leonardo da Vinci are three sketches of a type of lamp in which the flame burns in a long glass cylinder. which is in turn enclosed in a water-filled sphere.



(LEFT, ABOVE AND BELOW. AND CENTRE) BY COURTESY OF THE TRUSTEES, THE BRITISH MUSEUM; (RIGHT) C. H. CANNINGS, BY COURTESY OF VICTORIA AND ALBERT MUSEUM

FIG. 1.—ANCIENT LAMPS: (LEFT. ABOVE) GREEK BRONZE LAMP OF THE MYCENAEAN PERIOD: (LEFT, BELOW) SWAN-SHAPED ROMAN LAMP; (CENTRE) ROMAN BRONZE LAMP WITH LIONS AND DOLPHINS, FROM THE BATHS OF JULIAN, PARIS. 1ST CENTURY A.D.; (RIGHT) COPTIC BRONZE LAMP. 6TH CENTURY A.D.



(LEFT) CROWN COPYRIGHT, SCIENCE MUSEUM, LONDON; (CENTRE) BRIGHTON CORPORATION; (RIGHT) "COUNTRY LIFE"

FIG. 3.— LAMPS OF THE 18TH AND 19TH CENTURIES: (LEFT) GAS BURNER WITH WELLSBACH UPRIGHT MANTLE; (CENTRE) GASOLIER WITH SILVER DRAGONS HOLDING TINTED GLASS LOTUS BLOSSOMS. FROM THE ROYAL PAVILION. BRIGHTON, ENG.. EARLY 19TH CENTURY: (RIGHT) ARGAND LAMP. SHEFFIELD-PLATED. ENGLISH, c. 1790

Queen Elizabeth I owned a lamp of silver gilt embellished with a crystal. while another is described in the inventory of her plate as a "round silver lamp with two instruments to the same"; this may have been some form of spirit lamp for warming dishes and not intended for illumination. In the dwellings of the poor, the simple crusie lamp (an open tray with one or two spouts for wicks) was still in use in the 19th century. In Roman Catholic countries there was a constant demand for sanctuary lamps, and they must have been made in quantity. especially after the Counter-Reformation; fashions in church plate, however, led to the destruction of the earlier examples, and few of the lamps which hang in such large numbers in Flemish or Spanish churches are earlier than the late 17th or 18th century.

18th and 19th Centuries.— The hand lantern, which had been used since earliest times, became a common domestic accessory in the 18th century. These were usually square and made of brass sheet, glazed with horn or a glass bull's-eye. Fully enclosed open-flame oil-burning spout lamps, which illumined innumerable small homes in the 18th century, were made of brass, copper. tinplate or iron and had a cylindrical reservoir fitted with a straight tubular wick holder sloping forward from the base. The lamp burned a round plaited wick and emitted a yellowish light of about two candlepower. A table lamp was usually supported by a thick hollow stem rising from a spreading foot weighted with sand. Oil-burning lamps from which the time could be read during the night were also made in the 18th century; the oil was contained in a tall glass tube fitted into a brass case, the wick holder protruding at the top, and the time was indicated by the sinking of the oil in the tube, which was marked with the hours.

In the second half of the 18th century various improvements were invented in France, including self-filling devices and the plaited cotton wick to obviate smoke. The hanging oil lamps which were reintroduced by Robert Adam in the English houses he designed, while extremely elegant in form, did not incorporate the French improvements. The most important development of the late 18th century was the perfection of the Argand lamp, so-called after its Swiss inventor, in 1784. The burner consisted of two concentric tubes with the wick between them, an arrangement which allowed a double current of air. A little later the flame was protected by a glass funnel, thus increasing its brilliance. James Watt interested himself in lighting and a large number of Argand lamps were made in the Soho works at Birmingham. The containers of these lamps were made of Sheffield plate, the cheap substitute for silver that had been perfected by Matthew Boulton, and were filled with colza, a heavy oil that descended to the burner by gravitation. An alternative method was to force the oil upward by a mechanized device from a container below the level of the wick. At his Etruria works Josiah Wedgwood also produced many lamps of jasper ware and basalt in the neoclassical style.

Toward the end of the 18th century metal standard lamps and hanging lamps were designed in classical and Egyptian style. A superb set of standard lamps with mahogany pedestals and gilt metalwork are preserved at Syon house, Middlesex; in these the four burners are fed from a central vase by gravity. In 1812 the prince regent presented to the Royal Academy a magnificent bronze lamp. with 30 spouts and costing £2,400. In the reign of George IV two new kinds of lamp were devised, a reading lamp with an adjustable Argand burner and a japanned iron shade, and the Sinumbra lamp, in which the burner was set below a hollow ring which acted both as a tank for the oil and as a support for the large hemispherical shade. This latter type of lamp, invented in France, was generally known as the French lamp. The principle of the Argand burner, however. was retained well into the Victorian age for gas lighting. Although few examples have survived: brass chandeliers and wall brackets for gas, with prominent anthemion and acanthus ornament, were in production before 1830. The design of light fittings varied widely in the mid-19th century. Functional efficiency was seldom the first consideration and the design was usually concealed beneath a medley of more or less appropriate decorative features. Gas-burning chandeliers and wall lights spouted flames from monsters, cherubs or flowers. Some of the most extravagant of mid-19th century gas burners are or were to be seen in the larger English churches: huge standing lamps of a pseudo-Gothic design in lacquered brass, with burners formed as lilies. The term gasolier was used to describe these and the gas-burning hanging chandeliers.

20th Century.— In the 20th century the general use of electricity led to a great simplification of lighting fittings, and the usual form was a metal holder with glass shade. For lighting rooms designed in a "period" style there mas a constant demand for reproduction chandeliers, of which three main types were made: Venetian chandeliers in varicoloured glass; cut-glass chandeliers, mostly made in Bohemia; and brass ones based on Dutch or English 18th-century styles. Modern designers seemed to have had great difficulty in planning a satisfactory chandelier, and the tendency was to avoid the problem by using some form of concealed or difiused lighting. The most ingenious modern development was the adjustable desk lamp, the socketed arm of which could be set in a variety of positions. (J.F. H.)

Near **and** Far East.—The development of lamps in eastern countries does not present a picture of steady progress toward better standards of lighting. Many very primitive lamps, consisting of fibre wicks floating in shallow containers of oil and giving a flickering, smoky light of low intensity, are still in use throughout India. Africa and the far east.

Early Mesopotamian civilizations knew the use of a spout or channel for the wick, and lamps of alabaster, bronze and gold dating from before 2500 B.C. have been found. These would have been exceptional, however; the commoner types were of pottery or sea shells filled with vegetable or fish oil. Rush lights were also used. with copper or other metal stands. In Baluchistan a pottery bowl lamp with four pinched "lips" for wicks dates from about 3000 B.C. Archaeological finds from Mohenjo-Daro in the Indus valley indicate the use of hanging pottery lamps. and niches for similar small lights are set into the walls. These date from 2750–2500 B.C.

In China the use of the lamp was probably developed about 500 years later. The characteristic form: which changed very little

over many centuries, was of a candle in a small holder within a folding paper or silk covering. These Chinese or Japanese lanterns. usually of cylindrical or global form, may still be bought. The more elaborate are decorated with traditional motifs and hung with tassels

In Islamic countries, mosque lamps developed from earlier Byzantine types made use of glass at an early date, with floating wicks in small glass containers. These hanging lamps were held in brass or bronze supports which were pierced to allow more light to be carried downward. Gradually in the 13th and 14th centuries the containers came to be made of solid metal, throwing only upward light. The metalwork was embossed and damascened in fine patterns with calligraphic texts incorporated in the design.



C. H. CANNINGS BY COURTESY OF THE VICTORIA AND ALBERT MUSEUM

FIG. 4.— SYRIAN LAMP, MID-14TH CENTURY

The period of Mameluke rule in Egypt and Syria, from 1250, produced many fine glass lamps modeled originally on the hanging metal types and echoing their design. About 300 examples of these exist, dating mainly from the 14th century. They were larger than most metal lamps and were splendidly decorated with coloured enamels. A great variety of shape occurs in these lamps although in broad outline they are basically similar.

The 19th-century lighting of Hagia Sophia in Istanbul, with concentric circles of many small glass lamps suspended about nine feet from the floor, giving a restricted glow of light in the vast building, probably repeated a much earlier method of mosque lighting.

See LIGHTING, for a discussion of the various oils used in lamps and for electric lamps; CANDLESTICK: LANTERN. *See* also references under "Lamp" in the Index volume. (E. C. D.)

LAMPANG, an important town and province in northern Thailand. The province. with an area of 4.833 sq.mi. (12.517 sq.km.) drained by the Wang river. had a population in 1960 of 468.641 Major crops are tobacco. rice, beans. cotton and sugar cane, the last refined locally. Mineral products include lignite. exported in large quantities to Bangkok, antimony. lead and tungsten.

The capital town (*muang*) of LAMPANG, also known as Lakhon, has as its nucleus the old walled city which nas formerly the seat of an autonomous principality It is a commercial centre on the railroad. 399 mi. (642 km.) from Bangkok, and is one of Thailand's largest provincial towns; pop. (1957 est.) 33,876.

(G. W SK.)

LAMPBLACK: *see* CARBON BLACK.

LAMPEDUSA, a small Italian island in the Mediterranean, 112 mi. S.S.W. from the town of Girgenti, Sicily Pop (1951) 4,065. The nearby island of Linosa (pop.. 1951, 393) and Lampedusa are known as the Isole Pelagie, and are reached by steamer from Porto Empedocle. Lampedusa's greatest length is about 7 mi.. its greatest width about 2 mi.; the highest point is 400 ft. above sea level. It stands on the edge of the submarine platform of the east coast of Tunisia, from nhich (at Mahadia) it is 90 mi. E. The soil is calcareous; it was covered nith scrub (chiefly the wild olive) until comparatively recent times, but this has been cut, and the rock is now bare. The valleys are. however, fairly fertile. On the south, near the only village, is the harbour, dredged to a depth of 13 ft. and good for torpedo boats and small craft. There are prehistoric hut foundations, also Punic tombs and Roman buildings near the harbour. The island is the Lopadusa of Strabo. and the Lipadosa of Ariosto's *Orlando Furioso,* the scene of the landing of Roger of Sicily and of his conversion by the hermit. In 1436 it was given by Alfonso of Aragon to Don Giovanni de Caro, baron of Montechiaro. A thousand slaves were taken from its population in 1553. In 1661 Ferdinand Tommasi. its then owner, received the title of prince from Charles II of Spain. In 1737 the earl of Sandwich found only one inhabitant upon it; in 1760 some French settlers established themselves there. In 1843 Ferdinand II of Naples established a colony there. Eight miles west is the islet of Lampione. Linosa, about 30 mi. N.N.E.. measures about 2 by 2 mi. and is entirely volcanic; its highest point is 610 ft. above sea level. It has landing places on the south and nest and is more fertile than Lampedusa. but suffers from lack of springs. Fragments of Roman pottery and Roman coins have been found there.

After the Allied victory in north Africa in World War II, British and U.S. planes bombed Lampedusa and Pantelleria. The latter surrendered June 11, 1943, and Lampedusa the next day. Linosa and Lampione submitted to the Allies June 13.

LAMPETER, a municipal borough in the Cardigan parliamentary division, Cardiganshire, Wales, on the river Teifi. and on the borders of Carmarthenshire, 30 mi. E. of Cardigan and 23 mi. N.E. of Carmarthen by road. Pop. (1951) 1,799. Area 2.7 sq.mi As an outpost on the upper Teifi. Lampeter possessed a castle nhich uas demolished by Owain Gwynedd in the 12th century. The town was first incorporated under Ednard II. but the earliest knonn charter dates from the reign of Henry VI. Further charters were granted in 1814 and 1884. In postmedieval times Lampeter was an important centre for cattle to be driven through the hill passes to England. This activity ceased after the advent of the railway, hut Lampeter still remained important for its fairs, especially Dalis horse fair.

In 1822 St. David's college was founded by Bishop Thomas Burgess of St. David's and in 1827 it was opened. The college possesses by charter the privilege of conferring the bachelor degrees in arts and divinity and undertakes the preparation of students for holy orders. In the college library is a copy of the Liibeck missal.

LAMPHUN, a province of northern Thailand with an area of 1.702 sq.mi. and a population in 1960 of 248.809. The site of an early Mon principality, it was subjugated by Thai forces in the 13th century, but survived as an autonomous principality until the late 19th century. Major crops are rice and tobacco.

The town (*muang*) of LAMPHUN (pop. [1957 est.] 10,036), the provincial capital. with the old walled city as its nucleus, lies on the Kuang river in the densely populated northern plain. After 1921, when the railroad from Bangkok was built through Lamphun. the town lost commercial importance to Chiangmai, the rail terminus, only 20 mi. (32 km.) to the north. (G. W. SK.)

LAMPMAN, ARCHIBALD (1861–1899), Canadian poet, whose most characteristic work sensitively records the sensations evoked by scenes and incidents of the out-of-doors. Born in Morpeth, Ont.. Nov. 17. 1861, he was educated at Cobourg Collegiate institute, Trinity College school at Port Hope, and Trinity college in the University of Toronto. From 1883 until his death, Feb. 10, 1899, he lived in Ottawa, employed in the Post Office department of the Canadian civil service.

The material for his poems he derived from his contemplation of Ottawa and its environs, and the Gatineau countryside of Quebec. Among his finest nature poems are "Morning on the Lièvre," "Heat" and "In November." Of the many sonnets which Lampman wrote, a fair number are of admirable quality; *e.g.,* "Winter Uplands,'! "A January Morning," "Evening:" "Solitude" and "The Frogs." He composed, as well, several narrative poems, reminiscent of William Morris, Keats and Tennyson, but they were not very successful. Two poems, however, show individual qualities of insight and energy: "The City of the End of Things" and "At the Long Sault: May, 1860." A few short poems severely criticizing contemporary abuses of power and wealth show him to have been of radical tendencies in politics and economics, but do not create the kind of conviction communicated by his poems of description and reflection.

Lampman wrote several literary essays and collaborated with two other Ottawa poets in the writing of a weekly column. "At the hlermaid Inn." in the Toronto *Globe* during 1892 and 1893. Authentic impressions of his life and temperament may be drawn

from the extracts from his letters to E. W. Thomson published in 1956 by Arthur Bourinot and from the various memoirs by Duncan Campbell Scott. During his lifetime Lampman published two volumes of verse, *Among the Millet and Other Poems (1888)* and *Lyrics of Earth* (1893). After his death, his friend and literary executor. Duncan Campbell Scott, edited *The Poems of Archibald Lampman* (1900) and *Lyrics of Earth: Sonnets and Ballads* (1925) Several hitherto uncollected poems were published by E. K Brown in 1943. Most critics would name Lampman among the five or six foremost Canadian poets.

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LAMPONG, a people of southeast Sumatra who are closely related to the Redjang (and often considered together as the Lampong-Redjang group), occupying an area in which are found monumental stone carvings suggestive of the highly developed Dongson Bronze Age culture of northern Indochina. Despite this background, most of the present inhabitants appear to be just emerging from a simple Batak-like origin *(see* BATAK). The earliest accounts describe those dwelling in the hills as nomadic hunters, while their kinsmen in the valleys were somewhat more advanced due to trade relations with people of the coast. Eventually, because they grew excellent pepper plants in their dry-land fields. they fell under the influence of Sundanese traders.

Such contacts resulted in a curious mixture of Batak-type institutions with those of the highly organized Hindu-Javanese states. Chiefs with high-sounding titles sit on elevated benches. and they and their families wear rich garments and golden ornaments—all this in contrast to the simple life of most of their kinsmen. Government likewise is a mixture of the old customary law with borrowed ideas. The territory is divided into provinces made up of districts inhabited by patrilineal groups, but the basic unit is still the village with its headman.

A gift is given for the bride, who then belongs to her husband's group. Should he die she marries a brother. Elaborate feasts accompany marriages and all other great events of life. Each settlement has a communal house which is used as a seat of government, a ceremonial centre and as a dormitory for guests.

The Indonesian government, in its effort to move entire villages from overpopulated Java to this district, is threatening the existence of the Lampong-Redjang as a separate people. In the early 1960s they numbered about 1,000,000.

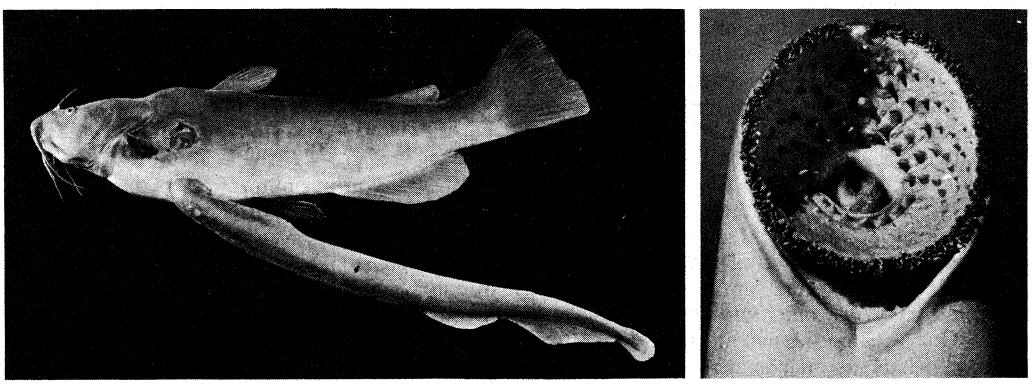
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LAMPOON, a virulent satire either in prose or verse; the idea of injustice and unscrupulousness seems to be essential to its definition. The word is used by Evelyn in 1645, "Here they still paste up their drolling lampoons and scurrilous papers," and soon after it is a verb—"suppose we lampooned all the pretty women in Town." Both of these forms, the noun and the verb, have been preserved ever since in English, without modification, for violent and reckless literary censure. Tom Brown (1663–1704) was a past master in the art of lampooning. As a rule, the lampoon possessed no poetical graces, and in its very nature was usually anonymous. The notorious *Essay on Woman* (1764) of John Wilkes was a lampoon, and was successfully proceeded against as an obscene libel. The law made it more impossible for private malice to take the form of baseless and scurrilous attack, and the lampoon, in its open shape, died of public decency in the 18th century.

LAMPREY, any of the eel-shaped, scaleless fishes comprising the family Petromyzonidae. which, with the similar hagfishes or slime eels, form a distinct primitive group of vertebrates: the Cyclostomata *(see* CYCLOSTOME; HAGFISH). The lamprey has a single nostril on the top of its head, seven round gill openings on each side; it has no jaws, but instead a round sucker beset with horny teeth. Many species of lampreys, especially the sea lamprey (*Petromyzon marinus*), are parasites. They feed on other fishes by holding on securely with the sucking mouth and rasping a hole in the flesh with the comblike teeth on the tongue. A chemical that is injected into the fresh wound prevents the coagulation of the blood; the lamprey ingests the free-flowing blood until its straight intestinal canal is filled to capacity and then detaches itself from the host fish. Other closely related species are not parasitic. Such, for example, is the northern brook lamprey (*Ichthyomyzon fossor)* of the American Great Lakes region. The nonparasitic type of lamprey never feeds when adult. is much smaller than the sea lamprey (which may attain three feet), has degenerated teeth and a shrunken alimentary canal.

All lampreys spawn in fresh water in gravel nests that they prepare, whereupon they promptly die. For several years the small young live in the stream bottom as toothless, nearly blind, wormlike larvae known as ammocoetes. Then they metamorphose rapidly into the adult type during late summer or fall. The nonparasitic species pass one winter without food, whereas the parasitic ones descend to a lake or to the sea, where they feed and grow rapidly for a year or more. All spawn in the spring. About 28 species are known from the temperate rivers and coastal seas of both hemispheres. In North America 19 species of lampreys occur, and in Eurasia. South America, New Zealand and Australia a feu- others are found. With only minor variations, all lampreys have a life history similar to that of the sea lamprey.

Lampreys, especially the sea lamprey, were considered a delicacy in Europe during the middle ages. Henry I of England is said to have died of eating a surfeit of them. The larvae are extensively used as bait. The sea lamprey occurs in the Atlantic ocean from Florida to the west coast of Greenland and from northern Norway to the Mediterranean. It can spawn only in cold streams having riffles of clean sand and gravel, and the young can survive only if there are also beds of sand mixed with organic material, which they feed on. Although Niagara Falls had been a natural barrier to the upstream migrating adults that spawn in the St. Lawrence drainage, the construction of the Welland canal in 1829 made it possible for many of them to invade Lake Erie. Lake Erie is generally too warm for adult sea lampreys, and most of the rivers emptying into it do not provide satisfactory spawning conditions; consequently they did not become well established there. However, early in the 1930s many sea lampreys somehow crossed that barrier to enter the other lakes, where conditions for their survival were conducive to rapid multiplication. The infamous sea lampreys' first and principal victims were the lake trouts, which had been the most valuable of the commercial and game fishes. As the sea lampreys increased and spread, the lake trouts



BY COURTESY OF THE AMERICAN MUSEUM OF NATURAL HISTORY

(LEFT) SEA LAMPREY (PETROMYZON MARINUS) ATTACHED TO CATFISH; (RIGHT) SUCKING MOUTH OF SEA LAMPREY. (BOTH ARE MUSEUM MODELS)

declined almost to the point of extinction, first in Lake Huron, then in Lake Michigan and finally in Lake Superior. Then the sea lampreys began preying on the large chubs and whitefishes. The United States Bureau of Commercial Fisheries and the Fishery Research Board of Canada initiated a control program against this destructive pest. To be most effective, control measures are directed at those points in the life cycle when the sea lampreys are most concentrated and vulnerable.

The upstream migrating adults are attacked by a combination of mechanical traps and electrical barriers; the larvae are killed with selective chemicals. (L. A. WD.)

LAMPROPHYRE, any member of a group of dark gray to black igneous rocks generally formed as dikes and characterized by a porphyritic texture in which large crystals (phenocrysts) of dark iron-magnesium (mafic) minerals including biotite, hornblende, augite or olivine are enclosed in a fine-grained to dense matrix. The abundance, large size, well-formed crystal outline and brilliantly reflecting cleavage faces of the mafic phenocrysts give the rock a striking appearance. Mafic minerals not only constitute virtually all of the phenocrysts but occur in the matrix or groundmass as well, together with much potash feldspar, plagioclase or feldspathoid.

Lamprophyres are set apart from most other igneous rocks by the occurrence of mafics both as phenocrysts and in the groundmass, by the lack of feldspar phenocrysts, and by the abundance of mafics combined with alkali-rich feldspar. Many varieties of lamprophyre have been described and given special rock names.

TABLE I.—A Simple Classification of the Common Lamprophyres

Dominant or characteristic mafic mineral	Dominant feldspar		No feldspar	
	Potash feldspar	Plagioclase	No olivine	Olivine
Biotite	Minette	Kersantite	Ouachitite	Alnöite
Hornbleude	Vogesite	Spessartite	Fourchite	Monchiquite
Barkevikite	—	Camptonite	Fourchite	Monchiquite

Due largely to the gradational character of the many types, no satisfactory classification has been proposed. A simple classification of the common lamprophyres, based on the type of feldspar and mafic mineral present or dominant, is shown in Table I.

The most common lamprophyres are frequently found associated with large masses of granite and diorite and include minette (also the name of an oolitic iron ore), vogesite. kersantite and spessartite (also the name of a variety of garnet). Classic examples are found in the Highlands and southern uplands of Scotland, the Lake district of Ireland. the Vosges, Black Forest and Hartz. In these varieties biotite mica exhibits corroded to well-formed hexagonal plates with red-brown. iron-rich rims surrounding pale yellow. magnesium-rich centres. In some rocks biotite is titanium-rich, particularly near grain borders. Green hornblends as slender prisms or needles and diopsidic augite are common. Augite crystals may show green cores surrounded by colourless material, which in turn is rimmed by hornblende. In some lamprophyres lilac coloured, titanium-rich augite is abundant. Olivine is rarely abundant and is generally replaced by serpentine or carbonate. Stumpy laths or irregular grains of potash feldspar (orthoclase or sanidine) make up much of the groundmass and may enclose abundant tiny grains of other minerals. Sodic plagioclase (albite-andesine) as poorly formed laths or irregular grains constitutes much of the groundmass. It may be zoned with more calcic cores and more sodic rims. Quartz is not abundant and is generally interstitial. Other minor constituents include apatite, magnetite and sphene.

Less common types include camptonite (from Campton, N.H.) in which barkevikite is the diagnostic mafic and labradorite the common plagioclase. Additional minerals may include olivine, titanaugite and biotite. Alnoites (after the island of Alno, Swed.) are rare rocks with unusual mineral assemblages. Diagnostic are melilite. perovskite, olivine and carbonates. Quachitite (from the Quachita river. Arkansas) is similar to alnoite but lacks olivine. Monchiquite (from Serra de Monchique. Port.) is uncommon and may carry much barkevikite in addition to olivine and augite. These mafics are embedded in a base of analcite or glassy material. Some varieties contain melilite, nepheline or other feldspathoid. Fourchite (from the Fourche mountains, Arkansas) is essentially an olivine-free monchiquite. In addition to the occurrences from which they were named classic examples are found in Bohemia, Brazil, Norway. Scotland and other places.

Lamprophyres show a strong tendency to weather and decompose. Many have been altered, undoubtedly while the rocks were still buried some distance beneath the surface, by hot solutions or vapours derived from crystallizing rock melts at still greater depth. The common alteration products include carbonate, chlorite, serpentine and limonite.

There is little justification for the once prevailing view that normal magma splits into two complementary fractions, a mafic component giving rise to lamprophyre and a felsic component giving rise to aplite and pegmatite.

Some lamprophyres have formed by direct crystallization of a lamprophyric magma; others represent the mixing of magma with foreign crystalline material. The abundance in some lamprophyres of large, strongly embayed and altered crystals of feldspar and quartz or fragments of granite, quartzite, schist, etc. suggests that large quantities of foreign matter may be incorporated and partly digested by basic magmas. The presence of corroded and altered mafic phenocrysts indicates these crystals were not in equilibrium with the differing magmas. There is good evidence that alkali-rich fractions of crystallizing magmas have acquired their phenocrysts by incorporating clusters of mafic crystals before being injected as dikes. Such a mechanism explains the unusual association of abundant mafics with alkali-rich rocks.

The highly altered character of many lamprophyres suggests that some varieties of these rocks have been transformed from more normal basic dike rocks. This transformation may have involved late-stage liquids or vapours which escaped from the crystallizing portions of the dike and moved out to attack and change those parts already solidified. Many lamprophyres may represent old basic dikes (diabase) which have been altered by permeation of fluids or ions escaping from large granitic bodies below. Fluids or volatiles, escaping from some deeper source and channeled along fractures in the earth, might react with the adjacent rock and convert it to dikelike masses of lamprophyre.

TABLE II.—Analyses of the More Common Lamprophyres

Component	Minette (10 analyses)	Vogesite (4 analyses)	Kersantite (20 analyses)	Spessartite (14 analyses)	Camptonite (15 analyses)	Monchiquite (16 analyses)	Fourchite (Arkansas)	Alnöite (Sweden)	Ouachitite (Arkansas)
SiO_2	49.45	52.62	50.79	52.85	40.70	45.17	42.03	33.37	36.40
Al_2O_3	14.41	14.56	1j.26	15.74	16.02	14.78	13.60	7.56	12.94
Fe_2O_3	3.39	3.60	3.29	3.04	5.43	5.10	7.55	5.33	8.24
MgO	5.01	4.18	5.54	4.81	7.84	5.05	6.6;	6.39	4.59
CaO	8.26	8.55	6.33	6.24	5.43	6.26	6.41	12.50	11.44
Na_2O	6.73	5.86	5.73	7.58	9.36	11.06	14.15	20.25	14.46
K_2O	2.54	3.21	3.12	3.58	3.23	3.69	1.83	2.03	0.97
TiO_2	4.69	2.83	2.79	2.39	1.76	2.73	0.97	3.06	3.01
H_2O	1.23	0.54	1.02	1.03	3.86	1.90	3.70	2.56	0.42
P_2O_5	2.43	2.70	3.10	2.05	2.62	3.40	1.08	3.16	2.36
CO_2	1.12	0.21	0.35	0.07	0.62	—	0.57	1.50	1.04
	0.61		2.61	0.12	2.97	—		1.56	3.94

Table II furnishes chemical analyses of the more common lamprophyres. Chemically the lamprophyres form a unique group of igneous rocks. They are characterized principally by a low silica content and a high iron, magnesium and alkali content. The high contents of water and carbon dioxide, as shown in Table II, may be due principally to the more or less altered condition of the analyzed specimens.

Further information on mineralogical and crystallographic processes and concepts referred to in this article is given under CRYSTALLOGRAPHY; GEOCHEMISTRY; MINERALOGY. (C. A. CN.)

LAMPS (ELECTRIC), MANUFACTURE OF. Electric lamps fall into two broad categories: (1) incandescent filament

lamps and (2) electric discharge lamps. The former are commonly referred to merely as incandescent or filament lamps. They are made in a great variety of electrical ratings, physical sizes and shapes, but all operate on the same principle of light production: a wire is heated to incandescence by passing an electric current through it.

Electric discharge lamps operate on a different principle. Light and ultra-violet energy are produced by an electric arc operating between two electrodes. Among the several types of electric discharge lamps in general use are fluorescent lamps, high- and low-pressure mercury-vapour lamps, sodium-vapour lamps, glow lamps and carbon are lamps. Of these, fluorescent lamps are by far the most widely used; they are also the most complex in design and operating characteristics. For these reasons, they have been chosen for discussion in this article as representative of the most interesting types of electric discharge lamps.

PRINCIPLES OF INCANDESCENT LAMP DESIGN

There have been many improvements in the incandescent lamp since Thomas A. Edison brought out the first successful lamp of this type in 1879, particularly in the filament; but the greatest change has been made in the methods of manufacture. Edison's lamp was handmade, while the modern incandescent lamp and all its parts are made almost entirely on high-speed machines.

The Filament. — Any radiator, such as a lamp filament, when heated sends out radiant energy over a wide range of wave lengths in the infra-red, visible and ultra-violet regions of the electromagnetic spectrum. As the temperature of the radiator is raised—up to (and above) the melting point of any material that may be used as a lamp filament—more and more of the radiated energy is found within the visible spectrum. This can be shown by heating a rod of iron, which at first is dark, but, as its temperature is raised, becomes dull red, then cherry red, then yellow—until finally it becomes white hot and emits a brilliant light. Thus, to produce the best lamp, it is necessary first to find the most suitable filament material available and then to arrange to heat the filament to as high a temperature as is practical, so that it will radiate as strongly as possible within the visible spectrum.

The first commercially made incandescent lamp had a filament of carbon and was so operated that its life was 600 hours; it gave light at an efficiency of 1.6 lumens per watt. (The watt is a unit of power equal to $\frac{1}{746}$ h.p. The lumen is a unit of light flux [flow] and is of such value that a source having an intensity of one candle in all directions [spherical candle] will give 4π lumens.)

Edison and others interested in this field devoted considerable time to studying methods of improving the filament. They sought to make it stronger and more uniform, with the aim of developing a more efficient lamp that could be more easily manufactured. It was soon discovered that a filament that was not uniform in diameter had a short life, since hot spots were likely to develop at the sections of smaller diameter; this increased the rate of evaporation of tungsten at these spots, causing early filament failure. Improvements in filament design included the development of filaments of carbonized Bristol board and carbonized bamboo (1880). In 1888 Leigh S. Powell of Great Britain developed a process of squirting a cellulose solution into alcohol, after which the resulting solidified thread was dried, wound on drums and carbonized. Filaments made from this material were stronger and more uniform than their predecessors. Methods of heat-treating the filament to drive off impurities were developed by Willis R. Whitney of the United States in 1905. This led to his invention of a filament of improved radiating characteristics, which was known, as the metallized carbon filament. These improvements resulted in a lamp that gave light at an efficiency of about four lumens per watt—an increase in efficiency of 150% over that of the first commercial lamp.

To be suitable for making into lamp filaments, a material must satisfy several requirements. It must be available in sufficient amounts so that it will not be too expensive. It must also be easily made into a strong, uniform filament, and it must radiate selectively in favour of the visible spectrum. It should also have a low vapour pressure and a high melting point so that it can be operated at a high temperature. This seems to be a description of the metal tungsten. Filaments have been made of many other metals and compounds, but none proved to be as satisfactory as tungsten. Beginning about the middle 1890s, the metals osmium and tantalum were tried out as filament materials, but they did not offer sufficient advantages over the improved carbon filament to be used to any great extent.

Experimentation with tungsten as a filament material began about the end of the 19th century. Successful tungsten lamps were introduced in Europe about 1904 and in the United States in the fall of 1907. The new lamp gave light at twice the efficiency of the then best carbon lamp.

The first tungsten lamp filaments were made by squirting a paste of tungsten powder mixed with a suitable binder through dies. When heat-treated, this material gave a filament that was a good light source but was so fragile that great care was required in mounting it and in handling the resulting lamp. After extensive investigation begun in 1906 by William D. Coolidge at Schenectady, N.Y., it was found that with the proper treatment tungsten could be made ductile and drawn into a uniform wire of small diameter. In 1911 drawn tungsten filaments were introduced in commercial lamps. They were much more rugged than the pressed tungsten filaments, and the lamps in which they were used operated at an efficiency of ten lumens per watt.

It was learned, quite accidentally, when the first wire was being drawn, that if about 0.5% of thoria were added to the tungsten powder better wire resulted.

The first wire was satisfactory for the old straight-filament lamps with all their supports, but it sagged too much to serve for some of the newer coiled-filament lamps. It was found that if certain materials, such as the salts of some of the alkali metals, were added to the powder, better nonsag wire was obtained. Apparently these salts are evaporated out of the filament by the heat-treatments to which the wire is subjected during manufacture, but they help to purify the metal and assist in obtaining the proper crystal form. This new method of producing nonsag ductile tungsten gave a very strong material which could be drawn into a wire of uniform diameter consisting of a bundle of threadlike crystals.

Another important consideration in lamp design is whether the filament is to be operated in a vacuum or in an atmosphere of some inert gas. It cannot be operated in air, since, at the temperatures developed, the tungsten would quickly oxidize and the filament would burn out.

The Vacuum Lamp. — When a filament is electrically heated in a vacuum, its performance as a light source depends on the character of the vacuum. If the vacuum is good (*i.e.*, if it has a pressure of only a very small fraction of a millimetre of mercury) the energy input to the filament is dissipated mostly by the radiation of the filament. The glass bulb may dissipate, by radiation and convection, as much as 5% of the input, and the conduction of the filament leads and supports may account for an additional 3% to 4% of the input. If the vacuum is not good, an electrical discharge capable of destroying the lamp may occur through the residual gas or vapour. If the vacuum is poor enough, the residual gases or vapours will attack the filament. Even in the most complete vacuum, however, the hot filament continually throws off particles from its surface as it burns. The speed of this process of evaporation determines filament life and depends on the temperature at which the filament is operated.

The Gas-Filled Lamp. — To increase the efficiency of the old straight-filament lamp an attempt was made to operate the filament in an atmosphere of a neutral gas (one that would not attack it chemically). It was reasoned that the molecules of the surrounding gas would interfere with the escape of molecules from the filament, thus reducing the rate of filament evaporation and lengthening filament life. The test showed that this was the case, and it meant that the filament could be operated at a higher temperature for the same life, as had been hoped. Unfortunately, however, the hoped-for gain in efficiency was not realized. In fact, efficiency actually was lowered because of the great amount

of energy lost from the filament in conduction and convection by the surrounding gas. (In this instance, conduction is the passing of heat from one molecule to the next, away from the filament; convection is the movement of heated molecules away from the filament.)

Irving Langmuir showed that the percentage of energy lost from the filament because of the gas depended upon the filament diameter, being smaller for the larger-diameter filaments. It was not practical, however, to use a filament of sufficient diameter to reduce this loss to an acceptable value.

In an attempt to overcome the difficulty, Langmuir found that the hot filament was surrounded by a sheath of stationary gas and that the heat lost from the filament had to be conducted through this sheath. He showed further that if the filament was coiled into a closely wound helix, the gas sheath covered the entire coil. Therefore, the loss of heat from a coiled filament depends upon the diameter of the coil and not upon that of the wire. By this means the energy loss to the gas was reduced to such a value that a worth-uhile gain in light-giving efficiency was obtained. Gas was tried first in the 120-v., 500-w. lamp, and an increase of about 20% in efficiency resulted for the gas-filled lamp over the corresponding vacuum lamp. Later this gain in efficiency was increased markedly through improved methods of making and coiling the tungsten wire.

The residual gas in the vacuum lamp and the gas used for the gas-filled lamps must be free from water vapour, since this acts as a catalytic agent, moving to the filament where it is brolren down and tungsten oxide and hydrogen are formed. The tungsten oxide moves away from the filament, and when it reaches a cooler part of the lamp the reverse reaction takes place: water vapour is again present in the bulb, free to dttack the filament. Experiment has shown that more than a fen parts of water vapour per 1,000,000 parts of gas is harmful.

For some time after the appearance of the gas-filled lamp, the 100-w. size was the smallest that shoned an advantage for gas filling. When filaments for smaller lamps were wound in coils large enough in diameter to keep heat loss to the gas from becoming excessive, these coils could not be made to hold their shape. The energy loss to the gas for the 120-v., 40-w. lamp with a coiled filament of such diameter that it could be operated at the temperature for normal life was about 35%. Later, by improvement in the coiling and by the use of an argon-nitrogen mixture as the filling gas, it was found possible to make a 120-v., 40-w. lamp that was more efficient than the corresponding vacuum lamp.

It was later found possible to coil these filaments twice. That is, the original coil was treated as if it were a length of uncoiled wire and was coiled again. With this construction, the sheath of stationary gas covered the entire coiled coil and thus gave an additional gain in efficiency for the smaller lamps.

Filling Gas.—The first gas used in incandescent lamps was nitrogen, but later nhen argon was found to give a marked gain in efficiency use of that gas was adopted. To avoid the danger of an internal arc. which may occur in pure argon, a small amount of nitrogen is added. A further gain in efficiency could be obtained by the use of the gas krypton, but the cost is prohibitive except for such special lamps as the miner's head lamp.

PROCESSES OF INCANDESCENT LAMP MANUFACTURE

Tungsten Wire.—The manufacture of tungsten wire starts with the production of tungsten powder by reducing ammonium paratungstate in a hydrogen furnace. The powder is pressed hydraulically into a narrow tungsten ingot about two feet long. This pressed ingot is fragile, but after it has been heated, again in an atmosphere of hydrogen, to d temperature of about 1,200° C., it is strong enough to handle and sufficiently consolidated to conduct electricity. It is then electrically heated to a temperature of about 3,000° C. in an atmosphere of hydrogen. This is done by passing an electric current through it. The ingot is suspended vertically, its upper end clamped and its lower end connected by another clamp to a pool of mercury, to allow for the shrinkage that occurs as the grains of metal powder grow together. The ends are then broken off. leaving a slug about 18 in. long that has a workable density. This slug is then heated and swaged while hot by passing it through rotating hammers. After several passages through successive hammers, the slug is reduced to a long rod about 0.1 in. in diameter. The tungsten rod is drawn, through dies, into a fine wire. By this time. the tungsten crystals have been elongated in the direction of the axis of the rod, giving it toughness and ductility. First tungsten carbide dies are used and then diamond dies for the smaller wire. When drawing is first started. the wire and dies are heated to about 1.000" C.; the temperature is gradually reduced to about 600" C. as the wire becomes smaller.

The Lamp Bulb.—The making of the bulb is truly the heavy industry part of the manufacture of incandescent lamps. The bulbs for the most commonly used lamps are made of a soda-lime-silica glass. Early lamp bulbs were hand blown—the blower and his helper were able to blow but a few hundred bulbs per day; modern bulbs are blown on a ribbon bulb-blowing machine that is about 8 ft. high, 3 to 4 ft. wide and about 50 ft. long. The ribbon machine consists of an intricate mechanism for feeding a succession of swiftly moving bulb moulds from a ribbon of molten glass that flows continuously from a furnace. Only about a quarter of the glass ribbon is made into bulbs; the rest is returned to the tank. This machine, operated 24 hours per day, six days per week, turns out bulbs for 120-v., 40-w. lamps (for example) at the rate of 900 bulbs per minute, or more than 1,250,000 per day.

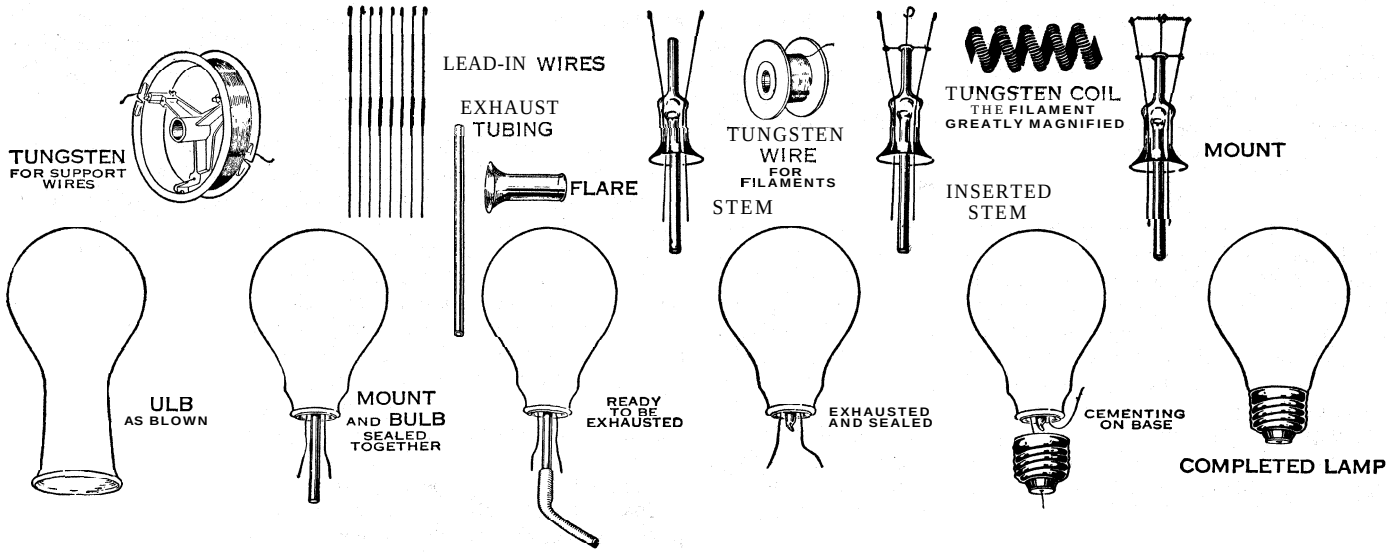
The glass for these machines is melted in a tank of about 400 tons' capacity, from which three of the ribbon machines can be operated. The advantages of so large a tank are that the components of the glass become thoroughly mixed and also that the temperature of the molten glass cannot change very rapidly.

The mixed batch, made up of precisely weighed amounts of the different ingredients, is automatically fed into the rear of this gas-heated tank just rapidly enough to keep the molten glass at the proper level.

From the ribbon machine the bulbs are conveyed through an annealing lehr, after which they are inspected and placed in trays. If the bulbs are to be inside-frosted, the trays are placed on another conveyer system which carries them through the automatic frosting process. This consists of flushing out the bulbs with an acid solution that etches the inside surfaces. The bulbs are then rinsed out, inspected and packed for shipment to the lamp factory.

Other Glass Parts.—Besides the bulb, there are some other parts of the lamp that are made of glass; these are the flare to hold the lead wires. the exhaust tube and the tube or rod to hold the supports for the filament. The tubes and rods used are drawn by a continuous process, the tubes from a mandrel and the rods through a die. The molten glass flows onto the rotating mandrel in a direction at right angles to its axis and is drawn off the end of the mandrel by the drawing mechanism. There is a hole in this pointed mandrel to permit forcing air through the tube as it is drawn off the mandrel. The speed of drawing, the size of the mandrel, the air pressure and the flow of the glass are factors that combine to determine the size of the resulting tube. The tubes are drawn at speeds from 50 to 1,100 ft. per minute, depending upon their diameter and the type of glass used.

Lead-in Wires.—The current is carried to the filament by leads that consist of three parts: typically copper from the base to the glass, then some material that can be sealed into the glass, and from the seal to the filament a wire of nickel, copper, molybdenum or some other metal. The part of the lead-in wire that is actually sealed in the glass must have a coefficient of expansion closely matched to that of the glass. Otherwise the glass will crack or the seal will not remain tight as the lamp is heated and cooled. In the early lamps, and, indeed, in all lamps made up to 1911, the material used to seal into the glass was platinum. Since the cost of this metal was rising steadily, efforts were made to develop a satisfactory substitute. Composite seal-in wire was developed and used commercially from 1911 to 1913. In the latter year an improved composite seal-in wire, invented by Colin G. Fink of the General Electric company, was put into general use. Fink found that a suitable seal-in wire could be made by using a nickel-iron core covered with a copper sleeve. The proportions of the three metals were chosen to give the final composite wire about the same ther-



DIAGRAMS ILLUSTRATING THE ASSEMBLY OF AN ELECTRIC LAMP

mal coefficient of radial expansion as the thermal expansion of the glass.

The leads are made on machines that cut the three parts into the proper lengths and weld them together.

The Lamp Base.—Base making ranks second to bulb blowing in terms of the quantity of material used. For many years bases were made almost exclusively of brass, but by the mid-1950s the majority of screw bases for incandescent lamps manufactured in the United States were being made of aluminum.

There are four principal types of bases made and used in the incandescent lamp industry: the screw, bayonet, prefocus and bipost types.

Screw bases are regularly made in several sizes: miniature, candelabra, intermediate, medium and mogul. Some of these bases are skirted to give better support to the bulb. Most of them have two contacts (the shell and the centre contact), but those that are to be used on two-filament lamps have three contacts.

The bayonet base is cylindrical in shape, with two small pins projecting from the sleeve to engage lock slots in the lamp socket. The base may have either one or two end contacts. This type of base is often used to seat the lamp in a selected position with respect to the filament. Its original use was in applications in which the lamps were subjected to movement, as in service on automobiles. This base is also made in several sizes.

The prefocus base is also cylindrical, but instead of locking pins it has a special prefocusing collar or flanged shell that positions the lamp precisely and holds it securely in the socket. This collar or flanged shell is soldered in place after the lamp has been assembled. and its orientation on the base sleeve is determined with respect to the exact position of the filament. Prefocus bases are used on many projection lamps and other lamps used with optical systems. They are made in the candelabra, medium and mogul sizes.

The shells of the screw, bayonet and prefocus bases are stamped out of sheet aluminum or brass and shaped by dies under pressure. The assembling of the base is performed on automatic machinery; the shell and the centre contact eyelet are correctly positioned in a mould, and the right amount of molten glass is poured in and pressed into its final shape by a plunger. The glass anchors the centre contact and insulates it from the shell.

All three types of bases are attached to the necks of the lamps by a special cement that sets on heating. Some of the larger lamps have what are called "mechanical" bases. A sleeve having rounded lugs on its inside surface is clamped tightly around the neck of the bulb, the lugs fitting into previously made indentations in the glass. The base is then soldered to this tight-fitting sleeve.

As its name partly suggests, the bipost base consists of two metal posts projecting through, and sealed to. a dishlike piece of glass that eventually becomes the bottom of the lamp bulb. A copper thimble with feathered edges is attached to each base post, and it is to these thimbles that the glass-to-metal seals are made. The supporting structure of the filament is mounted on the base posts, being attached inside the copper thimbles. Thus the bipost base supports both the bulb and the filament mount. This is an important advantage offered by this type of base, since the filament and mount in some of the larger lamps are too heavy to be supported adequately by a glass structure.

Lamp Assembly.— The various interior parts of the lamp—the flare, the exhaust tubing, the lead-in wires, the filament and the filament support wires—are brought to the mount machine for assembly. These parts are fed to the machine from bins appropriately located along a moving conveyor and automatically positioned and processed. The successive steps are shown from left to right in the upper half of the drawing on the preceding page.

The assembled mounts and the bulbs are then placed on the sealing and exhausting machine. This consists of a horizontal rotating turret with two rows of ports. The bulbs and the mounts are brought together on the upper row of ports, heated by gas flames and fused together. The assembled lamp is then automatically transferred to the other row of ports where it is exhausted, flushed out and then either exhausted again or filled with gas, depending on whether it is to be a vacuum or a gas-filled lamp. Such a machine delivers about 1,300 medium-sized lamps per hour.

The lamp is next flash-tested and then sealed off and transferred to a basing reel. Here the base is fitted to the lamp, heated and the leads either soldered or welded to the base contacts. This basing reel is of such size that it can base the lamps as fast as the assembly machine delivers them. The lamps are then tested and packed for shipment.

The assembly of lamps of the bipost construction, although necessarily somewhat different in the details of the several specific operations, is also performed on a rotating-turret machine.

It is to be noted that considerable planning must be done to get the parts or materials to these machines used in the different operations of lampmaking. Either a bulb-making machine turning out 900 bulbs per minute or a lamp-assembly machine delivering 1,300 lamps per hour would soon cause serious congestion if its finished product were not moved out of the building promptly. For a like reason material must be continually flowing into such factories. This, to be sure, is one of the unavoidable problems posed by modern high-speed production.

Many variations of the manufacturing techniques discussed above are employed. There are hundreds of larnps for specialized services and many of them are constructed quite differently from the familiar general service lamps. Examples are lamps of the sealed-beam type, embodying precisely moulded parabolic reflectors and lenses; blown-glass reflector lamps having sealed-in reflectors of vaporized aluminum or silver; deep-sea diving lamps;

long tubular lamps that resemble fluorescent lamps but have a filament stretching from end to end; surgical instrument lamps so small that it would take 9,000 of them to weigh a pound—the list could be extended almost indefinitely. It will be understood that a discussion of the specialized procedures followed in making such lamps is beyond the scope of this article.

FLUORESCENT LAMPS

For a discussion of the characteristics and aperation of fluorescent lamps, *see* LIGHTING.

Glass Parts.—All the glass parts of a fluorescent lamp are made from glass tubing. They consist of the lamp tube (or bulb. as it is often called—a carry-over from incandescent lamp terminoiogy), the flare and the exhaust tube. These are drawn from a mandrel by the same process described for the manufacture of the glass tubing used in incandescent lamps.

Phosphors.—The manufacture of the phosphors used in fluorescent lamps has no counterpart in the manufacture of incandescent lamps. For this reason, discussion of the manufacture of fluorescent lamps will deal chiefly with this phase of the general subject.

There are a number of considerations that determine the suitability of a fluorescent chemical for use as a fluorescent lamp phosphor. These include its sensitivity to ultra-violet energy of the 2,537-angstrom wave length; its luminous efficiency and stability; its ability to withstand high processing temperatures; and the colour of the emitted light. Only inorganic materials are used as lamp phosphors—the high processing temperatures would break down organic materials. There are a great many inorganic phosphor compounds available, but the following are most used in fluorescent lamp manufacture: (1) tungstates of magnesium, calcium, cadmium; (2) silicates of zinc, calcium, cadmium; (3) borates of zinc, cadmium; (4) phosphates of calcium, cadmium. Of these phosphor compounds, the calcium phosphates used for the various high-demand "white" fluorescent lamps represented at least 85% of phosphor tonnage used in the United States in the 1950s.

Although it is essential that the phosphor compounds be thoroughly purified before use, most of them will not fluoresce efficiently without the addition of an impurity called an activator. This is generally a metallic element such as copper, silver, manganese, antimony, bismuth or thallium. The activator not only facilitates the excitation of the phosphor but also affects the colour of the emitted light and in some cases is itself the source of the light. It comprises only a small percentage of the phosphor mixture. More than one activator may be used.

To explain the processes of phosphor manufacture, the steps in the manufacture of calcium halo-phosphate phosphors, the most-used type, are outlined below. The first step is the manufacture of calcium phosphate from the precipitation of highly purified calcium chloride and diammonium phosphate. After being thoroughly dried by heating, the calcium phosphate is in a soft, lumpy state. It is then pulverized.

Next, calcium carbonate, calcium fluoride and more calcium chloride are added to the powdered calcium phosphate. To precisely weighed amounts of each, small amounts of antimony oxide and manganese carbonate are added—a few per cent of each. These are the activators. The function of the antimony is to increase sensitivity to **2,537-A** energy and to emit light; the manganese regulates the spectral quality (*i.e.*, the colour) of the light produced. Since the activators are used in such small amounts, they must be weighed with extreme accuracy. These chemicals are placed in a blending machine and thoroughly mixed together.

After mixing, the phosphor blend is subjected to a ball-milling operation to reduce the size of the crystals. The machine into which the blend is poured consists of a rotating drum containing marble-sized spheres of flint rock. The phosphor is milled for about two hours.

Firing is the next step. The milled ingredients are put in silica dishes, which are placed on a conveyer leading through an electric oven. A two-hour heat-treatment changes the structure of the blend, forming new crystals, each of which contains all the ingredients. The oxides, carbonates and other volatiles in the phosphor are driven off by this firing process. The temperature of the oven and the duration of the treatment are both very critical, since these factors affect phosphor efficiency and spectral distribution of the light. The phosphor can be ruined by over-firing or under-firing.

In order to malre a coating of proper density and thickness, the phosphor is mixed with a binder or suspending agent. A nitrocellulose solution in an organic liquid is used for this purpose. The mixture is ball-milled again to reduce the crystals to the proper size, about two to eight microns in diameter. Like the preceding operations, this final milling is critical. Crystals that have been milled too fine may lose much of their fluorescence; crystals that have not been milled enough form masses that prevent full exposure to the exciting energy, hence are not efficient. There are said to be several billion phosphor particles in the coating of a single 40-w. fluorescent lamp. Each batch of phosphor is tested for luminous efficiency and colour before it is sent to the lamp factory. These tests are made on samples of the finished dry powders and on sample lamps made specially for testing the phosphors.

Coating the Tubes.—In the lamp factory, the phosphor suspension is poured into the reservoirs of the automatic tube-coating machines. These are rotating-turret devices on which the empty glass tubes are placed vertically, side by side. First the tubes are flushed out with deionized water and dried with hot air. Then the phosphor suspension flows down the insides of the tubes and coats them. A close check must be kept on the viscosity of the suspension in order to ensure coatings that are uniform and of proper thickness. This is much more than simply a matter of the appearance of the finished lamp: too thin a coating fails to take full advantage of the exciting 2,537-Å energy; too thick a coating absorbs too much of the generated light.

After they have been coated, the tubes are put through a lehr that bakes the phosphor, burns out the binder and drives off any remaining impurities. Any excess phosphor is cleaned off the ends of the tubes, mhich are now ready to go to the sealing machines.

Assembling.—Cathode mounts are not unlike filament lamp mounts in appearance and construction. An assembled mount consists essentially of the cathode itself (a doubly or triply coiled tungsten filament), the two lead-in wires, the flared tubing into which the lead-in wires are sealed, and the exhaust tube. Usually an exhaust tube is sealed into each mount, but passage through it is opened (by air pressure while the glass is still soft) in only one of the two mounts used in each lamp.

Assembly of the cathode mounts takes place on rotating-turret machines very similar in design and operation to the machines used to assemble filament lamp mounts. In addition to assembling the mount, this machine also applies an electron-emissive compound to the cathode coil. The paired cathode mounts and the coated tubes are brought together on another rotating-turret machine that seals the mounts to the ends of the tubes. The machine holds the tubes vertically and moves them through a succession of gas flames, which raise the temperature of the tube ends and the glass flares, fusing them together.

Exhausting and Gas Filling.—These operations are also performed automatically. Again, the lamps are held vertically, exhaust tubes up, as they go through the machine. In successive steps, the lamps are evacuated, a small amount of mercury is dropped through the exhaust tube, and, just before sealing off, a very low pressure of argon gas is added. During the process of exhausting, current is passed through the lamp cathodes to condition the emissive coating so that it will more readily emit electrons when the lamp is operating.

Basing.—The bases consist of aluminum or plastic caps in which are set the one or two insulated contact pins through which the lamp is to be connected to the electrical circuit. These pins are actually small, hollow ferrules. A ring of basing cement coats the inside of each base cap. The first step in basing the lamps consists of threading the lead-in wires through the base pins and fitting the bases over the ends of the lamps. Then, as the lamps proceed from position to position on the basing machine, heat is applied to the basing cement to cure and set it, the excess lengths of the lead wires are cut off, and the wires themselves are con-

nected to the base pins, usually by soldering. The completed lamp is lighted to check its stability of operation. It is then thoroughly inspected and packed for shipment.

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LAMPSACUS, an ancient Greek colony in Asia Minor, situated on the Hellespont, opposite Callipolis (Gallipoli) in Thrace, It was known as Pityusa or Pityussa before its colonization by Ionian Greeks from Phocaea (654) and Miletus. It possessed a good harbour, and the neighbourhood was famous for its wine. Lampsacus opposed the .Athenian occupation of the Chersonese (*c.* 546 B.C.) but took part, with Athens, in the Ionian revolt from Persia (499). After the defeat of Xerxes Lampsacus joined the Delian league (*q.v.*); its high tribute shows its prosperity. Revolt from Athens in 411 mas soon crushed, but when Athens' power was broken (405) Lampsacus again came under Persian control until the invasion of Alexander the Great of Macedonia (334). In winter 197–196 B.C. it was besieged by Antiochus III of Syria, after which its inhabitants were received as allies of Rome. Lampsacus was the chief seat of the worship of Priapus (*q.v.*), a god of fertility, closely connected with the culture of the vine. The ancient name is preserved in that of the modern village of Lapseki, but the Greek town possibly lay at Cardak immediately opposite Gallipoli.

LAMP SHELLS, a popular term applied to brachiopod shells on account of the supposed resemblance of certain forms, such as Terebratula, to an ancient Etruscan lamp: When resting upon its ventral valve the shell corresponds in form to the body of the lamp, and the slender pedicle, protruding from a perforation in the beak of the ventral valve, bears a fancied likeness to a wick. The family Terebratulidae, which dates from the Triassic, contains 63 genera.

LAMPSTAND, a pillar, tripod or figure extending to the floor for supporting or holding a lamp. The lampstand (*lampadère*) is probably of French origin; it appears to have been in use in France before the end of the 17th century. With electricity, the lampstand was supplanted by the floor lamp. The floor lamp is the subject of various designs, the shade of which may be made of one of several materials and the colour suited to the surroundings.

See LIGHTING.

LANAO, a region, formerly a province, of northern Mindanao, Republic of the Philippines, was divided after 1958 to form the provinces of Lanao del Norte (area, 1.314 sq.mi.; pop. [1960] 280,461) and Lanao del Sur (area, 1,261 sq.mi.; pop. [1960] 531,-269). About 30% of the population is Bisayan in origin and about 65% is Moro. Narrow coastal plains border the Mindanao sea and the Moro gulf and gently rolling plains border Lake Lanao; other areas are largely mountainous.

The separately administered city of Marawi, formerly Dansalan (pop. [1960] 48,463): is the capital of Lanao del Sur. The largest Moro city in the Philippines, it occupies a magnificent site at the head of Lake Lanao and is an important trading centre and the centre of Muslim handicraft and bladed weapons production. Southwest of Iligan, the capital of Lanao del Norte (pop. [1960] 60,083), are the Maria Christina falls which provide hydroelectric power for nearby industries, including a steel mill and a fertilizer plant. (R. E. HE.)

LANARK, a royal and small burgh and the county town of Lanarkshire, Scot., standing on high ground about half a mile from the right bank of the Clyde, 25 mi. S.E. of Glasgow by road. Pop. (1956) 8,436. Lanark was made a royal burgh by David I in whose reign St. Kentigern's church (now in ruins) was built and the ceremony of "the Lanimers" (the Riding of the Marches) was instituted. Lanimer day is still kept on a Thursday between June 6 and 12 when a procession of pageants and tableaus nith the Lanimer queen passes along the gaily decorated streets. The Scottish kings lived from time to time in Lanark castle and hunted in the surrounding forest. William Wallace is said to have lived and been married in the town, to have quarrelled with the English, who put his wife to death, and there slain the English sheriff, William Hazelrig. After this he hid in a cave (now called Wallace cave) at the Cartland crags (northwest), where Mouse water runs through a precipitous red sandstone ravine and is crossed by a bridge of single span, supposed to be of Roman origin, and by a three-arched bridge, designed by Thomas Telford. In the 14th century the Gray friars built a monastery in Lanark where a convention of the whole order was held in 1496. The grammar school is of 12th-century foundation. William Lithgow (1582?–1645), the traveller. William Smellie (1697–1763), the obstetrician, and Gavin Hamilton (1730–97), the painter, were born at Lanark.

New Lanark, 1 mi. S., is known for the socialist experiments of Robert Owen (*q.v.*) in 1800–28. The village was founded by David Dale (Owen's father-in-law) in 1785. with the support of Sir Richard Arkwright, inventor of the spinning frame. Lanark's industries are chiefly hosiery manufacture, skin works and agricultural engineering. while at New Lanark are mills making sailcloth. Lanark, in the centre of rich agricultural country, is mainly a market town with regular sales of cattle, horses and sheep. At the racecourse meetings are held in May, July and September, the principal trophy being the very ancient silver bell. The course is on the moor where also is Lanark lough, used as a pleasure place. Braxfield, on the Clyde? gave the title of Lord Braxfield to Robert Macqueen (1722–99), who was born in the mansion and acquired on the bench the character of the Scottish 'Jeffreys. He is portrayed by R. L. Stevenson in The Weir of Hermiston. Lee house, the home of the Lockharts, is 3 mi. N.W. The old castle, largely rebuilt in the 19th century, contains some fine tapestry and portraits, and also the "Lee penny," familiar to readers of Sir Walter Scott's *The* Talisman. It is a cornelian encased in a shilling of the reign of Edward I, which was brought from Palestine in the 14th century by Simon Lockhart of Lee.

LANARKSHIRE, a county in the heart of southern Scotland. representative of the mediaeval region of Clydesdale, from which the old barony of Renfrew was disjoined in 1402, in the reign of Robert III. It comprehends today the basin of the Clyde as far downstream as Glasgow and has an area of 837.3 sq.mi. It is bounded north by the shires of Dunbarton and Stirling, east by West Lothian, Midlothian and Peebles, south by Dumfries and west by Ayr. Renfrew and Dunbarton. Geographically it includes the whole of Glasgow, which administratively is a separate unit—the County of the City of Glasgow (*q.v.*). The shire is divided into three wards: the upper, comprising all the southern section; the middle, with Hamilton as its chief town; the lower, which looks to Glasgow as its economic and social centre.

Physical Features. — The key to the geology — and also to the scenery and to the modern economic history — of Lanarkshire is the presence of the southern Scottish fault. which runs in a northeasterly and southwesterly direction by Crawfordjohn, Roberton and Lamington to the county border near Culter. To the northwest of this fault the rocks have subsided until the Old Red Sandstone system has been brought level with the Ordovician rocks—the grits, conglomerates and volcanic lava—to the southeast of the line. The Coal Measures, which have played a vital part in the economic history of the county, form part of the Old Red Sandstone rocks. At Tinto a great sheet of igneous rock has been thrust into the surrounding strata.

The fault divides the Lowlands of Scotland, with their scattered remnants of that beauty of woodland and stream which delighted the Victorian artist, from the great mass of smoothly rounded hills of the southern uplands. Of these the highest summit entirely in the county is Green Lowther (2,403 ft.). Tinto (2,335 ft.) is a landmark all down Clydesdale. The county is drained by the Clyde and its tributaries. The once-famous Falls of Clyde, in the Old Red Sandstone area, have been so affected by the Clyde Valley Hydro-electric scheme that their impetuous torrent is now confined to the season of winter floods.

History. — The smooth summits of the southern uplands are in many places ringed by the ramparts of forts of early tribesmen. Across the north of the county runs a section of the Antonine wall; the site of one of the wall forts has been excavated in the "Wilderness plantation" at Cadder. From the days of the Romans

to those of the Jacobite retreat from Derby the highways of the county saw the corning and going of armed men. The great feudal castle of Bothnell, by the Clyde. and the strong toner of Craignethan, at the junction of Clyde and Nethan—the Tillietudlem of Sir Walter Scott — have, though in ruins. outlasted the 18th-century Bothwell house (taken off the valuation roll in 1930) and the Victorian Gothic of Mauldslie castle (demolition completed 1939). At Hamilton Queen Mary assembled her supporters for that march to Dumbarton castle which ended at Langside hill (1568). At Bothwell Brig the duke of Monmouth crushed the rising of the Westland Covenanters which had followed swiftly on their triumph over Claverhouse in the skirmish of Drumclog (6 9 But deeper, more widespread and more lasting in its influence on the life of the people of Lanarkshire than the military history of long past days has been the economic history of the 18th and 19th centuries, the exploitation of the Coal Measures and the development of the iron industry.

Industries. — To the technique of the iron industry the county made two notable contributions: the discovery by Robert hlushet of the possibility of using the Black Band ironstone; and the innovation, by the Eairds of Gartsherrie. of the employment of the hot-blast furnace. The inost outstanding feature since about 1930 has been the steady decline in the working of coal and the compensatory expansion of the iron and steel works. The county makes practically everything in the metal line: jet engines, sugar and laundry machinery. intricate electronic instruments. cranes. bridges. pipelines and oil tanks. In 1954 a scheme was initiated at Motherwell for the further extension of iron and steel production. The textile industry of various towns, such as Strathaven (woollens arid artificial silk, and Lanark, represents a modern adaptation of traditional activities.

Agriculture. — There is much good farmland, and many valleys shelter orchards and glasshouses. The total area of tomatoes under glass in the mid-1950s amounted to more than 4,000,000 sq.ft. The orchards bear mainly plums. Strawberries, raspberries and currants occupied 7jo ac. Cattle. sheep and pigs are the main livestock carried. Horses. especially the heavy Clydesdale breed, are also important. On the hills and rough ground sheep predominate.

Communications. — The railway line to London via Carstairs and Beattock traverses the county. The two railway routes from Glasgow to Edinburgh cut across the north of the county. Many of the branch lines have been closed to passenger traffic. All traffic on the Monkland canal ceased in 1934 and the tonnage carried on the Forth and Clyde canal declined steadily after 1913 when 776,701 tons were carried. Less than 15,000 tons per year were carried in the inid-1950s.

Population and Administration. — The population of Lanarkshire (excluding Glasgow) was 571.304 in 1961. The small burghs are Biggar (1.403) and Lanark (8.436); the large burghs are Airdrie (33.620). Coatbridge (53.946). Hamilton (41,928). Motherwell and Wishaw (72,799) and Rutherglen (25,067). Rutherglen and Lanark are royal burghs. The county is divided into seven parliamentary constituencies: Bothwell. Coatbridge. Hamilton. Lanark. Motherwell. Northern and Rutlierglen: each returns one member to parliament. Lanarkshire is a sheriffdom and the sheriff principal has his court in Glasgow; there are also sheriff courts at Hamilton. Lanark and Airdrie. (G. P. I.)

LANCASHPRE, a northnestern county of England. bounded on the north by Cumberland and Westmorland, east by Yorkshire. south by Cheshire and west by the Irish sea. The area is 1,878.5 sq.mi. with a population (1961) of 5,131,646.

The coast is generally flat with lon boulder-clay cliffs at places and broken by great inlets. with wide expanses of sandy foreshore at low tides. The chief inlets, from north to south. are: the estuary of the Duddon river: Morecambe bay; and the estuaries of the Ribble and the Mersey. Morecambe bay receives the Crake and Leven rivers in a common estuary. and the Kent from Westmorland; n-hile the Lune and the Wyre discharge into Lancaster bay, which is only partially separated from Morecambe bay by the promontory of Heysham head. Morecambe bay also detaches from the rest of the county the district of Furness (*q.v.*) having off its coast the island of Walney, 8 mi. long. The principal seaside towns from south to north are Southport, Lytham St. Anne's, Blackpool. Fleetwood and Morecambe.

Of the rivers the Mersey (*q.v.*) separating the county from Cheshire is the principal, and receives from Lancashire the Irwell. Sankey and other small streams. The Ribble. n-hich rises in the mountains of the West Riding of Torkshire, forms for a few miles the boundary with that county, and then flows southwest to Preston, receiving the Hodder from the north and the Calder and Darwen from the south. Furness. entirely hilly except for a narrow coastal tract, extends north to include the southern part of the Lake district (*q.v.*): it contains Coniston lake and borders Windermere, with some smaller lakes and such inountains as the Old Man and Wetherlam. Another elevated district, forming part of the Pennine (*q.v.*) uplands. runs along the nhole eastern boundary of the county. and to the south of the Ribble occupies more than half the area. The moorlands in the southern district are generally bleak and covered with heather. Toward the north the scenery is frequently beautiful, the green rounded elevated ridges being separated by pleasant cultivated valleys variegated by woods and watered by rivers. The finest scenery is found in the limestone area in the northern half of the county. while the moorlands of the southern district are formed of Millstone Grit and Coal-Measure shale;. and sandstone. None of the summits of the range within Lancashire attains an elevation of 2,000 ft.. the highest being Blackstone Edge (1.553 ft.). Pendle hill (1,831 ft.) and Ward's Stone (1.836 ft.). Along the seacoast from the Mersey to Lancaster there is a continuous plain, formerly occupied by peat mosses, many of which have been reclaimed. the bad drainage being due to deposits of boulder clay. The shore near Formby shows traces of submerged forests.

On the south Lancashire coal basin are situated the most important towns of the district. n-hile part of the Ingleton coal field also lies in the county. Large pockets of iron ore (haematite) occur in the Carboniferous Limestones of the Furness district. The available coal supply of the Lancashire coal field has been proved at 4,238,500,000 tons. In addition to coal and fire clay. quantities of limestone. sandstone, slate and salt, nhich is also obtained from the brine. are raised. Metals, excepting iron. are unimportant.

History.—Many small flint implements have been found. especially on the moorlands around Rochdale; a hosrd of bronze implements including socketed axes has been collected near Winmarleigh; a tanged bronze dagger was found near Colne. Winwick near Warrington has important early Bronze Age burials while Bleasdale has a unique wooden circle. There are remains of two stone circles in Furness. n-hich is richer in prehistoric remains than the rest of Lancashire, of two others in the moors north of Bolton and of two more south of Burnley. Manchester. Wigan, Ribchester and Lancaster were Roman centres. There arc various sculptured crosses. mostly of the 8th century or later. and a few traces of Celtic art. During the 10th century Lancashire was invaded by the Scandinavians. principally Norse. and after the peace of Wedmore (878) was included in the Danish kingdom of Northumbria. Scandinavian place names abound and indicate a wedge driven in between the Welsh of Wales and of Strathclyde. The Anglo-Saxon Chronicle records the reconquest of the district between the Ribble and the Mersey in 923 by the English king. when it appears to have been united to Mercia. but the district north of the Ribble still belonged to Northumbria until its incorporation with the kingdom of England. William the Conqueror gave the lands between the Ribble and the Mersey. and Amounderness to Roger of Poictou, but at the time of the Domesday Book these again belonged to the king.

The name Lancashire does not appear in Domesday; the lands between the Ribble and the Mersey were surveyed n-ith Cheshire and those north of the Ribble with Yorkshire. Roger of Poictou soon regained his lands. and Rufus added the rest of Lonsdale south of the sands, and, as he had the Furness fells. he owned all that is now known as Lancashire. In 1102 Roger finally forfeited all his lands and these Henry I held till, in 1118, he created the honour of Lancaster. and bestowed it upon his nephew. afterward King h e n . During Stephen's reign difficulties arose. for David

of Scotland held lands north of the Ribble ior a time, and in 1147 the earl of Chester held the district between the Ribble and the Mersey. Henry II gave the whole honour to William, Stephen's son; but in 1164 it came again into the king's hands until 1189, when Richard I granted it to his brother John. In 1194 it was confiscated and the honour remained with the crown till 1267. In 1229, however, all the crown demesne between the Ribble and the Mersey mas granted to Ranuli, earl of Chester, and on his death in 1232 came to William Ferrers, earl of Derby. The Ferrers held it till 1266, when it was confiscated. In 1267 Henry III granted it to his son Edmund, who was created earl of Lancaster. His son, Earl Thomas, married Alice, the heiress of Henry de Lacy, earl of Lincoln and Salisbury, and thus obtained the great estates belonging to the De Lacys. On the death of Henry. first duke of Lancaster. in 1361, the estates, title and honour fell to John of Gaunt, and by the accession of Henry IV, John of Gaunt's son, to the throne, the duchy became merged in the crown.

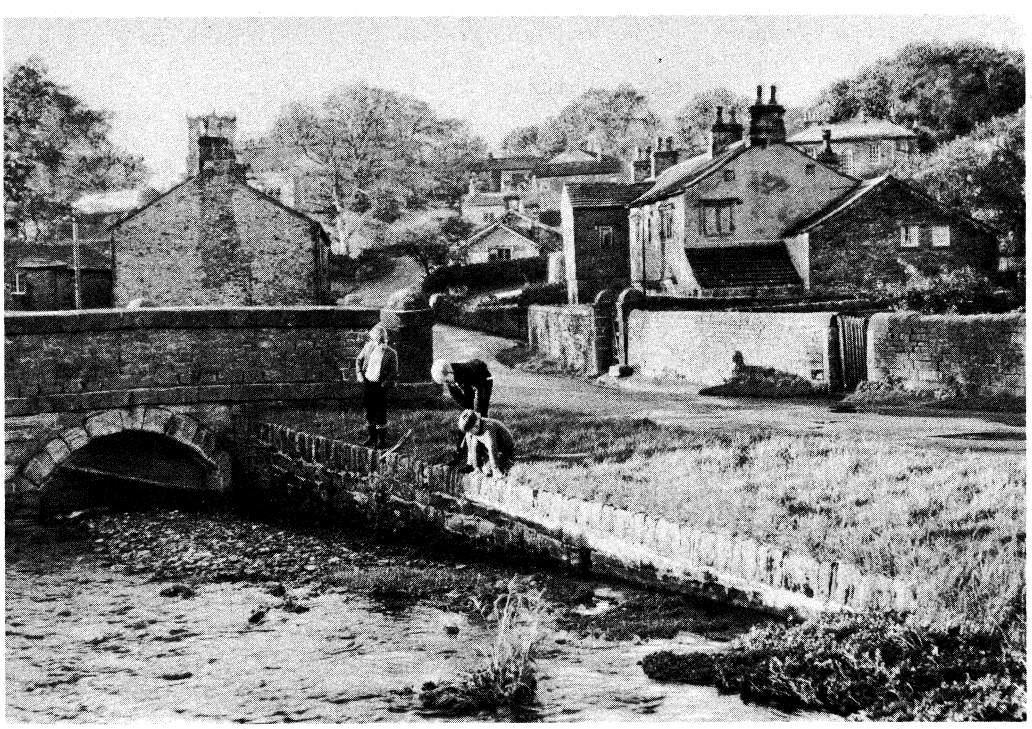
The county of Lancaster is mentioned in 1169, as first contributing to the royal exchequer. The creation of the honour decided the boundaries. Ecclesiastically the whole of the county originally belonged to the diocese of York but in 923 the district between the Ribble and the Mersey mas placed under the bishop of Lichfield. Up to 1541 the district north of the Ribble belonged to the diocese of York. but in that year the diocese of Chester was created and Lancashire was divided into two archdeaconries. In modern times bishoprics have been established at hlanchester (1847), Liverpool (1880) and Blackburn (1926) and they divide the county between them, except ior Furness and Cartmel, which were transferred to the diocese of Carlisle soon aiter that of hlanchester was created.

As a duchy and county palatine Lancashire has its own special courts. But the first record of palatinate jurisdiction being exercised was in 1351 under Henry, duke of Lancaster. In 1377 the county was erected into a palatinate for John of Gaunt's life. and in 1396 these rights were extended and settled in perpetuity on the dukes of Lancaster. The palatinate courts consist of a chancery which dates back at least to 1376, a court of common pleas, the jurisdiction of which was transferred in 1873 by the Judicature act to the high court of justice, and a court of criminal jurisdiction which in no way differs from the king's ordinary court. The duchy and the county palatine each has its own seal.

At the close of the.12th and during the 13th centuries there was a considerable advance in the importance of the towns; in 1199 Lancaster became a borough. in 1207 Liverpool, in 1230 Salford, in 1236 Wigan and in 1301 Manchester. The Scottish wars drained the county of some of its best blood. In 1349 the county was visited by the Black Death and in ten parishes between Sept. 1349 and Jan. 1350, 13,180 persons perished. From the effects of this plague Lancashire was apparently slow to recover; its boroughs ceased to return members early in the 14th century and trade had not yet made any great advance. The drain of the Wars of the Roses on the county must also have been heavy. Its poverty is shown by the fact that out of £40,000 granted in 1504 by parliament to the king, Lancashire's share was only £318. Under the Tudors the county prospered.

In the assessment of ship money in 1636 the county was put down for £1,000, toward which Wigan was to raise £50, Preston £40, Lancaster £30 and Liverpool £2j (cf. Hull £140 and Leeds £200). On the eve of the Great Rebellion parliament, early in 1642. resolved to take command of the militia, and Lord Strange, Lord Derby's eldest son: was removed from the lord lieutenancy. On the whole, the county was royalist. Manchester was the headquarters of the parliamentarians and was besieged by Lord Derby (Lord Strange. who succeeded to the earldom of Derby Sept. 29 during the siege) in Sept. 1642 for seven days, but not taken. At the opening of 1643 Sir Thomas Fairfax made Manchester his headquarters. Early in this year the parliamentarians from Manchester successfully assaulted Preston and then captured Hoghton Tower and Lancaster. Lord Derby made an unsuccessful attack on Bolton from Wigan. In March Lord Derby captured the town of Lancaster but not the castle, and marching to Preston regained it for the king, but was repulsed in an attack on Bolton. In April Wigan, one of the chief royalist strongholds in the county, was taken by the parliamentary forces, which also again captured Lancaster, and Warrington fell after a week's siege. Lord Derby also failed in an attempt on Liverpool, and the tide of war had clearly turned against the royalists in Lancashire. In June Lord Derby went to the Isle of Man, which was threatened by the king's enemies. Soon after, the parliamentarians captured Hornby castle and later Thurland castle. In Feb. 1644 the parliamentarians besieged Lathom house, the one refuge left to the royalists, which was bravely defended by Lord Derby's wife, Charlotte de la Trémoille. The siege' lasted nearly four months and was raised on the approach of Prince Rupert, who marched to Bolton and was joined outside the town by Lord Derby. Bolton was carried by storm; Rupert ordered that no quarter should be given. He advanced without delay to Liverpool and took it after a siege of three weeks. After Marston moor, Prince Rupert again appeared in Lancashire and small engagements took place at Ormskirk. Upholland and Preston; in November Liverpool surrendered to the parliamentarians. Lathom house, again the only strong place in Lancashire left to the royalists, in Dec. 1645 surrendered after a five-months siege. and was entirely destroyed. For the moment the war in Lancashire was over.

In 1648. however. the royalist forces under the duke of Hamilton and Sir hlarmaduke Langdale marched through Lancaster to Preston, hoping to reach Manchester; but near Preston were defeated by Oliver Cromwell in person. In 1651 Charles II ad-



AUTHENTICATED NEWS

THE VILLAGE OF DOWNHAM ON THE RIVER RIBBLE, LANCASHIRE

vanced through Lancaster, Preston and Chorley on his southward march to defeat at Worcester. This was followed by the execution of Lord Derby at Bolton.

During the rebellion of 171j Manchester was the chief centre of Roman Catholic and High Church Toryism. On Nov. 7 the Scottish army entered Lancaster, where the pretender was proclaimed king, and advanced to Preston, at which place a considerable body of Roman Catholics joined it. The rebels remained at Preston a few days, apparently unaware of the advance of the government troops, until Gen. Charles Wills irom Manchester and Gen. George Carpenter from Lancaster surrounded the town, and on Nov. 13 the town surrendered. In 1745 Prince Charles Edward passed through the county and was joined by about zoo adherents called the Manchester regiment.

Growth of Industries. — The first industry established in Lancashire was that of wool, and with the founding of Furness abbey in 1127 wool farming on a large scale began there, but the bulk of the wool was exported, not worked up in England. In 1282, however, there was a mill for fulling or bleaching wool in Manchester, and by the middle of the 16th century there was quite a flourishing trade in worsted goods. In an act of 1j52 Manchester "rugs and irizes" are specially mentioned. and in 1566 another act regulated the fees of the alnager who was to have his deputies at Manchester, Rochdale. Bolton. Rlackhurn and Bury; the duty of the alnagers was to prevent "cottons, frizes and rugs" from being sold unsealed, and it must be noted that by cottons is meant woollen goods. The 17th century saw the birth of the class of clothiers, who purchased the wool in large quantities or kept their own sheep and delivered it to weavers who worked it up into cloth in their houses and returned it to the employers. The earliest mention of the manufacture of real cotton goods is in 1641, but the industry did not develop to any extent until after the invention of the fly shuttle by John Kay in 1733, of the spinning jenny by James Hargreaves of Blackburn about 1764, of the water frame throstle by Richard Arkwright of Kolton in 1769 and of the mule by Samuel Crompton of Hall-in-the-Wood, near Bolton, in 1779. So rapid was the development of the cotton manufacture that in 1787 there were more than 40 cotton mills in Lancashire. all worked by water power. In 1789 steam power was applied to the industry. The increase of the import of raw cotton from 3,870,000 lb. in 1769 to 1,083,600,000 in 1860 shows the growth of the industry. The rapid growth was accompanied with intermittent periods of depression, which in 1819 in particular led to the formation of various political societies and to the Ulanketeers' meeting and the Peterloo massacre. During the American Civil War the cotton famine caused untold misery.

During the 18th century the only town where maritime trade increased was Liverpool, where in the last decade about 4.500 ships arrived annually of a tonnage about one-fifth that of the London shipping. The prosperity of Liverpool was closely bound up with the slave trade. With the increase of trade, means of communication also improved. The latter half of the 18th century saw the period of canal construction and in 1830 the first passenger railway of any length in England was opened between Manchester and Liverpool, and other railways rapidly followed.

Antiquities. — The Cistercians had abbeys at Furness (*q.v.*) and Whalley (founded at Stanlawe, in Cheshire, in 1178 and removed thither in 1296). There are remains at both these places. Priories of Black canons were founded at Conishead in the time of Henry II, at Burscough in that of Richard I and at Cartmel. There were friaries of Dominicans at Lancaster, of Franciscans at Preston and of Xugustinians at Warrington. An Austin priory existed at Cockerham; and at Cockersand, a hospital founded in the reign of Henry II was changed to a Premonstratensian abbey in 1190 and still shows its chapter house. Hornby had a Premonstratensian priory. Remains exist at Upholland of a Benedictine priory, and the order had a priory at Lancaster (1094) and cells at Lytham and I'enwortham. There was a Cluniac cell at Kersal.

Besides the churches discussed under the several towns the more interesting include Aldingham; Aughton; Cartmel; Churchtown; Garstang; Halsall; Hawkshead; Heysham (which has a pre-Conquest chapel dedicated to St. Patrick and an ancient cross); Hornby; Kirkby, which has a very ancient font; Kirkby Ireleth, late Perpendicular, with Norman doorway; Leyland; Melling (in Lonsdale), Perpendicular; Middleton, rebuilt in 1524, but containing part of the Norman church and several monuments; Ormskirk; Overton, with Norman doorway; Radcliffe; Ribchester; Seiton, Perpendicular, with fine brass and recumbent figures of the Molyneux family, also an exquisitely carved screen; Stidd, near Ribchester, much Norman work; Tunstall, late Perpendicular; Upholland priory church, Urswick; Walton-le-Dale; Warton, with old font; Whalley, with fine stalls from the abbey.

The principal old castles are those of Lancaster; Dalton, a small rude tower; Gleaston, built by the lords of Aldingham in the 14th century; Clitheroe (Norman keep); Hornby and Thurland; the ruins of Greenhalgh castle, built by the first earl of Derby; the ruins of Fouldrey in Piel Island near the entrance to Barrow harbour, erected in the reign of Edward III, almost dilapidated by the middle of the 20th century. Hoghton Tower (Preston) is a late 16th-century fortified manor house and in its banqueting hall the "Sir Loin" was knighted by James I. Rufford Old hall and Speke hall (Liverpool) are beautiful half-timbered houses and belong to the National trust. There are many other big historic houses in the county. (R. S. F.)

Climate and Agriculture. — The climate in the hilly districts to the north and east is often cold and bleak. with a rainfall exceeding 60 in. in places. but in the coastal plain to the west and south it is mild with a rainfall of about 30 in. Despite its great industrial reputation, Lancashire is still one of the most productive farming areas in the country and consists largely of family holdings. In the southwest the sandy loams and peats (mosslands) are devoted to intensive arable farming. Specialities are potatoes and peas and other vegetables grown on contract for canning or deep freezing. To the north and south of the Ribble estuary lies an area devoted to glasshouse cropping. with winter lettuce as a special crop. At Esprick is a small experimental station for glasshouse design and crops. The Fylde area and around Preston. where there is much heavy loam with peat and moss in some parts, grows excellent crops of grass, and intensive dairy farming is the main enterprise with intensive forms of pig and poultry husbandry. In the Furness fell area livestock rearing and hill sheep husbandry are carried on. On the slopes of the Pennines in east Lancashire. nhere the soils are thin and poor and the atmosphere is subject to heavy smoke pollution, there is poor permanent grass and rough grazing, farmed to produce milk or hill sheep. (J. C. BM.)

Industries and Trade. — South Lancashire is one of the principal seats of the world's cotton manufacture, the trade centring upon Manchester. The worsted. woollen. artificial silk and silk manufactures, flax, hemp and jute industries are also important. The manufacture of machines, appliances. conveyances, locomotives and motor vehicles is significant, especially in supplying the needs of the immense weaving and spinning industries. For the same purpose there is a large branch industry in the manufacture of wooden bobbins. The manufacture of iron and steel is carried on at Barrow-in-Furness. there are great glassworks at St. Helens, electrical and aircraft works at Preston and leather and soap works at Warrington. Printing, bleaching, dyeing works, paper and chemical works, rubber and tobacco manufactures are also very considerable activities of this great industrial region.

Besides the port of Liverpool, of world-wide importance, the principal ports are Manchester, brought into communication with the sea by the Manchester Ship canal (*q.v.*) in 1894, Barrow-in-Furncss. Fleetwood, Heysham, Preston and Lancaster. The sea fisheries, for which Fleetwood and Liverpool are the chief ports, are of considerable value.

Communications. — Apart irom the Manchester Ship canal, canal traffic is still important in the industrial area. In 1760 the Sankey canal, 10 mi. long, the first canal opened in Britain. was constructed from St. Helens to the Mersey. Other similar enterprises followed including the more-publicized Bridgewater canal. A network of railways connects the industrial centres. Many suburban lines have been electrified. There were about 3,000 mi. of roads in the county in 1956. In 1934 King George V opened a tunnel under the Mersey river which had been constructed for ve-

hicular traffic at a cost of about £7,000,000. This link between Liverpool and Birkenhead is more than two miles long and at the time of its completion was the largest underwater tunnel in the world. It was named "Queensway." (See BIRKENHEAD.)

Population and Administration. — The area of the administrative county is 1,619.4 sq.mi., with a population (1961) of 2,201,815. In the county boroughs are a further 2,929,831. The county returns in all 64 members to parliament.

There are four cities in Lancashire. Lancaster (pop. [1961] 48,887). Liverpool (747,790), hlanchester (661.041) and Salford (154,963), and three cathedral towns, Manchester, Liverpool and Blackburn. The county borough of Stockport is partly in Cheshire and partly in Lancashire. Besides the 18 county boroughs, there are 26 municipal boroughs. 68 urban districts and 14 rural districts. Preston is the seat of the county council. The National trust owned 7.8jo ac. in the county in 1956 of which 7.231 ac. were in the Lake district. Roundsea wood, in this national park. was declared a nature reserve in 1955; it is an area of varied woodland sloping down to the salt marshes at Morecambe bay. There is a nature conservancy research station at Merlewood, Grange over Sands.

Lancashire is one of the counties palatine. comprises six hundreds. is in the northern circuit. and assizes are held at Lancaster, Liverpool and Manchester. There are four quarter sessional divisions (Lancaster, Preston, Liverpool and Manchester) and 32 petty sessional divisions. The boroughs of Blackburn. Blackpool. Bolton. Burnley. Liverpool. Manchester, Oldham, Salford and Wigan have separate commissions of the peace and courts of quarter sessions. The following municipal boroughs have separate commissions of the peace: Accrington, Ashton-under-Lyne, Eccles. Lancaster, Leigh. Morecambe and Heysham. and Nelson. The dioceses of Blackburn. Liverpool and Manchester are wholly in Lancashire, and also parts of the sees of Carlisle, Ripon and Bradford.

Manchester and Liverpool are both seats of universities and of other important educational institutions. Within the county there are many denominational colleges, and near Clitheroe is the famous Roman Catholic college of Stonyhurst. There are training departments for teachers in connection with the hlanchester and Liverpool universities. and also at Edge Hill, near Liverpool, Liverpool (Roman Catholic), Warrington and blanchester.

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LANCASTER, HOUSE OF. The name house of Lancaster is commonly used to designate the line of English kings immediately descended from John of Gaunt. the fourth son of Edward III. But the history of the family and of the title goes back to the reign of Henry III. who created his second son. Edmund, earl of Lancaster in 1267. This Edmund received in his own day the surname of Crouchback. from having worn a cross upon his back in token of a crusading vow. His son Thomas. who inherited the title. took the lead among the nobles of Edward II's time in opposition to Piers Gaveston and the Despensers. and was beheaded for treason at Pontefract. At the beginning of the next reign his brother Henry was appointed guardian to the young king Ednard III and assisted him to throw off the yoke of Mortimer. Meantime the attainder had been reversed and the earldom restored. On this Henry's death in 1345 he was succeeded by a son, sometimes known as Henry Tort-Col or Wryneck, a very valiant commander in the French wars, whom the king advanced to the dignity of a duke. Only one duke had been created in England hefore — the king's son Edward, the Black Prince: duke of Cornwall. Henry Wryneck died in 1361 without male heir. His second daughter. Blanche. became the wife of John of Gaunt, who thus succeeded to the duke's inheritance in her right; and on Nov. 13, 1362, when King Edward attained the age of 50, John was created duke of Lancaster, his elder brother, Lionel. being at the same time created duke of Clarence It nas from these two dukes that the rival houses of Lancaster and York derived their respective claims to the crown As Clarence nas King Ednard's third son. while John of Gaunt was his fourth. in ordinary course on the failure of the elder line the issue of Clarence should have taken precedence of that of Lancaster in the succession. But the rights of Clarence were conveyed in the first instance to an only daughter, and the ambition and policy of the house of Lancaster, profiting by circumstances, enabled them not only to gain possession of the throne but to maintain themselves in it for three generations before they were dispossessed by the representatives of the elder brother. (See LANCASTER, JOHN OF GAUNT, DUKE OF.)

LANCASTER, EDMUND, EARL OF (1245–1296), fourth but second surviving son of Henry III (*q.v.*), king of England. and Eleanor of Provence, founded the house of Lancaster. His nickname "Crouchback" ("Crossback." crusader) enabled his descendant, Henry IV, in claiming the throne (1399) to assert that Edmund was really Henry III's eldest son but had been disinherited as a hunchback. Born on Jan. 16, 1245, Edmund received the Sicilian kingdom from Pope Innocent IV (March 1254), but Alexander IV canceled the grant (Dec. 1258). Edmund spent the Baron's War in exile in France (Oct. 1263–Oct. 1265), but after the royalist victory he received (Nov. 1265) the forfeited Montfort earldom of Leicester with the stewardship of England, and (1266) the forfeited Ferrers earldom of Derby. The new earldom of Lancaster was added (1267), and he obtained the earldoms of Aumale and Devon by marrying Avelina de Forz (April 1269), thus acquiring the greatest accumulation of titles and lands since 1066 Edmund commanded the ineffective operations against remaining rebels at Kenilworth until the lord Ednard arrived in June 1266 He took the cross (1268) and went to Acre without achieving anything (1271–72). He married Blanche of Artois, dowager countess of Champagne (c. Dec. 1275). and governed Champagne intermittently as a vassal of Philip III of France until the marriage (1284) of Blanche's daughter Jeanne. In the Welsh war of 1277 Edmund, as lord of Carmarthen and Cardigan (since 1266). commanded Edward I's southern army successfully, but surrendered his Marcher lands to the king before Nov 1279 He was regent while Edward was in France (1286–89) and suppressed the revolt of Rhys ap Mareddud (1287) He conducted Edward's negotiations over Gascony in Paris (1293–94) and was tricked into surrendering the duchy which Philip IV then refused to restore. In the ensuing war Edmund led one of Edward's invading armies but died at Bayonne on June 5. 1296. Easygoing. trustful. generous and knightly, politically ineffective and unambitious, he remained constantly loyal to Edward I.

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LANCASTER, HENRY, 1ST DUKE OF (*c.* 1300–1361), the son of Henry, earl of Lancaster (*q.v.*), was a soldier of unusual distinction. Probably from his birthplace in Monmouthshire he was called Henry of Grosmont. He fought in the naval fight off Sluys and in the one off Winchelsea in 1350; he led armies into Scotland. Gascony and Sormandy; he served frequently under Edward III himself; and he may be fairly described as one of the most brilliant and capable of the English warriors during the earlier part of the Hundred Years' War. During a brief respite from the king's service he led a force into Prussia and he was often employed on diplomatic business. In 1354 he was at Xvignon negotiating with Pope Innocent VI. who wished to make peace betn-een England and France. and one of his last acts was to assist in arranging the details of the treaty of Brétigny in 1360. In 1337 he was made earl of Derby; in 1345 he succeeded to his father's earldoms of Lancaster and Leicester: in 1349 he was created earl of Lincoln. and in 1351 he was made duke of Lancaster. He was steward of England and one of the original knights of the Order of the Garter. He died at Leicester on March 13, 1361. He left no sons; one of his daughters. Maud (d. 1362), married William V, count of Holland. a son of the

emperor Louis the Bavarian, and the other, Blanche (d. 1369), married Edward III's son, John of Gaunt, who obtained his father-in-law's titles and estates and formed the royal house of Lancaster.

LANCASTER, HENRY, EARL OF (c. 1281–1345), was the second son of Edmund ("Crouchback"), earl of Lancaster, and the brother of Earl Thomas. After his brother's execution (1322), he was so little suspected that he was allowed possession of another of the family titles. the earldom of Leicester (1324). Henry held lands adjacent to the increasing possessions in south Wales of Edward II's favourites, the Despensers, and in Sept. 1326 he joined Queen Isabella and Roger Mortimer after their return from France to depose the king. Henry captured Edward II at Neath abbey: and took him from there to Kenilworth where Edward remained in his keeping. He was a member of the deputation which informed the king of his deposition. In 1327 he was made chief of the council of regency, and after entering a petition in parliament he was reinstated to much of the Lancastrian inheritance, and allowed the title of earl of Lancaster. He soon quarreled with Mortimer. Lancaster complained that the council of regency was ignored, and refused to attend the Salisbury parliament of Oct. 1328. He gathered troops at Winchester but was compelled to make peace. In 1330 he was one author of the plot which, with Edward III's approval. overthrew Mortimer. About this time his eyesight failed, and after Mortimer's fall he retired from public life and died on Sept. 22, 1345. (J. TA.)

LANCASTER, SIR JAMES (*fl.* 1591–1618). English navigator and statesman, one of the foremost pioneers of the British Indian trade and empire. In early life he fought and traded in Portugal. On April 10, 1591, he started from Plymouth, with Raymond and Foxcroft, on his first great voyage to the East Indies; this fleet of three ships is the earliest of English oversea Indian expeditions. Reaching Table bay (Aug. 1, 1591), and losing one ship off Cape Corrientes on Sept. 12, the squadron refitted at Zanzibar (Feb. 1592), rounded Cape Comorin in May and was off the Malay peninsula in June. Crossing later to Ceylon, the crews insisted on returning home, but only 25 officers and men reached England in 1594. Lancaster himself reached Rye on May 24. 1594; his Indian voyage was an important factor in the foundation of the East India company. In 1600 he was given command of the company's first fleet (which sailed from Torbay toward the end of April 1601).

Going by the Cape of Good Hope (Nov. 1, 1601), Lancaster visited the Nicobars (from April 9, 1602), Achin and other parts of Sumatra (from June 5, 1602) and Bantam in Java; an alliance was concluded with Achin. a factory established at Bantam and a commercial mission dispatched to the Moluccas. The return voyage (Feb. 20 to Sept. 11, 1603) was prosperous, and Lancaster was knighted (Oct. 1603). He mas one of the chief directors of the East India company till his death in May 1618; most of the voyages of the early Stuart time both to India and in search of the northwest passage were undertaken under his direction; Lancaster sound, on the northwest of Baffin's bay (in 74° 20′ S.), was named by William Baffin after Sir James (July 1616).

See R. Hakluyt, *Principal Navigations,* vol. ii, *pt.* ii, pp. 102–110, vol. iii. pp. 708–715 (1599); S. Purchas, *Pilgrims,* vol. i, pt. ii, pp. 147–164; *The Voyages of Sir James Lancaster . . . to the East Indies . . .*, ed. by Sir Clements Markham, Hakluyt Society (1877), *Calendars of State Papers, East Indies.* The original journals of Lancaster's voyage of 1601–03 disappeared, and Purchas is the only source.

LANCASTER, JOHN OF GAUNT, DUKE OF (1340–1399), fourth son of Edward III and Queen Philippa, mas born in March 1340 at Ghent, whence his name. On Sept. 29, 1342, he was made earl of Richmond; as a child he was present at the sea fight with the Spaniards in Aug. 1350, and his military service was in 1355, when he was knighted. On May 19, 1359, he married his cousin Blanche, daughter and ultimately sole heiress of Henry, duke of Lancaster. In her right he became earl of Lancaster in 1361. and next year was created duke. His marriage made him the greatest lord in England, but for some time he took no prominent part in public affairs. In 1366 he joined his eldest brother, Edward the Black Prince, in Aquitaine, and in the year after led a strong contingent to share in the campaign in support of Pedro the Cruel of Castile. With this began his long connection with Spain. John fought in the van at Najera on April 13, 1367, when the English victory restored Pedro to his throne. He returned home at the end of the year. Pedro was finally overthrown and killed by his rival, Henry of Trastamara. in 1369. The disastrous Spanish enterprise led directly to renewed mar between France and England.

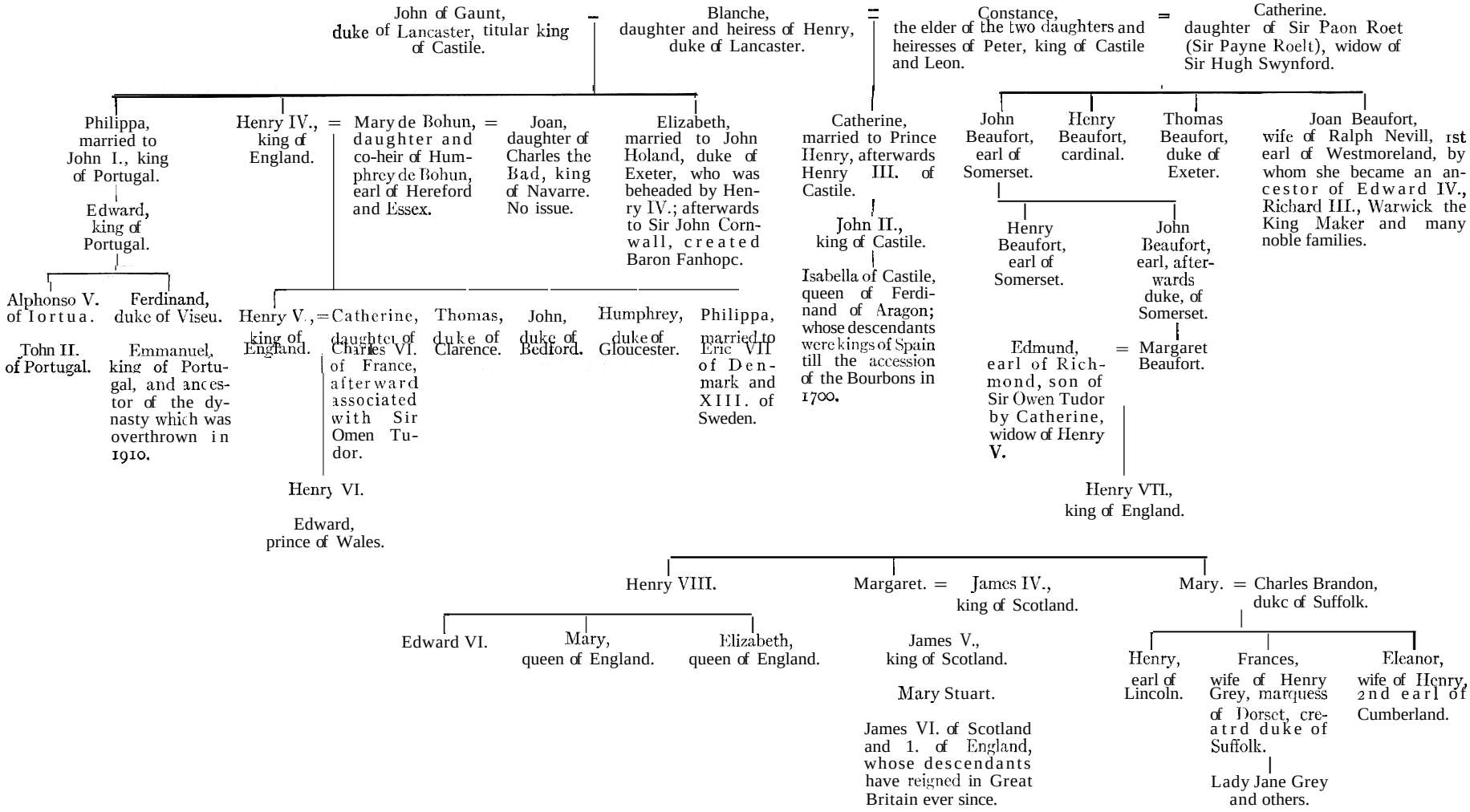
In Aug. 1369 John had command of an army which invaded northern France without success. In the following year he went again to Aquitaine, and was present with the Black Prince at the sack of Limoges. Edward's health was broken down. and he soon after went home, leaving John as his lieutenant. For a year John maintained the war at his own cost. His wife died in the autumn of 1369 and John married Constance (d. 1394), the elder daughter of Pedro the Cruel. and in her right assumed the title of king of Castile and Leon. For 16 years the pursuit of his kingdom was the chief object of John's ambition. No doubt he hoped to achieve his end when he commanded the great army which invaded France in 1373. But the French would not give battle, and though John marched from Calais right through Champagne, Burgundy and Auvergne, it was with disastrous results; only a shattered remnant of the host reached Bordeaux.

When John got back to England he was soon absorbed in domestic politics. The king was prematurely old, the Black Prince's health was broken. John, as head of the court party, had to bear the brunt of the attack on the administration made by the Good Parliament in 1376. As soon as the parliament was dissolved he had its proceedings reversed, and next year secured a more subservient assembly. There came, however, a new development. The duke's politics were opposed by the chief ecclesiastics, and in resisting them he had made use of Wycliffe. With Wycliffe's religious opinions he had no sympathy. Nevertheless when the bishops arraigned the reformer for heresy John would not abandon him. The conflict over the trial led to a violent quarrel with the Londoners, and a riot in the city during which John was in danger of his life from the angry citizens. The situation was entirely altered by the death of Edward III. Though his enemies had accused him of aiming at the throne, John was without any taint of disloyalty. Though he took his proper place in the ceremonies at Richard's coronation, he withdrew for a time from any share in the government. In 1378, he commanded in an unsuccessful attack on St. Malo. During his absence some of his supporters violated the sanctuary at Westminster. He vindicated himself somewhat bitterly in a parliament at Gloucester, and accepted the command on the Scottish border. He was there engaged when his palace of the Savoy in London was burned during the peasants' revolt in June 1381. Against his will he was forced into an unfortunate campaign on the Scottish border in 1384. His ill-success renewed his unpopularity, and the court favourites of Richard II intrigued against him. Finally the difficulties of his position at home strengthened his foreign ambitions.

Spanish Expedition. — In July 1386 John left England with a strong force to win his Spanish throne. He landed at Corunna, and during the autumn conquered Galicia. Juan, who had succeeded his father Henry as king of Castile, offered a compromise by marriage. John of Gaunt refused, hoping for greater success with the help of the king of Portugal, who now married the duke's eldest daughter Philippa. In the spring the allies invaded Castile. They could achieve no success, and sickness ruined the English army. The conquests of the previous year were lost, and when Juan renewed his offers. John of Gaunt agreed to surrender his claims to his daughter by Constance of Castile, who was to marry Juan's heir. After some delay the peace was concluded at Bayonne in 1388. The next 18 months were spent by John as lieutenant of Aquitaine, and it was not till Nov. 1389 that he returned to England.

By his absence he had avoided implication in the troubles at home. Richard, still insecure of his own position. welcomed his uncle, and created him duke of Aquitaine. During four years John exercised his influence in favour of pacification at home. and abroad was chiefly responsible for the conclusion of a truce with France. Then in 1395 he went to take up the government of his

TABLE OF THE PRINCIPAL DESCENDANTS OF JOHN OF GAUNT



duchy; but the Gascons had from the first objected to government except by the crown, and secured his recall within less than a year. Constance of Castile had died in 1394 and almost immediately after his return John married as his third wife Catherine Swynford. She had been his mistress for many years, and his children by her, who bore the name of Beaufort, were now legitimated. Though John presided at the trial of the earl of Arundel in Sept. 1397, he took no further active part in affairs.

The exile of his son Henry in 1398 was a blow from which he did not recover. He died on Feb. 3, 1399, and was buried in St. Paul's cathedral near the high altar.

John was neither a great soldier nor a statesman. but he was a chivalrous knight and loyal to what he believed mere the interests of his family. In spite of opportunities and provocations he never lent himself to treason.

He deserves credit for his protection of Wycliffe, though he had no sympathy with his religious or political opinions. He was also the patron of Chaucer, whose *Bokc of the Duchesse* was a lament for Blanche of Lancaster.

See Froissart, the maliciously hostile Chronicon Angliae (1328–88), and the eulogistic *Chronicle* of Henry Knighton (both the latter in the "Rolls Series"). *See* also the biography by S. Armytage-Smith, published in 1904. For his descendants *see* the table.

LANCASTER, JOSEPH (1778–1838), English educator, who developed the system of mass instruction identified with his name. was born in London in 1778. The monitorial or "mutual" approach employed brighter or more proficient children to teach other children under the direction of an adult master or teacher. During the early 19th century the system, as developed by Lancaster, Andrew Bell and Jean Baptiste Girard (*q.v.*), became perhaps the most widespread means of providing the rudiments of education for children of the common people on the continent and in England and America, and helped pave the way for universal education supported and controlled by the state.

Lancaster originally planned to become a Calvinist minister, but his religious views changed and he joined the Society of Friends. In 1789 he obtained from his father. an army pensioner. the use of a room in which to keep a school for poor children. Crowds of children came to him, and as he did not have money to hire assistants, he had his pupils teach each other, working out a plan whereby this could be accomplished very cheaply. His school. his lectures and his pamphlet *Improvements* in *Education as It Respects fhe Industrious Classes* of *the Community* (1803) attracted the attention of philanthropically minded people and even the royal family, and he felt encouraged to expand the school and found others. Vain, rash and extravagant, he soon was heavily in debt; in 1808 friends of the school paid his obligations, became its trustees and organized the Royal Lancasterian institution. later known as the British and Foreign School society.

Relations between the trustees and Lancaster becoming strained, he severed his connection with the enterprise and conducted his own school. This venture ended in bankruptcy, and in 1818 he emigrated to the United States, where his work and plan were well known and where Lancasterian schools had already been established in some cities.

Lancaster's reception in the United States was warm. He lectured extensively and wrote public letters to Pres. James Munroe and other prominent officials urging that his system be applied to higher as well as elementary education and to the education of the Indians. Nothing came of his projects, and in 182 j he went to Venezuela to recover his health and disseminate his method. He quarreled with Simón Bolivar and. returning north, he spent the last decade of his life in Canada and the United States. undertaking various experiments with his system and living on the bounty of admirers. He died in New York on Oct. 24. 1838. having been struck by a carriage as he crossed the street after visiting a school.

The use of children to teach other children was not new, but Lancaster took the approach and developed it into a systematic plan of education. From 200 to 1,000 children were gathered in one room and seated in rows, usually of ten pupils each. An adult master taught the monitors and then each monitor taught his row of pupils the lesson in reading, writing, arithmetic: spelling or the higher branches.

Besides monitors who taught. there were monitors to take attendance, monitors to examine and promote pupils, monitors to rule writing paper and check slates and books, and, over all the monitors. a monitor general.

Schoolroom activity proceeded with military precision. according to directions laid down in minute detail by Lancaster and from which his followers were not to deviate by a hair's breadth.

The defects of this system arose not from the principle that children can or should learn from each other—they do so anyhow—but from Lancaster's overelaboration and distortion of it. To achieve mass results and mass economies, the adult teacher was relegated to the position of bystander and inspector, learning was debased to drill and memorization and the matter to be learned was reduced to particles of information and sequences of habit. The whole process of teaching and learning was routinized and formalized to a point where opportunities for creative thinking, individual initiative and truly co-operative social learning scarcely existed.

Nevertheless, Lancaster and his system contributed substantially to educational progress. They made education and the means of education subjects of widespread interest and discussion, not least because of the violent public controversies waged by Lancaster and Bell and their followers in the British and Foreign School society and in the National Society for the Education of the Poor in the Principles of the Established Church. Experience with the monitorial system demonstrated too that even with the most economical instruction that human ingenuity could devise, private effort still was not equal to the task of universal education. Thus Lancaster's work brought nearer the day when the state would assume the responsibility of providing for all children the education needed in the urban, industrial and more democratic age that was emerging during his lifetime.

(R. L. McC.)

LANCASTER, THOMAS, EARL OF (*c.* 1277–1322), was the eldest son of Edmund, earl of Lancaster and titular king of Sicily, and a grandson of the English king, Henry III; while he was related to the royal house of France both through his mother, Blanche, a granddaughter of Louis VIII, and his stepsister. Jeanne. queen of Navarre, the wife of Philip IV. A minor when Earl Edmund died in 1296. Thomas received his father's earldoms of Lancaster and Leicester in 1298; he became prominent in English affairs after the accession of his cousin. Edward II, in July 1307.

Having married Alice (d. 1348), daughter and heiress of Henry Lacy, earl of Lincoln, and added the earldom of Derby to those which he already held, he was marked out by both his wealth and position as the leader of the barons in their resistance to the new king.

With his associates he secured the banishment of the royal favourite. Piers Gaveston, in 1308; compelled Edward in 1310 to surrender his power to a committee of "ordainers." among whom he himself was numbered; and took up arms when Gaveston returned to England in Jan. 1312.

Lancaster, who had just obtained the earldoms of Lincoln and Salisbury on the death of his father-in-law in 1311, drove the king and his favourite from Newcastle to Scarborough and was present at the execution of Gaveston in June 1312. After lengthy efforts at mediation, he made his submission and received a full pardon from Edward in Oct. 1313; but he refused to accompany the king on his march into Scotland, which ended at Bannockburn, and took advantage of the English disaster to wrest the control of affairs from the hands of Edward.

In 131j he took command of the forces raised to fight the Scots. and was soon appointed to the "chief place in the council." while his supporters filled the great offices of state. but he proved totally incompetent. The capture of Berwick by the Scots in April 1318 led to a second reconciliation with Edward. A formal treaty, made in the following August, having been ratified by parliament, the king and earl opened the siege of Berwick; but

the undertaking was quickly abandoned Lancaster was suspected of intriguing with the Scots and his lands mere spared nhen Robert Bruce ravaged the north of England In 1321 nhen the Despensers nere banished war broke out again betneen himself and the king He surrendered after a skirmish at Boroughbridge Taken to his own castle at Pontefract, nhere the king was he nas condemned to death as a rebel and a traitor, and was beheaded near the tonn on March 22 1322 He lett no children

Although a coarse, selfish and violent man, Lancaster's memory was long cherished especially in the north of England, as that of a defender of popular liberties.

See Chronicles of the Reigns of Edward I and Edward II, ed. W. Stubbs (1882–83); and W. Stubbs, *Constitutional History,* vol. ii (Oxford. 1896).

LANCASTER, a city. municipal borough. river port, and the county town of Lancashire. Eng., in the Lancaster parliamentary division. Lancashire. Eng., 231 mi. N.W. of London by road. Pop. (1961) 48,887. Area 7.6 sq.mi. It lies at the head of the estuary of the Lune river. mainly on its south bank, 7 mi. from the sea. The site slopes sharply up to an eminence, crowned by the castle and the church of St. Nary. and overlooks the rich valley and Morecambe bay. St. Mary's church, founded in the 11th century by Roger de Poictou. has a Decorated doorway. but is mainly 1 jth century. with a tower built in 1754–55 and a clock dated 1759. The castle occupies the site of a Roman *castrum.* The Saxon foundations remain, and the tower at the southwest corner is supposed to have been erected during the reign of Hadrian. The Dungeon tower. also supposed to be of Roman origin, was taken down in 1818. Of the old portion of the present structure. the keep was built by Roger de Poictou, who used some of the Roman towers and the old walls. In 1322 much damage was done to the castle by Robert Bruce. but it was restored and strengthened by John of Gaunt, who added the greater part of the Gateway tower. A turret built on the Norman keep or Lungess tower, is called "John o' Gaunt's chair." During the Civil War the castle was captured by the parliamentarians. Shortly after this period it was put to public use and now, largely modernized, contains a library and the assize courtroom (Shire hall). St. Peter's Roman Catholic cathedral was built in 1859. The Storey institute with art gallery, technical and art schools. museum and library, was presented to the borough by Sir Thomas Storey in 1887. An observatory stands in Williamson park. There is a city and regimental museum in Market square. The Ashton memorial in Williamson park was built by Lord Ashton (1842–1930) as a family memorial and the municipal buildings. including a large hall. were the gift of Lord Ashton (1909). The grammar school. on a modern site, dates from the 15th century and in its former Jacobean house William Whewell and Sir Richard Owen were educated.

The chief industries are linoleum making. cotton. rayon and silk spinning, engineering, dyeing and cloth printing and the making of special iabrics such as bookcloth. table baize. matting and knitwear. Among other products are furniture, foot\\-ear and beer. Glasson dock. 5 mi. down the Lune, with a graving dock, is accessible to vessels of about 700 tons. The Kendal, Lancaster and Preston canal crosses the Lune by an aqueduct and the river also is crossed by a well-designed bridge built in 1788. Lancaster has a covered daily market and. in Church street on Wednesdays and Saturdays. a fruit and vegetable market, granted in 1336–37.

History.—Lancaster was an important Roman station. and traces of the Roman fortification wall remain. The Runic cross is Anglo-Saxon, but the Danes left few memorials of their occupation. At the Conquest the place became a possession of Roger de Poictou. who founded or enlarged the present castle on the old site and founded St. Mary's priory as a cell of his Benedictine priory. The town and castle had a somewhat chequered ownership until 1266 when they were granted by Henry III to his son Edmund. first earl of Lancaster. and since have been part of the duchy of Lancaster. A town had grown around the castle by 1193 when John. count of Mortain (afterward king) grnnted its first charter. and another in 1199 after his accession. John of Gaunt in 1362 obtained a charter for the exclusive right of holding the sessions of pleas for the county in Lancaster itself, and up to 1873 the duchy appointed a chief justice and a puisne justice for the court of common pleas at Lancaster. The town was raised to the status of a city in 1937.

In 1322 the Scots burned the town, the castle alone escaping. The town was rebuilt but moved from its original position on the hill to the slope and foot. In 1389, after the battle of Otterburn, it was destroyed again by the Scots. At the outbreak of the Civil War the burgesses sided with the king, and the town and castle were captured in Feb. 1643 by the parliamentarians. In March 1643 Lord Derby assaulted and took the town, but the castle remained in the hands of the parliamentarians. In May and June, 1643 and in 1648 the castle was again besieged, but each time in vain. During the rebellion of 171j the northern rebels occupied Lancaster for two days. During the 174j rebellion Prince Charles Edward's army passed through the town in its southward march and again in its retreat. but the inhabitants stood firm.

A merchant gild that existed in Lancaster was ratified by Edward III's charter (1362), and in 1688 six trade companies were incorporated. The chief manufactures at one time were sailcloth, cabinet furniture, candles and cordage. The borough returned two members to parliament from 1295 to 1331. It renewed its privileges in 1529, returns again being made from 1547 until 1867, when it was merged in the Lancaster division of north Lancashire.

LANCASTER, a city of Ohio, U.S., 30 mi. S.E. of Columbus: on the Hocking river; the seat of Fairfield county. Among its municipal parks is Rising park, surrounding Mount Pleasant, a striking rock formation rising abruptly nearly 300 ft. above the surrounding plain. It was a well-known landmark to the Indians, explorers, traders and early settlers. Lancaster is the trade centre of a region producing principally dairy products, swine and beef cattle. Glass. shoes and machinery are also manufactured there. The town was founded in 1800 by Ebenezer Zane of Wheeling, W.Va. (then a part of Virginia). Following the treaty of Greenville in 1795 which made settlement within Ohio safe and legal, Zane in 1797 blazed Zane's trace from Wheeling to Limestone, Ky., a distance of 266 mi.. the first road of any consequence in Ohio. In payment Zane received three tracts, one of which became the site of Lancaster. The first settlers came over the trace in 1798; many of them were Germans from Lancaster. Pa., for which the new town was named. It mas incorporated in 1831.' Gen. William T. Sherman was born in Lancaster, as was his brother, John Sherman, sponsor of the Sherman Anti-Trust act; their birthplace is a state memorial. Lancaster is well known for its well-preserved early homes located on a hill in the heart of the city.

For comparative population figures see table in OHIO: *Population.* (H. RI. TU.)

LANCASTER, a city of southeastern Pennsylvania, U.S., 65 mi. W. of Philadelphia; the seat of Lancaster county. Pop. (1960) city. 61.055; standard metropolitan statistical area (Lancaster county) 278.359.

The city had its beginnings with the creation of Lancaster county (named for the English city and shire) in 1729. Commissioners selected the site of Hickory Ton-n or Gibson's pasture on Conestoga creek as the county seat of justice; and in 1730 the town was laid out by James Hamilton. Population grew rapidly, and Lancaster became a borough in 1742 and a city in 1818. An important trading and manufacturing centre, it produced in the 18th century the famous Conestoga wagon and the Pennsylvania rifle, both of which played important parts in American frontier history. There in 1763 William Henry experimented unsuccessfully with a steamboat. During the American Revolution, the continental congress. fleeing from Philadelphia, held a one-day session in Lancaster on Sept. 27. 1777; and the supreme executive council of Pennsylvania made the city its headquarters for nine months in 1777–78.

Lancaster was one of the sites considered for the new national capital in 1790, and in 1799 it became the capital of Pennsylvania, remaining such until 1812 when the state government moved to Harrisburg. In 1794 the 69-mi. stone-surfaced turnpike from Lancaster to Philadelphia was completed and its success began an era of turnpike building.

Lancaster n-as the home of James Buchanan, 15th president of

the U S , and of Thaddeus Stevens, noted abolitionist congressman, both are buried there.

Lancaster and Lancaster county have a prosperous and diversified economy based upon agriculture, trade and manufacturing Located in a fertile country with stone farmhouses and huge bank barns. the county is one of the most highly cultivated areas in the nation, its products including livestock. dairy products, poultry. wheat, corn. hay, tobacco and eggs. The city is one of the most important cattle markets in the east. Industry is diversified and highly skilled, producing watches, linoleum, electrical appliances. television tubes, farm machinery and a variety of other products.

The population is varied in origin, but is predominantly of Pennsylvania-German stock. Many Germans belong to the "plain sects" (Amish. Mennonites, and Dunkards), who are distinguished by their black, buttonless attire and because of religious beliefs do not use automobiles and other modern devices.

Lancaster has numerous public and private schools, a public library, several municipal parks, a symphony orchestra. a historical society and museum and many other cultural and recreational facilities Franklin and Marshall college, a men's liberal arts college chartered in 1787 and affiliated with the United Church of Christ, is located there and maintains the North museum and its planetarium. Nearby are Millersville State Teachers college chartered in 1854, and Elizahethtonn college, a Church of the Brethren institution established in 1899. Also near the city are the Pennsylvania Farm museum and the famous Ephrata cloister, the site of a German Seventh-Day Baptist monastic community (now dissolved) founded in the 1730s. (S. W. HM.)

LANCE, a form of spear used by cavalry. It usually consisted of a long wooden shaft with a sharp metal point. The date of its introduction into civilized armies is difficult to trace, but its employment can definitely be traced to the Assyrians and Egyptians. The Greeks and Romans also used lances. Despite the lack of stirrups, which do not appear until the 6th century A.D., the heavy cavalry of the ancient world depended on the lance for shock effect at the crisis of battle.

During the middle ages the lance was the favourite weapon of armoured knights on barded horses who sought to unseat a mounted opponent. Medieval battles usually disintegrated into hundreds of such single combats, the opponents holding their lances level and charging at each other. Shafts as long as 16 ft. were used. the butt end being couched in a leather rest attached to the saddle. The comparable weapon for foot soldiers was the halbert (*q.v.*).

With the introduction of firearms, the mounted man-at-arms and his lance became outdated. Troops armed with pikes, or infantry spears, were drawn up to protect musketeers from the charges of horsemen; the cavalry was generally recognized as effective only against broken infantry or in pursuit of an enemy.

When the bayonet (*q.v.*) superseded the pike, the lance was revived to give the cavalry a weapon useful for shock tactics. If the first charge did not prevail, however, the lance was obviously awkward to handle in a melee; and the horseman carried a sword and pistol as secondary weapons.

Eastern Europe and Russia led in this revival of lance tactics. A regiment of Polish lancers formed by Napoleon in 1807 was the forerunner of many others in his armies. His growing preference for cavalry shock over fire effect was shown four years later when he converted nine dragoon regiments into lancers. The British in turn were impressed by the weapon at Waterloo and in 1816 organized their first regiments of lancers.

Carbine and pistol were preferred to the lance in the United States, where the terrain was seldom suited to cavalry charges. Raiding and observation were the chief missions of Civil War horsemen who often dismounted and used dragoon tactics in a fight.

The vogue of the lance lasted throughout the 19th century in Europe largely because there was no severe or prolonged test of its effectiveness. The shaft, ranging from 9 to 12 ft. in various armies. was made of ash impregnated with linseed oil and tar, or of bamboo or other wood. The butt was carried in a leather "bucket" attached to the stirrup.

In time of peace no weapon contributed more to the pomp and pageantry of war. and the sight of a column of lancers, with steel points flashing and pennons flying, was a memorable spectacle. Moreover, the weapon was sometimes effective against savage or semicivilized opponents in colonial wars. A notable example was the charge of the 21st Lancers at Omdurman in 1898.

At the late date of 1889. despite several unhappy experiences with long-range, rifled firearms in the Franco-German War. Germany converted all its remaining cavalry regiments into lancers known as Uhlans. In 1914 they carried their medieval weapons into a machine-gun war, as did the French and British until a few bloody encounters taught discretion. Even after the tank proved itself in 1917, some British staff officers still envisioned a pursuit by the lancers. Not until 1927, in fact, was the lance finally abolished in the British army except for ceremonial purposes. By that time it was recognized everywhere as a relic of the military past.

See also TACTICS: *The Cavalry Cycle.* (T. J. E.; LN. MS.)

LANCELOT (Lancelot du Lac, or Lancelot of the Lake), a famous figure in Arthurian romance. There is no knight of Arthur's court whose name is so familiar to the great majority of English readers as that of Sir Lancelot. The secret loves of Lancelot and the queen are the dominating theme of later Arthurian romance. Lancelot, however, is not an original member of Arthur's court, and the development of his story is still a source of considerable perplexity to the critic.

In the earliest extant version, the *Lanzelet* of Ulrich von Zatzikhoven (the translation of a French original, now lost), the hero is nephew to Arthur but has no illicit relations with the queen; on the contrary, he indulges in a series of amorous adventures. of which three, at least, end in marriage. Here, as elsewhere, he is the son of Ban de Benoic (Pant von Genewîs), who is driven from his kingdom by the revolt of his subjects and dies of a broken heart. The queen lays her child on the bank of a lake, while tending her dying husband, and a water maiden, rising from the lake. carries off the babe to her mysterious kingdom. peopled by 10,000 maidens. where no man ever enters. There she brings up the youth. with the object of avenging her upon an enchanter who has robbed and dispossessed her son. The lad returns to earth, fulfils his mission and after various adventures not only wins a wife and a kingdom but regains his paternal inheritance. There he reigns in peace with his wife, begets a numerous family and dies in a good old age.

The French original of this poem must have been composed some time in the 12th century. as the manuscript from which Zatzikhoven worked was the property of Hugo de Morville, one of the hostages who replaced Richard Coeur de Lion in his Austrian prison in 1194. In the succeeding century, when the tradition of Lancelot's relations with the queen was firmly established (*see* GUENEVERE), the story was worked over and elaborated into the prose *Lancelot,* which eventually, by incorporating the Grail *Queste* and the *Mort Artus,* became the most important member of the Arthurian cycle. Here the primitive folklore elements of the *Lanzelet* have completely disappeared: the lake has become a mirage, and the education of Lancelot, with that of his cousins Lionel and Bohort, equally protégés of the Lady of the Lake, differs in no way from that of any other youth of his rank and period.

It is by no means easy to discover how Lancelot came to occupy the commanding position finally assumed by him in Arthurian story. He certainly does not belong to the early pseudo-historic tradition; he is never mentioned in any of the chronicles. In the earlier romances he either is ignored or occupies a position subordinate to that of Gawain, Erec, Yvain or even Perceval, who was, of course. not an original Arthurian hero. He suddenly appears as Guenevere's lover in the poem of *Le Chevalier de la Charrette,* of which he is the hero, to disappear from the scene again in Chrétien's subsequent work *Le Chevalier nu Lion* (Yvain); nor is he among the knights figuring on the doorway of Modena cathedral. The real cause for his apparently sudden and triumphant rise to popularity is thus extremely difficult to determine. What appears the most probable solution is that which regards Lancelot as the hero of an independent and widely diffused folk tale, which. because of certain special features. was brought into contact with and incorporated in the Arthurian tradition. This much has been

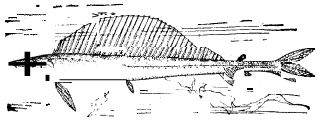
proved: certain of the adventures recounted in the *Lanzelet*—the theft of an infant by a water maiden; the appearance of the hero at a tournament on three consecutive days. in three differing suits of armour; the rescue of a queen or princess from an other-world prison—all belong to one well-known and widely spread folk tale. variants of which are found in almost every land and of which numerous examples have been collected alike by M. Cosquin in his *Contes Lorrains* and by J. F. Campbell in his *Tales of the West Highlands.*

Now, as noted above *(see* GUENEVERE), Arthur's queen was certainly the heroine of such an other-world adventure. and it seems probable that when the process of literary evolution and the social taste of the time demanded a love story in the Arthurian cycle which should parallel that of Tristan and Iseult. the hero of this immensely popular story was pressed into the service of Arthurian tradition and assigned this leading role. We cannot ignore the fact that his first appearance (in the *Charrette)* is precisely in connection with this adventure. The name of L: :elot is certainly continental (*see* Brugger's discussion of the proper names in Marie de France, *Zeitschrift für Franz. Sprache,* xlix), and any attempt to claim him as an original Celtic hero must be dismissed as ungrounded. It is certainly curious that Lancelot, as a figure of romance, possesses none of the characteristic traits which make Gawain, Perceval and Tristan, all genuine figures of Celtic tradition, well-marked individuals. Compared with these heroes Lancelot is a peg on which to hang romantic adventures, nothing more. The story of the loves of Lancelot and Guenel-ere has about it nothing spontaneous and genuine; in no way can it be compared n-ith that of Tristan and Iseult. The language of the prose *Lancelot* is good, easy and graceful, but the adventures lack originality and interest, and the situations repeat themselves in the most wearisome manner. Those readers who know the story only through the medium of Malory's noble prose and Tennyson's melodious verse carry away an impression entirely foreign to that produced by the original literature. The *Lancelot* story, in its rise and development. belongs exclusively to the later stage of Arthurian romance; it was a story for the court, not for the folk. and it lacks alike the dramatic force and human appeal of the genuine "popular" tale.

BIBLIOGRAPHY.—The prose *Lancelot* was frequently printed; Brunet chronicles editions of 1488, 1494, 1513, 1520 and 1533—of this last date there are two, one published by Jehan Petit, the other by Philippe Lenoire. The latter is by far the better, being printed irom a much fuller manuscript. H. O. Sommer, *The Vulgate Version of the Arthurian Romances* (1908–16), included the text of the *Lancelot.* A 13th-century Dutch verse trans., published by M. Jonckbloet in 1850, under the title of *Roman van Lanceloet,* is not complete, the part previous to Guenevere's abduction by Meleagant being lost. *Lr Chevalier de la Charrette* was published by Wendelin Foerster in his edition of Chrétien's works (*Der Karrenritter,* 1899). A Dutch version of a short cpiiodic poem, *Lancelot et le Cerf au pied blanc,* will he found in Jonckbloet's volume, and a discussion of this and other *Lancelot* poems in vol. xxx of *Histoire littéraire de la France.* For critical studies *sre* Gaston Paris, art., *Romania,* vol. x and xii; E. Wechssler, *Über die verschiedenen Redaktionen drs Graal-Lancelot Cyklus* (1895); J. L. Weston, *The Legend of Sir Lancelot du Lac* (1901) and *The Three Days Tournament* (1902), an appendix to the previous volume; F. Lot, *Études sur le Lancelot en prose* (1918). (J. L. W.)

LANCET, in architecture. a form of pointed arch (*q.v.)* in which the centres from which the curves of the arch are described are outside the base of the arch, so that the arch is high and narrow; also a window with such an arch at the top. As this type of arch is the dominant form in Early English Gothic architecture, that style is sometimes known as the lancet style. *See* ARCH AND VAULT; EARLY ENGLISH PERIOD.

LANCET FISH (*Alepisaurus*), an elongate. compressed. silvery fish reaching a length of three feet or more. The mouth is very large with unequal, formidable. knifelike teeth. suggesting those of a barracuda; a very high tin. suggesting that of a sailfish, extends along most of the back, and between this dorsal fin and the forked caudal (or tail). there is a small adipose fin like that of a trout or salmon. The few species of lancet fishes are much alike and not well known. They are supposed to swim at a considerable depth in the ocean and are occasionally cast up on American North Pacific beaches. One (probably *A. aesculapius*) is rather common in Aleutian shore waters and not infrequently becomes stranded. very likely in pursuit of smaller fishes. The commonest North Atlantic species is *A. ferox.* (J. T. N.)



ADAPTED FROM JORDAN AND EVERMANN, IN U S. NATIONAL MUSEUM PUBLICATION

LANCET FISH (ALEPISAURUS AESCULAPIUS), A LARGE, PREDACEOUS SPECIES, COMMON ABOUT THE ALEUTIAN ISLANDS

LANCEWOOD, a straight-grained. tough, light. elastic wood obtained from the West Indies and Guiana. It is brought into commerce in the form of taper poles of about 20 ft. in length and irom 6 to 8 in. in diameter at the thickest end. Lancewood was used by carriage builders for shafts. The smaller wood is used for whip handles, for the tops of fishing rods and for various minor purposes where even-grained elastic wood is desired. A number of trees of the Cherimoya family (Xnnonaceae) are called lancewood. The true lancewood, *Oxandra lanceolata* of tropical America, furnishes most of the lancewood of commerce. The black lancewood or carisiri of Guiana (*Guatteria virgata)* grows to a height of 50 ft., is of remarkable slender form. seldom more than 8 in. in diameter. The yellow lancewood tree (*Duguetia quitarensis,* yari-yari. of Guiana) is of similar dimensions, found throughout Guiana and used by the Indians for arrow points as well as for spars and beams. Trees of the genus *Rollinia* of Guiana are also called lancewood.

LANCHOW, the capital city of the Chinese province of Kansu. on the right bank of the Hwang-ho about 5,200 ft. above sea level (36" N. and 104° E.). The river in this part of its course is navigable only for small junks. The historical function of Lanchow from earliest times has been to serve as a bridge point on the chief avenue of overland approach into China from the west. With World War II Lanchow became a vital station on the Sinkiang route for Russian war materials and Chinese exports, a stopover on the new air route to Russia and a military air base. It is the western terminus of the Lunghai railway. An oil cracking plant and other industrial establishments indicated the beginning dcvclopmcnt of the northwestern industrial district.

The population of Lanchow according to the 1957 estimate was 699.000; it comprises a considerable number of Muslims. *See* KANSU.

LANCIANI, RODOLFO AMADEO (1846–1929), Italian archaeologist and authority on ancient Rome. was born in Rome on Jan. 1, 1846. He n-as educated in that city and in 1872 became secretary of the archaeological commission. In 1878 he was appointed director of excavations and professor of ancient topography in the University of Rome. He made important discoveries in the House of the Vestals, the Basilica Julia. the imperial palace on the Palatine. the baths of Caracalla, the temple of Jupiter Capitolinus, Ostia, Trajan's harbour at Porto and Hadrian's villa below Tivoli. In 1911 he was created a senator.

His works, some of which were written in English. include: *Ancient Rome in the Light of Recent Discoveries* (1888); *Pagan and Christian Rome* (1892): *The Ruins and Excavations of Ancient Rome* (1897); *Destruction of Ancient Rome* (1899); *New Tales of Old Rome* (1901); *Wanderings in the Campagna* (1909); *Ancient and Modern Rome* (192 j). He died in Rome on May 22, 1929.

LANCISI, GIOVANNI MARIA (1654–1720), Italian anatomist, physiologist, pathologist, physician, surgeon and botanist, the greatest Italian clinician of his time and the first modern hygienist, was born Oct. 26. 1654 in Rome and educated there. He was associated with S. Spirito hospital from his student days until his death. As a physician. he rapidly became eminent and was physician to Popes Innocent XI, Innocent XII and Clement XI.

Lancisi was a great epidemiologist. His monographs on influenza, cattle plague (rinderpest) and malaria were masterpieces. Malaria, he pointed out, was prevalent in swampy districts where mosquitoes were numerous; he advocated drainage far its prevention and quinine for its cure. In 1706 the pope, alarmed by an increase of sudden deaths in Rome. asked Lancisi to investigate the cause. Lancisi's monograph on sudden death pointed out that the deaths were due mainly to dilatation and hypertrophy of the heart and vegetations on the heart valves. In a later treatise on aneurysms, he pointed out their syphilitic nature and also described syphilis of the heart. These monographs on sudden death and aneurysms remain classics. Lancisi accumulated a valuable library n-hich he willed with all his property to S. Spirito hospital. He

died Jan. 20, 1720.

See Pietro Capparoni, *Profili Bio-Bibliografici di medici et naturalisti cellbri Italiani* (1932); Arturo Castiglioni, *A History of Medicine,* tr. by *E.* B. Krumbhaar (1941). (R. H. MR.)

LANCRET, NICOLAS (1690–1743), French painter, who became a brilliant depicter of light comedy which reflected French society under the regent Orléans, was born in Paris on Jan. 22, 1690. Lancret's first master was Pierre d'Ulin but he left D'Ulin (c. 1712) for the atelier of Claude Gillot (1673–1722) where he met and was advised by another of Gillot's students, Antoine Watteau (1684–1721).

Lancret was much admired as a decorator and executed numerous commissions for the mansions of many great collectors. Among his favourite subjects were balls, fairs and village weddings. In 1719 Lancret was received into the Royal Academy as a painter of *fêtes galantes.* The total number of his paintings has been estimated at 787. Lancret died in Paris on Sept. 14, 1743.

LAND, EMORY SCOTT (1879–), U.S. naval officer and shipbuilding and shipping administrator of World War II, was born in Canon City, Colo., Jan. 9, 1879. He graduated from the University of Wyoming, Laramie (1898), and attended the U.S. Naval academy where he excelled as student, athlete and leader. He completed graduate work in naval architecture in 1907 and was active in naval shipwork, including submarine design. He served with Adm. W. S. Sims in London (1917–18) and with the Allied Naval Armistice commission (1918). He became assistant chief (navy) bureau of aeronautics (1926–28), vice-president and treasurer, Guggenheim Fund for Promotion of Aeronautics (1928–30) and chief constructor and chief of (navy) bureau of construction and repair (1932–37). He retired from the navy and mas appointed a member of the U.S. maritime commission (1937) and was its chairman from 1938–46. He was chairman, Strategic Shipping board (1941) and administrator, War Shipping administration (1942–46). He was appointed a vice-admiral on the retired list in 1944.

As one of the leaders of World War II, Land led the policies of the maritime effort of the U.S. throughout the war. He personally steered the whole program and assured its rapid execution.

His wide knowledge of shipping and aeronautical affairs and his courage and forthrightness made him a trusted adviser of Pres. Franklin D. Roosevelt, as well as a respected witness before congressional committees. He served as the president, Air Transport association from 1946 until 1956 when he retired. (E. L. C.)

LAND. In economics, land is commonly treated as a separate factor or agent in production. differing from capital in that no increase of the price paid for its use will evoke an increased supply. What land furnishes is, first, room for productive operations or other activities: and, second, location, as. *e.g.,* with respect to markets. The value of urban land is mostly a matter of room and location. In the third place, different tracts of land have different special qualities or characteristics which permanently affect their productivity. Among these characteristics are such things as climate. configuration. tillability, other general qualities of the soil or subsoil. situation (as in a valley or on the north or the south side of a hill), feasibility of drainage or irrigation, etc. Finally, different pieces of land have other special attributes, set apart from those which have already been mentioned by the circumstance that they are perishable; *i.e.,* that they are used up in the processes of production. Mineral deposits and native forest are examples of this last class. So too are those elements of the soil which are exhausted by crop growing and which have to be replenished if the fertility of the land is to be maintained.

The value of any piece of land depends upon the serviceability and the scarcity of all the particular attributes which it possesses. Economists, however, sometimes find useful an abstract conception of land, in which only its permanent qualities are taken into account. Ricardo's statement that land rent is paid because of the "original and indestructible" powers of the soil has been challenged by a long series of critics. who point to the perfectly obvious facts that some of the valuable qualities of land have been imparted to it. as. *e.g.,* by fertilization or drainage, and that not all of its valuable qualities are indestructible. The critics miss the point. which is that it is important for some purposes to take separate account not only of the element in the value of land which may be imputed to the capital which has been incorporated with the land in the form of improvements but also of an element which reflects the gains which may be secured by appropriating and depleting some of the valuable attributes or constituents of the land. The rent of mines, for example, is in the nature of a royalty rather than a true rent, and the possibility of "mining the soil" is often an important element in the value of lands which have been newly opened for settlement.

Land, in the economic sense, need not be *terra firma.* Land under water (*e.g.,* oyster beds) and even tracts or bodies of water. as where valuable fishing rights are involved, may figure as land. It is often convenient, in fact, to regard land as synonymous with all that nature supplies, external to man, which is valuable. durable and appropriable, thus including, for example, waterfalls and other sources of water power. Valuable rights to particular uses of land, such as the right of a privately owned tramway to use a city street, may also be included, for the economic nature of land does not depend upon how it is owned or controlled. Only in respect of especially favoured spots or strips of land. which have unique uses or supply unique products, does land ownership or an exclusive right to a particular use of a piece of land constitute a monopoly. An important city street. the only practicable pass through a range of mountains. the only important deposit of a rare mineral, are examples. The circumstance that a particular piece of land is of high quality does not give its owner a monopoly if its uses and its products do not differ in kind from the uses and products of other pieces of land, even if these are of inferior quality. (See ECONOMICS; RENT.) (A. YO.)

LANDAU, EZEKIEL (1713–1793), rabbi and author of *responsa* (decisions on questioned points of the Law), was born at Opatow, Pol.! on Oct. 8, 1713, son of Judah Landau, rabbi and member of the Council of Four Lands. In 1734 Ezekiel Landau was head of the rabbinical court of Brody, and in 1745 he became rabbi of Jampol, Podolia. There he gained fame during the Emden-Eybeschiitz controversy by rendering a moderating compromise opinion (see EYBESCHÜTZ, JONATHAN). In 1755 he went to Prague as rabbi, and remained there till his death, on April 29, 1793.

In his collected halakhic decisions, in two cycles, entitled *Noda Biyehudah,* Landau's critical-analytical mind and his careful examination of sources are revealed. He was an implacable opponent of the two great movements which arose in his generation, Hasidism and Haskalah (Enlightenment), fearing the effects of nationalistic philosophy and the excesses of popular mysticism. On the other hand. he did not oppose Kabbalah or the attempt to integrate the Jews into the general community.

A list of Landau's works is found in S. M. Hones' *Toledot Haposekim,* pp. 144–155 (1911).

See the introduction to Landau's *Noda Biyehudah* (1810–11); *Y.* J. Kamelhar, *Mofeth Hador* (1903). *(S. K.* M.)

LANDAU, a town in the Rhineland Palatinate. Ger., on the Queich, under the slope of the Hardt mountains. 32 mi. by rail S.W. from Mannheim, at the junction of lines to Neustadt an der Hardt. Weissenburg and Saarbriicken. Pop. (1959 est.) 27,637. The Gothic Evangelical church dates from 1285, the chapel of St. Catherine from 1344 and the church of the former Augustinian monastery from 1405; the Augustinian monastery, founded in 1276, was converted into a brewery. There are manufactures of cigars. beer. hats, furniture and machines and a trade in wine, timber and cereals. Large cattle markets are held there. Landau was founded in 1224, becoming an imperial city 50 years later.

LAND DESCRIPTION. At what remote time in history land description was first used undoubtedly will never be known, but such use must have been coincidental with man's earliest assertion of the right to the exclusive use or occupancy of an identifiable part of the earth's surface. The description, in the language or gestures of that era, might have been some such expression as "My cave and 50 paces in every direction from its mouth." It may be assumed that with the advance of knowledge descriptions became more important, more accurate and more definite. Descriptions, some much like those of today. were in use in China,

Egypt and Rome long before the birth of Christ.

The purpose of a description of a tract of land, such, for example, as "the SW¼ of Section 10, Tp. 2 S, R. 75 W of the 6th P.M." or "Lot 6 Block 10, Bakers Addition to Denver" or "the So-acre tract south of Dever's Corner known as Mill's Farm." is not, strictly speaking, to identify the land. but rather to furnish a means or formula by which the tract in question can be identified and distinguished from all other tracts of land wherever they may be. Just as a name will not serve to identify a certain person until someone has pointed him out or has said where he can be found, so a land description will not serve to identify the tract until it is related to known points or monuments on the earth's surface

Using the description, plus available written or oral evidence, which may consist of local knowledge, of a government survey, of a tonn or city plat or of the location of fixed monuments, the lines which indicate and fix the boundaries of the property are ascertained and its size, its shape and its location on the earth's surface are thus determined.

UNITED STATES

In the United States land is sometimes located by means of its popular description, such as "Smith's farm," "the Lazy S ranch," "the house and lots commonly known as 1302 Wingate street" or "the Tierra Amarillo grant." Sometimes. also, a general description may be used, such as "the home place" or "all my land in Kern county, Calif." Such descriptions in legal instruments are good if, with the aid of extrinsic evidence, the tract in question can be located exactly and its boundaries clearly defined. These descriptions. however, must be distinguished from legal descriptions, such as ordinarily are used in U.S. patents and other legal documents, in county records and by surveyors.

The principal types of legal descriptions in common use in the United States are: (1) by government subdivision; (2) by metes and bounds; and (3) by reference to a map or plat of town or city additions or subdivisions. In some cases a description may contain elements of all three of these types, and any or all of such descriptions may in turn be related to the state co-ordinate systems of the U.S. coast and geodetic survey.

Description by Government Subdivision. — With the exception of the New England and Atlantic coast states (except Florida). Pennsylvania, West Virginia, Kentucky. Tennessee and Texas and small portions of western lands originally included within Mexican grants, nearly all land in the United States including Alaska has been surveyed and usually is described in accordance with the rectangular system established by act of congress. all lines of which are established with reference to meridians and parallels of latitude.

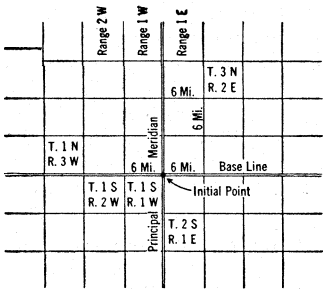


FIG. 2.— ARRANGEMENTAND NUMBERING OF TOWNSHIPS (T.) AND RANGES (R.) WITH RESPECT TO A PRINCIPAL MERIDIAN AND BASE LINE

The application of this system may be illustrated in a general way by showing how the division into townships and sections was made for the area comprising Kansas, Nebraska, Wyoming and most of Colorado. The east-west reference line for this area, called the base line, extends from the western boundary of Colorado to the eastern boundary of Kansas along the 40th parallel of latitude. The north-south reference line, called the sixth principal meridian, at longitude 97° 23' 0" W. of Greenwich, intersects the base line at a point on the northern boundary line of Kansas about 150 mi. north of Wichita. Beginning at this principal meridian and proceeding toward the east and west, north-south lines six miles apart mere laid out dividing all the land under survey into strips six miles wide running north and south, called ranges, numbered consecutively from the principal meridian. Thus the first range to the west is Range 1 West, the second Range 2 West, etc., and the first range to the east would be Range 1 East, etc.

Likewise, beginning at the base line, parallel east-west lines were laid out at six-mile intervals, intersecting the range lines and thus dividing the whole area into blocks approximately six miles square which are called townships. These townships contain 36 sq.mi. or 23,040 ac., "as near as may be," and are numbered consecutively, the first tier of townships north of the base line being Township 1 North, the second tier Township 2 North, etc., and the townships south of the base line Township 1 South, Township 2 South, etc.

Each township, in turn, is divided into sections by parallel lines run from south to north and from east to west at one-mile intervals. These sections, one mile on each side, corresponding to the 36 sq.mi. in the township, contain 640 ac., are the basic units of the system and are numbered by starting in the northeast corner of the township with Section 1. with Section 2 just to the west and running to Section 6 in the extreme northwest corner. Section 7 is immediately below Section 6, Section 8 just east of 7 and so on back across the township to Section 12. The sections themselves may be subdivided into half-sections, quarter-sections and smaller areas.

By reference to the section, township, range and principal meridian, the location of any section can be fixed; thus if a farm is described as "NE¼ NE¼ Section 12, Township 2 North, Range 70 West of the sixth principal meridian, in Boulder county, Colo.," it would refer to a 40-ac. tract in the extreme northeast corner of Section 12 in a township in the second tier north of the 40th parallel and in the 70th range west of the meridian 97° 23′ 0″ W. of Greenwich.

Metes and Bounds Description. — In the 18 states not included within the rectangular survey, and wherever within such survey lands are irregular in size and shape. it is common and

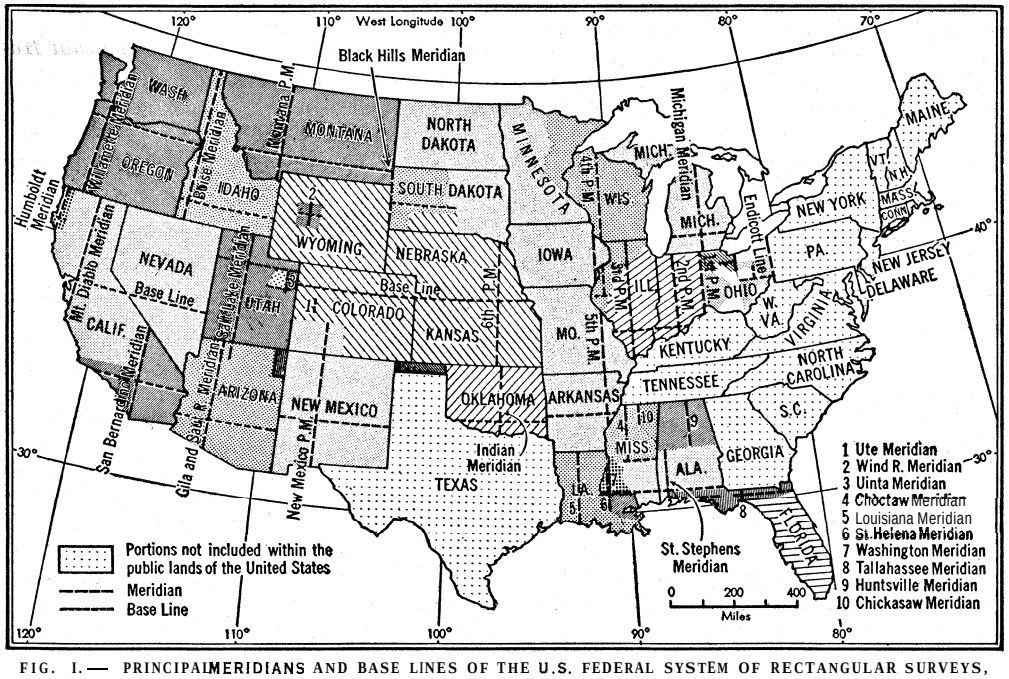


FIG. 1.— PRINCIPAL MERIDIANS AND BASE LINES OF THE U.S. FEDERAL SYSTEM OF RECTANGULAR SURVEYS, SHADED TO SHOW THE AREAS WITH REFERENCE TO EACH MERIDIAN.

proper practice to describe the land by metes and bounds. This is accomplished by running out the boundaries by courses and distances and fixing monuments, natural or artificial, at the corners or angles. A course is the direction of a line, usually with respect to a meridian but sometimes with respect to the magnetic north. Distance is the length of a course, measured ordinarily in chains. feet or some other well-known unit of lineal measurement. but in Mexican grants sometimes in varas (one vara equals approximately 33 in.).

A metes and bounds description might be as follows: "Beginning at a point from which the north quarter corner of Section 4, Tp. 1 N, R. 70 W of the 6th P.M. in Boulder county, Colo.. bears N 45° W 1,320 feet, at which point of beginning an iron stake has been placed; thence south 600 feet to a point also marked by an iron stake; thence N 45" W 700 feet to a large oak tree; thence northeasterly to the point of beginning." (See fig. j.)

Description by Reference to **Recorded** Plats.—In many states provision is made for the mapping or platting of towns, cities or other corporate areas. the process usually being for the owner of a tract of land to prepare a plat or map dividing the same into lots. plots, blocks or squares. with intersecting streets and alleys, and giving the platted area a name. such as Stiles Addition. After approval by the requisite municipal authorities the map or plat is recorded. After recordation the land included therein is properly described by reference to the map or plat and its subdivisions rather than to the government subdivision or other large tract of which it was a part. Typical, for example, would be a conveyance of Lots 1 and 2. Block 10, Stiles Addition to the city of Blue River.

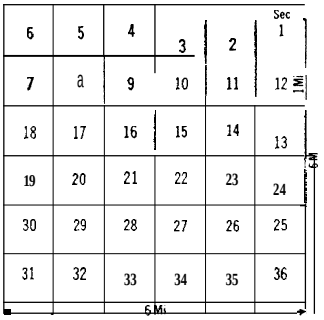


FIG. 3.— DIVISION OF A TOWNSHIP INTO SECTIONS

The State Co-ordinate **Systems.**—When any survey is made with reference to a description of land for the purpose of determining just what portion of the earth's surface is included. its accuracy will, depend upon the reliability of the monument representing the station which is the point of origin of the survey and also upon the correctness of the direction of the meridian of reference running through that station. In the United States, a former difficulty was that monuments in the form of stones, iron stakes. trees, concrete posts and the like had been obliterated or destroyed with the passage of time. This required restoration of the monument by local surveys, sometimes aided by court decree. With each restoration the accuracy of the survey diminished.

The only remedy for this condition was to find some other survey of great extent and accuracy. the stations of which would serve as starting points for resurveys to restore lost corners to their original ground locations. For nearly 100 years prior to 1935 the U.S. coast and geodetic survey had been engaged in determining precise geographical positions of thousands of monument points distributed throughout the country. The method used was based on the trigonometrical proposition (to which there are some exceptions) that if three parts of a triangle are known the other parts may he obtained by computation. The survey. however. took into account the spheroidal shape of the earth and was so highly specialized in its nature. made necessary the use of such expensive equipment and required such difficult mathematical calculations that the data could not be used by ordinary surveyors In 1933 these data were made available to surveyors by the establishment of the state co-ordinate systems, a system for each state. the geodetic positions being transformed by mathematical process into plane co-ordinates, or fixed positions on plane surfaces. so that their use involved only the usual methods and formulae of plane surveying

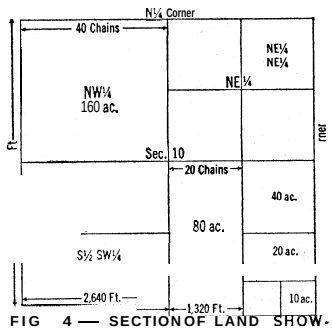


FIG 4 — SECTION OF LAND SHOWING LENGTHS OF VARIOUS LINES AND DIFFERENT TYPES OF SUBDIVISIONS

on the surface of the earth corresponding to a certain latitude and longitude. so too there is but one point corresponding to a given pair of plane co-ordinates. stated as X (east-west) and Y (north-south) on a definite plane projection. When all surface marks at a station have disappeared. it is possible to reproduce on the ground by surveys from other known stations the co-ordinate position of the lost point. The plane co-ordinate system thus has afforded a simple means of utilizing accurate geographical data in retrieving old stations and points which apparently are lost.

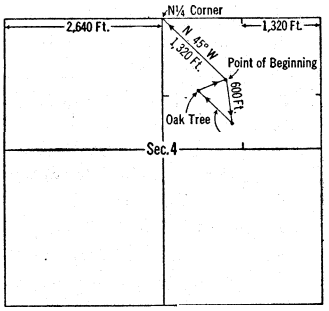


FIG. 5.— SECTION. SHOWING A METES AND BOUNDS DESCRIPTION

Whether local descriptions are by government subdivisions, by metes and bounds or by reference to town or city plats, the location of the original monument; if originally once correctly placed and if correctly referred to in an existing description, can be reestablished by reference to state co-ordinates.

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OTHER COUNTRIES

Land can be described verbally by the preparation in writing of a document which sets out all the relevant inforniation. In certain cases such a document will constitute a sufficient description for all practical purposes. It is generally better. however. to supplement the verbal description by means of a map or plan, and this is common practice nowadays. In England and Wales, for example, the Land Registration act of 1925 requires the verbal description of a registered property to he illustrated by a large-scale plan, called the general map. On the other hand, unregistered properties need only a verbal description. although a plan is generally provided for the sake of clarity and convenience.

In many countries there are available large-scale plans which can readily be used for land description. Such plans are often the outcome of a cadastral survey (a survey carried out to facilitate land taxation). To be of use, a plan must be on a scale large enough to show all the relevant details of the area in question, and it must permit the boundaries thereof to be defined as accurately as the circumstances warrant. In a town where land values are high and properties are crowded closely together with intricate boundaries dividing them, a scale of the order of 1:1,000 will almost certainly be necessary. At the other extreme, an extensive tract of unenclosed ranch land might very well be described with the aid of a map at 1:10,000 scale or even smaller. In the Cnited Kingdom a 1:1,250 survey is available in urban areas and a 1:2,500 survey covers the whole country apart from moorland; these two scales are widely used for land description.

An important aspect of land description is the use of a co-ordinate reference system to designate any given point. Such a system provides a sure means of relating a verbal description to the corresponding map. and has obvious advantages in undeveloped country or in places where similarity of the ground ieatures makes it difficult to define a particular one without ambiguity. It also enables a remote point to be designated rapidly and certainly without tedious reierence to other detail.

A rectangular co-ordinate system is simple to apply and is

widely used. It is customary, though not essential, for the two axes to run roughly north—south and east—west, and ordinates and abscissas are then referred to as northings and eastings. respectively. The square mesh of straight lines which represent constant northing and easting values is called a grid. Such a grid may be drawn on the map and the lines numbered. The co-ordinates of a point on the map may then be read off and used as a unique reference to that point.

In Great Britain, the survey is based upon the Transverse Mercator projection and the national maps bear a grid, known as the national grid, which corresponds with the rectangular co-ordinates of that projection. Each 100-km. grid square is designated by two letters; within that square, a point is defined by co-ordinates referred to the southwest corner of the square as origin.

For a full description of the national grid and its use for reference purposes, see The *Projrction for Ordnanre Survey Maps and Plans and the National Reference System (H.M.S.O.,* London. 1951). (B. S. I.)

LAND DRAINAGE: *see* LAND RECLAMATION.

LANDECK, BAD (LADEK ZDROJ), a town and spa in the province of Wroclaw, Pol., on the Biele. 73 mi. by rail south of Wroclaw; before 1945 in the province of Silesia, Ger. Pop. (1950) 3,431. It is situated at an altitude of 1,400 ft. It manufactures gloves.

The town is visited because of its warm sulfur baths, which have been known since the 13th century. In the neighbourhood are the ruins of the castle of Karpenstein.

LAND ECONOMICS: *see* AGRICULTURAL ECONOMICS.

LANDEN, JOHN (1719–1790), English mathematician, was born at Peterborough, in Northamptonshire, on Jan. 23, 1719, and died on Jan. 15, 1790, at Milton. He became known as a mathematician by his essays in the *Ladies' Diary* for 1744, and was elected fellow of the Royal society in 1766. He made important researches on elliptic integrals, being remembered for Landen's point and Landen's transformations. He produced the theorem known by his name (found in complete form in Landen's memoir of 1775, and reproduced in the first volume of his *Mathematical Memoirs,* 1780–89) for the expression of the arc of a hyperbola in terms of two elliptic arcs.

His other works include papers in the *Philosophical Transactions* (1754–85), *Discourse Concerning the Residual Analysis* (1758); *Mathematical Memoirs Respecting a Variety of Subjects,* 2 vol. (1780, 1789); *Mathematical Lucubrations* (1755).

(O. OE.)

LANDER, RICHARD LEMON (1804–1834) and **JOHN** (1807–1839), English explorers of the Niger, were natives of Cornwall, sons of an innkeeper at Truro. At the age of 11 Richard went to the West Indies in the service of a merchant. Returning to England after an absence of three years, he served various travelers. He was Hugh Clapperton's devoted servant and companion on his second expedition to West Africa. and on Clapperton's death near Sokoto in April 182; Richard Lander. after visiting Kano and other parts of the Hausa states, returned to the Guinea coast through Yoruba, bringing with him Clapperton's journal. To this on its publication (1829) was added *The Journal of Richard Lander Front Kano to the Coast,* and in the next year Lander published *Records of Captain Clapperton's Last Expedition to Africa. . . With the Subsequent Adventures of the Author.* The British government then decided to send him out to determine the course of the lower Niger. He was accompanied by his brother John. The brothers landed at Badagry on the Guinea coast on March 22. 1830, and traveled to Bussa on the right bank of the Niger. Thence they ascended the river for about 100 mi. Going back to Bussa the travelers began. on Sept. 20, the descent of the river. not knowing where it would lead them.

They journeyed in canoes accompanied by a few Negroes. their only scientific instrument a common compass. They discovered the Benue river. At the beginning of the delta they were captured by the Ibos, from whom they were ransomed by "King Boy'! of Brass Town; by him they were taken to the Sun mouth of the river. whence a passage was obtained to Fernando Po, reached on Dec. 1. The Landers were thus able to lay down with approximate correctness the lower course of the Siger—a matter till then as much in dispute as was the question of the Nile sources. The story of the expedition is told in *Journal of an Expedition to Explore the Course and Termination of the Niger,* 3 vol. (1832). Richard went to Africa again as leader of an expedition organized by Macgregor Laird and other Liverpool merchants, and while going up the river in a canoe was attacked by the natives on Jan. 20. 1834. and wounded. He was removed to Fernando Po. where he died on Feb. 6. John died in London on Nov. 16. 1839.

LANDES, a *département* in the southwest of France, formed in 1790 of portions of the ancient provinces of Guyenne (Landes, Condomois. Chalosse), Gascony and Béarn, and bounded north by Gironde. east by Lot-et-Garonne and Gers, south by Basses-Pyrénées and west (for 68 mi.) by the Bay of Biscay. Pop. (1954) 248,943. Area. 3.615 sq.mi. The Landes, occupying three-fourths of the surface of the department, are sandy, pine-covered stretches north of the Adour separated from the coast by dunes which have so interfered with drainage as to enclose behind them a chain of lakes. The department stretches across the Adour southeastward to include the more hilly Chalosse, drained by the left bank tributaries of the Adour, which receives the Midouze on the right. The Adour formerly reached the sea several miles farther north than now, at Capbreton, from which the discoverers of the Canadian island of that name set out; this is the only harbour in the department.

Only La Chalosse is fertile. The chief cereal is maize; next in importance are rye, wheat, millet and oats. Of vegetables. the bean is most cultivated. The vine and some tobacco are grown in the Chalosse, sheep are numerous, and the Landes breed of horses is well known. The resin of the maritime pine furnishes turpentine and resin to make varnish, tapers, sealing wax and lubricants. Tar and charcoal for smelting purposes are also obtained from the pine wood. The cultivation of the cork tree is also important. The department has several mineral springs, the most important being those of Dax, famous in the time of the Romans. and of Eugdnie-les-Bains and Préchacq. There are salt workings and stone quarries. There are several ironworks in the department, notably those at Le Boucau. There are also sawmills, distilleries, flourmills. brick and tile works and potteries. Exports include resinous products, pine timber, metal and brandy. Landes includes two *arrondissements* (Mont-de-Marsan and Dax), 28 cantons and 334 communes.

Mont-de-Marsan is the capital of the *département,* which domes within the circumscription of the appeal court of Pau, the *académie* (educational division) of Bordeaux and the archbishopric of Auch, and forms part of the region of the 18th army corps (Bordeaux). It is served by the Southern railway; there is some navigation on the Adour. Mont-de-Marsan, Dax. St. Sever and Aire-sur-l'Adour, the seat of a bishop, are the most noteworthy towns.

LANDES, an extensive natural region of southwestern France known more strictly as the Landes de Gascogne. It has an area of 5,400 sq.mi. The Landes, formerly a vast tract of moorland and marsh, now consist chiefly of fields and pine forests. They form a triangular-shaped low plateau, the base of which is the Atlantic coast while the apex is situated slightly west of Nérac (Lot-et-Garonne). Its limits are: on the south the river Adour; on the east the hills of Xrmagnac. Eauzan, Condomois, Agenais and Bazadais; and on the northeast the Garonne, the hills of Médoc and the Gironde. The height of the plateau is from 130 to 260 ft.; the highest altitude (498 ft.) is found in the east near Baudignan (department of Landes), from which point there is a gradual slope in all directions. The soil is naturally sterile.

LANDESHUT (KAMIENNA GORA), a town in Wroclaw province, Pol.. at the foot of the Riesengebirge and on the river Bobrawa (Bober), 65 mi. S.W. of Wroclaw; before 1945 in the province of Silesia. Ger. Pop. (1950) 13,700. The town dates from the 13th century. being originally a fortress built for protection against the Bohemians. Its industries are flax spinning, linen weaving and manufacture of cloth. shoes and cement.

LAND-GRANT COLLEGES AND UNIVERSITIES. In the United States. this group of institutions was established to carry out the purposes of the first Morrill act (1862), by which

public lands were donated to the several states. Proceeds of the sales of this land were to be used in the state as a perpetual fund, the interest from which was to be appropriated for the support "of at least one college where the leading object shall be. without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts. in such manner as the legislatures of the states may respectively prescribe. in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."

The origins of these colleges and universities are found in the efforts of groups of individuals in Michigan. Pennsylvania and Illinois in the 18 jos to establish schools and colleges of agriculture and industry. The appeal of these groups to the federal government for assistance resulted in the federal donations of public lands. With this aid the states undertook to develop this practical form of education "in the several pursuits and professions in life," and by the 1890s it was well under way.

By the second Morrill act (1890) congress began to make regular appropriations for the further support of these institutions, and these appropriations were increased through legislation passed in 1907, 1935 and 1952. The federal appropriations in the late 1950s varied from around $70,000 (Alaska) to more than $200,000 (New York) annually, the total amount being over $5,000,000.

The federal government makes appropriations to the land-grant colleges and universities for two particular purposes. In 1887 the Hatch act initiated appropriations for agricultural experiment stations, these stations to conduct research in agriculture and to acquire and diffuse "useful and practical information on subjects connected with agriculture." The Smith-Lever act. approved in 1914, provided for agricultural and home economics extension work to be carried on by the land-grant institutions in co-operation with the Cnited States department of agriculture, largely through county agricultural and home demonstration agents. Federal funds for agricultural research and co-operative extension work were greatly increased through additional legislation. In the late 1950s the institutions received annually nearly $25,000,000 for research in their experiment stations and about $44,000,000 for co-operative extension work.

The states and territories carried out the mandate of the Morrill act either by establishing separate institutions for instruction in agriculture, mechanic arts and military tactics. or by organizing such instruction as a part of a university. usually the state university.

By the 1950s there was one land-grant institution in each of the states and a second one in Massachusetts, all participating in the federal appropriations. Each of 16 states in the southeast also maintained an additional land-grant college or university established originally for the separate education of Negroes. These institutions were titled variously university, college or institute. Many of them were large, with enrollments above 10,000; a few of the colleges established originally for Negroes enrolled fewer than 500.

The main functions of these colleges and universities. for which they receive federal aid. are threefold: instruction of students on the campus; research through the experiment stations; and co-operative extension work carried on largely through county agricultural, home demonstrations and boys' and girls' club agents.

The fields of study in which the land-grant institutions have had a unique role are agriculture and veterinary m'edicine. Only a few other institutions of higher education have provided programs in these two subjects. About 81% of the bachelors' degrees and 99% of the advanced degrees conferred in agriculture are awarded by the land-grant colleges and universities. Practically every one of these institutions maintains a good college of agriculture. Among those that are outstanding in this respect are the state universities of Illinois. Minnesota and Wisconsin. Iowa State College of Agriculture and Mechanic Arts. Michigan State University of Agriculture and Applied Science. Cornell university. Ohio State university and Pennsylvania State university, all of which offer programs of education in agriculture lending to the doctor's degree. No other nation so generously supports agricultural education, agricultural research and agricultural extension work as does the Cnited States through its land-grant institutions. Of the 1; schools of veterinary medicine in the United States in the late 1950s all but two were in land-grant colleges and universities.

Engineering is another field of study that has been well developed in the land-grant colleges and universities. Land-grant institutions confer about two-fifths of all the engineering degrees conferred in the United States. Among the institutions that are widely known for their instruction and research in this field are the universities of California. Illinois and Wisconsin. Purdue university. Massachusetts Institute of Technology. and Cornell, Ohio State and Pennsylvania State universities.

The land-grant institutions also make a notable contribution to education in home economics, conferring 49% of all the degrees awarded in this field. This emphasis on home economics has given the subject a significant position in higher education.

In military education the contribution of the land-grant colleges and universities has been outstanding. From their beginning they made military tactics an essential feature of their programs. Generally they require at least two years of military training of all undergraduate male students. Kearly all of them maintain reserve officer training corps units.

The educational service of the land-grant institutions is by no means limited to the five fields of study mentioned. Education in the arts and sciences is found in all of them; the great majority confer degrees in chemistry. economics. mathematics, music, physics and sociology; other subjects are also well represented in their educational programs. A goodly number prepare students for the professions of architecture. dentistry, journalism: medicine. nursing and pharmacy.

Land-grant institutions are managed and largely supported by the states and territories, but they conform to certain broad policy stipulations of federal law. They make annual statistical reports to the federal government — the department of health, education and welfare and the department of agriculture—which two departments administer the federal funds appropriated to the land-grant colleges and universities. The U.S. office of education publishes an annual report on the institutions.

The American Association of Land-Grant Colleges and State Universities. established in 1887 as the .Association of American Agricultural Colleges and Experiment Stations, is the oldest. and one of the leading higher education associations of the country. The land-grant institutions greatly broadened the program of higher education, bringing it within the interest of vastly larger numbers of people than would otherwise have been reached. They demonstrated the partnership of the federal and state governments in maintaining a set of higher education institutions which are designed to fulfill federal. state and local needs.

The land-grant colleges and universities in the late 1950s enrolled annually about 500,000 resident students, constituting approximately 18% of the resident enrollment in all the colleges and universities of the United States. These institutions also conferred about 21% of bachelors' and first professional and about 26% of the advanced degrees conferred by all colleges and universities. The institutions serve large numbers of students who are not enrolled as regular resident college students. More than 110,000 take extension courses. more than 45,000 pursue correspondence courses and some 30,000 enroll in short courses.

The annual expenditures of the land-grant institutions in the late 1950s for educational and general purposes were about $1,000,000,000; for additions to the physical plants, nearly $200,000,000; and for other purposes, about $175,000,000. Almost one-third of all the money expended by institutions of higher education in the United States was expended by the land-grant schools.

About one-half of the funds which the land-grant institutions have available to spend for general and educational purposes are appropriated hy the state and territorial governments and about one-fourth are from the federal government. mostly for research. Only 10% of the funds come from tuition and other fees paid by students. The remainder is derived from private gifts, local governments endowment earning? and miscellaneous sources. *See* also TECHNICAL EDUCATION. (L. E. BH.)

LANDGRAVE, a German title of nobility surviving from the times of the Holy Roman empire, which originally signified a count of more than usual power or dignity. In later times it was borne by the sovereign of Hesse-Homburg, the heads of the various branches of the house of Hesse and a branch of the family of Fiirstenberg.

LANDIS, KENESAW MOUNTAIN (1866–1944), U.S. judge and first commissioner of baseball, was born at Millville, O., Nov. 20, 1866. He was named after a mountain near Atlanta, Ga., where his father, a Union soldier, was wounded in the Civil War. He was graduated from the Union College of Law in Chicago in 1891, practised law there and was appointed U.S district judge in 1905. He won nationwide fame in 1907 when he imposed a $29,000 000 fine on the Standard Oil company, although the verdict was reversed by higher courts. During World War I he presided at the sedition trials of socialist and labour leaders. Following the world series baseball scandal in 1919, involving the bribing of players, Landis was offered the post of baseball commissioner, in 1920, and took office Jan. 12, 1921. Previously. baseball had been run by the National Baseball commission, a three-man group of baseball officials. Landis' greatest trait was the absolute finality with which he dealt with those guilty of dishonesty. His decisions were never reversed. He served as commissioner for 24 years. Judge Landis died in Chicago on Nov. 25, 1944. See also BASEBALL; Organized Baseball. (J. D. McC.)

LANDLER, Austrian country dance in slow 3/4 or 3/8 time. An 18th-century forerunner of the waltz, its simple form (two parts of eight bars each) was employed by Mozart, Beethoven and Schubert. (LN. ME)

LANDLORD AND TENANT. In modern English law, the relationship of landlord and tenant is confined to cases where one person (the lessee or tenant) holds from another person (the lessor or landlord) an estate in land, less than freehold, under a lease or tenancy. Such leases show an interesting historical development Initially, a lease was regarded as giving the lessee a mere personal right against the lessor, and conferred no right on the lessee to recover the land against any third party who dispossessed him. Leaseholds were thus classified as personal property and not as real property, for the lessee could not recover the res (*i.e.,* the land) itself. U.S. law (see below) derived from English and is substantially the same.

ENGLISH LAW

When in the late 15th century the courts for the first time enabled the lessee to recover the land, and so treated a leasehold interest as an interest in the land, the classification of leaseholds as personalty had become too firmly established to be altered. In the 20th century legislation not only removed a number of the legal differences between realty and personalty, but also did much to protect specified classes of tenants against landlords; and freedom of contract was to a substantial extent replaced by statutory safeguards which went far toward conferring a protected status upon tenants. In short, the movement was from contract via estate toward status.

Power to Lease.—Generally speaking, the power to grant a tenancy is coincident with the general powers to make dispositions of land. Subject to certain disabilities (see COMPANY; CORPORATION; INFANT), any owner of an interest in land may grant a valid tenancy for any estate less than his own. By statute, however, certain persons with only limited interests in land may grant leases binding on all persons interested. Thus a tenant for life of settled land may grant leases for any period not exceeding 999 years for building or forestry, 100 years for mining and 50 years for other purposes (Settled Land act, 1925, s. 41). A person who has merely a tenancy himself may grant a subtenancy for any period shorter than his tenancy. Indeed, if a person with no interest at all in land purports to grant a tenancy of it, that tenancy, though ineffective as against the true owner of the land, will be a good "tenancy by estoppel" as between landlord and tenant, for by granting and accepting the tenancy the parties to it will be mutually estopped from denying its validity.

Forms of Tenancy.—The principal forms of tenancy are as follows: (1) Lease for a fixed period. A tenancy may be granted for any fixed and certain period, whether as short as a week or less or as long as 3,000 years or more. Apart from a limited statutory exception (Validation of War-Time Leases act. 1944), a lease for an uncertain period, such as the duration of a partnership, is void. Leases for life or lives, however, used to be valid even at common law, but for various reasons went out of favour during the 19th century. and most of those remaining were converted by the Law of Property act, 1925, s. 149 (6), into leases for 90 years determinable by notice after the dropping of the lives. Except for agricultural tenancies (see below), tenancies for a fixed period end automatically with the expiration of the period. (2) Periodic tenancies. Yearly, quarterly. monthly, weekly and other periodic tenancies continue indefinitely until ended by a notice to quit given by either landlord or tenant. Unless otherwise agreed, the requisite notice is that of a period of the tenancy, expiring at the end of a complete period. Thus for a weekly tenancy running from a Monday, notice must be given on or before one Monday to expire on the following Monday. Yearly tenancies, however, are determinable by half a year's notice expiring at the end of a year of the tenancy; *i.e.,* two quarters' notice if the tenancy runs from one of the usual quarter days, and otherwise 182 days' notice. (3) Tenancies at will. A tenancy at will endures at the will of both landlord and tenant. Accordingly. the tenancy determines if either gives notice to the other, or dies, or assigns his interest in the land, or does any act inconsistent with the continuance of the tenancy. Such tenancies are comparatively rare, but are sometimes used to meet mere temporary necessities. If rent is paid and accepted on a periodic basis. it will usually be inferred that a corresponding periodic tenancy has been substituted for the tenancy at will; thus from rent paid on a monthly basis, a monthly tenancy will be inferred. If no rent is agreed upon, the landlord is entitled to compensation for use and occupation. (4) Tenancies at sufferance. When a lawful tenancy ends and the tenant holds over (*i.e.,* remains in occupation) without the assent or dissent of the landlord, the tenant is a tenant at sufferance and not a trespasser. Tenancies at sufferance. like tenancies at will, are readily converted into periodic tenancies. and the tenant is similarly liable to pay compensation for use and occupation. By giving the tenant written notice to quit, the landlord can in most cases make him liable, if he still fails to go, for double the annual value (Landlord and Tenant act, 1730, s. 1), while if the tenant has given written or oral notice to quit, he will become liable for double rent (Distress for Rent act, 1737, s. 18).

Formalities.—With one exception, a lease or tenancy agreement cannot create any legal estate in land unless made by deed. The exception is a tenancy for a term not exceeding three years which takes effect in possession (*i.e.,* begins forthwith) and is granted at the best rent reasonably obtainable without taking a premium. Such a tenancy can be granted even orally (Law of Property act, 192j, ss. 52, 54, replacing in an extended form the Statute of Frauds, 1677, s. 1). However, even if a lease was void at law for noncompliance with these formalities, equity would usually enforce it if it was sufficiently evidenced by writing or part performance; and for most practical purposes an equitable lease is as good as a legal lease. At law. a legal tenancy can be assigned only by deed even if it was created orally (Lam of Property act, 192j, s. 52), although in equity an informal assignment will be effective if sufficiently evidenced by writing or part performance. In addition, no tenancy can arise unless the tenant obtains the right of exclusive possession of the land. If the landowner remains in general control, no tenancy has been granted but a mere licence. For example, whereas the occupant of a furnished flat is often a tenant, a resident in a hotel or lodging house is normally a licensee. (See FLAT.)

Determination of Tenancies.—The following are the principal ways in which a lease or tenancy may come to an end: (1) By expiration of the fixed term for which it was granted; (2) By expiration of notice to quit (these two heads have already been mentioned). (3) By forfeiture. It is usual to insert in a lease an express provision for forfeiture of the lease if the tenant fails to pay the rent or breaks any of his covenants. If a right of for-

feiture arises it lies with the landlord to decide whether to enforce it. If with knowledge of his right the landlord nevertheless treats the lease as still existing, as by accepting rent in respect of a period subsequent to the act giving rise to the forfeiture, he is said to have waived the forfeiture and cannot thereafter enforce it, although this does not affect any subsequent rights of forfeiture which may arise (Law of Property act, 1925, s. 148). Where a landlord enforces a forfeiture for nonpayment of rent, the court may restore the lease to the tenant if he pays all that is due, with costs, and applies for relief within six months of the forfeiture. In the case of other forfeitures, the landlord is in most cases required to serve on the tenant a notice specifying the breach, requiring it to be remedied, if possible, and requiring compensation, if desired. If the notice is not complied with within a reasonable time, the landlord may proceed to enforce the forfeiture, although at any time before the forfeiture is complete (but not afterward) tlie court may grant the tenant relief against it (Law of Property act. 192j, s. 146). (4) By surrender. If the tenant surrenders his tenancy to his landlord, either expressly or by operation of law (*e.g.,* where the landlord grants the tenant a new tenancy), the tenancy determines. (5) By merger. A tenancy is merged in the landlord's estate in the land if the tenant or some third party acquires both the tenancy and the landlord's estate.

Rights and Duties Under a Tenancy.— In the absence of any agreement, the obligations of landlord and tenant to each other are few. The former is under an implied obligation to give the tenant quiet enjoyment (*i.e.,* freedom from adverse claims to the land), and not to derogate from his grant (*i.e.,* not to do any act making the premises leas fit for the purposes for which they were let). The tenant must pay tlie rent. rates and most taxes, and is liable for voluntary waste (*i.e.,* acts damaging the property) and permissive waste (*e.g.,* failure to repair), though the liability of periodic tenants under the latter head is limited to keeping the premises wind- and watertight. But in most cases, tlie lease or tenancy agreement contains express provisions imposing extensive obligations. mostly on the tenant; *e.g.,* to pay rent. rates and taxes, to repair, to insure, not to use the premises except for certain specified purposes and not to assign or sublet without the landlord's consent. There is also a proviso for forfeiture on breach of covenant, and sometimes a "break clause" allowing the tenant to give notice determining the lease at some specified periods during its currency.

Liability of Assignees and Subtenants.— (I) As between the original parties. every lawful provision in the lease or tenancy agreement is enforceable, for it constitutes a contract between them, and so there is "privity of contract" between them. Such liabilities continue for the entire period of the tenancy, even if the lease or the landlord's estate in tlie land (the "reversion") passes to some other person, Thus altliougli after the tenancy has been assigned the landlord will normally look to tlie assignee in whom the tenancy is vested for payment of the rent and performance of the covenants, he may if he wishes hold the original lessee liable, although ii lie does so, the lessee has a right to claim indemnity from the assignee. (2j As between the landlord and tenant for the time being, there is "privity of estate," and all covenants "touching and concerning the land" (*i.e.,* affecting the landlord qua landlord or the tenant qua tenant) are said to "run with tlie land" (or with the reversion) and thus to be enforceable. For example. a covenant to use the premises as a private dwelling house only is one which touches and concerns the land. whereas a covenant not to keep a public house within half a mile of the property leased does not, and is merely collateral. (3) If there is privity neither of contract nor of estate. then in general no covenants in the lease are enforceable. If the tenant grants a subtenancy. there is no privity either of contract or of estate hetween tlie landlord and the subtenant, although to protect himself the tenant will usually insert in the subtenancy covenants at least as stringent as those which bind him. However, although in general the landlord has no direct right of action against the subtenant on the covenants of the head tenancy, he may indirectly enforce them against tlie subtenant by threatening to enforce them against the tenant: and if the covenants are negative or restrictive in nature, he may be able to enforce them directly against the subtenant under the equitable doctrine relating to restrictive covenants. (See also EJECTMENT; EMBLEMENT; FIXTURES.)

MODERN ENGLISH STATUTES

General Reforms.— During the 20th century a number of general reforms in the law of landlord and tenant were made. The Lam of Property acts, 1922 and 1925, removed a number of archaic rules, and the Landlord and Tenant act, 1927, effected certain reforms of substance. Thus by s. 19, notwithstanding any provision to the contrary, if a lease contains a provision against assigning or underletting without the landlord's consent, or against making improvements without his consent, the provision is deemed to be subject to a proviso that such consent shall not be unreasonably withheld, although this does not absolve the tenant from seeking consent; and any covenant against altering the use of the premises without consent is deemed to be subject to a proviso that no money penalty shall be payable for such consent. Again. by s. 18. damages for breach of a repairing covenant are limited to the diminution in the value of the reversion and are excluded altogether if the premises are to be pulled down. But even more important than these general reforms was the emergence of a piecemeal series of statutory provisions for the protection of tenants of certain specified types of property.

Agricultural Holdings.— The Agricultural Holdings act, 1948, was the lineal descendant of a series of statutes beginning with the Agricultural Holdings (England) act, 18; j, designed to protect farm tenants. Each successive act conferred a greater degree of protection, and in the act of 1948 the interests of the public in securing efficient farming were given due weight. The principal features of the act of 1948 (which in general prevails notwithstanding any agreement to the contrary) are as follows: All agricultural tenancies continue until determined by a year's notice to quit expiring at the end of a year of the tenancy. If within a month of receiving a notice to quit, the tenant serves a counternotice claiming the protection of the act, in most cases the notice to quit becomes invalid unless the minister of agriculture and fisheries allows it to remain effective; and he can do this only on certain limited grounds (ss. 24, 2j). If the tenancy is determined, there are elaborate provisions for securing compensation to the tenant for improvements effected by him, while the landlord may claim compensation if the holding has deteriorated in the hands of the tenant. The parties are free to agree upon whatever rent they please. but not more frequently than once in every three years either party may refer the amount of the rent to arbitration. (See LAND TENURE: ECONOMIC AND AGRARIAN ASPECTS.)

Unfurnished Dwelling Houses: the Rent Acts.— The complicated body of law found in the Rent and Mortgage Interest Restrictions acts. 1920–39, as subsequently amended, began with the short Increase of Rent and Mortgage Interest (War Restrictions) act, 191j. With a number of variations, the principles of the acts were adopted by many jurisdictions throughout the world. The basic idea of the acts is that the rent of every dwelling house within the acts should be restricted to the rent being paid at a particular date, with certain permitted increases. and that no landlord of such a house should be able to obtain an order for possession against the tenant except on certain limited grounds. The acts apply to every house or part of a house "let as a separate dwelling" (a phrase so complex in its evolution that even the word "as" requires more than three pages of a textbook to explain it), provided the ratable value in April 1939 did not exceed £100 in London and £75 elsewhere. There are a number of exceptions to this rule, such as agricultural holdings, houses controlled by local authorities! public houses, parsonage houses of the Church of England. tenancies at less than two-thirds of the ratable value and premises let with attendance or use of furniture of a substantial value to the tenant, or with board.

The acts empower a tenant to hold over as a "statutory tenant" notwithstanding the determination of his lease or tenancy. but enable the court to make an order for possession on various grounds if it is reasonable to do so. These grounds range from misconduct of the tenant (*e.g.,* nonpayment of rent, breach of

covenant or nuisance) to cases where no person is at fault; *e.g.*, where suitable alternative accommodation is available, or where the tenant was the landlord's servant and the landlord requires the premises for another servant, or where the landlord requires them for occupation by himself or his near relations and the tenant cannot show that to make the order would cause greater hardship than to refuse it. The standard rent is the rent at which the premises were let in Aug. 1914 or in Sept. 1939, the former if the premises were already within the acts when the act of 1939 came into force in Sept. 1939 (old control), and the latter in other cases (new control). If the premises were not let at these dates, the standard rent is fixed by the rent of the last letting before that date or, failing that, the rent of the first letting after that date. Unduly high or low standard rents established by lettings after Aug. 1939 are liable to be revised by rent tribunals. The only permitted increases above the standard rent are 8% of the cost of any improvements effected by the landlord and the amount of any increases in rates which the landlord has to bear. For old-control houses, there are certain other permitted increases: including 15% of the net rent together with a further 25% if the landlord is liable for all repairs. Further, the Housing Repairs and Rents act. 1954, authorized any landlord of a house in good repair to make a repairs increase of twice the "statutory repairs deduction"; this is an allowance for repairs roughly varying from a third to a fifth of the gross value of the property for rating purposes. The landlord must first show, however, that during the last year he has spent at least thrice the statutory repairs deduction on repairing the house. The Rent acts also rigidly prohibit the payment of any premiums for the grant or assignment of any tenancy within the acts.

Furnished Dwellings. — Certain provisions of the Rent acts attempted to restrict the rents of furnished dwellings, but these were so ineffective that the Furnished Houses (Rent Control) act, 1946 (as amended). set up rent tribunals. consisting of three members and in some cases containing no lawyers. These tribunals were empowered to reduce the rents of premises let with either furniture or services or shared with the landlord (for. not being let as "separate" dwellings, these were not within the provisions of the Rent acts).

There is only a limited and ill-drafted provision for security of tenure: if the landlord serves a notice to quit after a reference to the tribunal has been made, it cannot take effect until three months after the decision of the tribunal. The tribunal may, however, extend the period of three months unless the landlord refrains from serving any notice to quit until the initial three months has expired; and if the tenancy, being for a fixed period. determines without a notice to quit, the act of 1946 confers no security of tenure.

Business Premises. — The Landlord and Tenant act. 1927, part i, enabled a tenant of business premises. on quitting them. to recover compensation for improvements which he had carried out, provided he had first given the landlord three months' notice of his intention to effect them. and made a formal claim in due time. The act also contained relatively ineffective provisions enabling a tenant to claim compensation for good will when his tenancy ended. or a new lease in lieu thereof; hut these were superseded by the Landlord and Tenant act. 1954. part ii.

Under that act, a landlord cannot determine a business tenancy by notice to quit; and if the tenancy is for a fixed term. it continues automatically for an indefinite period. A landlord can determine such tenancies only by giving at least six months' notice in the statutory form. expiring not earlier than the tenancy could have been determined or would have expired. If within two months of receiving this notice the tenant gives notice that he is unwilling to give up possession, he may then apply to the court for a new tenancy. There are only seven grounds on which the landlord may oppose the grant of a new tenancy (*e.g.*, substantial breaches of terms of the tenancy. or the offer of suitable alternative accommodation, or the landlord's intention to demolish or reconstruct the premises). If the landlord's opposition fails, the court must order the grant of a new tenancy. for not more than 14 years. on such terms as it thinks fit; and further nevi tenancies may be obtained repeatedly. A business tenant thus has a prima facie right to remain indefinitely in his premises; and although his initial rent is unrestricted, the rent on any renewal is controlled by the court.

If a new tenancy is refused on grounds other than the tenant's default or the provision of alternative accommodation, the tenant is entitled to compensation equal to the ratable value of the premises, or twice that sum if he has been there for 14 years or more.

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SCOTS LAW

Conditions of Lease. — Under the old common law of Scotland a lease was a personal contract binding only on the lessor and his representatives. and not on creditors or purchasers from him. The act of 1449 c. 1:, however. which applies to leases of lands, houses, mines and salmon fishings, created a real right in the tenant, provided the conditions of the act are complied with. viz., the lease (if for more than a year) must be in writing, there must be a rent, an ish (term of expiry) and the tenant must have entered into possession.

The equivalent to possession is provided by the Registration of Leases (Scotland) act, 1857, which applies to probative leases which are for 31 years or more or contain an obligation of renewal so as to endure for that period. In the case of mining leases (commonly for such periods as 99 years or more) there is no limit as to acreage; in other cases the subjects must not exceed 50 ac. Such "long leases" may be recorded in the Register of Sasines, and when that is done they are effective in questions with singular successors; *i.e.*, purchasers or creditors.

The rights and obligations of the lessor and tenant are similar to those under English law, but in Scotland rates are assessed partly on the owner and partly on the occupier. The tenant is not entitled, without the landlord's consent, to change the character of the subjects let. There is an implied condition that agricultural and residential subjects are reasonably fit for their purpose and will last the period of the lease. Complete destruction, where a house is burned down or a farm reduced to sterility by flood or hurricane. discharges the tenant from his obligation to pay rent. It is a question of degree whether he can abandon his lease. but if not maintained in full possession he is entitled to an abatement of rent. It is implied that a lease of extraordinary duration is assignable and that the subjects can be sublet, subject always to the terms of the contract, and the same applies to leases of urban or country subjects, where the main object is residence and not cultivation of the ground. Agricultural leases, whether arable or pastoral. and leases of shootings or fishings are not assignable. In the absence of an express contrary provision a lease passes to the trustee in bankruptcy of the tenant, but he is not bound to adopt the lease. A lease is heritable in the succession of the tenant. When a lease comes to an end and without either party giving notice. it is continued for a further period on the same terms by "tacit relocation." Notice (usually in writing) must be given (1) in the case of houses, shootings and fishings let for a year or more, 40 days before the terms of Whitsunday (May 15) or Martinmas (Nov. 11); (2) in leases for less than a year. 40 days before the ish; (3) in leases of less than 4 months, one-third of the period of the lease; (4) in all agricultural leases, not less than 1 year. Theoretically rent is not due for an agricultural holding until a crop has been harvested, but there are conventional terms of payment and some rents are payable backhand (after they would normally be due) and some forehand (before they would normally be due). Entry to a farm is usually at Martinmas in pastoral subjects; in arable farms there is usually a double entry; *e.g.*, at Whitsunday as to houses and grass and Martinmas or separation of crop as to the land in grain crop. Different arrangements prevail

about the disposal of the last (waygoing) crop which is oiten delivered to the incoming tenant at valuation. A lease may also be terminated by the enforcement of an irritancy. which may be either legal or conventional. The legal irritancies relate to nonpayment of rent. and agricultural or industrial leases frequently provide that breach of important conditions will give rise to an irritancy. The landlord has a limited right for recovery of his rent known as hypothec in addition to his ordinary remedies as a creditor. This now applies only to leases of houses, shops, mines and market gardens, and enables the landlord to recover one year's rent by sale of the ordinary equipment, furniture and the stock in trade known as *invecta et illata.*

Rent Restriction Acts.— These apply to most dwelling houses and control the amount of rent chargeable, and provide tenants with a large measure of security of tenure. By the Tenancy of Shops (Scotland) act. 1949, a tenant of a shop has a right to appeal to the sheriff if he objects to a notice to quit and wishes to continue his tenancy. The Rent of Furnished Houses Control (Scotland) act. 1943, affords protection to tenants of furnished houses against excessive charges for rent. The Houseletting and Rating (Scotland) acts, 1911 and 1920, make provision ior the landlord being liable to collect the occupiers' rates and lay down certain conditions for the protection of tenants of small houses.

Agricultural Leases.— Many leases of farms in Scotland are for 14 or 1 j years with breaks in favour of either party to enable the lease to be terminated at intervals of 5 years. Modern statutory law, which applies to practically all subjects used for the business of agriculture, is consolidated in the Agricultural Holdings (Scotland', act of 1949 and its most important provisions deal n-ith the following: (1) compensation for statutory improvements on termination of tenancy; (2) freedom of cropping; (3) restriction on notices to quit (security of tenure); (4) compensation for disturbance on dispossession; (j) adjustment of terms of leases in certain cases, by arbitration; (6) the provision of. and repairs to, fixed equipment in all new leases: (7) variation of rent by arbitration; (8) bequest of lease by tenant; (9) making of records of the condition of farms and fixed equipment: (10) notices to quit; (11) settlement of all disputes by a single arbiter. The tenant has a statutory right under the Ground Game act, 1880, to kill ground game; *i.e.,* rabbits and hares.

Numbers of holdings in Scotland are subject to the provisions of the Small Holdings acts, the principal being the Small Landholders act of 1911 which applied to all holdings not exceeding 50 ac. or with a rent not exceeding £50. The small holder having in most cases erected or improved the buildings on the holding or croft has a right to compensation for their value at the end of the tenancy. A "fair rent" of the holding is fixed by the land court. The tenant has security of tenure and can only be removed on certain statuton conditions. such as nonpayment of rent, failure to reside on or cultivate the holding. etc.. and the holding passes to his heirs according to the rules of heritable succession. In addition to those known as small holders there are certain "statutory small tenants." who would be landholders but for the fact that the buildings and other improvements have not been provided by them or their iamily predecessors.

In general these statutory small tenants have the same rights as the small holder.

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UNITED STATES LAW

Since the law of landlord and tenant in the United States developed from the English law, it is substantially identical with that law without the later statutory modifications of the latter. Certain statutory changes were. however. made in some of the states and there seemed to be a growing tendency to treat the relation between landlord and tenant more as one of contract and less as one of distinct and separate property ownership as was the traditional common-law view. Statutes usually permit a letting for a period of one year or less by oral agreement. A lease for a longer period must be made by a formal instrument of conveyance. subject to the rule: as in England, that an oral contract of lease may be ordered specifically to be enforced if there has been part performance by the person seeking the remedy. Many state statutes also provide that a holding over by a tenant aiter the expiration of his lease shall only constitute a holding from month to month or at will and not. as at common law, for a like period as the original letting. The length of the notice necessary to terminate periodic tenancies. such as those from year to year or month to month, is usually governed by specific statutes, considerable variation existing among the several states. Thus, the period required varies from 30 days to 6 months for year-to-year tenancies and from 1 week to 1 month for month-to-month tenancies. It is common also for statutes to require notice of some length to terminate a tenancy at will. The landlord is generally given a statutory remedy of a summary nature for quickly ejecting a tenant who has failed to perform the obligations of his lease or whose lease has terminated. The ancient remedy of distress whereby the landlord may enter, seize and retain personal property in the possession of the tenant until arrears of rent are paid is still available in some states, although in a considerable number it has been abolished. leaving as the landlord's remedies only the ordinary legal processes for the collection of a debt and the summary procedure for ejection of the tenant **(see** RENT). The landlord frequently is given a statutory lien, enforceable by legal process, for rent on crops raised on the premises, and sometimes on personal goods of the tenant, and to that extent is a preferred creditor **(see** LIES).

Covenants.— The law concerning covenants contained in the lease is similar to the English law, but there are a few differences. Covenants seem to be held more freely assignable than in England. Many states hold a covenant by a landlord not to enter into a competing business with that of the tenant to be enforceable by an assignee of the tenant. The English "implied warranty of possession." under which it is the duty of the landlord to deliver possession of the leased premises to the tenant. is enforced in many states though denied in others. There is a conflict of authority whether. as under the English law. there is an "implied warranty of habitability" or "implied covenant of fitness" of furnished premises let for dwelling purposes. Thus tenants have been excused from accepting premises infested by cockroaches or other bugs or rats. The rule is. however, denied in some jurisdictions. There is also a greater tendency than in England to treat the promises of each party as mutually dependent, so that nonperformance by one excuses performance by the other. For example, there is considerable authority in the United States to the effect that failure by a landlord to perform his covenants to repair or heat the premises excuses the tenant on his part from performance of his covenants and justifies him in refusing to pay rent or in abandoning the premises. More often similar results are achieved by applying the doctrine of "constructive eviction," whereby a tenant may treat as an act of eviction by the landlord any act of the landlord on neighbouring premises such as conducting a nuisance or creating a disturbance, or any omission of the landlord to perform a duty assumed by contract or otherwise which renders the premises unfit for the tenancy. The tenant is, however, required to abandon the premises within a reasonable time or else no such eviction is shown. If the tenant abandons the premiies without cause and refuses to pay rent, the lessor generally is permitted. in accordance with the doctrine of anticipatory breach of contract, to sue for complete damages without waiting until the end of the term. Beyond these situations the doctrine that a lease is more a contract than a conveyance has not as yet found very general acceptance. Thus, if a part of the premises is destroyed, the tenant in the absence of agreement must still continue to pay rent and to perform his covenants. This rule has, however. been changed by statute in several states. and it is not applied to a lease of rooms in a building. The tenant is excused from further obligation under his lease by total actual eviction by the landlord, or by eviction by title paramount. or by taking by eminent domain. Where the eviction is irom only a part of

the premises, the tenant may, if it is by act of the landlord, either abandon his lease or remain in possession without paying rent. But where it is by title paramount he is not entitled to abandon his lease and must pay a proportionate part of the rent. The authorities are conflicting. where there is partial eviction by eminent domain. as to whether the tenant should pay rent and claim compensation for the taking. or receive a reduction in his rent without any share in such compensation.

Between World Wars I and II.—A number of problems in the law of landlord and tenant arose or became more significant during World Wars I and II and in the period between. The shortage of housing facilities during both wars resulted in aome government regulation of rents. Federal regulations adopted pursuant to the Emergency Price Control act of 1942 fixed maximum rents in defense-rental areas and permitted tenants to remain in possession after the expiration of their leases by paying the established rent. These regulations and later laws of similar nature were designed to operate only temporarily during an emergency. Situations presenting problems of illegality and "frustration of purpose" had a more permanent effect on legal doctrines. The 18th (prohibition) amendment to the U.S. consrition gave rise to numerous lease cases involving questions of illegality. Where the lease expressly limited the use of the premises to saloon purposes, most of the courts held that the lease terminated when that use became illegal. The tenant was relieved from liability to pay rent and the landlord could recover possession. But a statement that the premises were let for saloon purposes was held not to be a designation of an exclusive use, and the lease was still effective, the premises being available for other uses. Wartime government restrictions on the use. sale or manufacture of certain products also tended to reduce the business of many tenants—of gasoline filling stations, for example—and make operations unprofitable although not illegal. In a large number of cases tenants sought to have their leases declared terminated by application of a doctrine of frustration of purpose. The decisions followed the same course as in the prohibition cases and refused to relieve the tenant if the lease permitted him to engage in another unrestricted business or if the government restrictions did not completely prevent him from doing business. Leases for the duration of the a-ar also presented a problem because of a common-law rule regarding certainty of the term. Many courts recognized the practical need for such leases and gave them effect as intended by the parties—a result that could be obtained under common-law rules by a careful drafting of the lease.

Waste.—The law of waste by a tenant is similar to the English law, except. that in certain parts of the country it may be considered good husbandry for a tenant to cut trees in order to develop the land. The tenant may work open mines or cut timber where the land has been so used prior to the execution of his lease. No technical distinction is made between voluntary and permissive waste; either may be actionable. Ancient statutes coming from the English law providing for treble damages for waste are usually strictly limited by the courts as not being applicable to modern conditions. The implied duty which a tenant has at common law to make minor repairs arose out of his duty not to commit waste. In a few states statutes, some of which are limited to "multiple dwellings" or "tenement" houses. place on the landlord a duty to keep premises leased for dwelling purposes in good repair, thus changing the common-law rule.

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OTHER COUNTRIES

It is virtually impossible to describe the law of landlord and tenant in other countries except by means of the broadest of generalizations. It is true to say that the general principles of English law are in force in most English-speaking countries. Thus the commonwealth countries, with notable exceptions such as part of Canada. the Union of South Africa and Ceylon. substantially follow English law. India and Pakistan retained local customary and religious law upon which were imposed during the period of British rule statutory modifications which had the effect of applying, so far as possible, English principles.

To take an example, the Transfer of Property act, 1882, and the Indian civil code of 1908 applied. among other things. the British conception of leases. British colonies, generally speaking, retain their original systems of law, but these have been modified by the application of English law to a large extent. Of the exceptions referred t~ above, the Union of South Africa applies Roman Dutch law and the remaining areas apply the Napoleonic code referred to below.

The greater part of the rest of the world applies codes of one kind or another. These are, generally speaking, influenced to some extent by the Roman law of the Byzantine empire to be found in the *Corpus juris.* Thus in France the source of the whole of the substantive law, including that of landlord and tenant, is the Napoleonic code; while in Germany the code is contained in the *Bürgerliche Gesetzbuch.* There are similar codes in Austria, Scandinavia and Switzerland. These codes were all promulgated at the beginning of the 19th century and they were applied, wholly or partly, throughout the world—in Europe and in Asia, in the western world and in the east—and Turkey, China, Japan and Thailand (Siam) all adopted such codes. One of the countries to adopt such a code was imperial Russia (1833). Subsequent to the Revolution of 1917, on Nov. 30, 1918, all prerevolutionary law was abolished and by art. 21 of the civil code land became the property of the state and could not be the subject matter of private commerce. Possession of land was permitted only on the basis of rights of enjoyment. Thus in the U.S.S.R. the law of landlord and tenant became the law of government and tenant. The underlying principle is that no profit may be made by anyone out of the letting of land or buildings. The Soviet system was applied in varying degrees to the satellite countries after World War II.

The continental codes, generally speaking. have certain conceptions in common. A distinction is drawn between the letting to hire of houses—bail *à* loyer in France and Miete in Germany—and the letting to farm of agricultural properties—bail *à ferme* in France and *Pacht* in Germany. The codes, as one would expect, provide for the concepts known to all systems of law. The concepts provided for are, among others: the manner in which tenancies are to be proved. whether by words or writing. and the effect of part performance; the manner of giving and the effect of notices to quit; the procedure and result of subletting and assigning; liability for waste and the obligation to repair; the duty of the landlord not to derogate from his grant and to give quiet enjoyment of the demised property; rights of indemnity for defects in the property leased; the destruction of the subject matter of the lease by accident or other causes; the duty of care in the use of the demised property; inventories to be drawn up upon the letting of property; loss or damage by fire; the vicarious liability of a tenant, holding over and the effect of death upon a contract of letting. It is indeed remarkable how systems emanating from completely different historical backgrounds converge.

A word must be said about the Moslem countries. There is, of course. a body of law derived from religious sources but most of the Mohammedan countries have adopted the principles of the European codes. Turkey and Pakistan have already been mentioned. Egypt promulgated the mixed code applicable to foreigners in Egypt in 1875 and this code in modified form was applied to Egyptians in 1883. It was based on the Napoleonic code and takes into account the pre-existing Mohammedan law.

BIBLIOGRAPHY.—Books on the lam of landlord and tenant in all countries within the English system may be found in any well-equipped law library in the United Kingdom. Investigation of the law in other countries is more difficult. however. Reference should be made to the code of the country in question. Such codes are republished periodically. For a compendious work on comparative law, including property law, *see* Armintin, Nulde and Wolff. *Traité de droit comparé,* 3 vol. (1950–51); *see* also V. Gsovski, *Soviet Civil Law,* 2 vol. (1948, 1949). (P. E. L.)

LANDO (LANDUS) became pope in July or Aug. 913 and died early in 914 after a pontificate of six months and a few days.

LANDON, ALFRED MOSSMAN (1887–), U.S. politician, was born Sept. 9, 1887, at West Middlesex, Pa. He migrated with his parents to Kansas where he became an independent in the oil industry, accumulating a fortune which justified his father's laconic remark, "I guess he is solvent." During World War I he served as lieutenant in the chemical warfare service. Landon in earlier years was a disciple of Theodore Roosevelt and a strongly progressive Republican. In 1928 he became chairman of the state Republican committee for Kansas and in 1933 he was elected governor. His reputation for careful finance spread from coast to coast and in 1936 the Republican presidential convention, meeting at Cleveland, nominated him by acclamation to run against Pres. Franklin D. Roosevelt. He was, however! badly defeated, carrying only two states — Maine and Vermont.

LANDON, LETITIA ELIZABETH (1802–1838), English poet and novelist, better known by her initials L. E. L., was descended from an old Herefordshire family, and was born at Chelsea on Aug. 14, 1802. About 1815 the Landons made the acquaintance of William Jerdan, and Letitia began her contributions to the *Literary Gazette* and to various Christmas annuals. She also published some volumes of verse. The gentle melancholy and romantic sentiment her writings embodied suited the taste of the period. An engagement to John Forster. it is said, was broken off through the intervention of scandalmongers. In June 1838 she married George Maclean, governor of the Gold Coast, but her marriage was unhappy.

She died on Oct. 15, 1838, at Cape Coast from the supposedly accidental taking of prussic acid.

For some time L. E. L. was joint editor of the *Literary Gazette.* Her first volume of poetry appeared in 1820 under the title *The Fate of Adelaide,* and was iollowed by other collections of verses with similar titles. She also wrote several novels, of which the best is *Ethel Churchill* (1837). Various editions oi her *Poetical Works* have been published since her death, one in 1880 with an introductory memoir by W. B. Scott. *The Life and Literary Remains of Letitia Elizabeth Landon,* by Laman Blanchard, appeared in 1841.

LANDOR, WALTER SAVAGE (1775–1864), English writer, eldest son of Walter Landor and his wife Elizabeth Savage, was born at Warwick on Jan. 30, 1775. He was sent to Rugby school, but was removed at the headmaster's request and studied privately with Lañgley, vicar of Ashbourne. In 1793 he entered Trinity college. Oxford. He adopted republican principles and in 1794 fired a gun at the windows of a Tory for whom he had an aversion. He was rusticated till the end of the term, and, although the authorities were willing to condone the offense, he refused to return. The affair led to a quarrel with his father in which Landor expressed his intention of leaving home for ever. He was. however, reconciled with his family through the efforts of his friend Dorothea Lyttelton. He entered no profession, but his father allowed him £150 a year, and he was free to live at home or not as he pleased.

In 1795 appeared in a small volume, divided into three books, *The Poems of Walter Savage Landor,* and, in pamphlet form of nineteen pages, an anonymous *Moral Epistle, respectfully dedicated to Earl Stanhope.* In 1798 appeared his first great work, *Gebir.* In 1800 he issued but suppressed *Poetry by the Author of "Gebir,"* with a postscript to that poem. The second edition of *Gebir* appeared in 1803. with a text corrected of grave errors and improved by magnificent additions. About the same time the whole poem was also published in a Latin form, which must always dispute the palm of precedence with the English version.

His father's death in 1805 put him in possession of an independent fortune. In 1808, Landor, then aged thirty-three, left England for Spain to serve against Napoleon at the head of a regiment supported at his sole expense. After some three months' campaigning came the affair of Cintra and its disasters; "his troop," in the words of his biographer, "dispersed or melted away, and he came back to England in as great a hurry as he had left it," but bringing with him the material in his memory for the sublimest poem published in our language between the last masterpiece of Milton and the first masterpiece of Shelley — one equally worthy to stand unchallenged beside either for poetic perfection as well as moral majesty — the lofty tragedy of *Count Julian,* which appeared in 1812, without the name of its author. The style of *Count Julian,* if somewhat deficient in dramatic ease and the fluency of natural dialogue, has such might and purity and majesty of speech as elsewhere we find only in Milton so long and so steadily sustained.

In May 1811 Landor had suddenly married Miss Julia Thuillier, with whose looks he had fallen in love at first sight in a ballroom at Bath; and in June they settled for a while at Llanthony Abbey in Monmouthshire, from whence he was worried in three years' time by the combined vexation of neighbours and tenants, lawyers and lords-lieutenant; not before much toil and money had been nobly wasted on attempts to improve the sterility of the land, to relieve the wretchedness and raise the condition of the peasantry. He left England for France at first, but after a brief residence at Tours took up his abode for three years at Como; "and three more wandering years he passed," says his biographer, "between Pisa and Pistoja, before he pitched his tent in Florence in 1821." In 1835 he had an unfortunate difference with his wife which ended in a complete separation.

In 1824 appeared the first series of his *Imaginary Conversations,* in 1826 "the second edition, corrected and enlarged"; a supplementary third volume was added in 1828; and in 1829 the second series was given to the world. Not until 1846 was a fresh instalment added, in the second volume of his collected and selected works. During the interval he had published his three other most famous and greatest books in prose: *The Citation and Examination of William Shakespeare* (1834), *Pericles and Aspasia* (1836), *The Pentameron* (1837). To the last of these was originally appended *The Pentalogia,* containing five of the very finest among his shorter studies in dramatic poetry. In 1847 he published his most important Latin work, *Poemafa et inscriptiones,* comprising, with large additions, the main contents of two former volumes of idyllic, satiric, elegiac and lyric verse; and in the same golden year of his poetic life appeared the very crown and flower of its manifold labours, the *Hellenics of Walter Savage Landor,* enlarged and completed. Twelve years later this book was reissued, with additions of more or less value, with alterations generally to be regretted, and with omissions invariably to be deplored. In 1853 he put forth *The Last Fruit off an Old Tree,* containing fresh conversations, critical and controversial essays, miscellaneous epigrams, lyrics and occasional poems of various kind and merit, closing with *Five Scenes* on the martyrdom of Beatrice Cenci, unsurpassed even by their author himself for noble and heroic pathos, for subtle and genial, tragic and profound, ardent and compassionate insight into character, with consummate mastery of dramatic and spiritual truth. In 1856 he published *Antony and Octavius — Scenes for the Study,* twelve consecutive poems in dialogue which alone would suffice to place him high among the few great masters of historic drama.

In 1858 appeared a metrical miscellany bearing the title of *Dry Sticks Fagoted by W. S. Landor,* and containing among other things graver and lighter certain epigrammatic and satirical attacks which reinvolved him in the troubles of an action for libel; and in July of the same year he returned for the last six years of his life to Italy, which he had left for England in 1835. *W. Landor's Remarks . . .* 1859, of which a copy was owned by Swinburne, but of which no example in its issued state is now obtainable, was said by Swinburne to have been a complete vindication. He was advised to make over his property to his family, on whom he was now dependent. They appear to have refused to make him an allowance unless he returned to Fiesole. By the exertions of Robert Browning an allowance was secured. Browning settled him first at Siena and then at Florence, where in 1864 he was visited by Swinburne and received the dedication of *Atalanta in Calydon.* Embittered and distracted by domestic dissensions, if brightened and relieved by the affection and veneration of friends and strangers, this final period of his troubled and splendid career came at last to a quiet end on Sept. 17, 1864. In the preceding year he had published a last volume of *Herozc Idyls, with Additional Poems, English and Latin, —the* better part of them well

worthy to be indeed the "last fruit" of a genius which after a life of eighty-eight years had lost nothing of its majestic and pathetic power. its exquisite and exalted loveliness.

A complete list of Landor's writings, published or privately printed, in English, Latin and Italian, has been provided by T. J. Wise and S. Wheeler, 1919, and *The Complete Works,* edited by *T*. Earle Welby, began to be published in 1927. The one charge which can ever seriously be brought and maintained against his style is that of such occasional obscurity or difficulty as may arise from excessive strictness in condensation of phrase and expurgation of matter not always superfluous, and sometimes almost indispensable.

Landor's English prose and his Latin verse are perhaps more frequently and more gravely liable to this charge than either his English verse or his Latin prose. But from no former master of either tongue in prose or verse was ever the quality of real obscurity, of loose and nebulous incertitude, more utterly alien or more naturally remote. There is nothing of cloud or fog about the path on which he leads us; but we feel now and then the want of a bridge or a handrail; me have to leap from point to point of narrative or argument without the usual help of a connecting plank.

BIBLIOGRAPHY.—See The Works and Life of Walter Savage *Landor* (8 vols., 1876), the life being the work of John Forster, inaccurate and incomplete. Another edition of his works (1891–93), edited by C. G. Crump, is also incomplete. The first full and critical edition is that edited by T. Earle Welby. His Letters and other Unpublished *Writings* were edited by Stephen Wheeler (1897).

There are many volumes of selections from his works, notably one (1882) for the "Golden Treasury" series, edited by Sidney Colvin, who also contributed the monograph on *Landor* (1881) in the "English Men of Letters" series. Some minor writings, including Letters of a Canadian, 1862, are lost; of his *Commentary on Memoirs* of *Chas.* Jas. Fox (1812; ed. by S. Wheeler, 1907), Lord Crewe's is the only copy known. A critical biography was prepared by T. Earle Welby. Robert Browning's *Some* Records of *Walter Savage Landor* was privately printed in 1919. Articles by Lord Houghton, Mrs. Lynn Linton, Sir Leslie Stephen (Dictionary of *National* Biography) and Arthur Symons (*The Romantic Movement* in *English* Poetry), 1909, should be consulted.

LANDOWSKA, WANDA (1877–1959), Polish pianist and harpsichord player, was born in Warsaw in 1877. She studied music in her native place and in Berlin, and afterward went to live in Paris, where she was recognized as the foremost interpreter of the early keyboard composers. She was the first pianist of front rank to realize the possibilities of the harpsichord in the concert-room, and her vivid rendering of the music of Bach and Handel on that instrument was a revelation to concertgoers. She nas able to reproduce the "graces" of the older composers with inimitable sprightliness and charm. From 1913 to 1919 she was a professor at the Hochschule, Berlin, after which she again settled in Paris. In 1925 she established her school, École de Musique Ancienne, near Paris. She left in 1940 and eventually nent to the United States. She died in Lakeville, Conn., on Aug 16, 1959.

Her books include *Bach et* ses *interprètes* (1906) and *La musique ancienne* (1908).

LAND RECLAMATION is the process of improving lands to make them suitable for a more intensive use. Reclamation efforts may be concerned nith the improvement of rainfall-deficient areas by irrigation. the removal of detrimental constituents from salty or alkali lands. the diking and draining of tidal marshes, the smoothing and revegetation of strip mine spoil areas and similar activities.

This article is divided into the following sections:

I. Reclamation of Arid Land
II. Reclamation of Salt-Affected Soils
III. Reclamation of Swampy Lands
IV. Reclamation of Coastal Areas
V. Reclamation of Strip-Mine Spoils
VI. Reclamation of Eroded Lands, Infertile Areas and "New" Lands

I. RECLAMATION OF ARID LAND

In the United States, the most extensive reclamation activities are those concerned with irrigation. To a marked extent, reclamation has come to mean irrigation in the western United States. The United States bureau of reclamation has as its central purpose the construction of dams, canals. pumping systems. etc., to bring irrigation nater to arid, semiarid or subhumid lands in the 17 western states. The National Reclamation association is a group interested primarily in irrigation. and the Federal Reclamation act provides for governmental development of irrigation systems

Other extensive areas reclaimed from a desert or near-desert status by irrigation arc found in Israel, Egypt and other countries of the middle east. India. Mexico, Peru and the Soviet Union. (*See* separate articles on states and countries.)

Irrigation of arid lands has been practised in the middle east for thousands of years and extensive irrigation projects were developed in what is now southnestern United States by the Indians before Columbus. The real impetus to reclaim the arid western United States by irrigation, honever, came about the middle of the 19th century when the hlormons established their settlements in the Salt lake basin, and settlers drann to California by the discovery of gold turned to irrigation in order to supply themselves with food

A further incentive to irrigation was brought about by the passage of the Federal Reclamation act in 1902. This act led to the formation of the bureau of reclamation in the United States department of the interior. Major provisions of the reclamation act called for federal construction of irrigation works, required repayment of the costs of the works by the water users, and limited the amount of land any one individual could irrigate with water provided by a federal reclamation project. This maximum amount of land was set at the amount considered to be sufficient to support a single family.

In the late 1950s the bureau of reclamation reported that on about 7j reclamation projects approximately 6,500,000 ac. of land received either full irrigation service or supplemental water. This land was divided into approximately 127,000 farms. The total acreage of irrigation land in the 17 western states was estimated at 27,500,000 ac. by the United States department of agriculture.

Water for reclamation of land by irrigation in federal projects has largely been obtained through storage dams and diversion on snow-fed rivers of the west. Pumping from ground waters also is a major source of water, especially in privately developed reclamation enterprises.

The extent to which land is improved by irrigation is related to the aridity of the land in its natural state. The deserts of the middle east, the alluvial valleys of the central Asian region of the U.S.S.R., the Imperial valley of California and the Columbia basin are examples of areas reclaimed from a near-desert state to a highly productive intensive agriculture. Land reclamation by irrigation is, however, not limited to desert regions, and in the period from 1939 to 1949 irrigated land in the 31 eastern states of the United States about doubled, from about 740,000 ac. to 1,500,000 ac.

Much of the land irrigated in humid areas throughout the world is used for the production of paddy rice, although irrigation of vegetable crops, usually with overhead sprinkler systems, also is practised on a considerable acreage.

Many irrigation projects have failed because of salt accumulations in the irrigated soils or the silting in of reservoirs and irrigation canals. These failures have led some to believe that no permanent civilization could be founded on irrigation agriculture. This belief is contradicted by the long history of irrigated areas of the middle east and the Nile valley. It is essential, however. that provision for drainage of the irrigated lands be considered in the planning of all irrigation reclamation projects, and that water relatively free from dissolved salts be used.

Reclamation of land by irrigation has been extensively developed by the Russian government. By the late 1950s the Russians reported a total of about 11,000,000 ha. (1 ha.= 2.471 ac.) under irrigation, about one-half of this being in the middle Asian republics.

The Syr Darya and Amu Darya rivers are the principal sources of irrigation water in this area. Inasmuch as these rivers carry a heavy load of sediment, the structures through which irrigation waters are diverted from the rivers are engineered so as to minimize the amount of silt entering the irrigation canals.

Another important irrigation development in Russia is found along the Volga-Don canal and in the area below the Tsymlanky reservoir which supplies water to the Volga-Don canal. In Russia, as in most other parts of the world, hydroelectric power is frequently developed at irrigation water storage dams.

II. RECLAMATION OF SALT-AFFECTED SOILS

In the arid regions of the world, and along coastal areas subject to periodic inundation by sea water, soils may have such a high content of soluble salts that production of economic plants is not possible.

The salts found in soils are generally the chlorides, carbonates, bicarbonates and sulfates of sodium, with lesser amounts of potassium, magnesium and calcium salts.

Normally the salt is carried into the soil by water, either by upward moving saline ground waters or by saline irrigation or flood waters. As the water evaporates from the soil or is transpired by plants the salt is left behind. Unless provision is made for removing it from the soil by flushing with nonsaline waters, the salt will accumulate until plant growth is inhibited. Thus, salts tend to accumulate in poorly drained soils where water does not move down through the soil profile and out in the drainage water, and in soils of arid areas where the annual addition of nonsaline water to the surface soil in the form of rain is insufficient to wash the salts downward. Since all irrigation waters carry at least some salt, irrigation may hasten the process of salt accumulation in soils and reclamation of arid lands by irrigation may be followed by a need for reclamation of salty lands by drainage and leaching.

The salt in soils dissolves in the soil water and damages plant growth by preventing the plants from getting needed water from the soil, since the energy required to remove a given quantity of water from a salt solution increases as the salt concentration of the solution increases. In some cases, the dissolved salts may be toxic to plants when taken up by the roots.

In addition to their detrimental effects on plants, sodium ions from the dissolved salt may become adsorbed by the clay particles of the soil and render the soil very sticky when wet and hard and cloddy when dry. Soils containing significant amounts of adsorbed sodium are nearly impervious to water and roots. These detrimental accumulations of sodium are formed through a process called cation exchange.

Most productive soils have calcium cations adsorbed on the surfaces of the clay particles. But when such a soil is treated with a salt solution high in sodium and low in calcium, sodium cations from the salt solution replace the calcium cations held by the soil and a so-called "sodic soil" results. These cations of sodium remain adsorbed by the soil after the salt solution is drained away. Whenever sodium cations are in excess of about 10% of the total amount of cations held in adsorbed form by the soil, a sodic soil of undesirable physical properties results.

The reclamation of salt-affected soils follows the exact reverse of the process by which they are formed. The first step is to improve the drainage so that upward movement of ground water to the soil surface ceases and water applied to the surface can move down through the soil profile. Then fresh, nonsaline water is applied to the surface by irrigation. This fresh water washes out the excess salts and they are carried away in the drainage water. In the case of sodic soils, amendments that will supply a fresh source of soluble calcium to replace the sodium adsorbed by the soil are added and leaching is carried out until the replaced sodium is removed. Gypsum (calcium sulfate) is the most common amendment used to supply calcium for the reclamation of sodic soils.

Procedures for the diagnosis and reclamation of salt-affected soils, developed through research at the United States Salinity laboratory at Riverside, Calif., are generally used for planning this type of reclamation activity throughout the world.

Saline and sodic soils are found in extensive areas in Russia, Pakistan, Egypt and other countries of the middle east, north Africa. Spain and in the western United States. In Russia. sodic soils are designated by the term solonetz soils. Deep tillage to break up the horizons high in adsorbed sodium is a common technique used in Russia for the reclamation of these soils.

III. RECLAMATION OF SWAMPY LANDS

Where excess water accumulates in and on the soil. the land is rendered unfit for production of many crops. Even where the wet condition is of fairly short duration, cultural operations required for crop production may be delayed past the optimum planting date or crops already planted may be drowned out.

The reclamation of such wet areas is centred on means of removing the water from these areas more rapidly than it is removed in their natural condition. This process is termed drainage.

The first requirement of a drainage project is an outlet for the water. One of the most common means of providing this outlet is to dig a ditch from the swampy area to a river, sea or other natural body of water. Frequently this ditch is constructed by large power shovels. The size of the ditch is determined by the amount of water to be carried and the gradient of slope along the ditch.

The topography of the land, the amount of water to be removed in a given time (called the drainage coefficient) and the distribution and nature of underlying strata are factors determining the design of the drainage systems for moving the water from the land to the outlet.

Of particular importance is the permeability, or ability to transmit water, of the soil and underlying strata. If the soil and underlying strata have a low permeability, frequently found in clay soils, the excess water must be removed by surface flow. This may require regularly spaced small ditches throughout the area to be drained, and a land forming or grading operation to provide slopes toward the field ditches and to eliminate low spots between ditches.

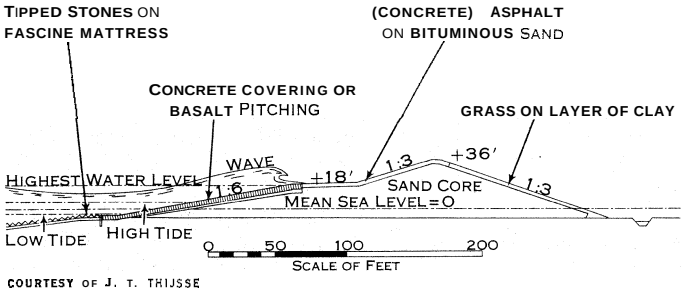
If the soil is permeable. the excess water may be removed through tile lines installed beneath the surface of the soil. The tiles are usually made of fired clay or concrete. The spacing of the tile lines is governed by the permeability of the soil. The more permeable the soil, the farther apart the tile lines. The tile lines may be installed in a regular pattern in large wet areas or in a random pattern where critical wetness is confined to scattered spots in the area. Tile drains have the advantage over open ditch drains in that farm operations can be conducted across the tile lines, making it possible to use larger and more efficient fields, with no loss of land occupied by ditches.

Occasionally underground drains are constructed without use of tile by drawing a bullet-shaped tool through the soil at $1\frac{1}{2}$ to 3 ft. depth. This bullet-shaped tool leaves a channel through the subsoil that may serve the same drainage function as a tile line. This practice of forming unlined underground drains is called mole drainage. After a period of time, depending upon the stability of the soil, the unlined channels collapse and the mole drainage operation must be repeated. With the development of low-cost flexible plastic materials, devices for lining mole drains with perforated plastic liners to increase the life of the drains were developed.

If a permeable strata such as gravel underlies the area to be drained, widely spaced open ditches dug into the permeable strata usually provide effective drainage.

Frequently, poorly drained swampy areas are occupied by soils very high in organic matter, called peats and mucks. When these organic soils are drained, the improved soil aeration brings about an increase in the rate of oxidation of the organic material, resulting in a loss of the soil material itself. This leads to a subsidence of the land surface and in some cases the land surface may sink several feet. Subsidence of drained organic soils is more rapid in warm climates than in cooler areas. Appreciable subsidence has taken place in the reclaimed organic soils of the Everglades of Florida.

Some areas are too wet for crop production because of recurrent flooding from adjacent rivers and creeks. Reclamation of this type of wet land is usually effected by building levees along the stream to keep it confined in its channel. If necessary, excess water originating in the protected area is lifted over the levee by pumps. An extensive area of land is protected by levees in the



COURTESY OF J. T. THIJSSE

FIG. 1.—CROSS SECTION OF A SEA EMBANKMENT ON AN EXPOSED SECTION OF THE NETHERLANDS COAST

lower Mississippi valley of the United States.

Extensive projects for the reclamation of land by drainage are found in England, Europe and the eastern United States. Large areas of organic soils have been reclaimed by drainage near Minsk in Byelorussia. Mole drainage is used in England. in New Zealand and in Australia. Reclamation of wet land by drainage is an ancient practice. having been used by the Romans along the Tiber river.

IV. RECLAMATION OF COASTAL AREAS

Where offshore lands or tidal marshes are covered by shallow water, and additional land is critically needed, the offshore lands have been reclaimed by construction of dikes roughly parallel to the shore line, followed by drainage of the area between the dikes and the natural coast line.

Where a sediment-laden stream can be diverted into the area between the dikes and the shore line, the sediment from the stream may be used to build the diked-off land to a higher level, thus facilitating the drainage operation.

Occasionally, reclamation of tidal marshland can be accomplished by closing the mouth of tidal estuaries by dikes. Where the land surface is above low-tide level, a dewatering system based on tide gates which discharge water into the sea at low tide and automatically close to prevent re-entry of sea water at high tide may be used. In other instances, pumps have been used to lift water over the dikes. The use of pumps permits the reclamation of lands that are below low-tide level.

The most notable example of reclamation of coastal lands is the polder (tract of artificially drained land) system developed adjacent to the Zuider Zee in the Netherlands. Other examples of this type of reclamation are found in England. During the colonial period, extensive areas of tidal marsh uere reclaimed for rice production in the Carolinas and Georgia in the United States. The systems of dikes used in reclaiming marshlands in the Carolinas and Georgia were not maintained and most of the diked-off land again reverted to tidal marsh.

Areas newly reclaimed from inundation by sea water contain so much salt that most plants will not grow. For this reason the procedures for reclamation of salt-affected soils (see above) must be used in addition to diking and draining in order to develop productive agricultural land.

Some marshlands formed in brackish water are very high in sulfides. As long as air is excluded from the soil because of saturation with water, these sulfides are stable and the soil will produce marsh plants. But when the soil is drained, the improvement of soil aeration brings about an oxidation of the sulfides to sulfates, and if the soil is low in basic constituents free sulfuric acid is produced, making the soil too acid for any plants to grow. Marsh soils high in sulfides are termed cat clays by the Dutch. Very large quantities of lime are required to neutralize the sulfates and make the soil suitable for crop production. Unless the sulfide containing sediments naturally contain sufficient lime to neutralize the potential sulfate content, drainage and reclamation are rarely attempted and these areas are left as wildlife reservations.

The only feasible method of producing crops on cat clays is to grow rice using cultural methods that provide for planting and harvesting the rice without draining the land. Inasmuch as these methods preclude the use of modern machinery. the use of cat clays for rice production is confined to southeast Asia and similar areas where the supply of farm labour is abundant in relation to the supply of available land.

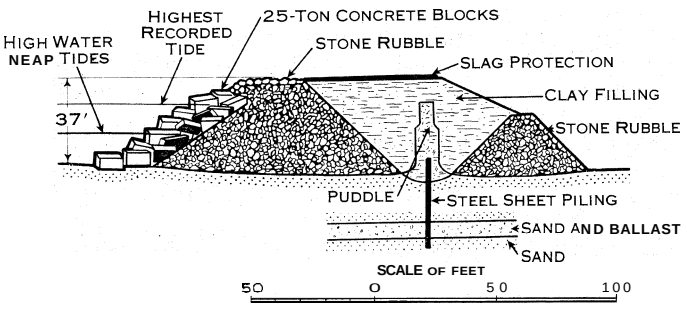
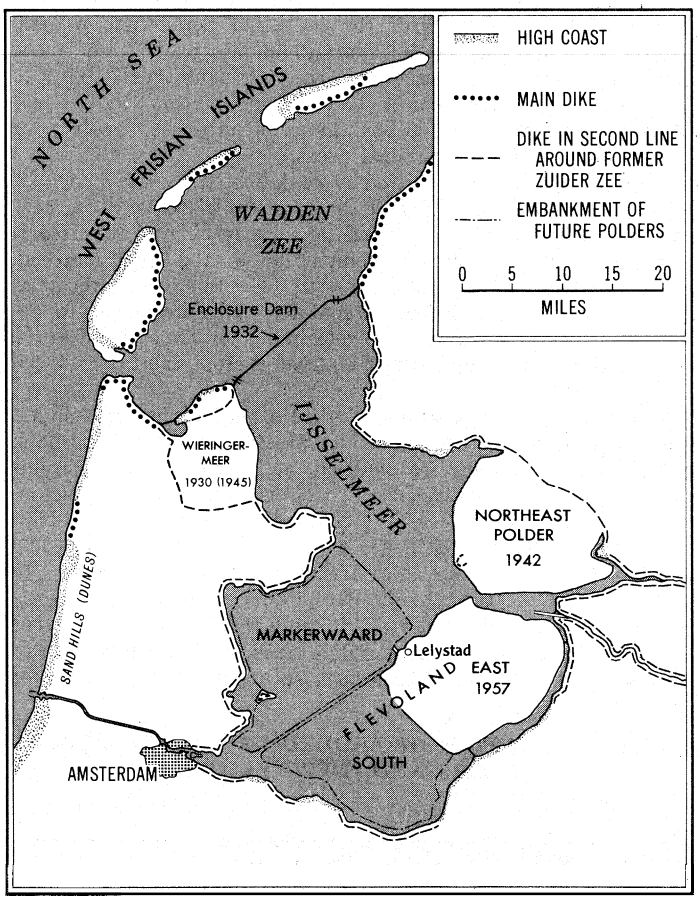


FIG. 2.—CROSS SECTION OF PART OF THE RECLAMATION BANK FOR THE HODBARROW IRON MINES IN CUMBERLAND COUNTY. ENGLAND, ILLUSTRATING THE USE OF PUDDLED CLAY TO MAKE THE BANK IMPERVIOUS TO WATER



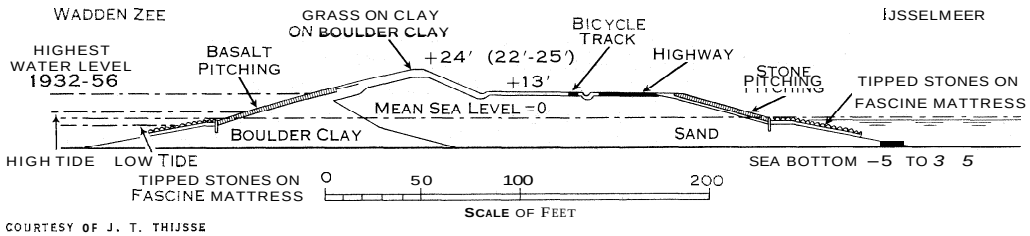
COURTESY OF 1. T. THIJSSE

FIG. 3.—MAP SHOWING DAM AND POLDER CONSTRUCTION IN IJSSELMEER (PART OF THE OLD ZUIDER ZEE), THE NETHERLANDS

V. RECLAMATION OF STRIP-MINE SPOILS

Where mineral deposits are near the surface of the earth, frequently they are exposed for mining by excavating the entire overburden with power shovels. This process is called strip mining and is widely used as a method for mining coal in the Ohio river valley and in England. This technique is also used for mining phosphate deposits, gypsum, gravel, limestone, copper, iron and other minerals.

The overburden removed to expose the mined deposit is dropped by the power shovel in a series of generally conical mounds. Normally, the mining operation is conducted so as to deposit the overburden material in a previous excavation left after the mined deposit is removed. The final excavation is not filled.



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FIG. 4.—CROSS SECTION SHOWING THE CONSTRUCTION OF THE ENCLOSURE DAM OF THE ZUIDER ZEE

The strip-mined area is then left as a series of piles of overburden, called spoil banks, with a deep trench at the side where operations ceased. The piles of overburden are generally loose and porous, but barren of plant life and only slowly revegetated by natural processes. With the increased popularity of strip mining. there was increased interest in the problem of more rapidly reclaiming and revegetating the spoil-bank areas. By 1950 the states of Pennsylvania, West Virginia, Ohio and Indiana enacted legislation requiring strip-mine operators to replant or smooth and replant strip-mined areas.

The problem of revegetation is complicated by the irregular, frequently steep topography of the spoil-bank area and the raw, infertile nature of the spoil material. Smoothing of the area is likely to result in excessive compaction of the spoil material, rendering it less suited to plant growth. For this reason, reclamation of spoil banks is generally confined to reforestation, to development of grazing land or to reclaiming for recreational areas. Reclamation to the point where cultivated crops can be produced is rare.

Materials overlying coal deposits are often high in iron sulfides. Under the well-aerated conditions present in loose spoil-bank material, these sulfides are oxidized, and highly acid conditions may develop in the spoil. The process is similar to the development of acidity in cat clays in reclaimed tidal marshes. In strip-mine spoil, however, drainage is generally good and the acid constituents will be removed by leaching in a period of years. In some states of the U.S. the legislation governing strip mining requires grading of the spoil areas to form water-retaining benches to hasten the leaching process. Pine trees are frequently used to reforest spoils high in sulfides because of the acid tolerance of the pines.

VI. RECLAMATION OF ERODED LANDS, INFERTILE AREAS AND "NEW" LANDS

Where soil erosion is severe, a land area may be denuded of topsoil and interlaced with a dendritic, or branched. system of steep sided watercourses called gullies. These areas are generally devoid of vegetation and sediment eroded from them may menace lower lying lands or water retention structures.

In humid regions these eroded areas are usually reclaimed by reforestation accompanied by exclusion of livestock from the area. Where the subsoil material is friable and fertile. the land may be graded to obliterate the gullies and permit production of pasture or other close growing crops. In the southeastern United States, kudzu, a leguminous vine, has frequently been used to stabilize gullied areas.

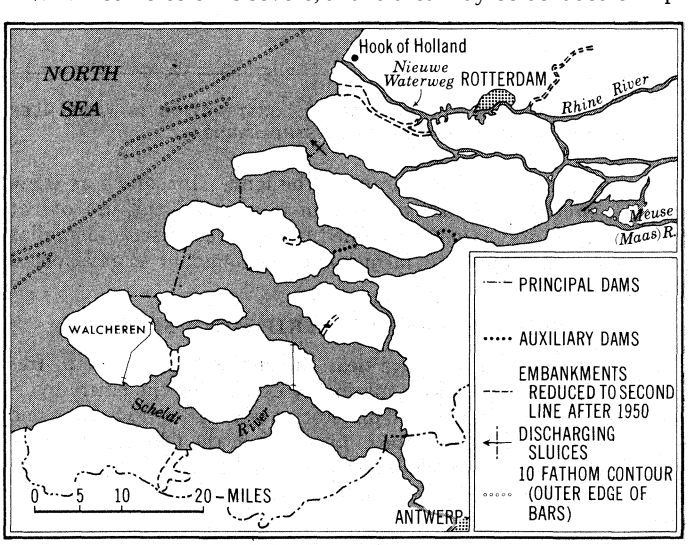
If the gullied area is not large and topographic conditions permit, a diversion ditch to prevent runoff from higher lying areas from entering the gullied area may hasten the reclamation process. Natural plant invasion and succession may revegetate eroded areas if they can be protected from the cause of the accelerated erosion.

One of the most striking instances of reclamation is offered by certain hill areas of New Zealand. There, areas covered by unproductive vegetation have been converted to highly productive pasture through fertilization with phosphorus and cobalt, liming, seeding of clovers and grasses and poisoning of rabbits. Many of the materials added to the land to improve it for grazing have been dropped from airplanes.

The development of farming on new lands in Kazakhstan and Siberia is frequently considered a reclamation process. In this case. however, no engineering works or chemical modification of the land was generally required. The process included colonization. selection of most promising soils, plowing of the native grass sod and planting of crops. The principal crop produced is spring wheat. By the late 1950s, large sections of new land were brought into production in Kazakhstan by this process.

See also FORESTS AND FORESTRY; HOLLAND: *Physical Features;* IRRIGATION; ROTATION OF CROPS; SOIL; SOIL EROSION AND CONSERVATION.

See J. A. Steers, *The Sea Coast* (1953); J. van Veen, *Dredge, Drain, Reclaim,* 4th ed. (1955). (W. H. A.)



COURTESY OF J. T. THIJSSE

FIG. 5.—MAP SHOWING THE DELTA REGION IN THE SOUTHWESTERN SECTION OF THE NETHERLANDS AND THE FIVE DAMS TO BLOCK THE MOUTHS OF THE RHINE AND MEUSE RIVERS. THE SCHELDT RIVER REMAINS OPEN TO PROVIDE ACCESS TO THE PORT OF ANTWERP, AND THE NIEUWE WATERWEG FOR THE PORT OF ROTTERDAM

LAND REFORMS. Renewed emphasis on land reforms under the initiative of the United Nations at mid-20th century may have obscured the fact that such reforms have been one of the dominant themes of history, and, from antiquity, the cause of many political and military conflicts.

In the 7th century B.C., Solon introduced limitations on the amount of land that could be held by an individual Athenian. However. the history of Athens and the other city-states of Greece continued to be marked by bitter struggles between the landless and the landowners up to the time of the Roman conquest.

In England. one of the guarantees forced from King John in 1215 by the Magna Carta was that religious bodies, which had been accumulating lands at a rate that alarmed the barons, would not be allowed to acquire more. At the same time, the inequities imposed on peasants were somewhat relaxed by defining their obligations to their feudal lords.

Among the many clashes due to the demand for land reforms were the Peasants' revolt led by John Ball and Wat Tyler in 1381, the rebellion led by Robert Ket (Kett) in 1549 and the quickly suppressed uprising of 1830.

The United States was partially insulated from the ancient problem while free land was available; but agrarian discontent in the south was a factor in both the American Revolution and the Civil War.

In the last years of the 19th century and the early ones of the 20th century, the vanishing of the supply of free land was accompanied by the flurry of journalistic attacks on business and politics that was characterized by Theodore Koosevelt as "muckraking."

Scope of Land Reform. — Although opinion is by no means uni-

form in defining the term land reform. it usually means a specific, integrated-action program to bring about more effective control and use of land for the direct benefit of the agricultural population and for the indirect benefit of the community as a whole. For example, land reform includes. without widespread dissent. the redistribution of agricultural land among existing or new owners, including consolidation or subdivision; development or settlement of holdings; adjustment of rental charges; compulsory reimbursement of costs incurred by the tenant for improvements made on the land he cultivates; increase in the security of tenure; adjustment of policy and procedure in the taxation of agricultural land; and the adjudication and registration of land and water titles.

But land reform may also embrace improvements in the entire agrarian structure, such as agricultural or general education of rural populations; improvement of working conditions and the social status of all classes of farm workers; improvement of farm credit conditions; the establishment of industries or co-operative societies for the production, processing and marketing of farm products and for the purchase of farm supplies; technical advice to farmers; and numerous other types of farm community or individual services. "Basically," states Isador Lubin, "land reform comprises improvement in all the social and economic institutions surrounding farm life." *(Land Reform: A World Challenge,* Department of State publication 4495, Economic series 29 [Washington. D.C.. 1952].) Thus. if there is a consensus, it invariably merges the meanings of the terms land reform and agrarian reform.

Population Pressure and Tenancy in South Asia and the Orient.--Assessment and collection through intermediaries of the ancient king's share of the proceeds of agriculture originated the fundamental features of the land tenure system. It evolved through the millenniums under the Hindus and the centuries under the Moslems and the British. to become the oppressive landlord system which characterized the Indian land tenures of the first half of the 20th century and which resulted. finally, in the demand for reform in modern India and Pakistan. Although there is indication in the Islamic sacred law that peasants could inherit and transfer certain rights in the land by sale, gift or mortgage, the concept of ownership in land as it is thought of in modern times probably did not emerge in India until the decay of Moslem rule in the 17th century. A weakening of the central government is said to have been brought about by the extent to which peasants were absconding because of the oppressive demands upon their proceeds of production. Gradually, property rights in a land and landlord–tenant system emerged. Also out of the confusion of the 17th and 18th centuries came a class of individual holders, a type of collective ownership and grant lands upon which the government assessment was lower because of some service or merit of the original possessor. These types of tenure, in the absence of inheritance control, together with increasing population pressure, resulted in the extremely small and fragmented owner- and tenant-operated holdings characteristic of contemporary south Asia.

In primitive China. as in Hindu and Moslem India, farm lands owned by the state were allocated to the tillers of the soil from whom the government's share was collected either directly by officers of the state or through intermediaries. The Shang dynasty (about 1700 B.C.) introduced land reforms which matured during the Chou dynasty (about 1100 B.C.) as the *ching t'ien* tenure. Under this system: which endured for many centuries! arable lands were divided into *ching.* In each *ching,* comprising at different times from 630 to goo *mou* of land (one *mou* is now commonly equivalent to about 807 sq.yd., but this varies locallyj, a group of eight farmers tilled their own lands individually; they farmed collectively for the ruling lord a ninth allotment. on which they lived. In time these exact dimensions became blurred. and after a period of disintegration and feudalism, Ch'in Shih Huang Ti (246–210 B.C.) abolished feudalistic military and civil government structures and with them the *ching t'ien* tenure system. He established private property and a free land market in which small holders sold their farms to rich landlords who operated their large holdings under a harsh tenancy system.

In A.D. 9 Wang Mang nationalized the land. returned to *ching t'ien* tenure. limited the size of holdings and prohibited purchase and sale of land. The reform failed because of political pressure; private ownership, large holdings and exchange of property were resumed. Repeated attempts to return to *ching t'ien* tenure failed until in 624 a reform by Kao Tsu of the T'ang dynasty promulgated the *tsu yung tiao* system Under one of the provisions of this system land allotments under onerous tax burden were made to male adults for a limited period of time; the allotments reverted to the state upon the death of the holder. Again under political pressure the system failed in China. but not before it had become incorporated in the Reforms of Taikwa (645) in Japan. After a generation or two in Japan. this imported system gave may under corrupt government to a manorial system which was abolished in 1868.

After the abolishment of feudal tenures in Japan and repeated unsuccessful attempts at reform in China. the contemporary oriental tenure pattern evolved. An active commercial land market, an inheritance system free from any form of entail, combined with population pressure upon land resources. reduced the landholdings into tiny scattered fragments subject to an intensive competition that invited fraudulent exploitation and encouraged tenancy. The end product nas a complex system of individually, family-, clan- and collectively owned properties; a combination of tenant- and owner-operated plots of ground incapable of economical operation; an increase in the percentages of tenancy and the numbers of landless labourers; insecurity of tenure; inequitable distribution of income among numerous middlemen; oppressive rents; chronic indebtedness; usurious interest; primitive methods of farming; low investments of capital; heavy expenditures of labour; short seasons of employment; unorganized markets; and a high degree of illiteracy among rural populations.

In turning to contemporary reform measures, it is important to note that the countries of the orient and south Asia fall into two groups with respect to the degree of population pressure upon land resources.

Land Reform in Areas of High Population Density.—India. Pakistan, Portuguese India. Ceylon. Korea, Taiwan (Formosa) and Japan are areas of very high population density. High-density areas occur in a number of the other countries of south and east Asia, but they are offset by extensive areas offering opportunity for development and settlement. In the countries listed, on the other hand, opportunities for reclamation and land settlement are limited. Large properties are not sufficient in area to suggest expropriation, subdivision and settlement as expedient means of relief. Irrigation and intensification of farming, although otiering important possibilities on existing farms, were pushed about as far as possible in the 20th-century stage of technological progress and farm size. Shunting the population into industrial and commercial employment. as some proposed, would involve various complex and uncertain factors; moreover: such measures could be untimely.

Modern reform programs of countries in this group included elimination of intermediary rent receivers, usually with compensation; provision for purchase by the tenant of the holding which he occupied. subject to resumption by the landlord of a limited area for personal cultivation; establishment of permanent occupancy rights and minimum lease periods with definitions of legal bases for eviction; establishment of maximum rents; establishment of cottage and small-scale industries; encouragement. through subsidies or other means, of co-operative systems of cultivation on consolidated holdings; and limitation of subdivision through sale or inheritance below a minimum size unit. A program might or might not include improved credit facilities, minimum interest rates, community development and agricultural advisory services.

But the high man–land ratio and the uneconomic size of farms, at mid-20th century, remained unsolved problems. Co-operati e farming was suggested by specialists in most of the oriental countries as a means of increasing the efficiency of utilization of the small and fragmented holdings. But care should be taken to distinguish between co-operative farming and collective farming. That distinction is made later in connection with land reform in eastern Europe.

Land Reform in Areas of Low Population Density.— The

absence of land reform programs at mid-20th century in such countries as Laos and Cambodia may be explained by their low population density and low percentage of tenancy, and in such countries as Afghanistan by the extensive mountainous areas. On the mainland of China, however, important possibilities exist for expanding agriculture and increasing production through drainage, flood control and irrigation. Land reform programs were well under way in China before the advent of the Communist government made the country inaccessible to western observers. Thailand. Burma, the Philippines, Malaya. Vietnam and Indonesia also are in the low-density group. The important difference between land reforms of this group and those of the high-density countries is that the former are more likely to place major importance upon expropriation and redistribution of land in possession of absentee landowners, land reclamation and subdivision of large holdings. Where such reform programs are involved, great expenditures of capital and the application of the highest quality of experienced technical skill are required. Political forces opposed to reform. regardless of the balance between costs and benefits, frequently use these heavy capital outlays as a means of tearing down the legislative structures of reform.

The long history of the orient illustrates well the temporal characteristics of agrarian problems and institutions in general.

Ibero-America.—Areas *of Low Population Density and Retarded Modernization.*— *The* countries of Central America. plus northern Brazil, British and French Guiana, Surinam, southern Venezuela, Colombia. Ecuador, Bolivia, Paraguay, Andean and trans-Andean Peru and parts of Chile, constitute an area of agrarian problems. It contains a combination of underdeveloped landholdings that are too large for economy and social justice on the one hand, and a multitude of miniature poverty farms, usually located on the poorest soil, on the other.

These countries are areas of rapidly growing low-density population living under a land tenure system inherited from the ancient Roman empire through Spain and Portugal, blended with pre-Spanish agrarian institutions of the Indian tribes, and molded on a perpetual frontier. A class struggle between the great and the little men who claim tenure in the great and little landholdings, respectively, has raged for centuries with bloodshed and continued poverty, illiteracy and degradation of the masses.

Early in the 20th century civil war in Mexico and a series of revolutions in Bolivia resulted in two land reforms: the first at mid-20th century with its work only partly completed, the second with its work barely begun. Expropriation of large holdings, redistribution to landless and "little landers" under restrictions to insure permanence of the reform, emphasis upon community ownership of land and options of individual or co-operative cultivation were the major features of both of these reforms. Defaulting on land purchase payments, reduced production and other points of cricitism raised questions as to the superiority of such revolutionary types of reform as compared with gradual improvement of the agrarian structure through less drastic legislative controls.

Areas of High Population Density.— A second problem area of Ibero-America is comprised of the Antilles, which occupy the transition waters between the Atlantic ocean, the Gulf of Mexico and the Caribbean sea. These islands are characterized by teeming and rapidly growing populations; latifundia (large landed estates) worked by tenants and owned by absentee landlords; plantation systems of cultivation dominated by sugar-production economy under manager operation; multitudes of landless agricultural labourers; and countless primitive poverty farms of the subsistence type. The Indian populations long ago disappeared under the land grant and *encomienda* forced-labour systems of the Spanish colonial period. Africans took their place and left their progeny. Puerto Rico sought to solve this problem by the introduction of the "proportional profit farm" (a type of co-operative), and by family farms, organized rural communities and rural education.

Land Acquisition, Transformation, Redistribution and Settlement in the Mediterranean Countries.—In Greece, Egypt and Lebanon, population pressures created problems and directed land reform legislation into forms similar to those of south Asia. In other Mediterranean countries, although other reforms were introduced or proposed, land acquisition, redistribution, development and settlement were the major objectives in making reform appropriations.

In Italy, especially, the completeness of development and its expeditious execution have been impressive. But costs per hectare (about 2½ ac.) were high, including as they did expenditures for (1) farm development, including houses, preparation of the land, plantings, farm roads; (2) farm capital such as machines, power equipment, livestock and forage supplies: (3) public works, including roads, complete villages with public buildings, aqueducts, off-farm agricultural processing industries benefiting the populations of the entire locality; (4) social facilities such as co-operatives, schools, professional instruction and many other community services; and (5) program administration. The high cost of these facilities, exclusive of the price of land, involved generous public subsidies and thus provided ammunition for the political enemies of the reform administrations. These opponents (always present in such programs the world over) rose in force to redirect or to stop the reform movement.

In Israel various Jewish agencies introduced after World War II an entirely different type of agricultural organization featuring several types of voluntary co-operative farming.

Family Farms v. Collective Farming in Eastern Europe.—Most of the countries of eastern Europe experienced two major land reforms after 1918. Emerging from World War I. a great part of their lands were in large holdings, held so by ancient systems of entail and operated by tenants whose social and economic status was little better than that of serfdom—remnants of a feudal system imposed by many conquering armies representing many racial and political entities. Also, the resettlement of confiscated lands of former enemies introduced land settlement as a major feature, notwithstanding, these are all countries of high population density.

The first reforms were called failures because they were not complete, but they succeeded in breaking up many of the large holdings into peasant farms.

After World War II, under communistic domination, new reforms were promulgated in which upper limits in size of 20 to 50 hectares on all agricultural holdings were imposed and redistribution was made. Because of high population densities. holdings were too small for efficient operation. As a solution, co-operative farms having various degrees of collectivization were introduced. Complete compulsory collectivization is said to be the ultimate goal of communist land reform. The individual small holding is said to be the first step in this direction. Experience in the U.S.S.R. is offered in support of these assertions.

The countries discussed are the major problem areas of the world calling for land reform or, possibly more wisely, for family-size limitation of farms uith gradual improvement in land tenure, more efficient production methods and expansion of agrarian institutions.

See also LAND TENURE: ECONOMIC AND AGRARIAN ASPECTS. For early land reforms, *see* also SOLON: *Economic Reforms* and ROME: *Ancient History.* For modern land reforms, *see* accounts in the articles on the separate countries listed above, and also CHINA: *History: China After World War II: Domestic Reforms;* and RUSSIA: *Economic conditions: Collectivization of Agriculture.*

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LAND REGISTRATION: *see* TITLE TO LAND.

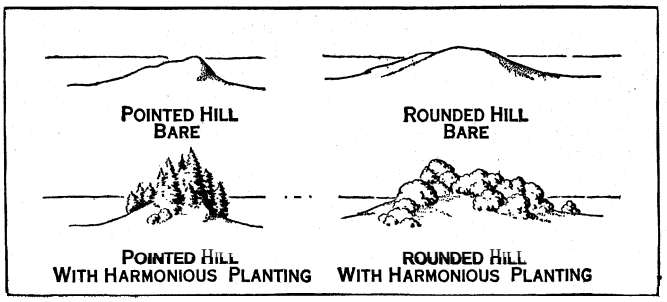
LANDSBERG AM LECH, a town in the *Land* of Bavaria, Germany, on the river Lech, by rail 38 mi. W. of Munich. Pop. (1959 est.) 11,818. Adolf Hitler was imprisoned here for several months after the failure of his Beer Hall Putsch on Nov. 9, 1923. Here he dedicated part of *Mein Kampf* to Rudolf

Hess. Brewing. tanning and the manufacture of agricultural machinery are ambng the principal industries.

LANDSBERG-AN-DER-WARTHE (GORZOW WIELKOPOLSKI), a town formerly in the Prussian province of Brandenburg, Ger., and after 1945 in Zielona Gora province. Pol., at the confluence of the Warthe and the Kladow. 75 mi. W.N.W. from Poznan. Pop. (1946) 19.796. It obtained civic privileges in 1257. It became an active trade centre and the population was 47,447 in 1939. During World War II, however, the town suffered extensive damage.

LANDSBERG BEI HALLE or LANDSBERG. a town in the former Prussian province of Saxony, central Germany, and after 1945 in Saxony-Anhalt; 9 mi. E.N.E. of Halle. Pop. (1933) 2,070. It was the capital of a small margraviate of this name, ruled in the 12th century by a certain Dietrich, who built the town. Later it belonged to Meissen and to Saxony, passing to Prussia in 1814. Its industries include quarrying and malting, sugar refining and the manufacture of machinery.

LANDSCAPE ARCHITECTURE. "Landscape Architecture is primarily a fine art, and as such its most important function is to create and preserve beauty in the surroundings of human habitations and in the broader natural scenery of the country;



FROM HUBBARD AND KIMBALL, LANDSCAPE DESIGN (MACMILLAN)
DIAGRAM OF GROUND AND PLANTING SHOWING RELATION OF PLANT-FORM TO GROUND-FORM

but it is also concerned with promoting the comfort, convenience and health of urban populations." This famous definition by Pres. Charles Eliot of Harvard expresses the modern scope of the art and profession—the beautiful and efficient adaptation of land to human use—as distinguished from the earlier field of *landscape gardening*, which concerned itself largely with ornamental designing and planting of private estates and gardens, deriving its title from the "landscape school" of the 18th century. In England, where the term *landscape architecture* is at present little used, the term *landscape gardening* persists, partly because much institutional and public work included in the practice of American landscape architects is done there by architects.

In France the historic term is *l'art des jardins*, and the professional designer is called *architecte paysagiste*. In Germany *Landschaftsgartnerei* corresponds in origin and use to the English *landscape gardening*, but the accepted term is *Gartenkunst*, although recently *Gartemrchitektur* has been applied to the formal work of German designers.

Theory.—A theory of landscape design, as of the other fine arts must be based on a subjective definition of beauty, which ultimately attributes to the individual the formation of ideals, taste and style in landscape materials, and which recognizes no standards of landscape beauty except as the collective expression of individual ideals under given conditions of environment and culture.

The review of historic styles will show a series of humanized treatments of landscape, most of which have in common the quality of man's dominance over nature. The landscape style of the Romantic period in Europe and of 19th century America suggests the other mode of design, in which man tries to emphasize certain natural characters, either by enhancement of existing landscape or by new creation, producing a result in which art appears only in the perfect unity of the natural scene. Taste in landscape compositions varies widely, but is tending away from the historic violent condemnation of the formal style by partisans of the natural and vice versa, to the more rational viewpoint which recognizes that each has its appropriate use and each its claim to appreciation.

In both the humanized and naturalistic modes of design, the great artist in landscape materials attempts to create a pervading landscape effect or sequence of effects, be it gaiety, repose, mystery or grandeur. In the 18th century, discussion of landscape appreciation distinguished especially "the beautiful" (or calm and smooth) and "the picturesque" (or striking and sharply contrasted).

In striving to kindle emotion, landscape architecture resembles the sister arts, architecture and sculpture, with which there exists a close relation in actual practice of design. But whereas the architect deals in rigid materials of brick and stone which can be constructed into a finished building, the landscape architect deals in living and growing materials, some of which may scarcely reach full maturity and beauty during his lifetime. Buildings, architectural details and statuary all play an important part in landscape design, but the special field of landscape architecture in which no other artist is trained to work remains the adaptation of ground forms to human purposes and the composition with these of trees and shrubs and herbaceous plants of multifarious shapes, textures and colours.

Although three-dimensional composition in landscape materials differs from two-dimensional landscape painting, because a garden or park design contains a *series* of pictorial compositions,—in which series there is often a super-compositional relation,—nevertheless in each of these pictures we find the familiar basic principles of unity, of repetition, sequence and balance, of harmony and contrast. While some part of a landscape design may be intended mainly to form a picture seen from a given point within the visual angle, there must be more often a unity of larger landscape composition which it is impossible to see at one time and which must be appreciated by sequential experiences. To give examples, in the first case we may be looking through an arched loggia (as at the Generalife in Granada) along a strongly marked axis to a vista point beyond, and this whole enframed picture with its symmetrical balance and its simple, formal disposition of elements, we can visually apprehend. In the other case, perhaps a large country estate in the English park style or an Italian Renaissance garden, the three-dimensional unity must be reconstructed in the mind from memories of a number of different views, related by consistency of scale, of style, of landscape character and of emotional effect. This larger unity may be expressed in formal or, often less obviously, in naturalistic terms, but its presence is essential to any successful landscape design.

In making his outdoor compositions the landscape architect, unlike the landscape painter, has to modify the position and characteristics of masses to produce pleasing compositional relations both in the various views which the observer gets as he moves about and in the resulting idea of the constructed whole. Also the shape, colour and texture of the objects used in composition are constantly modified by effects of light and shade, of atmosphere and aerial perspective; and these transitory effects often play a dominant part in the compdsition.



FROM HUBBARD AND KIMBALL, "LANDSCAPE DESIGN" (MACMILLAN)
AN INFORMAL THATCHED SHELTER

As elements of landscape design, the natural forms of ground, rock, etc., offer infinite variety to the designer. In large scale work he deals with hills which may be welded into the composition by harmonious or contrasted planting; with valleys which may be displayed by effective choice of viewpoints; and with bodies of water, which, when all boundaries are visible, constitute unified and dominating elements in landscape compositions, and when seen only enframed by a series of promontories, give incomparable effects of extent and mystery.

Lakes and ponds, islands, shores and beaches, streams and

stream banks, may all be included in large designs, or some part of one may form a striking feature in a smaller composition. In naturalistic gardens, often a brook with little waterfalls may be encompassed, the water falling over rocks laid in natural forms.

Rocks as boulders and ledges are often important elements in design, their colour and texture contrasting with the green of trees or shrubs or rock-garden plants, and their ruggedness serving as the motive of larger picturesque scenery.

Even in small designs the minor modelling of ground surface must be handled with artistry, and its effect in the composition studied in relation to planting and structures. Earth banks and slopes necessitated by construction of roads and buildings can be designed with smooth flow of surface which moulds them imperceptibly into the surrounding natural forms.

Plants as elements in composition are subject to seasonal variation, 'and the time factor in planting design makes the handling of trees, shrubs and herbaceous plants the most complicated problem of the designer. The intricate form of deciduous trees covered with foliage or bare in winter, the more constant shape of evergreens, the texture of leaf and bark, the colour of foliage and flower in garden border or shrubbery, are almost impossible to classify exactly; but certain typical sizes, shapes, colours and textures can be designated, which with time and season can be expected to fulfil the designer's schemes. A large body of garden literature has accumulated in which may be found lists of plants classified in every conceivable way for practical use in design.

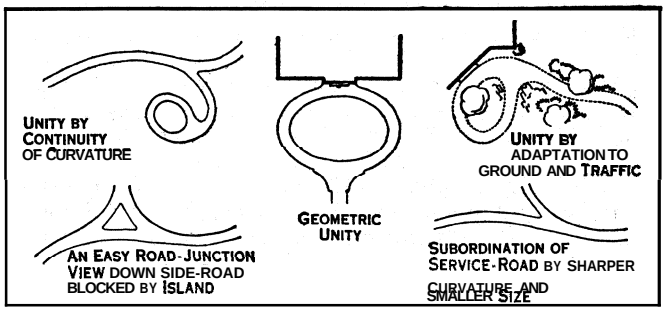
Not only must the compositional aspects of plants be studied, but their oecology, their suitability to the soil and situation. Also the expected amount of care and maintenance may preclude certain choices, as well as immediate questions of cost in selection.

Plantations fall naturally into several classes: boundary or enclosing plantations, including informal shrubberies, formal hedges and garden edgings; specimen trees and shrubs, selected for their individuality; tree and shrub groups composed within themselves and with the larger design; herbaceous beds and borders, either as parts of enclosed gardens or as units in bays of boundary plantings; and ground cover, whether turf on lawns, carpet bedding on parterres or plants as naturalistic surface texture.

Plantations may be considered primarily in relation to the other main elements of composition: to topography and to water features; to architectural structures, whether buildings or garden details; and to roads and paths. The composition of plants with buildings is one of the most common problems; and here planting may serve as enframement, as a transition between ground and structure or as decoration of wall or window.

The design of architectural structures in relation to landscape may involve either their subordination to natural character or the recognition of their dominance, according, for instance, to whether a building is an incident in the grounds, as in a park, or the grounds a setting for the building, as in a small estate. While form relations of buildings to their landscape surroundings are the most obvious, considerations of colour and texture are equally important; for example, compare a successful composition of a long, low stone house, with green slate roof, fitted to a rocky evergreen-clad hillside, with an unsuccessful combination of a high thin building of bright red brick staring out from the same situation. Similar considerations govern the appropriate use of shelters and pavilions in landscape settings, of terraces with their accompanying walls and parapets, of steps in formal or naturalistic compositions, of walls and fences of various materials and decorative qualities, of gates and gateways, and of the many garden details such as seats or sun-dials. Statuary may be incidental but it more usually marks a dominant point in the design; and fountains, pools and basins, and other architectural and sculptural water features are apt to occupy key positions because of their striking individuality.

Roads and paths are differently handled by the designer according as they form part of a numanized or a naturalistic composition. In formal landscape design, roads and paths are often important elements in the composition — as great approach avenues or as brick-paved walks among flower beds. In natural or naturalistic landscape, however, roads and paths are usually conveniences to be tolerated only as they reveal the beauties to be seen along their routes. The selection of their surface and the design of their form would be intended to make them as little conspicuous as possible. Road design in general must be carefully adjusted to topography, and sequence of curve carefully studied in relation to traffic. Views of and from roads and paths are important factors in the enjoyment of landscape designs. In



FROM HUBBARD AND KIMBALL, "LANDSCAPE DESIGN" (MACMILLAN)

PLANS OF CURVING ROADS FOR THE COUNTRY ESTATE

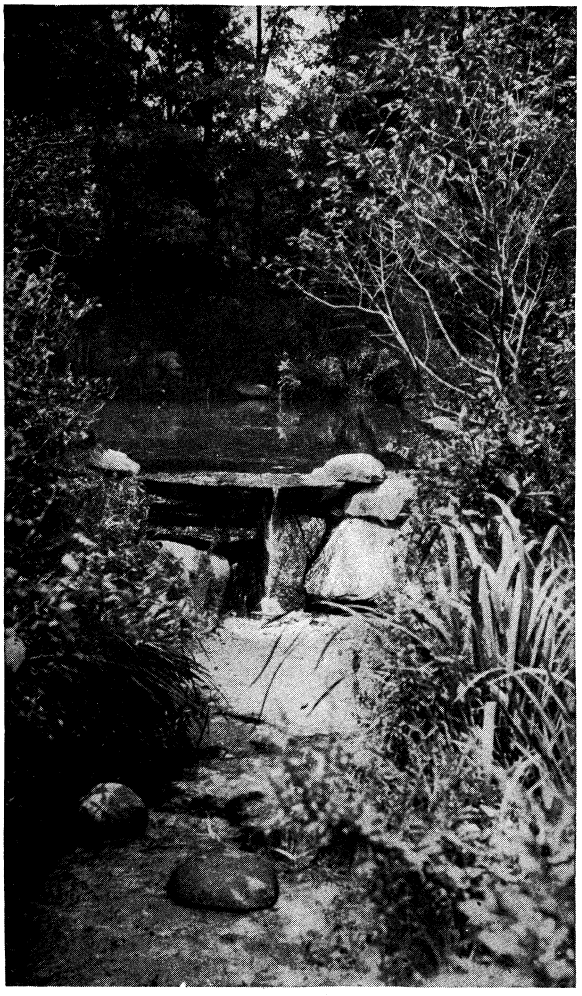
informal landscape there is usually to be secured a series of pictures along the way itself and between groups of plantings off across the country-side. In formal designs, roads and paths may mark important axes, constituting the basic pattern of formal park or garden; and, in any case, serving inevitably as boundaries between other units, their proportions must be carefully studied, as well as their colour and texture, in relation to other elements in the whole composition.

Practice. — In the actual designing of works of landscape architecture, purely aesthetic consideration such as those just considered are constantly being modified by economic aspects inherent in the proposed use of the land. These economic aspects are just as much part of the design as the aesthetic; and on their recognition and skilful embodiment depends the success of the result as a physical organism to be used by man. In some problems — such as the small house on a city lot or a low-cost housing development--economic considerations are paramount and leave to the designer little choice of the aesthetic form in which he shall express them; in others — such as a great formal garden for a wealthy client--economic limitations are slight, and the designer can build his work of art more out of his imagination.

Having composed the aesthetic and economic elements required by the problem, and recorded his scheme either by drawings or, less often, by verbal explanations, the designer must proceed to put the design into execution. If he is experienced, most of the possible difficulties of construction will have presented themselves as limiting economic factors and will have been provided for in the design. Design and construction, in landscape architecture even more than in architecture, cannot be divorced, since on the knowledge of what can actually be built and grown depends the designer's ability to produce real rather than theoretical solutions of the problems offered.

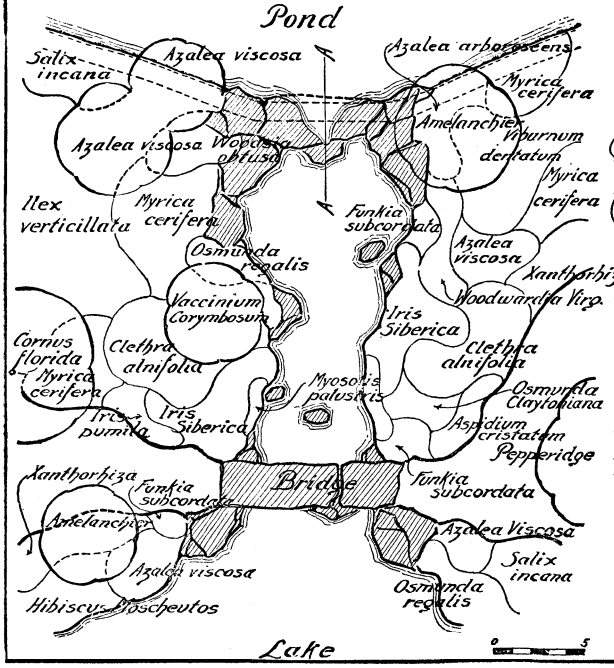
The relations of landscape architect to clients, contractors and collaborating practitioners are generally established in America, as well as the sequence of work on a given job, following from collection of topographic data and making of preliminary sketches, through representation of design in show plans and construction drawings, to superintendence on the ground of construction and maintenance.

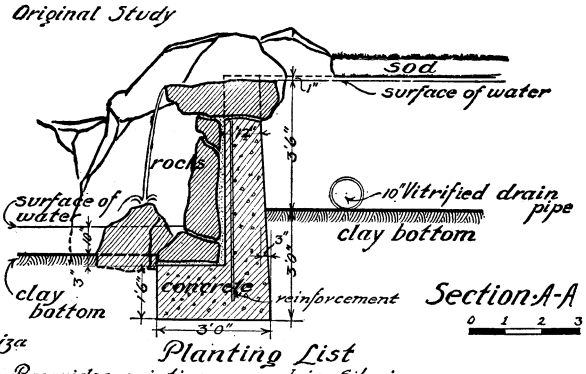
The types of problems now within the field of landscape architecture in various parts of the world, developing from the smaller range of historic examples and from multifarious modern needs, comprise private estates, urban and rural; country clubs, golf courses, hotels and camps; the grounds of hospitals and similar institutions, of universities, colleges and schools; the grounds of manufacturing plants and commercial establishments; railroad grounds; the grounds of national, State and civic buildings; expositions; fair grounds and amusement parks; open-air concert and tea gardens, beer gardens and outdoor restaurants; zoological parks, botanical gardens and arboretums; cemeteries; the whole range of outdoor recreation facilities — from great scenic or forest





Original Study





Planting List

Pepperidge: existing	Iris Siberica
Cornus florida	Iris pumila
Amelanchier	Funkia subcordata
Vaccinium corymbosum	Myosotis palustris
Viburnum dentatum	Osmunda regalis } Ferns
Ilex verticillata	Osmunda Claytoniana } Ferns
Azalea viscosa	Woodwardia Virginica } Ferns
Azalea arborescens	Aspidium cristatum } Ferns
Myrica cerifera	Woodsia obtusa } Ferns
Clethra alnifolia	Ilex verticillata } Among shrubs
Salix incana	Campanula carpatica } Among shrubs
Hibiscus Moscheutos	Aster alpinus } Among shrubs
Xanthorhiza	Hemerocallis flava } Among shrubs

Manmade Naturalistic Composition through manipulation of natural materials and the transplanting of fully developed trees and plants collected in the neighbourhood.

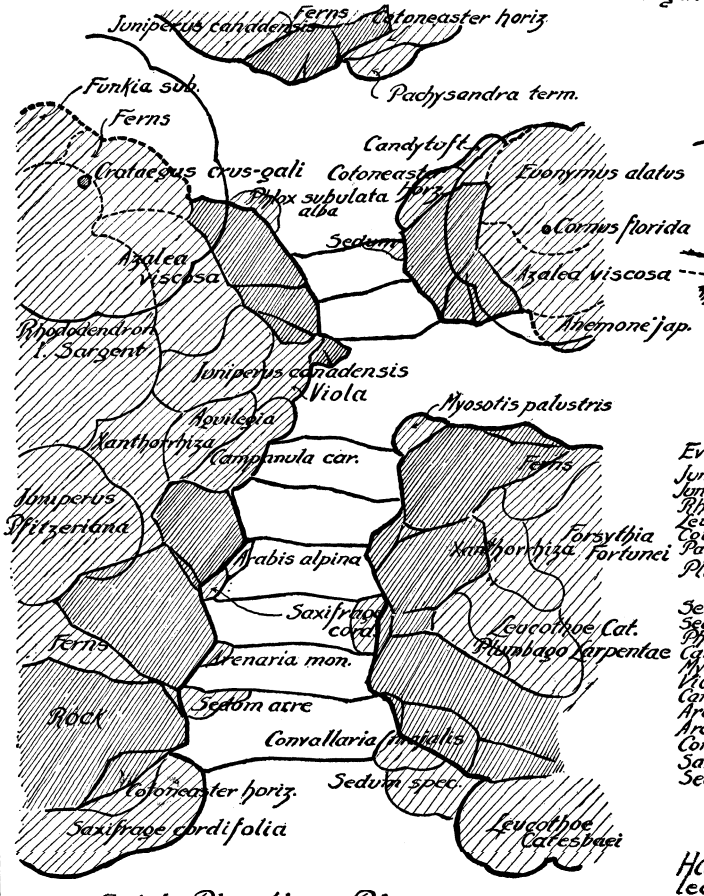
A WATERFALL

On the estate of Myron C. Taylor, Locust Valley, Long Island.
Ferruocio Vitale and Alfred Geiffert. Jr.. landscape architects

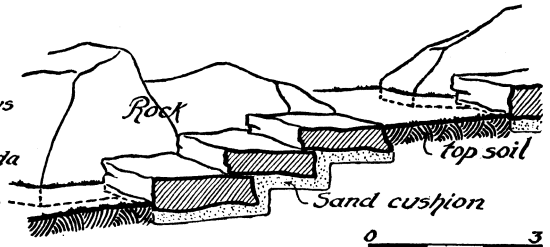




Original Study



Guide Planting Plan 0 5 Ft



Typical Section through steps

Planting List

Evergreen	Deciduous
Juniperus Pfitzeriana	Crataegus crus-gali
Juniperus canadensis	Cornus florida
Rhododendron I. Sargent	Evonymus alatus
Leucothoe Catesbaei	Forsythia Fortunei
Cotoneaster horizontalis	Azalea viscosa
Pachysandra terminalis	Xanthorrhiza

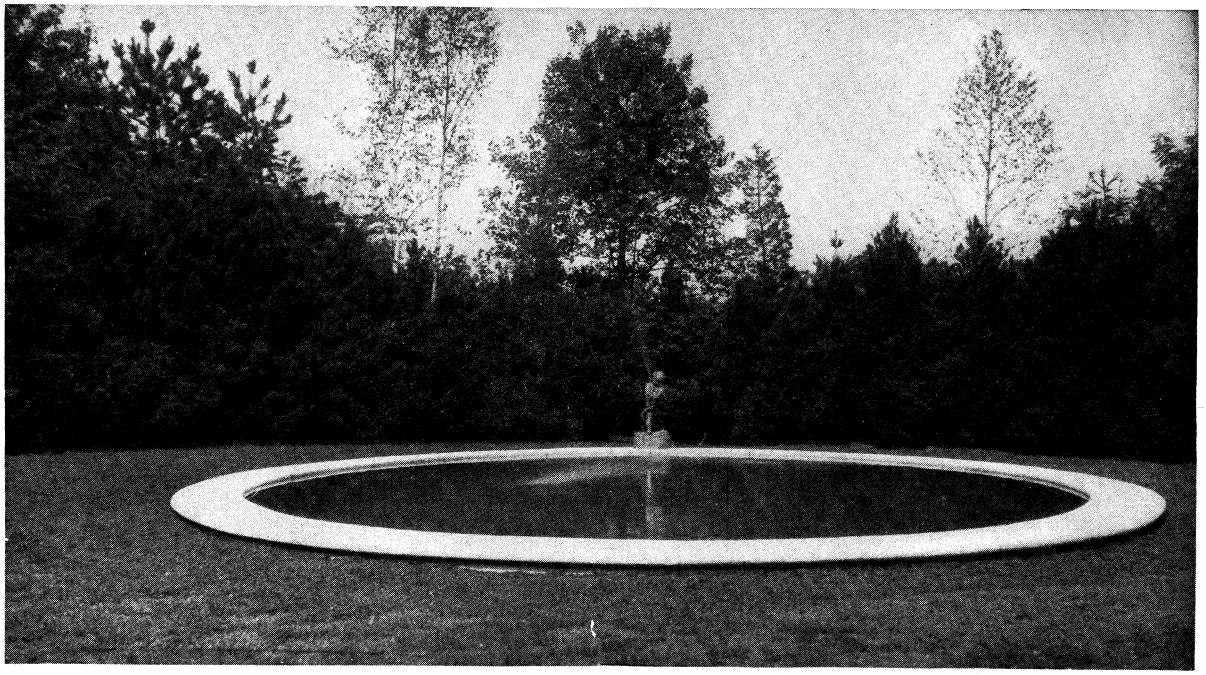
Plants used in cracks, along sides of steps and among rocks

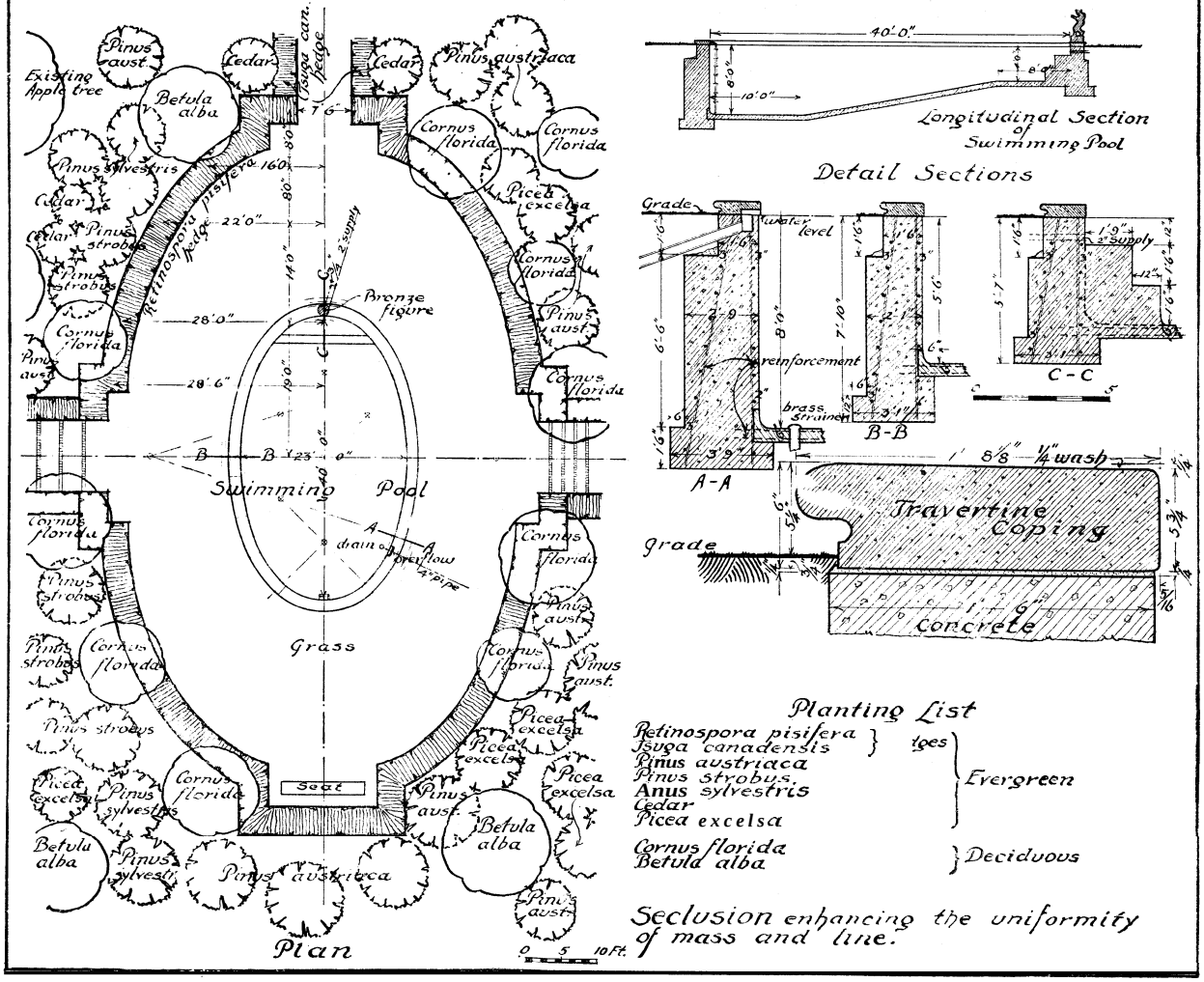
Sedum acre	Plumbago Larpentae	
Sedum Sieboldei	Aquilegia	
Phlox subulata alba	Anemone japonica	
Candytuft	Thymus Serphyllum	
Myosotis palustris	Veronica repens	
Viola	Funkia subcordata	
Campanula carpatica	Dicksonia punctilobula	Ferns
Arabis alpina	Aspidium acrostichoides	
Arenaria montana	Asplenium ebeneum	
Convallaria majalis	Woodsia obtusa	
Saxifrage cordifolia	Polypodium vulgare	
Sedum spectabile	Aubrietia Lavender	

Harmony of tone and texture. The leaf and rock forms selected for their similarity in mass and striation.

STEPS IN A NATURALISTIC GARDEN

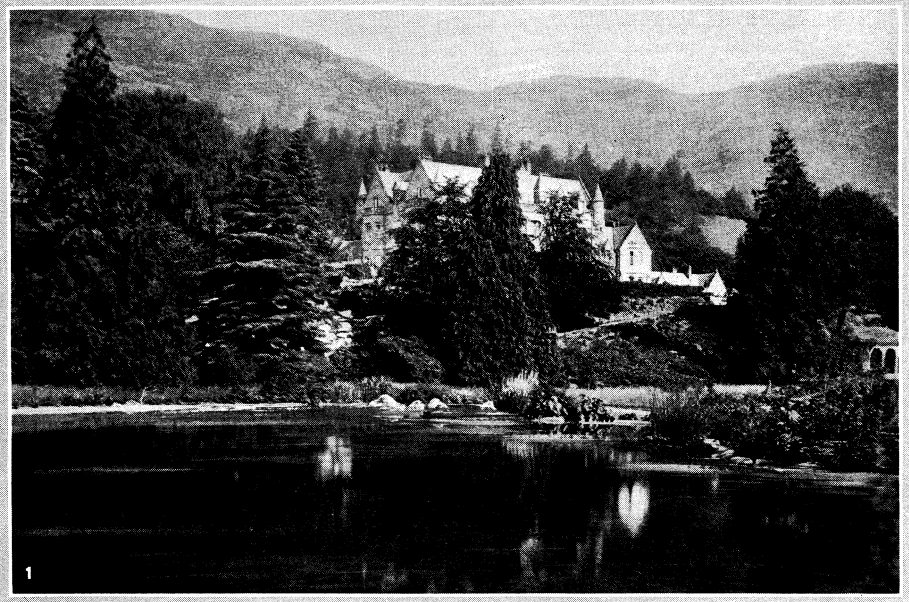
In the garden of Francis E. Drury, Cleveland. Ferruccio Vitale and Alfred Geiffert, Jr., landscape architects

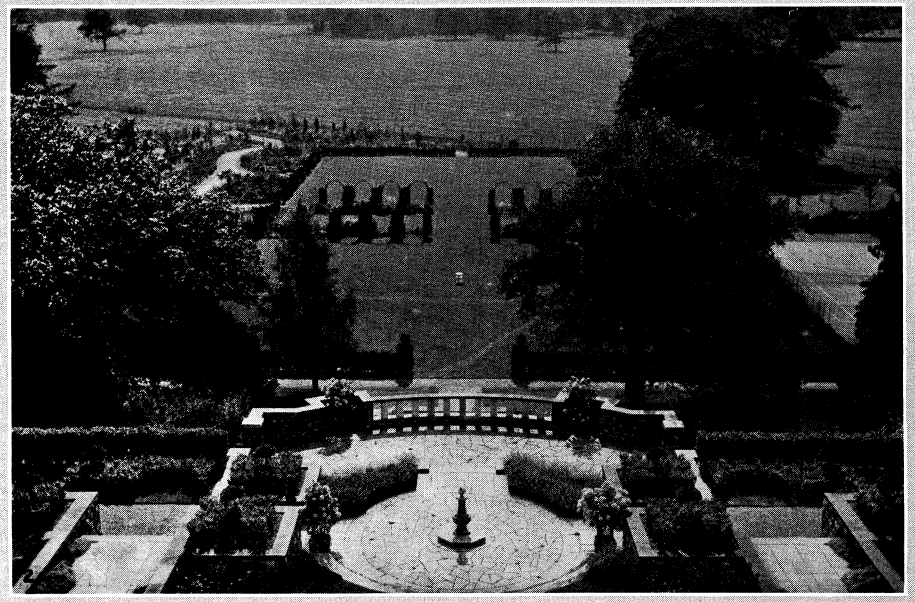




SWIMMING-POOL

On the grounds of Bronson Winthrop, E. Norwich, L.I. Ferruccio Vitale and Alfred Geiffert, Jr., landscape architects





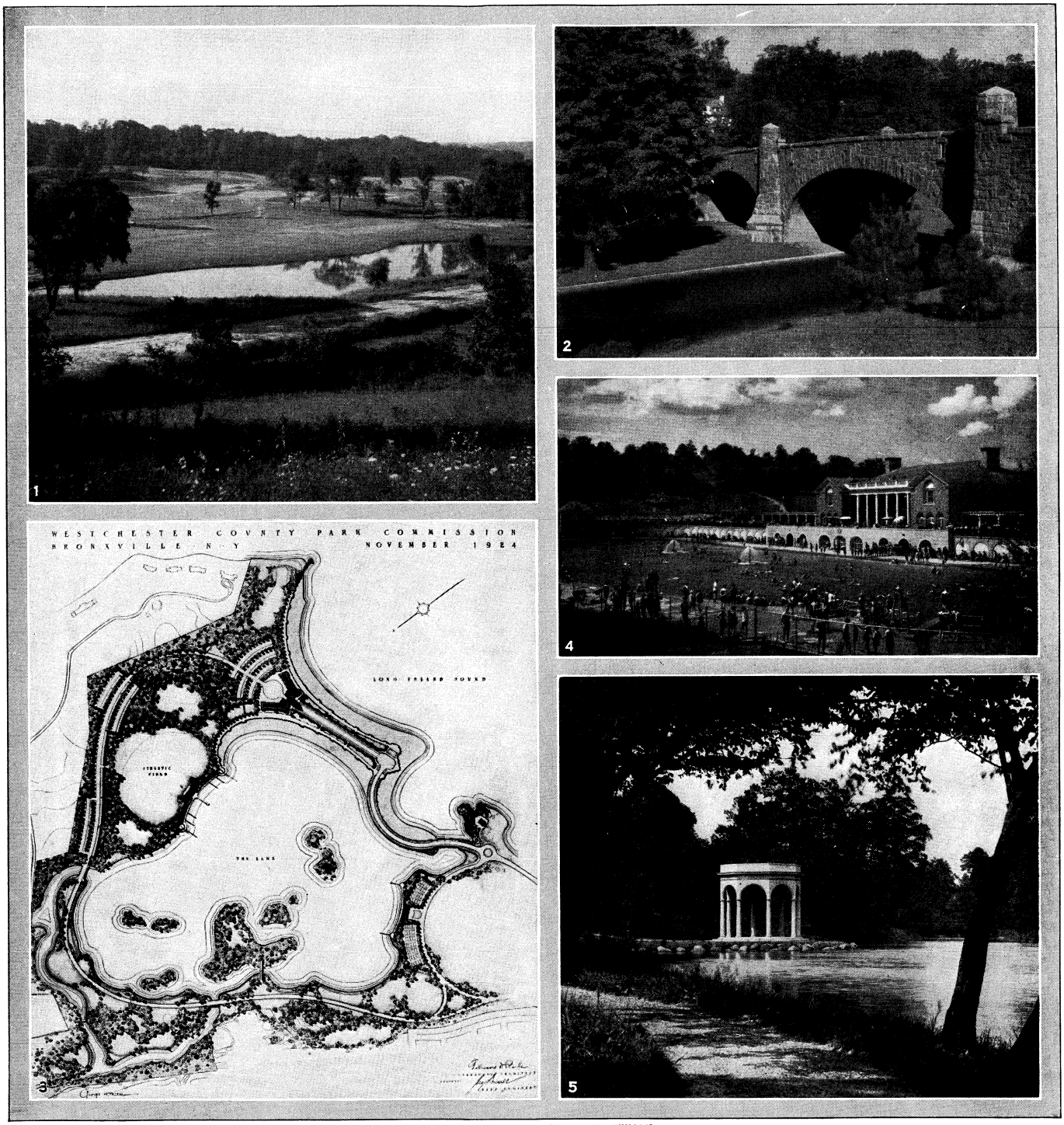




BY COURTESY OF (1, 4) THOMAS H. MAWSON, "THE ART AND CRAFT OF GARDEN MAKING" (B. T. BATSFORD, LTD.)

LANDSCAPE ARCHITECTURE IN ENGLAND AND SCOTLAND

1. View of the lake at Dunira looking southeast towards the house
2. Dunira. View on south side, showing the park
3. Blickling Hall, Norfolk, formerly the residence of Anne Boleyn
4. Rocky stream at Dunira



BY COURTESY OF (1, 2, 3, 4) THE WESTCHESTER COUNTY PARK COMMISSION; PHOTOGRAPH, (5) P. A. NYHOLM

LANDSCAPE DESIGN IN PUBLIC PARKS

1. Maplemoor Golf Course, Westchester County Park System. Gilmore D. Clarke, landscape architect
2. Bridge over the Bronx River, Yonkers, N.Y. Gilmore D. Clarke, landscape architect
3. Plan of development of Mansuring Island Park, Westchester County. N.Y. Gilmore D. Clarke, landscape architect
4. Swimming Pool, Tibbetts Brook Park, Yonkers, N.Y. Gilmore D. Clarke, landscape architect
5. Music Pavilion, Tibbetts Brook Park. Giimore D. Clarke, landscape architect









PHOTOGRAPHS, (1) EWING GALLOWAY, (2, 3) MATTIE EDWARDS HEWITT, (4) AMEMYA

TOWN AND CITY GARDENS

1. City back yard garden, showing use of dense screen planting. Potash-Marl, landscape architects
2. Garden in Bronxville designed by Mrs. J. T. Duryea, with open planting, as used in suburban communities
3. Garden of John A. Hoagland, New York city. Addition of lattice to brick wall to cut off unpleasant view. The statue placed at the end of the garden gives an effect of increased length
4. Garden of Mrs. Howard Cullman, New York city. An example of circular planting in confined area. Ruth Dean, landscape architect

reservations and national or State parks through naturalistic or formal urban parks,' large and small, to the provision for active sports in playgrounds, athletic fields, "sport parks" and grounds for the special sports, such as flying, racing, polo, bowling, tennis or winter sports; and also to recreational waterfronts on sea, lake or river; in addition, land subdivision and larger problems of city, regional and even State and national planning, including systems of parks and parkways, of motor highways for pleasure and commercial traffic, and "zoning" of land for appropriate use.

In many of these larger problems the landscape architect collaborates with other professional practitioners,—engineers, architects, economists, sociologists or lawyers. In domestic problems the collaboration of architect and landscape architect is common in America, although in some of the best formal work Charles A. Platt has combined these functions; but in England and France architect, contractor and nurseryman frequently complete the estate without benefit of landscape architect.

Taking a general retrospective view, the problems which have most influenced the growth of the art and profession of landscape architecture are: the garden, because it offers the oldest and most numerous examples; the park, because in it developed the conscious adaptation of landscape for public enjoyment; the exposition, because from the Chicago World's Fair came a revival of the collaboration of artists; and in the past two decades, the land subdivision, because it has revealed fruitful opportunities in city building.

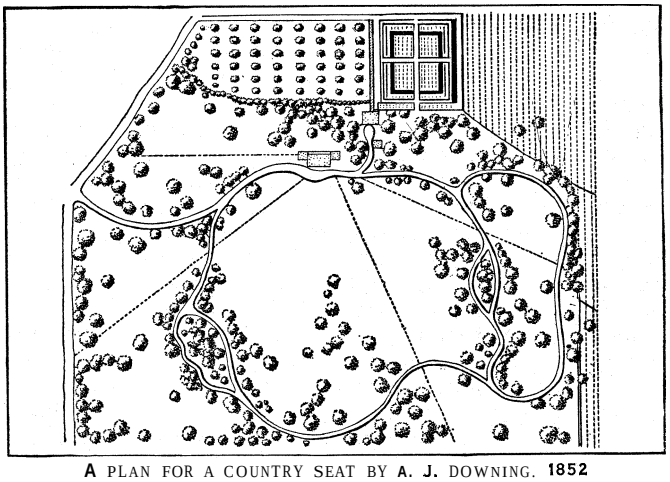
Nowhere is the profession of landscape architecture developed so highly as in the United States. Although in Germany two societies have been formed in this field, the Deutsche Gesellschaft für Gartenkunst and the Verband deutscher Gartenarchitekten, and in Japan a professional landscape architectural society published a magazine from 1925 to 1927 edited by Prof. Uyehara of Tokyo, nevertheless in England and France there have been no similar national organizations, while the American Society of Landscape Architects founded in 1899 contains 215 members (1928). Admission to this society is controlled by an examining board, guided by fixed standards as to professional qualifications. The society has published a code of ethics governing professional practice, and also a circular on methods of charges, which requires the fees of members to come from professional advice only and not from profits on construction. In several important regions, chapters of the American Society of Landscape Architects have been constituted. The co-operation of architect, landscape architect and sculptor on the National Commission of Fine Arts appointed by the President of the United States has been an important factor in raising the national standards in the fine arts.

Training for professional practice of landscape architecture is now well organized in the United States. The leading graduate school (course established in 1900) is at Harvard university. In addition, Cornell university, University of Illinois, University of Michigan, Massachusetts Agricultural college, Iowa State college, Ohio State university, University of California and University of Pennsylvania maintain schools; graduates are eligible (1928) to compete for the prize fellowships in the American academy at Rome. Harvard offers annually a travelling fellowship in landscape architecture and the Lake Forest institute, a collaborative travelling fellowship. The professional schools of landscape architecture exclusively for women are the Cambridge school and Lowthorpe-Simmons. National competition among both men and women students is promoted by the "Landscape Exchange" problems. Many colleges give courses in appreciation of landscape architecture or elementary problems, some of which join with the professional schools in the National Conference on Instruction in Landscape Architecture (founded 1920) which meets annually and works with the American Society of Landscape Architects in improving standards of instruction. The subject is not recognized by the profession as capable of being adequately taught by correspondence. Study tours in landscape architecture are conducted annually by officers of recognized American professional schools.

In France? where the number of professional practitioners is small, students are taught in ateliers. In Belgium a course of professional instruction in landscape architecture was established (1927) in the Institut supérieur des Arts décoratifs de l'État.

In Germany instruction in *Gartenkunst* is offered largely in schools of horticulture as at Pillnitz and Dahlem, but men trained primarily as architects are frequently concerned with the formal design of home grounds and parks.

In America public interest in landscape improvement—both of public areas and of home grounds—and in landscape preservation



A PLAN FOR A COUNTRY SEAT BY A. J. DOWNING. 1852

has been promoted by "Extension Services" maintained by State universities, by national organizations such as the American Park and Outdoor Art Association, now merged into the American Civic Association, the American Scenic and Historic Preservation Society, the Garden Club of America, the State federations of garden clubs, and above all by the Government's National Park Service and the National Conference on State Parks. In England there are the National Trust, Scapa, the Commons and Footpaths Preservation Society and the recent Council for the Preservation of Rural England; on the Continent, such organizations as the Rheinische Verein für Denkmalpflege und Heimatschutz and the Dutch Vereenigung tot Behoud van Natuur en Stedenschoon. In France and Belgium the movement, prior to the World War, for national preservation of landscape as distinct from historic monuments which were already cared for by their national Governments, has since merged into general planning programmes fostered by the Union Internationale des Villes. Too much emphasis cannot be laid on the importance of preserving and restoring typical natural landscape all over the world for the public benefit and for the true development of landscape architecture as an art.

HISTORY

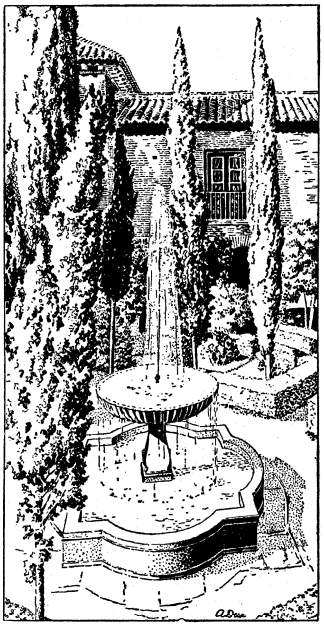
Of ancient gardens, Egypt supplies records of the earliest examples: in the fertile Kile valley even in the 4th dynasty horticulture and design of decorative enclosed gardens flourished. Ancient Persia and Assyria later developed in great hunting grounds an artistic treatment of nature from which sprang the conception of the park. Enclosed gardens too were cherished; and at Babylon trees and flowers crowning a lofty palace site are supposed to have formed the famous "Hanging Gardens." Although we know the Greeks had palace gardens in the Mycenaean age, few records remain except such as Homer's famous description of the gardens of Alcinous. Sacred groves were numerous. In the great age philosophers frequented quiet, shaded public gardens, as the Lyceum in Athens. Influenced by Greece and Asia Minor, Roman gardens blossomed with Lucullus into lavish magnificence, then flourished, with classical restraint, as *villa urbana* and *villa rustica,* pictured in Cicero and in Pliny's description of his splendid Laurentine and Tuscan establishments. The remains of Hadrian's villa at Tivoli and murals at Pompeii reveal to-day the importance of gardens in Roman life.

Mediaeval gardens on the Continent paralleled the development of those in England described in the following section. The monks in *hortus* and *herbularis* fostered horticulture—as we see from plans of the abbey of St. Gall of the 9th century—and in cloister garths made pleasant arrangements for outdoor meditation.

In Spain the flowering of garden art came with the Moors, who through Africa from Persia had brought the conception of sheltered arcaded pleasure grounds, sweetened by rare plants and cooled by deep shade and water in many forms. Between the 8th and 15th centuries great works of art were created in Cordova, Toledo and Granada, where the Alhambra and Generalife remain to suggest their original beauty. In Seville, the Moorish Alcazar suffered from the French grand style, which, however, found successful expression in La Granja and Aranjuez. In Spain to-day Spanish-Moorish tradition is being sympathetically revived, within the Maria-Luisa park at Seville and the new Spanish-American Exposition.

In Italy, with its tradition of classical villas, the Renaissance brought renewed desire for princely residence in town and country. Beginning with early Florentine villas, as Palmieri (described in Boccaccio) and Castello, characterized by simple terraces, excellent sculpture and water display, not motived by any general axial arrangement, we see in Villa Madama (Rome) transition to a generally unified scheme. The 16th century villas—best represented to-day by Lante (Bagnaia), d'Este (Tivoli), Medici (Rome) and the upper terrace of Farnese (Caprarola)—are evidently the conscious application of architectural design to outdoor settings, important points being recognized by statues or fountains, with fanciful elaboration of water in many forms. In the late 16th and 17th century villas, the Baroque style (see BAROQUE ARCHITECTURE), often carried to extremes, produced striking and picturesque contrasts in scheme and detail, as exemplified by Aldobrandini (Frascati), Garzoni (Collodi), Giovio (Como) and Isola Bella. Through these three centuries of Italian garden development, the great artists were architects, sculptors, painters or landscape designers, as occasion demanded: the villa was one design.

France, where from the 15th century, as security and wealth increased, chateau gardens in walled units had been gradually spreading out, succeeded Italy in the late 17th century as the central influence over European garden design. Le Nbtre seized and created elements to express in new terms the magnificence of Louis XIV. When he undertook Versailles, after successes at Vaux and Chantilly, he secured grandeur by effects of almost unlimited extent. From great open parterres, the view extended along allées cut through woodlands on vaster scale than ever before, intersecting allées offering a succession of vistas marked by one splendid axially-placed fountain after another. This simplicity and spaciousness, combined with multitudinous subordinate details, characterized the French grand style, which, in the hands of a great designer like Le Nbtre during his 50 years of practice, aided by many sculptors, gave us also St. Germain, Fontainebleau and St. Cloud. Although the grand style found numerous imitators, in less skilful hands it often degenerated into stiffness, barren decoration or inappropriate treatment of topography. The impatience with artificiality developing in the 18th century gave rise in France, following the English "landscape school," to a garden style in which nature and romantic detail were employed to arouse the emotions, as at Ermenonville. Under Napoleon III. the great public parks of Paris designed by M. Alphand exerted international influence.



FROM GROMORT, "JARDINS D'ESPAGNE" (VINCENT TRÉAL ET CIE)

FOUNTAIN AND POOL IN THE DARAXA PATIO, IN THE ALHAMBRA

In Holland pre-eminence in cultivation of flowers joined to Italian Renaissance influences produced a style of garden design in which closely enclosed geometrically-designed areas on a small scale were filled with gay beds and specimens of topiary work, overlooked by tiny garden houses. In the 18th century the French grand style spread to Holland, where the expanse of fertile flat country lent itself to allées and parterres, usually richer in horticultural than in sculptural embellishment. Views of these, such as Loo, are fortunately preserved in contemporary albums, since many succumbed to the succeeding landscape craze.

Germany, where popular garden art is now consciously propagated, produced little indigenous design, but followed Dutch fashions in the 16th and 17th centuries and French grandeur in the 18th—as at Herrenhausen, Salzburg, Nymphenburg and Sans Souci—guided by actual pupils of Le Nôtre, until the novelty of landscape or "English" gardens swept all before it. In Prince von Piickler-Miiskau, an admirer of Repton, the landscape style was rationalized, and it continued in general favour until challenged by the modern formal vogue which subjects private and public areas alike to the supreme dominance of man. In Austria, of older gardens in the French style, Schonbrunn is most important.



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TEMPLE OF LOVE IN THE BORGHESE GARDENS, ROME

In America gardens of the English colonists naturally followed the simple formal traditions of their earlier cottage and manor homes. About the time of the Revolution, notably through the influence of Thomas Jefferson at Monticello, the Romantic landscape style was consciously introduced, and later in uninspired form continued to prevail until it was revivified by Andrew Jackson Downing in the '40s. The real genesis of the modern American landscape style, however, was in Central park, New York, designed by Frederick Law Olmsted, Sr., and Calvert Vaux in 1858, the first great public work of landscape architecture in the United States, at once a bold municipal enterprise and a successful work of art. Its influence spread rapidly so that by 1870 most large cities of the country had undertaken public parks, and the development of public and private grounds received increasing attention. Largely through the extensive practice of the Olmsteds, Vaux and H. W. S. Cleveland, the profession was built up in the '80s, so that the Chicago World's Fair of 1893 offered to Olmsted an equal opportunity with Burnham and his collaborators for a monumental triumph. Simultaneously Charles Eliot through his work in Boston gave to the country the conception of metropolitan landscape reservations.

Gardens in Sweden and Russia followed styles imported largely from France, the influence of Le Nôtre manifesting itself in such magnificent palaces as Drottningsholm (near Stockholm) and Tsarskoye Selo (near Petrograd), where the landscape style imported from England was also employed.

Garden design, through the spread of Persian culture, reached high development in India under the Moguls, as in Spain under the Moors. The gardens of the Taj Mahal at Agra and Nishat Bagh in Kashmir remain as supreme examples of symbolic combination of water, shade, flowers and fruit. In the Far East landscape art found consummate expression in China centuries before the Western landscape school—on which Chinese gardens exerted profound influence—and similarly in Japan and Korea, where symbolism crystallized nature into conventions employed by successive generations of artists in landscape gardens of exquisite intrinsic form.

The influence of landscape architecture on culture through the centuries has manifested itself most strikingly in the impetus to outdoor recreation and in the greater appreciation of amenity as a necessary quality of human environment. Material wealth, private and public, has given the opportunity and furnished the means for great works of the past, be it in the era of princely splendour or of modern industrialism; but the art itself, having proved its desirability to potentate and citizen alike, is bound in the future to become more widely applied to all forms of land

development for human use and thus to penetrate more completely into the fabric of civilization.

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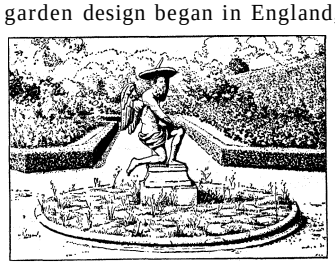
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(T. K. H.)

ENGLAND

It would be impossible to say when the art of landscape and garden design began in England, but it is not so difficult to trace its successive stages, because it follows the history of the English people. As soon as there was any reasonabie assurance of security from invaders, people were free to give their attention to ornamental and fruitful planting. and further to adorn their own secluded portion of ground surrounding their residences. The ancient Britons have left no trace that they cultivated the ground, nor is there any direct evidence that their conquerors, the Romans, laid out gardens, although it may be inferred that they did so, since remains of their villas and numerous artistic adjuncts of luxurious houses have been unearthed. During the period of invasion and counter-invasion by the Danes and Norsemen, which followed the withdrawal of the Roman legions, and the factionary wars amongst the Saxon kings themselves, there could not be sufficient tranquillity for serious husbandry or even for farming, seeing that the country was given up largely to war and to the chase. There is no evidence of gardening to be gleaned up to the Norman Conquest at least, and then we have a suggestive account of the salient features of the country in general. but no gardens.



BY COURTESY OF "LANDSCAPE ARCHITECTURE"

A FORMALLY SET SUNDIAL IN AN ENGLISH GARDEN

Monastery Gardens.—When the possessions of others were plundered, the sacred property of the Church was respected, and to the monks, with their culinary and medical plants, is ascribed the first mention of gardens and orchards in England, in or about the 12th century. The evidences which have come down to us go to prove that for a century or two these monastic gardens existed in order to supply the monastery with food and fruit, and that it was purely a matter of profit or loss for the gardeners entrusted with them. With men of refined and scholarly ideas, as many of the monks were, there must have been design in these early gardens, but we have no direct evidence of it.

Although in the first mention of monastery gardens they appear to have existed solely for vegetable and fruit, as time progressed we find. after a lapse of two centuries from the 12th to the 14th, that the one circumscribed domain increased to include ornamental gardens all within the monastery walls, and flowers. such as roses, appear in their inventories, to crown the priests on certain high days. These ornamental spaces surrounding the ecclesiastical edifices gradually assumed the character of design, until we hear of royal gardens being made for the Plantagenet kings at their seats of Westminster. the Tower, Charing and Windsor. We read of Henry III. commanding his bailiff to make at Woodstock a garden enclosed by walls, wherein was an herbarium and a fish-pond, "whereat the queen may be able to amuse herself." Thus with the monastic fish-ponds and the runnels of water, the sequestered cloister gardens laid down to quiet expanses of grass for meditation, and the bowers and arbours, the flowers grown for priestly

purposes and for decorating the churches on high days, we have all the elements accumulating which go to the making of a garden. Out of the none too plentiful evidence to be gleaned from writers of this period of English history, notably from Chaucer and Langland, we can put together a fairly comprehensive list of features and flowers which of themselves opened up scope for the play of fancy, and formed a basis of design in their artistic arrangement.

Practically all the features of the mediaeval gardens have been demolished, but the one that has survived destruction is the fish-pond which supplied the needs of the monks on fast days. Stately houses have been built with gardens on the delectable sites, of many of these old monasteries, and the fish-stews have been incorporated (in many cases with amplification) into the design, as for example at Woburn, Welbeck, Burghley, Sion, Beaulieu, Audley End, etc. Undoubtedly, in the latter part of this mediaeval period, gardens of royalty and the nobility were designed and pleasingly contrived for effect, and were always more or less protected by a high wall in a style which was distinctly English, and were not trammelled to any large extent by foreign influences. It is to be remembered that during the reign of Ring John, the barons and nobility secured their independence by the terms of Magna Carta and henceforward, since the kings had given them the lead, they began to frame for themselves secluded gardens at first within the protecting walls of their castles and moats. Then in the comparative peace which followed the English conquests on the Continent and the Wars of the Roses, the nobles and barons essayed to make gardens in the open country; then the rich merchants of the city of London followed suit. The material was there, and with the country's progress towards the attainment of freedom and opulence the arts kept pace, and gardens likewise.



FROM SIR FRANK CRISP, "MEDIAEVAL GARDENS" (JOHN LANE, THE BODLEY HEAD)

A CONVENT GARDEN OF 1490

Raised banks run round the walls, and flowers grow in the beds and in pots

The Renaissance.— The mediaeval period now blossoms forth into what is known as the Renaissance in England's advancing history. It is usually called the Tudor period, and the characteristic English style in architecture during this period is distinguished by the same term. For a time at least, during the early part of the Renaissance period, gardens had to suffer the domination of the Italian phase of design, but eventually the definite national convictions of garden design which had been previously followed came into their own. At first the sumptuousness of the Italian style gave it popularity and promised to make it all pervading but as time went on its grandiose stiffness, its extravagant array of fountains and masonry, its statues in white marble palled upon the English taste, and the result was a compromise. The quaintness of the mediaeval work and its homeliness of manner were allowed to modify the sumptuousness of Italian ideas in the 17th century. It was during this century that Henry VIII. employed Italians to lay out the grounds of his palace at Nonsuch in Surrey, commenced in 1539. He also in 1530 brought many Italian features into the gardens at Hampton Court, which had been treated by Cardinal Wolsey in the mediaeval English manner.

That landscape gardening was a subject of serious study can be gathered from the number of books written at this period. There were books by Dr. Andrew Borde, Thomas Hill, Didymus Mountaine and Bacon. In all these writers there is evidence that they were swayed by the Italian fashion, although at the same time they pronounce the true English delight in trees and flowers for their own sake. The open acceptance of their works proves that the subject was one that appealed to many readers. The Renaissance added little to the garden designer's materials save knots, mazes, labyrinths and dovecotes, also bowling greens and alleys. The latter were a decided acquisition, since they gave occasion for level green spaces which count for so much in the modern tennis and croquet lawns, and are always a restful note wherever found. The most valuable part of Hill's book is the light it throws upon the refined Englishman's garden in the 16th century and the woodcut illustrations. These depict the gardens as a circumscribed rectangular space with a broad walk down the middle and a similar broad walk all round within the enclosing wall, the two large equal spaces being subdivided by narrow paths into a number of smaller rectangular plots, with the maze, the labyrinth or any of the various knots occupying each or all of them as fancy dictated.

Owing, no doubt, to their being enamoured of the Italian manner, neither Borde, Hill nor Mountaine's books are inspiring in their style, but in Gervase Markham, and with him may be associated William Lawson, we begin to break away from Italian pedantry and find men who wrote from the sense of pleasure derived from gardens rather than from the standpoint of garden theorists. Furthermore, they wrote in quaint Elizabethan prose, with its old-world charm imbued with a sense of what is beautiful in nature. Markham's works were deservedly popular and undoubtedly did much to mould the English taste and preferences in garden design. One of his books went through 15 editions. He deals with the farm as well as the garden, directing where the stables, cow-houses, swine-cotes, barns and poultry-houses were to be placed, also the lodges. As yet there is no suggestion of the landscape treatment as we know it. Even though Borde and Markham go beyond the bounds of the gardener's realm, and branch out into the park and the farm-buildings and the lodges, everything they deal with is angular and formal. The garden, the kitchen garden as well as the orchard, was to be confined within high walls or a hedge and ditch. These pioneers adventured out into the domain claimed by the modern landscapist, who is often called in to advise upon a scheme of residence including mansion, dower-house, gardens and park shelters, plantations, lodges, farm-buildings, stables and garage, water-supply, electricity, sewage scheme, etc. When wisely directed a proprietor will settle the site and disposition of each and all of these policies before a sod is cut or a stone is laid.

Contemporary with the foregoing writers there appeared a group of ten or a dozen writers of herbals, the most notable being John Gerard and John Parkinson. Gerard's book is a great folio of over 600 pages, published in 1597. The value of these writers is that they fostered the innate love of the country and the open face of nature in general, stimulating the imagination by their method of expressing their pleasures in the teeming life around them. Moreover, they were the foster-parents of modern botanical gardens, such as Kew and Oxford and the Apothecaries garden at Chelsea, and indirectly to such ventures as the Royal Horticultural Society's gardens at Wisley, for several of these writers, including Gerard, ran physic or botanical gardens. Undoubtedly, there was during the 17th century a generally accepted principle of design in the garden, everything therein being square and geometrically set out, as may be gathered from all or most of the writers mentioned, so that the country gentleman could lay out his garden himself on traditional lines with very few variations.

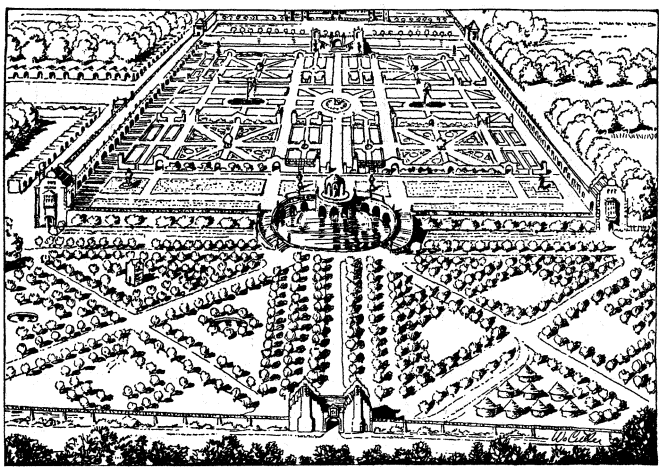
Thus matters continued up to the Civil War, which marked a period of garden destruction by the Puritans, until the Restoration, when once more foreign fashion came to dominate the simple English taste. The lavish extravagance of Louis XIV. of France could not but have its effects upon Charles II. who was in intimate relations with that monarch and his splendid court, and it is recorded that he or his nobility invited Le Nôtre, the genius of the gardens of Versailles, to England. These imported ideas might induce the rank and file of stolid English country gentlemen to adopt a more comprehensive style of design and enlarge their ideas, but such pretentiousness, including sumptuous fountains and white marble sculpture, was not in the tradition of Markham and Lawson, with their established national taste, nor of John Worlidge, who succeeded them.

In the sequence of events the next phase was the Dutch style introduced from Holland by William and Mary. The Dutch love

of quaintness was responsible for an exaggeration in topiary work, thus reducing to ridicule a practice which had served well for centuries when kept within legitimate bounds. The apostles of this departure were London and Wise, who ran a large nursery at Brompton. Wise, influenced by the Le Nôtre school, was in practice before the Restoration, and planned the chestnut avenue in Bushey Park, 1m. long and 60ft. wide, with four additional rows of limes on either side terminated by the great "Diana" basin at Hampton Court, 400ft. in diameter. Formalism was now reduced to a series of rules and a few variations upon stock recipes which foreshadowed its break-up. It was during this period that the gardens at Levens, Westmorland, were laid out, which are to-day the essence of quaintness, and have a certain richness of their own when the box-edged borders are full of bloom; nevertheless, it is easy to understand how soon such picture gardens would pall if there were many of them.

It must not be supposed that all who adhered to the then popular formal method of design were committed to its vagaries. Men such as Bridgman. who succeeded London and Wise in the favour of royal patronage (being gardeners to George I.), had the soul and sense of real design. He banished the clipped animals and monstrosities in yew, box and holly, and refused to be bound by the square precision or rules of the foregoing age. He refused to conform to the set symmetrical balance of one-half answering exactly to the other, and although he still adhered to straight walks and clipped hedges, they were only his determining axial lines and he diversified the free open parts with groves of oak and native trees, and incorporated in his schemes pieces of the natural, if such were worthy to be included. In this way Bridgman anticipated the present day, when gardens are modelled upon long determining axial lines, allowing the subsidiary walks to wander forth in easy routes as they fit in with the contours.

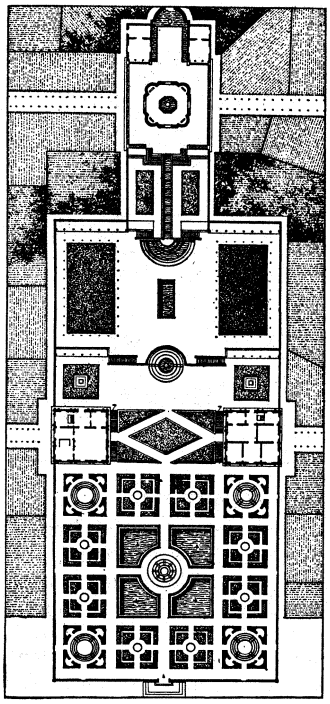
We may lay the blame for the change of the public taste upon the vagaries of topiary work, but change was inevitable. Whenever men fall to imitating one another in art and hold solely by academic rules, their system is bound to run to seed. In garden design we must ever be refreshing ourselves by communion with nature in her broadest aspects on the mountain side, in the woods and fields, and any rules which we formulate must thereby be proved and attested. It was by this line of argument that Addison began the attack upon the formalists in the Spectator, and whether right



MOOR PARK AS ORIGINALLY LAID OUT, FROM A DRAWING MADE BY L. ROME GUTHRIE TO SIR WILLIAM TEMPLE'S DESCRIPTION

or wrong this was his statement: "We may assume that works of nature rise in value according to their degree of resemblance to works of art. Therefore, works of art- rise in value according to the degree of their resemblance to nature. Gardens, being works of art, therefore rise in value according to the degree of their resemblance to nature." Time has modified the crudeness of this argument, for we do not in general prize works of art or gardens according to the degree of their resemblance to nature; rather we deduce certain principles and conventions from nature, and produce a rhythmic pattern based upon them, modified to suit the scale of the district, the nature of the garden and the residence. Pattern and rhythm are the soul of design.

Pope and Horace Walpole, who wrote in the reign of Queen Anne, followed up the attack begun by Addison. Walpole's complaint against the lack of ideas and imagination in the prevalent formalism may be judged from the following quotation: "At Lady Orford's in Dorsetshire, there was when my brother married, a double enclosure of 13 gardens, each I suppose not more than 100yd. square, with an enfilade of corresponding gates, and before you arrived at these you passed a narrow gut between the two stone terraces that rose above your head and which were crowned by a line of pyramidal yews,"



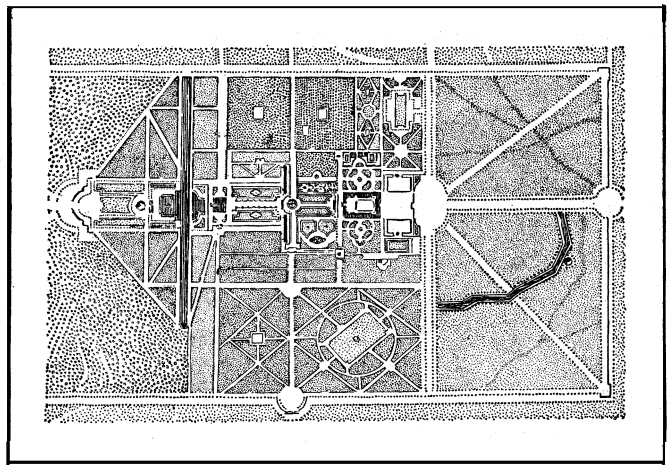
FROM GOTHEIN, "GESCHICHTE DER GARTENKUNST" (DIEDERICHS VERLAG)

PLAN OF THE VILLA LANTE, AFTER PERCIER AND FONTAINE

The Naturalists. — By this means the natural manner gained the day and became the rage, and for a time lost its head, perpetrating as many extravagances as the school it had replaced. Revolutionaries are always extremists and we may smile at Pope turning his five acres at Twickenham into a compendium of nature, condensing every kind of scenery into his villa garden. Into this ferment of rebellion against the old garden usages entered William Kent, architect and painter, fresh from a period of study in Rome, his mind steeped with the heroic landscape compositions of Claude and Poussin, which it was his intention to visualize materially, using the country as his canvas, and the trees, the water and the rocks as his paints. Such a propaganda was foredoomed to failure; nature will not be rushed out of her country and clime. Yet Kent. under the patronage of Lord Burlington and with the eulogies of Walpole and others behind him, was deemed a genius. In spite of his rich patrons and advocates, Kent was not the man to lead the movement; he had no feeling for pure landscape for its own sake. He was a creditable architect and furniture designer and in his gardens he always harked back to his bent by inserting Greek and classic temples.

After Kent came Launcelot, or as he was nicknamed, "Capability" Brown, a man who has been much derided; yet, judging from the work he did at Blenheim and from the survivals of his vast planting schemes, composed mostly of oak or one kind of tree he had a true eye for landscape composition. He ran the contours of the landscape right up to the mansion, with no apparent break. In order to keep the deer and cattle from approaching the mansion he made use of the ha-ha fence which made the grass appear to be of one uninterrupted sweep. His was the erroneous motto, "Nature abhors a straight line," therefore even when the ground was flat and the logical thing to do was to lay it down to a level lawn, he undulated it. Again, when a level plain invited a straight drive through an avenue, he made it wind about, and girded it with clumps of trees. Although he was somewhat hemmed in with his own maxims and mannerisms, his work marked a distinct advance, as did the work of his successor, Humphrey Repton, who is justly celebrated as a champion of the landscape style. In his way Repton was an idealist, a fact which is proved by his "Red Books." For each place of importance he prepared a report, bound in a red cover, and a series of sketches showing the result when the trees had attained a certain maturity, so that although his effects were not as demonstrable as geometrical gardens, which can be projected in planes by perspective drawing, there was a degree of probability in his proposals. Although Repton professed to be a follower of Brown, he was far ahead of his master in in-

telligent grasp of what constitutes design. In many instances he refused to destroy worthy old gardens and in others he readjusted the vagaries of his predecessors. He knew what was consistent with the various styles of architecture and recommended mostly a broad expansive formal scheme near the house, merging into the natural, attaching the house by imperceptible gradations to the landscape. He never lost sight of the house as the dominating



FROM H. L. GOTHEIN, "GESCHICHTE DER GARTENKUNST" (DIEDERICHS VERLAG)

PLAN FOR VAUX-LE-VICOMTE, AFTER SILVESTRE

factor, and in his domestic schemes everything worked from it and ministered to its elegance and comfort. He was a fairly prolific writer, and became the champion of the landscape school, maintaining a long argument in print with Sir Uvedale Price on its behalf. Other writers such as Burke, in his *Essay on Taste*, dealt with the philosophic aspect of beauty. Then there were long poetic effusions by William Mason and Richard Knight. The former published between 1772 and 1782 four consecutive books of poetry which were often reprinted.

All this discussion has been profitable to modern garden design. Repton and his sons, who continued his practice, verged upon the Victorian period; thenceforward garden design has been largely divided between architects and landscape gardeners. The outstanding works done by the architects are the gardens at Trentham, Staffordshire, by Sir Charles Barry, and at Penhurst, Kent, by George Devey. A noted man of the landscape school who practised successfully during the 19th century was J. C. Loudon. Then arose Sir Joseph Paxton, whose fame as a garden designer is a doubtful one, although after constructing the Crystal Palace for the Great Exhibition of 1851 his practice was extensive. Later followed Edward Milner, Robert Marnock, Nasmyth, the artist, Edward Thomas and Edward Kemp, men who could be relied upon to make an effective and beautiful garden, conveniently planned, free from the raw errors of the early landscape men and not devoid of imagination.

There are a few architects of the present day who design the whole garden to the houses they build and many more who limit their planning to the terrace and architectural portion immediately surrounding the house. Among the former, mention may be made of Sir Edwin Lutyens, who was usually assisted in the horticultural branches by Miss Jekyll. He had a versatile and original fancy in garden accessories. Inigo Triggs was an architect by training who specialized in gardens, having written and largely illustrated two indispensable text-books *Formal Gardens in England and Scotland* and *The Art of Garden Design in Italy*. The most informative and authoritative book on the formal branch of garden design is Reginald Blomfield's *Formal Garden in England*. The landscape school is not so well represented professionally in England as it might be if there were a national school for the proper training and equipment of would-be garden and park designers, like those at many of the universities in the United States. In a liberal profession which includes and impinges upon so many sciences, it is of the first importance that its students should grasp the principles of their art and its imaginative range before they are immersed in office detail.

BIBLIOGRAPHY.—Besides works on English landscape architecture mentioned in the bibliography for the main section, *see* also R. Blomfield and I. Thomas, *The Formal Garden of England* (1892); J. D. Sedding, *Garden Craft Old and New* (1892); G. Jekyll, *Wood and Garden* (1899); E. Kemp, *Landscape Gardening: How to Lay Out a Garden* (1911); and G. Jekyll and L. Weaver, *Gardens for Small Country Houses* (1914). **(T. H. MA.)**

MODERN TENDENCIES IN AMERICA

This article is confined almost entirely to domestic landscape architecture, institutional landscape architecture and park design. Although its scope is intended to cover only the United States, its reference to principles and tendencies will apply in a considerable degree to the American continent and to Europe.

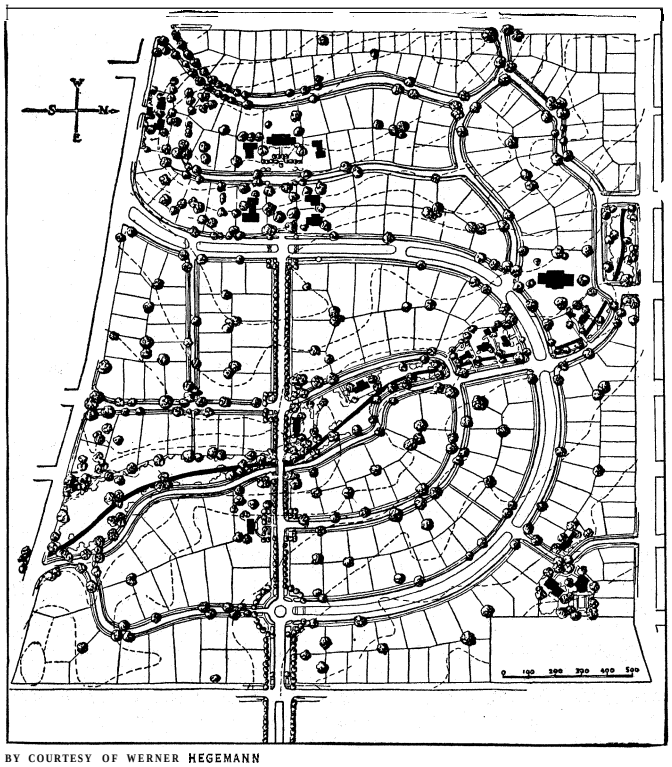
Throughout the United States of America the curtailment of private incomes and the burden of Government taxes have modified in scope the application of domestic landscape architecture.

On the other hand, through Government agencies and expenditure, there has been a marked increase in institutional landscape architecture as represented by schools, asylums, and Government housing, in addition to extended operations in the development of parks and parkways.

Landscape architecture made distinct and extraordinary progress after the beginning of the 20th century, particularly in North America.

It has met with much public favour and patronage, and through the work of instruction in several of the American schools and universities, qualified professional practitioners have increased in numbers,

Like architecture, it is a fine and applied art, dependent for its success upon so planning as not only to afford the utmost beauty of aspect, but to facilitate practical use in its many requirements. The elements of composition include not only stone,



BY COURTESY OF WERNER HEGEMANN

PLAN OF SUBDIVISION OF PABST FARM. WAUWATOSA. WIS.

brick, cement and other building materials, but also organic things—trees and plants—which are subject to constant change in growth and decay. It is necessary to compose these contrasting elements into an expression of beauty, and marked improvement may be noted in contemporary examples of landscape design by evidence of mass composition as the dominant feature and the use of colour, pattern and detail as contributory to the expression of form. More pleasure is afforded from the contemplation of a garden or other feature thus designed than from the inspection

of any single element of that garden. This has been made possible through improved technique and wider knowledge in the moving of trees and shrubs of larger size than had heretofore been practicable, thus enabling the use of organic elements which are in immediate scale with the buildings or environment of which they are made a part.

Domestic Landscape Architecture. — This phase of the subject is closely allied to domestic architecture. It responds to the same tendencies and requirements; it has to do with the design and development of all of the area outside of the building destined to be used as part of the home. It is, therefore, influenced in its development by the same factors which affect the house design.

A change in the economic and social conditions since the World War (1914–18) has had a very marked influence upon the physical aspects of the home. The difficulty and expense of employing labour to maintain the home grounds, scarcity of domestic servants, increased taxes and the more general use of the motor car have affected the design of the modern home surroundings. This applies to the homes of rich and poor, and to those living in the open country, in the suburbs and in the town. The result has been a concentration of area and of use. The person formerly requiring an estate of 100 or more acres carefully maintained for outdoor pleasure, is now content with half that area. The suburban dweller who formerly enjoyed ample ground space about his residence now has a confined area intensively used. The small householder is giving up his individual home unit and is moving to the multiple dwelling, or to an apartment or flat where, among other features used in common with his neighbour, may be a roof garden, a court garden or a play area. This tendency has been intensified, of course, particularly in America, by an increased concentration of people in and about the larger towns and cities.

Successful design is dependent upon rhythmic spacing terminating in focal or emphasis points. These may be defined by such features as garden benches, sculptural ornaments or figures, groups of figures or architectural structures, trees or plant forms. It matters not whether the design be formal or informal in spirit, the necessity for such points of emphasis prevails. This principle of spacing applies to all design as well as to music.

In landscape design, sculpture thus used is occupying an increasingly important place. The sculptural forms need not be executed with the same degree of refinement as might properly be employed in museum pieces. The silhouette in proper scale and contrast with its surroundings is of more importance than its other perfections of modelling. Bronze is a popular medium for such features on account of its permanence, but it is not otherwise successful as it does not show in strong enough contrast against a foliage background. Marble, on the other hand, is too marked a contrast. Lead, as popularly used in England for this purpose, does not withstand the severe weather conditions prevailing in more rigorous climates. There is, therefore, an opportunity for metallurgists to devise a metal which will lend itself to easy casting, withstand severe weather and afford a medium colour tone and texture between bronze and lead. The matter of contrast and of texture of the sculptural features in relation to the foliage mass is so important that they should be studied together and made to harmonize in one organic whole.



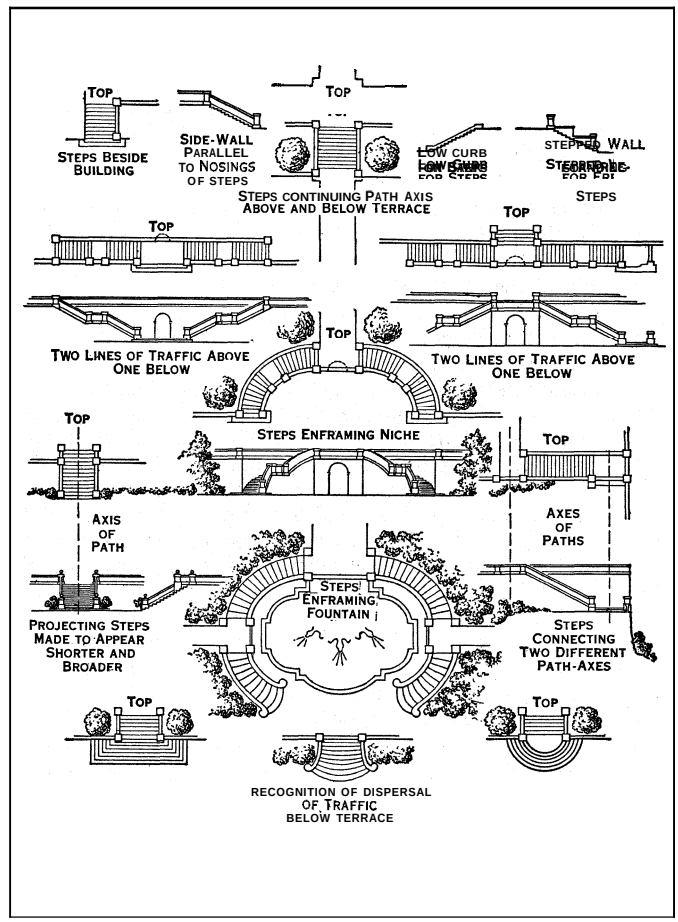
FROM HUBBARD AND KIMBALL, "LANDSCAPE DESIGN" (MACMILLAN)

WATERFALL IN THE "WILD GARDEN," ESTATE AT NEWPORT, R.I.

Multiple Homes. — This term is intended to include all structures designed to provide for more than one family unit. The present tendency is toward an increased use of dwellings that provide for many conveniences to be shared in common, so arranging these dwellings as to afford a garden area, frequently an enclosed or partially enclosed court, to be enjoyed co-operatively by all of the dwellers in that unit.

Marked progress has been made in the sphere of community or regional design. It varies, of course, in scope. A mere group of two or three homes planned in relation one to the other may come under this designation, and it may extend to include a considerable geographical area, providing for more than one nucleus or civic centre. Many benefits may be derived from thus planning home sites in groups.

Institutional Landscape Architecture. — So far as the application of landscape architecture is concerned with the design of areas intended for institutional use, it follows the same motives and principles as domestic landscape architecture. Its purpose always is to provide for use of the area in the most appropriate manner and afford the utmost pleasure through the creation and conservation of beauty.



FROM HUBBARD AND KIMBALL, "LANDSCAPE DESIGN" (MACMILLAN)

PLAN SHOWING SOME TYPICAL FORMS OF STEPS

A marked increase has occurred in recent years in activity and interest in organized exercise and athletics. The schools, both public and private, as well as colleges and universities, have given more and more consideration and space to outdoor exercise. Some universities have required large stadiums with seating capacity for from 20,000 to 100,000 spectators. This requirement must necessarily be recognized and provided for in planning these institutions. Some of the sports, such as football, baseball, racing and the like, are exacting in their requirements as to specific areas; but all may be so organized with the introduction of trees and other foliage masses as to afford a park-like aspect and influence the students toward an appreciation of natural beauty as a result of their daily and intimate contact with that environment.

Another sign of changing social conditions has been the adoption of the golf or country club as the centre of interest in each community. For those who cannot afford membership in such clubs, municipalities and counties have provided golf courses on public park areas. The primary purpose, of course, has been to afford facilities for playing golf, but as the game requires large open areas on fertile soil and must of necessity be kept in an

orderly condition, the opportunity for creating and maintaining pictorial effects is very favourable. While the golfer may be primarily interested in the game of golf, the indirect and subtle pleasure resulting from a beautiful environment must necessarily make its appeal and afford a lasting benefit.

It is particularly necessary in developing the outdoor environment for hospitals and asylums that a quiet, restful atmosphere be created. The doctors and experts in the care and treatment of defectives fully appreciate the necessity for affording scope to the designer in his efforts to create such an atmosphere, and fortunately, public opinion favours a liberal policy in providing the necessary funds. Improved transit facilities have distinctly favoured the removal of institutions of the above character from congested districts to the open country, where the opportunity is so much greater for a pleasant and beautiful environment.

Park Design. — Public parks as they exist in the United States have been created for the recreation and pleasure of the public. In Europe the parks were originally created for a favoured few and were later turned over to the use of the public with comparatively slight change in their design so far as the aesthetic elements were concerned. The demand for play area, however, and the effort to meet that demand have been almost as evident in Europe as in the United States.

The pleasure parks in the United States, such as Central Park in New York city, are an integral part of the city, designed to afford quiet pastoral beauty in the midst of an urban environment. Drives for horse-drawn vehicles and walks for pedestrians made the various landscape pictures available. The present tendency is toward a practice which recognizes the demand for play by providing areas designed primarily for exercise and athletics, with the element of beauty incidental to that purpose. The "pleasure park" is being superseded by parkways or motorways no longer limited to the geographic limitation of the municipality, extending for many miles through territory selected for its possibilities of development aesthetically, but less desirable for home-building or commercial development.

Despite the increasing application of landscape architecture which has prevailed during the past decade, it has not yet received the general recognition and use which are its due. It should be of general benefit to all the people, and its significance as a cultural influence recognized. No one of the applied arts can progress beyond a certain point without the corresponding progress of the others, so that it is very necessary that a collaborative and sympathetic interest should prevail among the designers.

There is distinct evidence to-day of this mutual interest. and with the introduction of artistic training in the common schools and the increasing appreciation of the arts by the public, the United States is undoubtedly on the verge of a great artistic renaissance in which the art of landscape architecture will take a prominent part.

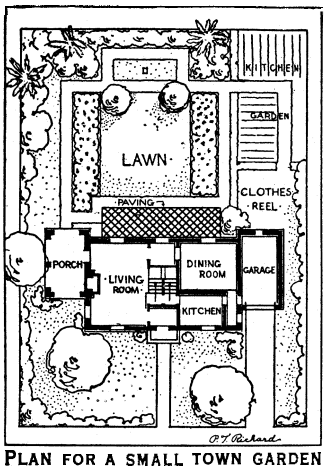
(See Box-SAI; BOTANICAL GARDENS; HORTICULTURE: MINIATURE LANDSCAPE.) (A. F. BR.)

TOWN GARDENS AND ROOF GARDENS

The plainest yard can be made a lovely garden by planning its arrangement, instead of putting in flower beds, vegetable patches and chicken runs without thought for their relations to each other. The householder should so arrange his plot that the flowers are a coherent part of the general scheme, not a mere interruption in the lawn, the trees and shrubs form a pleasing composition and the vegetables contribute to the beauty of the whole. In planting a garden, three things need to be considered almost simultaneously: its orientation, its relation to the house, and its relation to the surroundings. It must be so arranged that its flowers and vegetables are not shaded, its paths, lawns and beds have some pleasing and logical relation to the house, and suitable objects outside its limits, such as a beautiful tree or a neighbouring wall, may be utilized to frame it or make it appear larger, while unsightly objects on adjoining property may be shut out by screen planting, or have attention distracted from them.

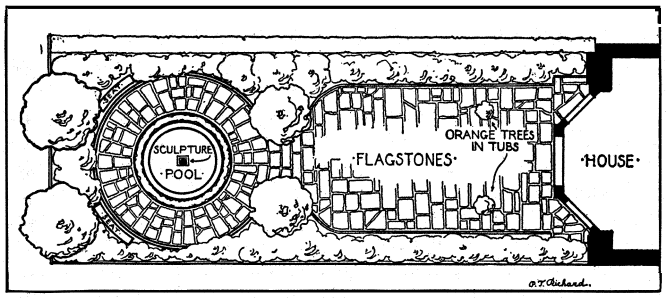
The simplest way to examine all elements of the design at once is to draw a plan of the garden on paper. For a small piece of property the most convenient scale is that of one quarter of an inch to the foot, but if drawing to scale seems too difficult a sketch plan that maintains the proper proportions between house, lot and adjoining objects is better than none.

The plan of a garden is devised with the entrance as the feature of primary importance. The point of entrance having been established, the walks, the open grass and the beds, whether for flowers or vegetables, will fall into place naturally. A tree should no more be set in the middle of a garden entrance than a chair in the middle of a doorway. Just as one arranges furniture so as not to hinder movement in a room, so must paths in a garden be arranged to permit easy circulation. To carry the parallel a little further, in placing furniture inside a house its appearance from the adjoining rooms is always considered; so in a garden, the appearance of the garden through the windows of the room most used is important. Any garden, and especially a town garden, should be considered as an open air extension of the house and the principal axes and openings of the house must be continued or indicated in its arrangement. The plan can then be developed through consideration of its orientation; *i.e.*, how it lies with respect to the sun. Trees and high shrubs should not be so placed as to shade flowers or vegetables. Still sunlight is not the only factor that determines the placing of trees and light shrubs. Their inherent effectiveness as things of beauty must be taken into account also, In the town garden they will almost invariably have a dual function, — that of being part of the garden and that of screening unsightly surroundings. The final element entering into the plan is that of placing architectural features, — such as a sundial, a bench, a summer house, a pool, or especially important trees, shrubs or plants, — to attract attention to certain spots, to mark entrances to paths or to strengthen corners of flower beds. Such things have a function like that of ornaments or pictures in a house, and whether the garden be formal or naturalistic it will have some kind of vista or focal point. In winter when there is no foliage nothing enhances the appearance of a small garden so much as well-designed and well-executed architectural ornaments, but they must be carefully placed not to appear to have been dropped in the garden with the intention of putting them somewhere when there was time to consider where. We are all familiar with the old-fashioned Victorian method of placing cast iron dogs, china gnomes and fountains in almost any prominent place regardless of the relation of such objects to their surroundings, and of an exactly similar nature is the method of placing specimen trees and shrubs wherever they will grow best regardless of their function as part of the general design.



PLAN FOR A SMALL TOWN GARDEN

Usually the geometrically planned garden is most satisfactory in a town. It is difficult to make 40 by soft. into a miniature yet complete piece of wilderness, and it becomes impossible if a garage, a clothes-line or intensive cultivation of vegetables has a place in the scheme. The necessity of developing the plan logically cannot be stressed too strongly. A common and usually incorrect way to lay out a garden is to divide the available space by placing paths at right angles to each other; through the windows of the house such paths generally seem to begin and lead nowhere; the beds left by such arrangement are of sizes unsuited both to easy cultivation and to treatment in a pleasing manner. What matters least in the layout of a garden is its being symmetrical about a centre line, what is most important is to have the openings of the house opposite the axes of the garden regardless of whether they are on the physical centre of the garden space or not. While a plan on paper may appear lop-sided, in the garden itself, with varying heights and masses of planting to produce effects, it can appear



DESIGN FOR A BACKYARD OR ROOF GARDEN IN A CONFINED AREA

well proportioned. The garden's entrance should be centred on a door or porch or window; even though there is no path betneen them, so that its connection with the house is at once apparent.

Having observed how the planting and surroundings will throw shadows, what unsightly objects must be screened, the views of the garden from the house, and having decided whether to have lawn, flowers, vegetables or all three—sketches may be made. Generally speaking the flower borders should be twice as wide as the paths and the paths should be $2\frac{1}{2}$ ft. to 5 ft. wide.

Conifers are often unable to survive urban atmospheric conditions; but a few broad-leaved evergreens whose hard glossy leaves shed dirt easily, will live. Rhododendrons, Japanese holly (Ilex crenata), andromeda japonica, aspidistra and English ivy all do well, as do privet and the ailanthus tree. As vegetation is so uncertain, the city garden is much more dependent on an architectural background and accessories than the suburban one. Walls, trellises. walks, fountains and seats must be so well designed as to create the atmosphere of a garden even though foliage is largely absent. A New York city garden is shown in the above plan, and although its size is only 20 by 40 ft. it appears larger because two Japanese flowering cherries form an arch creating an illusion of distance. To afford a place for children, the entire fore part of the garden is paved with flag. leaving on each side a border only 18 in. wide. The figure is the garden's most prominent feature.

On the city roof the designer faces all the difficulties of the backyard with the added handicaps of wind and a scarcity of soil. It is usually aisest to arrange the planting in tubs and boxes. Privet and English ivy are the chief resources; annuals such as calendulas, petunias, marigolds and morning glories will thrive; most evergreens die and have to be replaced at least annually; everything needs to be fertilized frequently. Perhaps the best way to consider the roof garden is as'a bit of stage scenery with an architectural background against which a few plants may grow well. In all small gardens, suburban, city or roof, the points to be emphasized are proper scale, a logical relation between house and garden, economy of plant material and good design in architectural accessories. (R. DE.)

LANDSCAPE PAINTING may have originated in the attempt of the earliest painters to give a sense of background to representations of men and animals. Ancient Egyptian and Cretan painters often depicted natural settings but in highly conventionalized terms with spatial recession expressed by elements superimposed from bottom to top of the image. Much of this convention persists in Persian manuscript illumination of about the 14th century (see PERSIAN ART), and still later in Indian art (q v.) of the Mogul period.

Chinese artists painted landscape with brush and ink on silk as early as A.D. 400. During the T'ang and Sung dynasties they achieved some of the most sophisticated effects in all landscape art in their treatment of atmosphere and of mists in distant valleys, and in their meditative spirit in the presence of nature. Among the most famous were Li Ch'eng (about 950), Chao Po-chü (about 1150), Hsia Kuei, Ma Yuan (both about 1200) and Mu Ch'i (about 1250). (See also CHINESE PAINTING; JAPANESE PAINTING AND PRINTS.)

Ancient Rome.—In western art, little is known of landscape painting before ancient Roman times. Roman art, like other Roman developments, may be assumed to have had precedents in late Greek art. The Augustan age produced the celebrated *Odyssey* landscapes, illustrating scenes from Homer's great epic. These wall paintings were found on the Esquiline in Rome in 1848, and are now in the Vatican library. They are primarily landscapes with deep spatial and atmospheric effects; the figured subjects are relegated to a subordinate role though they occupy the foreground and front planes. Equally remarkable are the pictures of a garden painted on the four walls of a room in the Villa of Livia at Prima Porta, outside Rome. These are often associated with an artist named Studius (or Ludius, or Tadius), mostly because Pliny (*Natural History*, 35, 116) called him the inventor of garden and villa landscape and described just such scenes as these.

Middle Ages.—Between ancient Roman and Gothic times, landscape art was restricted to manuscript illumination, where it appears primarily as simple backgrounds to figured themes. Occasionally, as in the 10th-century Paris Psalter (Bibl. Nat., Paris) they are sufficiently elaborate to suggest Roman or near-Roman models. In Gothic manuscripts, landscape extensions of religious and secular images developed very rapidly, until by the early 15th century nothing stood in the way of a full-fledged landscape art except custom and patronage. The so-called *Boucicault* Hours (Museum Jacquemart-André, Paris) is the most spectacular. Through such works the way was paved for the Limburg brothers, notably in the illuminations of the *Très* riches Heures du *duc* de Berry (Musée Condé, Chantilly) of about 1415, and Hubert and Jan van Eyck, founders of the Flemish school of painting, whose art is known to have originated in manuscript illumination.

A few water-colour studies by Albrecht Diirer (1471–1528) are generally considered the first pure examples of landscape art. These views of Trento, Innsbruck and the Tyrol (at Bremen, Vienna, Oxford and the British museum) were probably made on Diirer's first trip to Italy in 1495, and were entirely personal notations. The point is important, because they resemble Flemish landscape backgrounds of nearly a century earlier, minus the foreground figures which gave them their public sanction. It would not be too much to say that Diirer's personal sketches were almost as fully developed as early 19th-century landscapes, and that nothing except other purely personal sketches rivaled them in the intervening centuries. But they were little known until the 19th century itself, when scholarship joined with the prevailing romantic interest in nature to resuscitate them.

As regards public works of art, an extraordinary series of frescoes was painted by Ambrogio Lorenzetti (c. 1300–48) on the walls of the Palazzo Pubblico in Siena. These represent the "Effects of Good and Bad Government in the City and in the Country." While the allegorical, or even propagandistic, intent is perfectly clear in the paintings, they represent an achievement in the art of landscape that equaled and surpassed that of ancient Roman times and was never rivaled in the intervening millennium. Their influence was very great, as may be seen in borrowings in French and Flemish art during the next 50 to 75 years. A natural link with Italy, especially Siena, mas provided by the Papal court at Avignon, where Simone Martini (c. 1285–1344), Siena's chief painter, spent the final four years of his life. Throughout the early 14th century, Sienese art, in its interest in *mise-en-scène* both in interiors and in landscapes, differed from Florentine art, as it was best represented by Giotto.

Renaissance.—Florentine Renaissance artists, who were primarily interested in the human figure: and in landscape only as incidental background, seldom approached the understanding of landscape shown by the earlier Sienese. Leonardo da Vinci (1452–1519) was the great exception, in this as in virtually every other respect; but as in Diirer, his excursions into landscape appear in personal sketches and in his notebooks more than in his public painting. Such 15th-century Sienese masters as Sassetta (1392?–1450) and Giovanni di Paolo (1403?–1482) continued to outstrip their Florentine contemporaries as regards landscape art. Six panels from the "Life of St. John Baptist" (Art institute, Chicago) are among the most inventive of Giovanni di Paolo's works, with dynamic and whirling space, curved horizons. and fantastic rock formations no less extraordinary than those dimly visible in the distances behind Leonardo's "Mona Lisa," of 50 years later.

16TH CENTURY

Northern Europe. — In the Gothic north, which was relatively untouched by the humanist culture of Renaissance Florence, painters continued to develop landscape backgrounds for religious scenes. Often these were wild and violent, as in the Hell scenes and in the "Temptation of St. Anthony" (National museum, Lisbon) by Jerome Bosch (c. 1450–1516), and in the multipaneled Isenheim altar (Museum, Colmar) by Mathias Grünewald (c. 1480–*c.* 1530). In the work of both of these artists nocturnal effects abound, and light becomes expressive of mystical rapture. The cultural distance which separated these attitudes from that of the Italian Renaissance may be suggested by the fact that the Isenheim altar (c. 1513) was contemporary with Michelangelo's Sistine ceiling.

Dominated by the more moderate art of Diirer, landscape art in central and southern Germany appeared in the backgrounds of works by such painters as Albrecht Altdorfer (1480–1538) and Lucas Cranach the Elder (1472–1553) and in etchings by Altdorfer, Augustin Hirschvogel (1503–53) and Hans Sebald Lautensack (1524–61/66). As prints were made in some quantity and sold at cheap prices, they were important in the popularization of pure landscape. There was a similar development in Flanders toward the middle of the 16th century, especially in the work of Pieter Brueghel the Elder (c. 1525–69), whose landscapes and marines, usually engraved by professional craftsmen from the master's designs, rival his more celebrated paintings. Among the latter, the series of landscapes of the seasons (most of them at Vienna; "Summer" at the hletropolitan Museum of Art, New York city) may be thought of as a magnificent extension of the calendar scenes in late Gothic Books of Hours. In Brueghel's work, weather itself is a protagonist, and the art of Vincent Van Gogh is already foreshadowed in it.

Venice. — With the decline of Florence in the early 1500s, Venice began to vie wirh Rome for leadership in Italian painting. The salt air condemned fresco painting to a brief life span in Venice, so the introduction of oil painting from Flanders opened up new possibilities. Intensely mundane and with little taste for Florence's antique-inspired masters, Venice commissioned paintings expressive of its own lavish mode of life. It should not be forgotten that Titian (1477–1576) was born at Cadore in the Dolomites, nor that these mountains are visible from Venice on a clear day. Landscape painting thus offered a natural departure from Venice's sea-bound horizons. Although it was generally restricted to background or religious and allegorical compositions in the work of Giovanni Bellini, Giorgione, Titian and Tintoretto, it appeared occasionally in a pure state. Moreover, Titian made designs for woodcut landscapes to be executed by others, one of them a huge composition in 12 sheets representing "Pharaoh's Army Submerged in the Red Sea" (1549). Another Venetian painter important to the development of landscape was Lorenzo Lotto (c. 1480–1j56). The sulfurous and often violent settings of Tintoretto (1518–94) for his religious pictures, as in the remarkable series in the Scuola di San Rocco in Venice, were the basis of the landscape art of El Greco (1541–1614). This solitary genius from Byzantine Crete studied painting in the studio of the very aged Titian, but he was obviously attracted to the art of Tintoretto. El Greco's "View of Toledo" (Metropolitan Museum of Art, N.Y.) is Byzantine in space, Tintorettolike in dramatic energy, Spanish in theme, and Spanish again in its accentuation of flat planes; yet it is unified by deep personal feeling. Its livid greens do not exist in Toledo; they originated in El Greco's mind.

17TH CENTURY

Rome. — By 1600 Rome had become the acknowledged world centre of art, and its several colonies of painters included many from northern Europe. Among these the German, Adam Elsheimer (1578–1610), and the Fleming. Paul Brill (1554–1626), exerted a powerful influence on the growing popularity of landscape art. Elsheimer passed along this interest to Annibale Caracci and through him to Guercino, both of them figure painters from Bologna who also worked in Rome. One of Brill's pupils, Agostino Tassi, was the teacher of Claude Lorrain (1600–82). With Claude, a Frenchman whose entire career was spent in Rome, landscape achieved a definition which was hardly to be challenged until the 19th century, and even the Impressionists were to some extent his disciples. Nicolas Poussin (1593/94–1665), the great French figure painter who also lived in Rome, met Claude's challenge late in his life by turning to landscape. Together, they foreshadowed Corot and Cézanne: Claude in his effects of tender light and his quality of reverie, Poussin in bringing nature's disorder to an order like that of architecture. Compare Claude's "Landscape With Mill," also called "The Wedding of Isaac and Rebecca" (1648; National gallery, London), with Poussin's "Summer," also called "Ruth and Boaz" (1660–64; Louvre, Paris). In both, the story is told by figures in the foreground, but both can be approached as landscape in its purest sense.

Flanders. — In the north, landscape art made great strides, both in painting and in the graphic arts. In Flanders, Peter Paul Rubens (1577–1640) turned his abundant energies in his final years to compositions based on the scenery near his country residence, the Castle of Steen, outside Antwerp. The tremendous sweep of these pictures, together with their progression of colour from warm earth-brown foregrounds to ice-green distances was probably suggested by the work of Pieter Brueghel and other Flemish precursors, but Rubens replaced their crisp line with washes of paint suggestive by their very texture of torrential powers. John Constable later said of him: "In no branch of art is Rubens greater than in landscape painting . . . . Rubens delighted in phenomena, rainbows in a stormy sky, bursts of sunshine, moonlight, meteors and impetuous torrents mingling their sounds with wind."

Holland. — In Holland, Protestant opposition to church adornment and the commercial interests of the republic discouraged painters from attempting religious subjects and led them to turn to secular ones. Wealthy burghers built handsome town residences, and a demand for small paintings quickly developed. Curiously, landscape was not popular. The poverty of Dutch landscapists was proverbial; Meindert Hobbema (1638–1709) had to give up painting to take a post in a wine cellar. He died a pauper. Landscape art therefore represented a high water mark of idealism, since painters without prospect of profit were seeking to express their knowledge and love of nature.

Among the earliest landscapists of the 17th century, Hercules Seghers (1589/90–*c.* 1638) may be considered a Dutch equivalent of Rubens, though his art was touched with an air of foreboding suggestive of Van Gogh. He was both a painter and an etcher who made some 60 experiments in printing in colour. Rembrandt admired and owned some of his work. The three outstanding specialists in Dutch landscape were Jan van Goyen (1596–1656) of Leyden and The Hague; Jacob van Ruisdael (1629–82) of Haarlem and Amsterdam, pupil of his less profound uncle, Salomon van Ruysdael; and Meindert Hobbema of Amsterdam, who was trained by Jacob van Ruisdael. Van Goyen excelled in monochromatic effects of harbours and estuaries; van Ruisdael, in panoramic effects across fields and dunes, and also in rugged forest scenes; and Hobbema, in quieter rustic compositions of humble dwellings set in a clearing in the woods. There were many others: Philips de Koninck, with his large panoramas of the lowlands; Aelbert Cuyp, sometimes called the Dutch Claude because of his radiant light; and the marine painters Jan van de Capelle, Adriaen van de Velde, and his brother Willem. Jan van der Heyden, the painter of city views, and the rare cityscapes of Jan Vermeer, especially his crystalline "View of Delft" (The Hague, Mauritshaus) should be mentioned.

Rembrandt van Rijn (1606–69) did not specialize in any one kind of painting; his painted landscapes hardly number more than a dozen. "Landscape with Obelisk," a rather early work (1638; Gardner museum, Boston) is one of the finest. Taken together, his many wash drawings and his etchings, notably the "Three Trees" (1643) indicate his complete mastery of the theme. As always! he mastered it in the sense that he bent it to his own needs of personal expression. Rembrandt's landscapes are the least "documentary" among Dutch works of the kind. Even more than

Ruisdael's, however, they are documents of the spirit, now lonely, now ominous, now quiescent, always restless and charged with tension.

18TH CENTURY

Italy and France. — In the 18th century, landscape painting was dominated by the growing demand for views of famous places, Venice and Rome above all. Works of Antonio Canale, called Canaletto (1697–1768), and Francesco Guardi (1712–93), both native Venetians, are superficially similar, but careful observation reveals the crisp draftsmanship of the former and the more "painterly" eye of the latter. Guardi in particular used a palette with pinks and pale blues generally similar in tone to those of the art of rococo Paris, which increasingly dominated the art of the century. Bernardo Bellotto (1720–80), the nephew and pupil of Canaletto who also used his uncle's name, extended Venetian landscape art to Germany, Austria, Poland and Russia. Canaletto himself traveled to England and remained there from 1746 to 1753. In Rome, the honours were shared by Giovanni Paolo Panini (1691–1765), a painter whose undoubted gifts gradually succumbed to the demand for accurate and meticulous representation, and Giambattista Piranesi (1720–78), a Venetian stage designer who became caught up in the current enthusiasms for the archaeology of Rome. Piranesi's production of views of Roman ruins was prolific. His large etchings are often marked by a sense of vanished grandeur, expressed through rich contrasts of light and dark which were unusual in the art of his century.

More characteristic of the age, but less deeply felt, are the landscapes with ancient ruins by Hubert Robert (1733–1808), who enjoyed an immense vogue in France. His art contrasts considerably with the exquisite and nostalgic park scenes of Jean Antoine Wattean (1684–1721), and the brilliant rococo inventions of François Boucher (1703–70) and Jean Honoré Fragonard (1732–1806). The line of historical development from Watteau to Boucher or Fragonard and then to Robert approximated cultural changes in France and in Europe as a whole from the Régence to the reign of Louis XV and then to that of Louis XVI. It is a sequence from the period of gentle release from the formalities of the age of Louis XIV, to the full rococo age, to that of incipient neoclassicism, spurred by the writings of Winckelmann and Lessing.

England. — In 18th-century England, despite the growing force of the romantic attitude toward nature, landscape painting had no status. and it mas not possible to make a living by practising it. Romanticism was, in its early stages at least, a literary movement; its full impact on the visual arts occurred in the 19th century. Nevertheless, England produced two very gifted landscapists in the Age of Enlightenment; their careers help us to understand that this age, like others, had its rim of darkness. Thomas Gainsborough (1727–88), England's most accomplished portraitist, might very well have devoted his career to landscape had there been any demand for it. In many portraits he enveloped the figure, as much as he dared, in the mists of foliage of Britain's great parks. He drew landscape constantly, and he left a brilliant series of oil compositions which brought English painting as close as it ever came to the subtleties of Jean Antoine Watteau. Richard Wilson (1714–82) is justly called the "father of English landscape painting." A prosperous portrait painter, he visited Italy, fell hopelessly in love with the work of Claude, and abandoned his former work to face starvation and experiment with a new manner of painting almost a century ahead of his time.

Rembrandt's "Mill" (National gallery, Washington) and Rubens' "Castle of Steen" (National gallery, London), which were both shown in a loan collection in England in 1815, had a profound effect upon Joseph M. W. Turner (1775–1851) and John Constable (1776–1837). These two pictures and other 17th-century Netherlandish landscapes, together with the daring examples of Wilson, Gainsborough and Thomas Girtin, who was Turner's boyhood friend and a brilliant experimenter in water-colour, formed the basis of Turner's and Constable's remarkable break with tradition. With them, romantic art was born; without them, developments in Europe would have lacked a major stimulus. Turner was fortunate in finding an impassioned critic to support him. In *Modern* Painters, John Ruskin summarized his mork: "He saw that there were more clouds in every sky than had ever been painted, more trees in every forest, more crags on every hillside, and set himself with all his strength to proclaim the great quality of the universe." Constable took much ionger than Turner to find himself, but succeeded by a singular persistence that carried him through years of public neglect. He painted with a deep understanding of his beloved countryside. If Turner suggests the wild power of Byron or the aerial flights of Shelley, Constable is an exact visual counterpart of Wordsworth.

19TH CENTURY

France. — To a considerable extent French romantic landscape was liberated by the exhibition of British landscapes at the Salon of 1824, in particular Constable's "Hay Wain" (National Gallery, London). Its moist, laden pigments, suggestive of a green out-of-doors, flatly contradicted the rigours of David's neoclassical doctrines. It threw younger French painters into a fever of excitement, and Delacroix is said to have repainted the whole landscape background of his "Massacre of Scio" in the brief period between the hanging of the pictures and the public opening of the Salon. The whole Barbizon movement in France (Théodore Rousseau, J. F. Millet, C. F. Daubigny, N. V. Diaz de La Peña, and others in the period 1830–60) may be thought of as a Dutch-influenced French variation of the art of Constable and his English rivals; it was named after a village in the Forest of Fontainebleau to which these artists retired from what they considered to be an unsympathetic metropolitan environment.

The greatest French landscapists of the mid-19th century were unquestionably J. B. C. Corot (1796–1875) and Gustave Courbet (1819–77). In his youth Corot rediscovered the light of the Roman Campagna through his study of Claude, and strengthening it with the organizing principles of Poussin, he returned to his native land to paint a long series of images at once restrained, aloof, crystalline and sure. They have the same ring of inevitability that one feels in the finest Greek art. None of this was appreciated in Corot's time, and so he developed a very different feathery style. based on the surface values of romantic photography, which gained him both recognition and a fortune. But he continued to paint in his earlier vein, gradually deepening its emotional impact. He uas instrumental in turning Courbet toward landscape painting; he was perhaps the most important single source of Impressionist landscape, and through Pissarro he deeply affected the art of Cézanne. One may safely say that Corot was the greatest force in the most crucial theme of painting in his century. As one critic phrased it, he had the power to destroy the proscenium and to guide the spectator to a fresh view of nature, unimpeded by convention.

In his own time, Courbet was damned as a "naturalist" for much the same reasons as Zola was excoriated by critics of literature. It is true that Courbet often failed to master his subject, so intent was he on defying convention by painting shocking themes. In landscape. however, to which he increasingly turned, there was no such conflict. In paint he mastered the elements: great cliffs of his native Jura or of the Norman seacoast, massive waves and massive banks of cloud, trees gigantic in trunk and foliage, the source of a stream as it emerges from a wall of rock, and, most surprising of all, marine views toward endless nothingness, but a nothingness dense with atmosphere ("Infinity" is one title). Without Courbet, it is unlikely that Monet and Cézanne could have formulated their styles.

Impressionism. — Much has been written about the scientific pretensions of the Impressionists. It is true that they studied and discussed the researches into the nature of colour by physicists like M. E. Chevreul and O. N. Rood and sought to challenge the rainbow by eliminating neutral tones and juxtaposing unmixed pigments of high intensity. Following Courbet in a pragmatic reduction of the themes of painting to that which is observable in the outer world. they nevertheless sought a world different from Courbet's. Landscape was their essential subject, but it was a landscape of joy: boats on the river, fields in flower, Paris in the

spring, all were populated by Renoir with the denizens of a glamorous Bohemia. Impressionism developed in and around Paris from just after 1870 to about 1885. The group of participants numbered over 30. They were of extremely varied temperaments, sharing a common fate of rejection from the Academy-dominated Salons and a common love of colour. The name Impressionism was an accident: a hostile critic coming into their first group show in 1874 picked out Monet's "Impression of a Sunrise" and used it as the butt of his jibes. The name stuck. Many other labels of artistic movements were born of derision (Baroque, Gothic, Medieval, Cubist, Fauvist, Mannerist) and all of them eventually lost their sting.

The leading Impressionist landscape painters were Claude Monet, Auguste Renoir, Alfred Sisley and Camille Pissarro. All but the last were born about 1840; Pissarro, ten years older, became a sort of kindly patriarch, enduring his poverty with extraordinary dignity. All were excited by the art of Delacroix as well as by his observations of colour faithfully set down in his journals; and they were enthusiastic students of the early 19th-century English landscapists, notably Constable, Turner and Bonington. Monet, a Norman, was temperamentally akin to Courbet; he too painted the cliffs of Étretat along his native coast. He gradually developed into what might be called an Impressionist mural painter, for his late works (after 1900) frequently present forms dissolved almost beyond recognition on great yardages of canvas. Thus while Impressionism has lost its appeal for advanced modern sensibilities, Monet's late style inspired a whole movement called Abstract Impressionism among painters in New York city in the middle 1950s.

Post-Impressionism.—Pissarro was deeply devoted to the art of Corot, who generously supported him. Compared to Monet's his gift was limited, though sure. But he was enormously influential as a teacher. Paul Cézanne (1839–1906), Paul Gauguin (1848–1903), Vincent Van Gogh (1853–90) and Henri de Toulouse-Lautrec (1864–1901) all mastered Impressionism through his guidance. His impact on Cézanne was especially strong, and through it Cézanne learned to clarify his spatial organization and eliminate detail by seeking out the controlling planes of a form. After 1880 Cézanne succeeded in turning the passing show, so greatly beloved by the Impressionists, into what he called "something durable, like the art of the museums." The same could be said of Georges Seurat, whose "Sunday Afternoon on the Grande Jatte" (1884–86; Art institute, Chicago) is much closer to Poussin and to early Renaissance painting than its subject might suggest.

With Gauguin and Van Gogh, the intense, broken colour of Impressionism took a radical turn in the direction of vehement personal expression, often with symbolic overtones. The association of these two artists at Arles in 1888 (Gauguin lived a few months with Van Gogh in the latter's little yellow house) was one of the most wildly improbable in the history of art. Gauguin was arrogant, vain, and publicity-minded even in his final years in the south seas; Van Gogh, an apparent failure, was pathetically diffident in Gauguin's company, though his letters show him to have been far more brilliant and penetrating. Both disavowed Impressionism as emotionally superficial, but in their search for a deeper reality in the painting of landscape, Van Gogh was the more authentic primitive. Gauguin turned his back on western civilization and in so doing he released a world of new colour for the 20th century; but his primitivism was thoroughly self-conscious, and to the very end recognition in Paris was his goal. Van Gogh was, on the contrary, a true child of nature; a disappointed, yet confirmed, evangelist, he found his soul by losing it in the contemplation of landscape, and the sermons he could never preach eventually spoke to all mankind through his brush. His biography is one of the great human tragedies; his art, one of the great triumphs.

20TH CENTURY

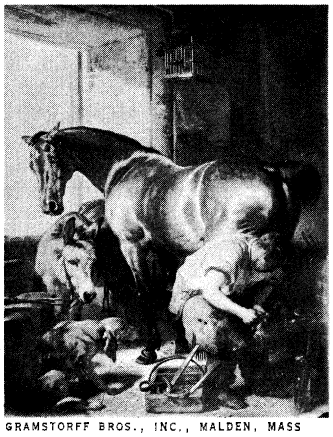
Since landscape was the greatest achievement in painting during the 19th century, and 19th-century landscape painting outstripped that of all previous times, it is not surprising that in the 20th century it went into a decline. There have probably been more landscape painters than in any previous age, but the creative force has moved elsewhere, and most of the practitioners have coasted on the work of previous artists or contented themselves with making careful documents in competition with other reproductive media. Early in the century in Paris, however, *Les Fauves* ("Wild Beasts," as a critic tauntingly labeled them) carried Van Gogh's passion and Gauguin's colour to new conquests of nature. Henri Matisse, André Derain and Maurice de Vlaminck prepared the way for such German Expressionists as Emil Nolde and Ernst Kirchner. The colour-improvisations of Wassily Kandinsky (1866–1944) gradually emerged from his earlier landscapes of the Bavarian Alps just prior to the outbreak of World War I. Cubism introduced a new concept of movement in space and while it is hardly relevant to the subject of landscape, its thin, overlapping planes seem to have originated in Picasso's studies of the hill towns of his native Spain. "The Reservoir of Horta de Ebro" (1909) was once owned by Gertrude Stein, who made the observation about the landscape origins of Cubism in her book on Picasso. A more conservative painter, Roger de la Fresnaye (1885–1925) was also a Cubist.

In the interim between the two world wars, the most significant landscapes were perhaps those of the Swiss-German painter Paul Klee (1879–1940). Highly imaginative and personal, they are exquisite divagations on the theme of nature, rather than records of the outer world. In the 1940s and 1950s the Austrian landscapist, Oskar Kokoschka (1886–) painted an impressive series of large "portraits" of European cities.

United States.—Charles Demuth (1883–1935) adapted the forms of Cubism to a fresh view of nature; he caught the prim elegance of Puritan America in some of his architectural compositions. Marsden Hartley (1877–1943) and John Marin (1870–1953) employed some of Cubism's shorthand to give a modern flavor to representations of the New England seacoast based directly or indirectly on the art of Winslow Homer (1836–1910). Homer is generally regarded as America's most gifted landscape painter, a judgment that does not overlook the sensitive, but somewhat effete London nocturnes of his contemporary, the expatriate James A. McNeill Whistler (1834–1903). His early work "Coast of Britanny" (1861; Wadsworth Atheneum, Hartford, Conn.) has much of Homer's strength; his native American idiom was refined by his association with the Impressionists, especially Degas, from whom he learned much about pictorial composition.

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LANDSEER, SIR EDWIN HENRY (1802–1873), foremost English animal painter, was born in London on March 7, 1802, the third son of John Landseer, the engraver and writer. He learned drawing from his father and became considerably proficient. At the age of 13 he drew a St. Bernard dog so finely that his brother Thomas engraved and published the work, and in the same year (1815) he exhibited "Portrait of a Mule" and "Portrait of a Pointer Bitch and Puppy" at the Royal Academy, where he became a student in 1816. Under B. R. Haydon's guidance, he studied the Elgin Marbles, the animals in the Tower of London and the Exeter exchange, and dissected every animal whose carcass he could obtain. His sense of humour already began to appear in animal portraits, and "The Cat's Paw," shown at the British institution in 1824, brought his name before the public. In that year also he made the first of many



GRAMSTORFF BROS., INC., MALDEN, MASS

"SHOEING" (1844) BY SIR EDWIN HENRY LANDSEER. IN THE TATE GALLERY, LONDON.

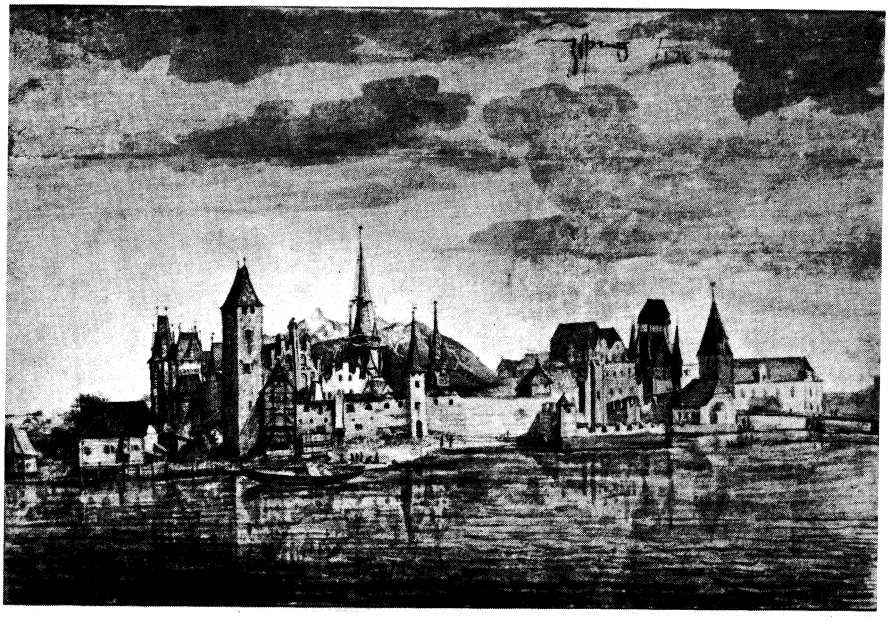




CONSTABLE AND COROT

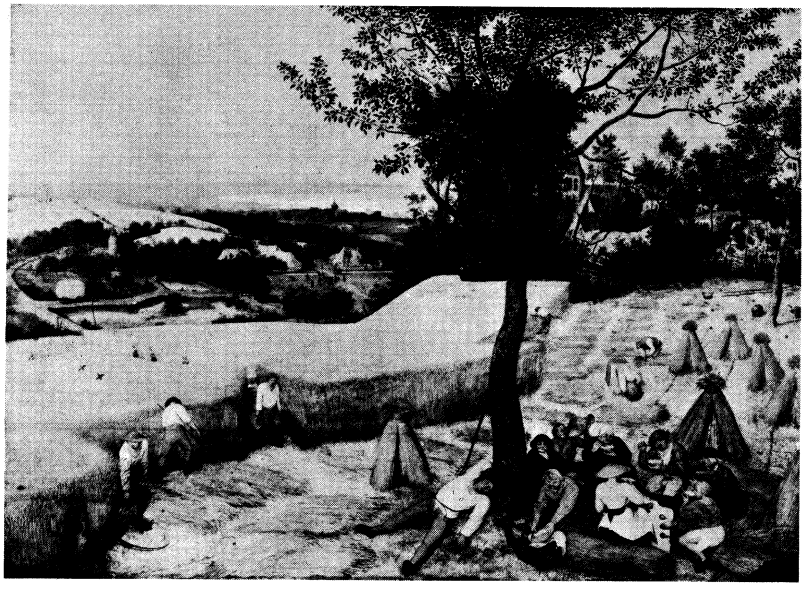
Top: "Glebe Farm with a view of Langham Church" (1827), by John Constable (1776–1837), English. In the Metropolitan Museum of Art
Bottom: "The Island of S. Bartolomeo" by Jean B. C. Corot (1796–1875), French. In the Museum of Fine Arts, Boston

LANDSCAPE PAINTING



"View of Innsbruck" by Albrecht Durer (1471–1528). German. In the Albertina collection of the Austrian National library, Vienna

LANDSCAPES BY THREE PAINTERS OF NORTHERN EUROPE



"The Harvesters" by Pieter Brueghel the Elder (*c.* 1525–69), Flemish. In the Metropolitan Museum of Art, New York city

"The Castle of Steen" by Peter Paul Rubens (1577–1640), Flemish. In the National Gallery of Art. London



BY COURTESY OF (TOP) ALBERTINA: PICTURE ARCHIVES OF THE AUSTRIAN NATIONAL LIBRARY, (CENTRE) THE METROPOLITAN MUSEUM OF ART, NEW YORK, ROGERS FUND 1919, (BOTTOM) TRUSTEES OF THE NATIONAL GALLERY



BY COURTESY OF THE TRUSTEES OF THE HOME HOUSE SOCIETY

"Mont Sainte Victoire" by Paul Cézanne (1839–1906), French. Cézanne painted this scene several times; this particular version is in the Courtauld institute, London

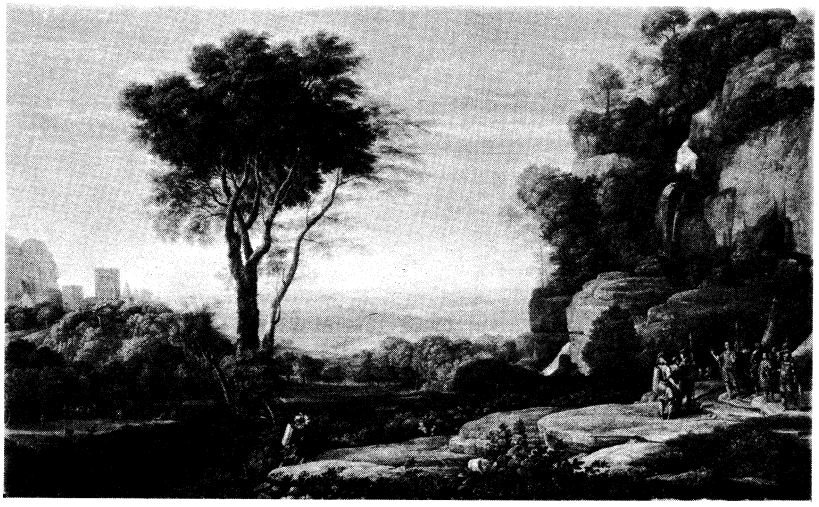
CÉZANNE AND SEURAT

"Sunday Afternoon on the island of la Qrande Jatte" by Georges Seurat (1859–91), French. Generally considered to be Seurat's masterpiece, the painting is in the collection of the Art institute of Chicago

BY COURTESY OF THE ART INSTITUTE OF CHICAGO; HELEN BIRCH BARTLETT MEMORIAL COLLECTION



LANDSCAPE PAINTING



"David at the Cave of Adullam" by Claude Lorrain (1600–82), French. In the Metropolitan Museum of Art, New York city

THREE LANDSCAPES AND A SEASCAPE, 17TH–19TH CENTURIES



"Wheatfields" by Jacob van Ruisdael (*c.* 1629–82), Dutch. In the Metropolitan Museum of Art, New York city

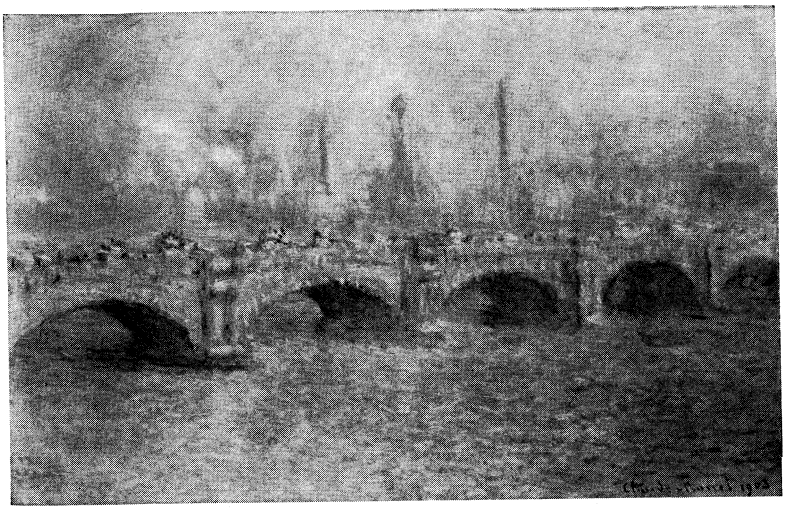
"Summer" (the meeting of Ruth and Boaz) by Nicolas Poussin (1593/94–1665). French. In the Louvre. Paris



"The Grand Canal, Venice" by Joseph Turner (1775–1851), English. In the Metropolitan Museum of Art, New York city

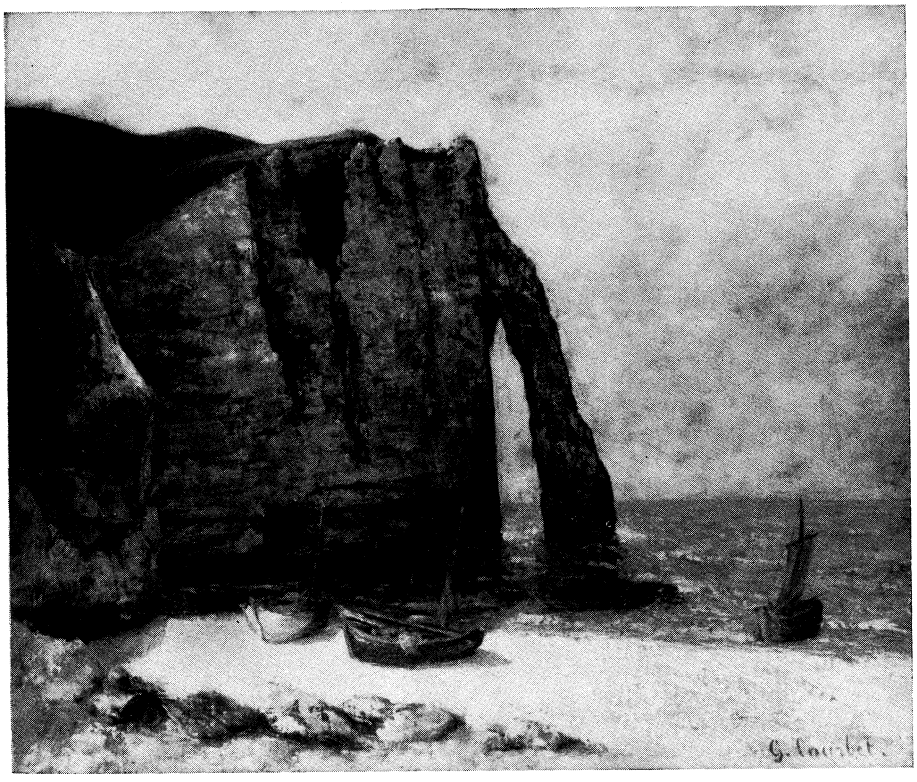


BY COURTESY OF (TOP, CENTRE, BOTTOM RIGHT) THE METROPOLITAN MUSEUM OF ART, NEW YORK; PHOTOGRAPH (BOTTOM LEFT) ARCHIVES PHOTOGRAPHIQUES



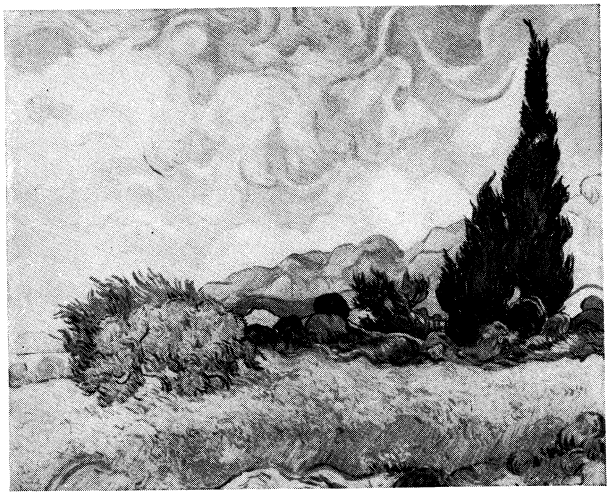
"La Tamise" by Claude Monet (1840–1926), French. A typical Impressionist exercise, this painting was one of many identical views of Waterloo bridge under various conditions of light and atmosphere. This particular example, dated 1903, shows the effect of falling snow

LANDSCAPES OF THE LATE 19TH AND EARLY 20TH CENTURIES



"Sea and Rocks at Étretat" by Gustave Courbet (1819–77), French. In the Cleveland Museum of Art

"Cornfield With Cypresses" by Vincent Van Gogh (1853–90), Dutch. In the Tate gallery, London

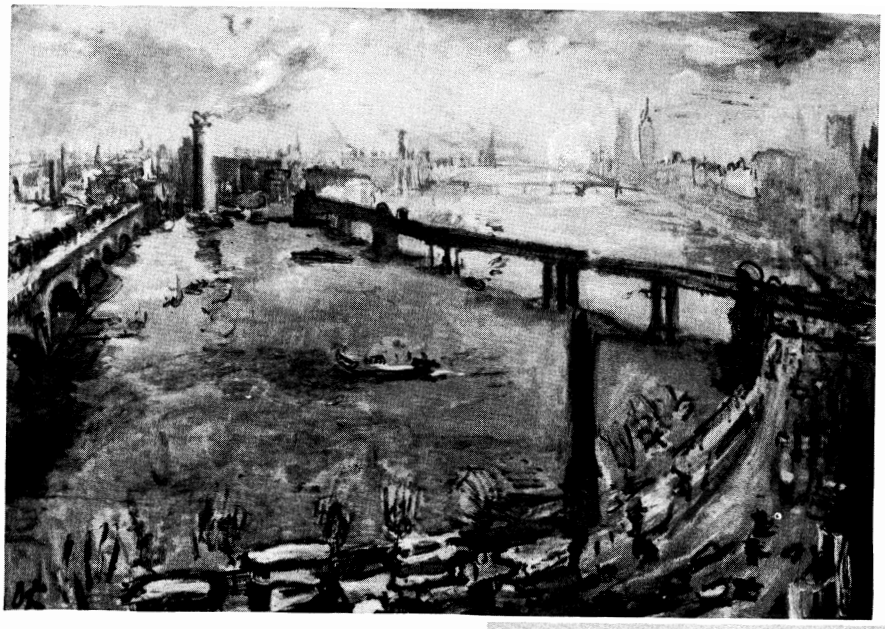


"Tahitian Landscape" by Paul Gauguin (1848–1903), French. In the Emil Bührle collection, Zurich, Switz.



BY COURTESY OF (CENTRE) THE CLEVELAND MUSEUM OF ART, GIFT OF THE ESTATE OF CHARLES F. BRUSH, (BOTTOM LEFT) THE TRUSTEES OF THE TATE GALLERY. (BOTTOM RIGHT) EMIL BÜHRLE COLLECTION; PHOTOGRAPH, (TOP) © H. BONNAIRE

LANDSCAPE PAINTING



"View of the Thames" by Oskar Kokoschka (1886–), Austrian, a leading Expressionist painter. Contrast this with the view of the Thames by Monet (Plate V), painted about 20 years earlier. In the Albright Art gallery, Buffalo, N.Y.

KOKOSCHKA, HOMER AND MATISSE



"West Wind" by Winslow Homer (1836–1910), U.S. In the Addison Gallery of American Art, Phillips academy, Andover, Mass.



"Joy of Life" by Henri Matisse (1869–1954), French. In the collection of the Barnes foundation, Merion, Pa.

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visits to the Scottish Highlands, painting "Taking a Buck" (1825) from his experiences there. This work, on a larger scale than previous pictures, was broadly painted and much less emphasis was put on elaborate draftsmanship and careful modeling. "Chevy Chase" (1826, Birmingham Art gallery) is one of his few history pieces, painted with great force and directly inspired by Rubens.

The healthy animation of Landseer's early works was gradually displaced by an unfortunate sentimentality, so that the animals depicted became invested with near-human emotions of pathos or humour, as in "High Life" and "Low Life" (both 1829, Tate gallery, London) and "Dignity and Impudence" (1839, Tate gallery). This anthropomorphism gradually sapped away the vigour of his work, and although he enjoyed enormous popularity in his day and long afterward. Landseer's true qualities of brilliant dexterity and sound anatomical knowledge have largely been obscured by this jarring element. Wherever this is absent, as in "Shoeing" (1844, Tate gallery) or in the "Rout of Comus" (1843, full-scale study, Tate gallery) painted for the garden pavilion of Buckingham palace, he ranks among the great 19th-century animal painters.

Landseer was elected Royal Academician in 1831, and was knighted in 1850. At the Paris Exposition Universelle of 1855 he was awarded the gold medal. His work in his last years was impaired by failing health. and by 1860 his mind began to fail him so that in 1865 he was obliged to refuse the presidency of the Royal Academy. He managed to complete the great sculpture commission of the four bronze lions at the base of the Nelson monument in Trafalgar square, London. which were unveiled in 186;. He died in London on Oct. 1, 1873.

JOHN LANDSEER (1761 or 1769–1852), father of the foregoing, is known chiefly for his topographical engravings, and for his writings on archaeology, lectures on engraving and art criticism. He exhibited at the Royal Academy from 1792 onward: was elected a fellow of the Society of Antiquaries and became engraver to William IV. A man of wide culture, his *Fifty* of *tlze Earliest Pictures in tlze National Gallery* (1834) marked a new phase of critical appreciation backed by scholarship. He died in London on Feb. 29, 1852. His eldest son, THOMAS LANDSEER (1795–1880), became well known for his engravings after Edwin Landseer pictures, as well as for the engraving after Rosa Bonheur's "Horse Fair." His own designs included illustrations to S. T. Coleridge's "Devil's Walk" (1831), and he wrote *The Life and Letters* of *William Bewick* (1871). He died in London on Jan. 20, 1880. CHARLES LANDSEER (1799–1879), John Landseer's second son, a history and genre painter ("Clarissa Harlowe in the Sponging House," 1835, Tate gallery), became an Academician in 1845 and keeper of the Royal Academy in 1851. He died on July 22, 1879, bequeathing £10,000 to the Academy to found the Landseer scholarships.

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LAND'S END, a promontory of Cornwall and the westernmost point of England, about 873 mi. by road from John o'Groats. It is a fine granite headland, pierced by a natural arch. Dangerous reefs lie off the point, and one group a mile from the mainland is marked by the Longships lighthouse, in 50° 4' N., 5° 4' W. The Land's End is the westernmost of the granite masses which rise at intervals through Cornwall from Dartmoor. A raised beach and a submerged forest indicate sea level changes. In classical times it was known as *Belerium,* and later as *Penwith.*

LANDSHUT, a city in Bavaria, Ger., on the Isar, 40 mi. N.E. of Munich. Pop. (1950) 46,785. Founded about 1204, it was from 1255 to 1503 the principal residence of the dukes of lower Bavaria. During the 'Thirty Years' War it was captured several times by the Swedes. From 1800 to 1826 the university, later at Munich, was there. Among its churches are those of St. Martin, of St. Jodocus, and of the Holy Ghost, all begun before 1410. The former royal palace contains fine Renaissance work. Overlooking Landshut is the castle of Trausnitz. erected early in the 13th century. but the chapel, the oldest part existing. dates from the 14th century. Industries include brewing. tanning and founding, and the manufacture of tobacco, chemicals, soap and cloth.

LANDSKNECHT, a German mercenary foot soldier of the 16th century. The name (German for "man of the plains") was given to mark the contrast between the force composed of these soldiers, formed by the emperor Maximilian I about the end of the 15th century, and the Swiss. the "men of the mountains," at that time the typical mercenary infantry of Europe. After the battles of Marignano and Pavia, where the military reputation of the Swiss had been broken, the Swabian *Landsknechte* came to be considered the best fighting troops in Europe. Though primarily a German force and always the mainstay of imperial armies, they served in organized bodies as mercenaries elsewhere in Europe.

In fact *Landsknecht,* and more particularly its French corruption *lansquenet,* became in western Europe a general term for mercenary foot soldiers. It is because of the *lange Spiess* (long pike or lance), the typical weapon with which they were armed, that the corrupted French form. as well as a German form, *Lanzknecht,* and an English lance-knight came into use.

The *Landsknechte* were raised by colonels *(Obersten),* to whom the emperor issued recruiting commissions corresponding to the English indents; they were organized in regiments made up of a colonel, l eutenant colonel and regimental staff, with a varying number of companies, colours (*Fähnlein*), commanded by captains (*Hauptleute*); subaltern officers were lieutenants and ensigns (*Fähnriche*). In thus defining the titles and duties of eacn rank, and in almost every detail of regimental customs and organization, discipline and interior economy, the *Landsknechte* may be considered as the founders of the modern military system on a regimental basis. *See* further ARMY and INFANTRY.

LANDSKRONA, a seaport of Malmöhus, Sweden, on the Sound, 15 mi. N.E. of Copenhagen. Pop. (1950) 25,143. Landskrona, originally called Landora or Landör, owed its first importance to King Erik XIII, who introduced a body of Carmelite monks from Germany in 1410, and bestowed on the place the privileges of a town. It suffered heavily during the wars of the 16th and 17th centuries. In 1677 a great naval battle was fought in which the Swedes defeated the Danes. The harbour is excellent. The principal industries are tanning, flour milling and the manufacture of sugar and artificial manures. On the little island of Hven, immediately opposite, Tycho Brahe built his famous subterranean observatory of Uranienborg.

LANDSLIDE. Downward mass movement of earth or rock on unstable slopes includes many forms resulting from differences in rock structure, coherence of material involved! degree of slope, amount of included water, extent of natural or artificial undercutting at base of slope, relative rate of movement, relative quantity of material involved, etc. Many terms cover these variations. Among them is landslide or landslip. Creep, earth flow, mudflow, solifluction, debris avalanche, etc., are related forms in which mass movement is by flowage.

The slump landslide is usually the consequence of removal of buttressing earth at the foot of a slope of unconsolidated material. It commonly involves a shear plane on which a back tilting of the top of the slumped mass occurs. The plane is slightly concave upward and outward and separates the slump block from unslumped material of the same character. If shearing movement occurs on a surface of consolidated rock, the dislocated mass is a debris slide. Cliffs may become so steepened through undercutting by rivers, glaciers or waves that masses of rock will fall freely and constitute a rock-fall type of landslide. *See* also GEOLOGY.

See C. F. S. Sharpe, *Landslides and Related Phenomena* (1938). (J. H. Bz.)

LANDSTEINER, KARL (1868–1943), Austrian scientist. discoverer of the four primary human blood groups, and Nobel prize ninner in medicine. was born in Vienna on June 14, 1868. He received the degree of doctor of medicine from the University of Vienna in 1891, later returning there to teach pathology (1909–19. In 1919 he moved to the Netherlands. and three years later accepted an invitation to go to New York city as a member of the Rockefeller Institute for Medical Research.

Karl Landsteiner's discovery in 1901 that human bloods are of different types led to the practice of using only similar blood types for transfusions, thereby eliminating much of the danger of that

operation (see also BLOOD). In pursuance of his studies in this field, Landsteiner worked out the mechanism causing paroxysmal hemoglobinuria. His principal work and interests were in immunology, bacteriology and pathology, but he also carried on researches in virus diseases and, in connection with work on poliomyelitis, succeeded in transmitting the disease to monkeys. He was awarded the Nobel prize for medicine in 1930 and also won the Paul Ehrlich medal and the Dutch Red Cross medal.

Landsteiner, a naturalized citizen of the United States, died in New York on June 26, 1943.

LANDSTURM, the army reserve category in German-speaking nations comprising the oldest age classes. Literally the "territorial assault force," the term originally implied a general levy of all able bodied citizens in time of war. The Prussian Landsturm was given a legal basis in 1813 in preparation for the war of liberation against Napoleon which culminated in the battle of Leipzig. All men not serving in the regular army or the Landwehr (*q.v.*) were called upon to harass the enemy in their local districts with all available means: operating on the model of the Spanish guerrillas. In imperial Germany the Landsturm comprised both trained and untrained men from 17 to 45 who were considered not fully fit for service in the field and were to be used only for local garrison duty in case of dire necessity; but in World War I many such men were incorporated into the field forces. Hitler's defense law of 1935 defined the Landsturm as the reserve category comprising all men from 45 to 55; in World War II they were initially assigned to local defense battalions but were later used in occupation duties and ultimately in line units.

In the Austro-Hungarian monarchy the Landsturm included all male citizens who were fit but were not serving in either the active forces or the first-line reserves. Men from 19 through 37 comprised the first ban, and those from 38 through 42 the second ban; except for the Tirolese units, no peacetime training was received. Swiss regulations, as revised in 1949, assigned men from 43 to 48 to the Landsturm. They were intended for use in local home defense units in time of war. (P. N. T.)

LAND SYSTEM (U.S.). The early development of the land system of the United States is a documentation on the one hand of the continuity of history, and on the other of economic determinism. On the side of historical continuity the key fact is the feudal land system in Europe out of which the new world's tenure arrangements grew. On the side of historical determinism the most significant point to note is the failure of feudalism to strike deep roots in North American soil.

Under feudal land organization complete ownership of property was unknown. All land was held "of" the supreme ruler: great lords held titles subject to the prior rights of the king, lesser lords owed similar obligations to the great lords, and serfs had to meet the conditions laid down by the lesser lords (see LAND TENURE: ECONOMIC AND AGRARIAN ASPECTS).

With the discovery of America, vast land resources came into the possession of various European monarchs to do with whatever they would. Overwhelmingly, the pattern followed was the granting of vast tracts to particular persons or groups of persons with all of the rights and responsibilities then accruing to manor-holders in the mother country. Indeed, in numerous instances, for example Maryland and Pennsylvania, the grantees were even given a right which was no longer permitted in England—the right of subinfeudation (that is, the right to establish lesser manors).

However, because the reckivers of these huge grants were typically absentee owners, because these lands were virtually valueless unless manpower could be made available, and perhaps especially because these resources were part of a vast, unexplored wilderness occupied by uncivilized peoples, it turned out to be very difficult actually to transplant feudal institutions to the new land. And this, of course, was the point at which economic determinism began to challenge the influence of historical continuity.

This conflict made itself felt from the beginning. Under its 1612 charter, for example, only five years after the first settlement, Virginia began officially to drift away from the intentions of its founders. Originally a trading company organized on the basis of no land distribution to settlers, this lone British colony in North America soon felt compelled to bargain with potential colonists by offering them land of their own. This was the origin of the famous headright system, the dominant method of land distribution in the southern colonies and a method which found some use in every one of the original 13. Under that system anyone responsible for bringing one or more settlers into the new world was given land in proportion to the number of people thus added to the population. Land distributed in this way continued to be encumbered by some of the ancient feudal restrictions, but tenure conditions were already beginning to be more free than in Europe.

The predominant pattern of land distribution was very different in early New England. Here the principal settlement agency did not function on an absentee basis; the governor and council of the Massachusetts Bay company brought their documents with them and operated on the spot. Furthermore, New England settlers were far more apt to be self-sufficient, and therefore not in debt for passage and subsistence on arrival. Here the pattern was to grant land to a group of reputable citizens who had declared their intention to found a town at some specified point. These men as the new town's chief citizens and ruling group then parceled out the available territory to actual settlers. Understandably under these circumstances certain elements of the inherited feudal pattern also quickly dropped away. Thus quitrents, an arrangement whereby the holder of a particular plot of land must in perpetuity pay a "rent" to the grantor, were much less characteristic of land distribution in New England than in the south.

By 1681, the year William Penn became the largest private landowner in the world, another method of distributing land was becoming popular. As one way in which his vast holdings were to be disposed of Penn listed the method of sale, and this device became the primary distribution procedure in Pennsylvania. Nor was this approach any more successful in resisting the erosion of feudal relationships than New England and Virginia programs. On one hand, the policy of selling land in large, manor-size units even more pointedly than heretofore taught the lesson that old world citizens would not brave the elements in the new world at the price of an indefinite period of servitude. And on the other hand, because there was much resistance to the payment of quitrents, Penn inaugurated the practice of giving a purchaser the option of paying a higher initial price and reserving no quitrent.

Dramatically illustrative of the fact that a new form of land tenure was indeed growing up in America is the experience in Georgia under the trustees. The last of the 13 colonies to be officially launched, Georgia's charter provided explicitly for an ownership arrangement known as "tail male"—requiring that ownership units could not be subdivided and could pass by inheritance only through male issue. However, so intense was settler objection to these restrictions that before the charter was ten years old "tail general" had been substituted for "tail male," and by the end of another ten years this requirement had in turn given way to a form of tenure closely approximating the modern fee-simple arrangement.

But if there was a steady, even irresistible, movement toward freer tenure conditions, it is nonetheless true that it took the American Revolution to complete this work. As a part of the revulsion of feeling against the mother country after 1776, quitrents and primogeniture and entail laws were eliminated on a wholesale basis. With the settling of this issue, however, a closely related conflict promptly took the centre of the stage, a controversy which had all along given some difficulty. That question was whether land should be distributed in the first instance to the many or to the few, and this issue was to dominate the evolution of the land system for more than a century.

Though it was not realized at the time this decision had already basically been made; historical continuity was to rule in this sphere. And the decision was that a continuous battle would be waged between proponents of both these approaches, with neither winning a clear-cut victory. Just as in the New England township system a number of large grants were made side by side with the many grants of small farms to actual settlers, just as under Virginia's headright procedure a few financiers and ship captains secured sizable holdings, and just as in Pennsylvania small grants were intermingled with the majority of larger ones—so in the new nation

were both the yeoman group and promoter-speculators accorded concessions in the policy actually worked out.

Because there was in this important sense no real change in policy, the key difference after the Revolution was that a uniform policy law had to be worked out within the framework of the new national government. In the course of the actual fighting each of the seven states that claimed land to the west beyond its own boundaries was compelled to surrender this land to the central government as a major condition of the acceptance of that government by the other six. Moreover, during the next three quarters of a century the government in Washington was given the responsibility of disposing of the Floridas plus all of North America west of the Mississippi river between Mexico and Canada. Most of the pressures relating to land policy which had earlier raged in the capitals of the several colonies now converged on the nation's capital.

As it began to wrestle with the problem of administering a vast public domain. the central government first decided that these lands were an important resource from which the state should derive a revenue. Accordingly a policy of sale was inaugurated, though on terms rather more favourable to speculators than to settlers. The smallest quantity of land that could be sold was a full section of 640 ac., and the only points at which purchase could take place were land offices located in the east.

From this time onward until the American Civil War land legislation was progressively liberalized to promote settlement—because western political pressure became almost irresistible, because tariff revenue was so great as to lessen the need for revenue from land sales, and because eastern manufacturers saw in cheap land a way of reducing agitation for tariff reduction. Three events especially illustrate this evolution. As early as 1796 the government began to open up sales offices located much closer to the actual frontier. In 1820 a movement to reduce the minimum quantity that could be bought reached its climax in a law specifying only 80 ac. And in 1841 by far the most important victory to date of settler over speculator was won in the form of the Pre-emption act. Under the terms of this law anyone locating himself on public land not yet surveyed was permitted when his plot was surveyed to buy this land at the $1.25 per acre minimum price, even if some land company did get to the land office first. After the Civil War the situation changed markedly. Though in 1862 the west won what seemed at the time to be its greatest public land victory, the sequel to that success pointed a quite different moral.

The Homestead act was in concept a settler's dream. Under its terms any individual might obtain 160 ac. of the public domain merely by living on this plot and working it for five years. In practice, however, the dream did not remain intact for long. The earlier policy of disposition by sale was not wholly discontinued. Tens of millions of acres were given to corporations to encourage the building of railroads. A commutation clause in the Homestead act itself, specifying that after six months an entrant might buy his quarter section at the pre-emption price, was an open invitation to speculators aided by dummy homesteaders. Other post-Civil War land legislation intended to complement the Homestead act actually permitted individuals to violate the spirit of these laws by securing land under several acts. The entire network of legislation was badly administered. All in all, it is not surprising that by 1890 a pathetically small quantity of land had in fact been disposed of by way of the homestead route.

In short, by the end of the 19th century, just as the opportunity to use a vast rich public domain to shape the nation's land policy mas nearly past, it had become apparent that a fee-simple land tenure arrangement is no guarantee of an agriculture of free farmers. The evidence of this sobering fact, moreover, was dramatically advertised when in 1880 the bureau of the census first included farm tenancy in its survey of U.S. agriculture. To be sure, a large part of the tenancy problem centred around the south's crop-lien system—a semifeudal relationship growing out of the abolition of slavery in which the operator furnished only labour, borrowing everything else from the owner on terms that made it very difficult ever to get out of debt. The fact that the tenancy rate was more than 25% even in the upper Mississippi valley region gave much cause for concern.

Thus made sharply aware of a trend which seemed to be running directly counter to the American creed, the nation took a long look at the federal government's responsibility for the land system that was emerging. Put differently, as the federal government (with the end of the frontier now in sight) lost the power to promote a vigorous farm-owning group by means of public domain distributions, pressures developed for accomplishing this objective in other ways.

The numerous techniques actually employed can be summarized under four principal headings. Before the turn of the 20th century the federal government had commenced a program of agricultural research and experimentation linked with a network of farmer education endeavors designed to place modern science at the disposal of even the smallest operators. Shortly after the 20th century began congress authorized the expenditure of government funds for large-scale irrigation projects to reclaim otherwise unusable land for the nation's farmers, this effort greatly broadening during and after the 1930s into a massive program of soil conservation available to all farmers.

Toward the end of World War I a farmer complaint that had been loudly heard since the beginning of the nation became the subject of major legislation. That was the cry for more adequate credit resources. This beginning evolved into the farm credit administration which became the basis of the farm credit structure, providing government assistance to farmers in this field on a very wide front. And finally, the great depression of the 1930s launched the federal government into the business of placing a floor under the prices of many farm products in order to protect the income especially of farmers in the lower-income brackets. For discussion of these four principal approaches *see* AGRICULTURAL EDUCATION AND RESEARCH; IRRIGATION; AGRICULTURAL ECONOMICS: *Agricultural Credit Systems; Agricultural Prices and Incomes.*

See also FARM TENANCY; HOMESTEAD AND EXEMPTION LAWS.

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(H R. S.)

LAND TAXES. The traditional land tax may be defined as a global tax ad *rem* having as its theoretical tax base the productive capacity of land or standards devised to represent such capacity. The oldest and the most prevalent forms of this tax have been the farm output tax and the land tax proper. The farm output tax in the form of the religious or political tithe *(see* TITHES) has been experienced in the middle east in the biblical and Islamic periods; in India, especially under the Hindu regime; in ancient China and in medieval Europe. China developed a system of farm-output tax based on the total summer harvest (major crop), computed annually for each holding on the spot and collected usually in kind by the government. The land tax, on the other hand, was usually based on the presumptive assessment of land income (annual or capitalized) according to the cadastral survey for one specific year or for an average of a number of years. The amount of tax determined on the basis of such assessment usually remains fixed for a period of years. This type of land tax can be traced to ancient Egypt and India, but it found extensive use only in Europe in the 19th and the early 20th centuries. It was applied extensively in some of the former dependencies (*e.g.,* British India and Burma), and in modern times has been widely used in the so-called underdeveloped countries.

The pragmatic concepts of land taxation have been haphazard and the theoretical speculations manifold. The tax, rent and cultivator's income are the three criteria for the sharing of the (net) produce of the land. A variety of theoretical discussions deal with the nature and fairness of such distribution among the sovereign, the owners and the cultivators in the light of definition, significance and place assigned to each of these elements in the prevailing political, religious and economic thinking. In the ancient and medieval periods most discussions were devoted to the juridical base for land-tax liability. The tax was regarded as a payment to the sovereign in whom the ownership of land was vested in exchange for the use of the land. This was the basic concept behind the feudal system of land tenure.

In countries where the emphasis was on the communal character of landholding (*e.g.*, India and parts of China), the land tax was considered as a payment for the protection given by the sovereign or the conqueror, the ownership of land according to this concept being retained by the community. But as the concept of individual ownership developed in these countries, the rights on land gradually passed into the hands of the proprietors. Where the sovereign is regarded as the owner of the land, as in the case of government domain, the total payment to the sovereign takes the form of a combination of rent and tax. Where the ownership is vested in the cultivator, he, as the owner, pays only the tax, and the rest of the (net) output represents a combination of rent and the cultivator's share.

A new phase of the evolution of the land-tax doctrines found its impetus in the French Revolution. Economic, administrative and social reforms were influenced by the attention that the leading economic and social thinkers gave to the significance of agriculture and the concept of land taxation. The French physiocrats of the 18th century had laid the doctrinary groundwork for the preponderant role assigned to the taxation of land (see PHYSIOCRATIC SCHOOL). The theoretical concepts of land rent were further developed by David Ricardo and other economists of the 19th century. In the second half of the 19th century Henry George of the United States became the leading exponent of the land tax as a single tax (*q.v.*) and influenced the adoption of new tax measures in certain states of the U.S. and even in Australia and New Zealand.

A decline of the land tax occurred as industrialization progressed and industrial and commercial sources of income accounted for higher proportions of the national income. The growth of income and sales taxes after World War I eventually made the taxation of land lose its primary significance in all highly developed economies. It had, however, considerable ancillary significance in connection with the postwar capital levies in Europe, and in connection with the revised property taxes in Scandinavia and the Netherlands. This was, however, the taxation of land through new methods and not the traditional land tax. With the growth of income taxation and with the commercialization of agricultural exploitation, the problem of taxing agricultural income on the same basis as other income arose everywhere. Concepts of equity became predominant as the tax burdens grew in volume and scope. Special provisions for taxation of agriculture continued to prevail, however, even in countries which applied a general income tax with equal rates to income from all sources. In Latin countries, which have a tradition of schedular income taxation applying different rates to incomes from different sources, the problem became acute when transitions were made to the general income tax plan as used in Italy and France. In these, as in other cases, agricultural income, while no longer taxed at differential rates, was taxed on a different base. The nature of the agricultural activity, the methods of production, the role of consumption in the agricultural community and the uncertainty of crops require a special approach.

In less-developed countries, agricultural income was often excluded from the general income tax even where this tax had been in existence for a long time. In India and Pakistan, for example, land taxes were continued, partly as a substitute for personal income tax payments by landowners. In the greater part of Asia one of the real problems has been the case of submarginal farmers and tenants who often are in extreme difficulty and unable to pay any tax at all.

In some states of India income derived from land exempt from the general income tax was made subject to an independent system of progressive agricultural income taxation complementary to the prevailing land tax. In other countries, a shift was made to the taxation of agricultural commodities when marketed so that the difficulty of the cadastral revision and assessment could be eliminated. In these countries land taxes were abolished and taxes were introduced on products marketed for domestic consumption or for export. Such types of taxes can be regarded as a variation of the farm-output taxes, although the bases—the total farm output as contrasted with only that part delivered to the market—differ significantly.

Under the traditional land tax, the theoretical assessment base is the productive capacity of land, which is not easy to determine. Productive capacity measured in terms of net output requires determination of gross output by direct inspection of farms, especially at the time of harvest when the crop is piled in the field, or indirectly through evaluation of factors such as yield, area, rent, etc., and the determination of the cost of production. Productive capacity measured in terms of cash values requires valuation of net output on the basis of prevailing prices after deducting the cost of transportation and other incidental charges. For those types of agricultural production such as plantafion and large-scale farming, for which accounting records are kept, the tax administration can avoid intricate computations by relying on the tax declarations based on income records.. In the majority of agricultural exploitations, however, such records are not available.

Small-scale agricultural production is a mixture of business and a way of living in which the keeping of accounts and ascertainment of profit and loss are not as vital as in other businesses. In these cases, the tax administration usually makes its own computations. It is interesting to note that even in the case of advanced nations presumptive assessment has been used for estimation of the agricultural incomes subject to the income tax. Finland, for example, established a system of presumptively determining agricultural income on the basis of the actual yield of yardstick farms operated by the government.

Presumptive assessment is usually simplified by the adoption of one or a few standards or indicia as the tax base. These take a variety of forms depending on the nature and characteristics of agricultural production, marketing and ownership of agricultural land,. In some states of the U.S. (Vermont and North Carolina) and in some Latin-American countries (Argentina and Brazil), the area of holdings was made subject to taxation. In the middle east, in Iraq, the method of irrigation such as pump machines or manual wells was made subject to taxes; in other countries, certain types of land, such as "wet" or "dry" areas, are taxed at specific rates. In Egypt and Great Britain, land is assessed on the basis of rent. Presumptive earnings, fertility and type of production were used as the assessment basis in the states of Connecticut and Ohio. Land tax has been used theoretically in the form of a percentage of the net rental or the net (or gross) output in India and Pakistan, depending upon whether the land was settled by landlords or owner-cultivators.

In a number of provinces, the land tax assessed originally on the landlords was made fixed and permanent by virtue of the Land Settlement regulations passed at the end of the 18th century by the British administration. In the rest of the provinces, whether landlord or owner-cultivator areas, the land tax was made subject to revision at long intervals.

Land tax in the form of real property tax usually has as its base the capital or sales value of the land, as in most states of the U.S. and in some cantons of Switzerland. For lands which yield revenue (*e.g.*, agricultural land) such revenue is directly or indirectly used as a criterion for the determination of capital value in addition to other standards such as cost or market value. For lands yielding no recurring income (*e.g.*, certain city sites and plots), determination of capital value is based on a number of other valuation methods, namely the prospective value appreciation, social utility and prestige value of the land, all of which are usually expressed in terms of sales value. In most states of the U.S. land (yielding return or not), as well as other forms of real estate, is subject to the general property tax. In this system, land-tax assessment is based on the classification of land according to use or other criteria. (See TAXATION).

The rigidity of the land-tax structure contributed to the gradual loss of relative significance of this type of taxation in the revenue composition of a great number of countries. The cadastral tax liability, usually determined in fixed charges, became extremely low in real value as prices followed upward trends in the recent decades. The difficulty of cadastral revision at short intervals is that it does not allow the necessary tax adjustments. In order to reduce such rigidity in some systems the assessment is based on the average price and output of five to ten years; and, when the actual

prices or output fluctuate beyond a certain limit of the standards used, revision is allowed either at the request of the taxpayer or according to the discretion of the tax administration. In other systems only output is determined on the basis of previous experience, and prices are calculated annually according to the market conditions before the respective taxes are determined. Furthermore, the tax liability in some years is multiplied by a coefficient without resort to cadastral revision.

The land-tax rigidity is nonexistent in the case of taxes levied in kind and also under systems whereby the cadastral records refer only to the revenue capacity of the holding. The amount of tax is then calculated and announced annually on the basis of the prevailing prices.

In the case of the latter two systems, the decline of the significance of the land tax in terms of relative yield is the result of increase of receipts from taxes levied on other sources of income. The land-tax rigidity and proportionality is to some extent overcome in those tax structures in which progressive taxation of agricultural income is given full treatment.

To further develop tax equity and to improve land utilization, special taxes, separate or in the form of surcharges. have been levied on uneconomical use of land and undesirable forms of ownership. A number of experiments in using land taxation for nonfiscal purposes were attempted in Canada, where uncultivated but arable land was taxed at special rates in some provinces, and especially in Australia and New Zealand, where until 1952 land taxation was widely used with the intention of discouraging absentee ownership of large estates and encouraging agricultural improvement.

Both penalization through heavy taxation and incentives through tax remissions far desirable economic activity were resorted to in a number of systems. Large holdings are made subject to heavy taxes in some states of Argentina by surcharges, and in other countries the rates progress as the total value of holding or area increases. In Argentina and Brazil surcharges are applied to absentee landlords.

Urban land is usually taxed by the municipalities and a share is given to either the state (U.S.) and/or to the central government. In the case of rural land it is administered and shared by the counties and states in countries with a federal form of government; in countries with a unitary form of government such taxation is administered directly by the central government, although shares may accrue to subordinate governmental authorities.

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LAND TENURE: ECONOMIC AND AGRARIAN ASPECTS. The word "tenure" (Latin, *tenere,* to hold) probably derives from the feudal system, the basis of which was that all land was "held" by one individual from another and none was absolutely owned (see REAL PROPERTY AND CONVEYANCING, LAWS OF).

Feudalism. — After the Norman Conquest in 1066, all land in England mas held by tenants from feudal lords upon various forms of feudal tenure, with the king as the lord paramount and the manor as the most important unit of ownership. .Subject to wide variations at different times and in different parts of the country, the principal classes of tenant may for the purposes of this article be classified as free tenants, villeins (who became copyholders by the end of the 14th century), serfs and cottars. Free tenants, the yeomen of English history, at first rendered military service, but later this was commuted for a quitrent. Sometimes their land was in a separate holding but much more frequently it was a part of the open common fields. "Copyholders," although less independent, frequently had, like them, a status akin to ownership as they held their land subject to the payment of certain fines and heriots on specified occasions.

Serfs and cottars were occupiers of a cottage and garden and perhaps five acres of arable land and grazing rights in the common fields, but they had to depend for their livelihood mainly on labour for the lord—in addition to their obligatory service—or for the tenants. The status of the villeins was at the outset one of modified servitude. They were unfree in that they were tied to the manor and were subject to the will of the lord. But each held an allotment in the common field with rights over the common pasture and on the waste or woodland surrounding the manor. He paid rent to the lord, mainly in the form of labour, being under obligation to give so many days' service on the lord's demesne during the year.

The arable land of the manor was divided into strips of an acre, or in some cases, half an acre, separated by balks of turf, but otherwise unfenced and in large open fields. Every villein held a number of these strips distributed in various parts of the two or three open fields, and not adjoining. The extent of the holding differed but the hide of 120 ac. appears to have been the conventional holding of the free tenants. Each villein usually had a yardland, conventionally a virgate of about 30 ac. but varying according to the soil. Each cultivator had a number of working oxen proportionate to his holding, eight being regarded as forming a plow team for a "hide" of land.

The manorial organization had no sooner attained these apparently rigid lines than it began to be modified. The villeins struggled continually to secure greater freedom. The "custom of the manor" became established and eventually became binding on the lord as well as the tenants. Individuals more enterprising than their fellows not only acquired larger holdings but in many cases secured a commutation of their services for payment in cash or kind.

Leases. — The long story of the slow dissolution of the manorial system and the eventual evolution of the villein and the serf into the tenant cannot be told here. But by the end of the 15th century a large part of the agricultural land was let to tenants on lease either for a term of years, or for lives, at fixed rents. What was termed a stock-and-land lease was common, the tenant renting not only the land and buildings but also a certain head of livestock. The rent was fixed partly in produce and partly in cash. By the middle of the 16th century probably more than half the land in many parts of the country was let on lease.

The letting of farms was generally established on the basis that the owner provided the land; house and necessary buildings, the tenant supplying the livestock and working capital. The terms on which the farm was let were minutely set out in the lease, the landlord binding the tenant by strict and detailed conditions designed to prevent the property from deteriorating. These conditions or covenants varied on different estates and they were gradually elaborated by the ingenuity of agents and lawyers astute to protect the interests of the owner. The main object of these conditions was to maintain the fertility of the land and to bind the tenant to farm in accordance with what were then considered the principles of good husbandry. The average farmer would not regard them as unreasonable. It was not until the latter part of the 18th century that the "new farming" brought improved practice, more enlightened landowners and more intelligent and responsible farmers.

Leases for 7, 14 or 21 years were offered by the new race of "improving" landlords and eagerly taken by the new race of capitalist farmers. The lease for 21 years was popular in the eastern counties and it was also adopted in Scotland. Leases fell into some disfavour during the disturbed period of the Napoleonic Wars, but when conditions became more stable they again prevailed generally until the depression of the '80s. Many who then held their farms on lease were saved from ruin only by the consideration of landlords, and tenants have ever since been very chary of bind-

ing themselves for long periods. Leases are still common in Scotland, but throughout England and Wales tenancies from year to year (continuing until notice of termination is given) have long predominated.

English Tenant Right.—The equitable claim of a tenant to be recouped for his improvements arose as soon as the letting of farms became general. In many districts custom in some degree mitigated the legal position of tenants. By law, everything that was put into the soil, or attached to the land, became the property of the landlord.

Bills to deal with this injustice were introduced by Lord Portman in 1843 and Philip Pusey in 1847. Both were unsuccessful, but the latter was referred to a select committee before which evidence was given showing the small amount of protection afforded to tenants by custom. In most districts no allowance could be claimed even for durable improvements such as draining or liming, and still less for the use of artificial manures or purchased feeding stuffs.

Still parliament refused redress, and it was not until the political influence of farmers was increased by the Reform act of 1867 and they began to organize in chambers of agriculture that in 1875 the first Agricultural Holdings act was passed in England, Irish legislation of 18 jo having preceded it.

Since then, the tendency has been for the statutory control of agriculture to become more detailed and stringent. In very general terms, for these purposes the 19th and 20th centuries may be said to fall into three main periods. First, before the act of 1875, the predominant feature was freedom of contract. Second, between the act of 1875 and the Agriculture act, 1947, there was an era of increasing protection for the tenant against the landlord. Third, the act of 1947 made permanent the main features of the control of agriculture in the interests of the state which were introduced by emergency legislation during World War II. The second and third periods must now be considered in outline.

1875–1947: Protection of the Tenant.—The Agricultural Holdings act, 1923, represented the culmination of a period during which freedom of contract had been progressively modified by parliament in the interests of the tenant. The act of 1875 was of little value to tenants, for although it gave them the right to compensation for the unexhausted value of improvements made by them, this was subject to any agreement to the contrary, and most landlords accordingly contracted out of the act. The act of 1883 in effect invalidated contracting out unless the lease gave the tenant terms not less favourable than the statutory provisions. With subsequent legislation, tenants received further protection, and under the act of 1923 the main heads were as follows:

1. Removal of *Fixtures.*—Even at common law, when a tenancy ended the tenant might remove any trade fixtures attached to the premises by him. But in Elwes v. Maw (1802), 3 East 38, it was held that agricultural fixtures were not within this rule, and by a series of statutes (commencing with the Landlord and Tenant act, 1851, s. 3, and ending with s. 22 of the act of 1923) tenants were given a general right to remove agriculture fixtures and buildings affixed or acquired by them, subject to various conditions, including giving the landlord one month's previous notice in writing of the intended removal and allowing the landlord to keep the building or fixture on payment of compensation. This right of removal did not apply, however, where the tenant was entitled to compensation for the fixture or building.

2. *Compensation* for Improvements.—The act of 1923 divided improvements into three categories. In the first category, the consent in writing of the landlord to making the improvement was a condition precedent to compensation being claimed by the tenant. In the second category, only notice in writing to the landlord was necessary, while in the third category, neither consent nor notice was required. The items in these three categories, as set out in the three parts of the first schedule to the act of 1923, were as follows:

Part I

Improvements to which consent of landlord is required:

(1) Erection, alteration or enlargement of buildings
(2) Formation of silos
(3) Laying down of permanent pasture
(4) Making and planting of osier beds
(5) Making of water meadows or works of irrigation
(6) Making of gardens
(7) Making or improvement of roads or bridges
(8) Making or improvement of watercourses, ponds, wells, reservoirs or works for the application of water power or for supply of water for agricultural or domestic purposes
(9) Making and renewal of permanent fences
(10) Planting of hops
(11) Planting of orchards or fruit bushes
(12) Protecting young fruit trees
(13) Reclaiming of waste land
(14) Warping or weiring of land
(15) Embankments and sluices against floods
(16) Erection of wirework in hop gardens
(17) Provision of permanent sheep-dipping accommodation
(18) In the case of arable land the removal of bracken, gorse, tree roots, boulders or other like obstruction to cultivation

Part II

Improvement in respect of which notice to landlord is required:

(19) Drainage

Part III

Improvements in respect of which consent of or notice to landlord is not required:

(20) Chalking of land
(21) Clay burning
(22) Claying of land or spreading blaes upon land
(23) Liming of land
(24) Marling of land
(25) Application to land of purchased artificial or other purchased manure
(26) Consumption on the holding by cattle, sheep or pigs, or by horses, other than those regularly employed on the holding, of corn, cake or other feeding stuff not produced on the holding
(27) Consumption on the holding by cattle, sheep or pigs or by horses, other than those regularly employed on the holding, of corn proved by satisfactory evidence to have been produced and consumed on the holding
(28) Laying down temporary pasture with clover, grass, lucerne, sain-foin or other seeds, sown more than two years prior to the termination of the tenancy in so far as the value of the temporary pasture on the holding at the time of quitting exceeds the value of the temporary pasture on the holding at the commencement of the tenancy for which the tenant did not pay compensation
(29) Repairs to buildings, being buildings necessary for the proper cultivation or working of the holding, other than repairs which the tenant is himself under an obligation to execute:

Provided that the tenant before beginning to execute any such repairs shall give to the landlord notice in writing of his intention, together with particulars of such repairs, and shall not execute the repairs unless the landlord fails to execute them within a reasonable time after receiving such notice.

The measure of compensation payable was the sum which fairly represented the value of the improvements to an incoming tenant, and in general was to be settled by arbitration in default of agreement.

3. Compensation for "High Farming."—A tenant who adopted continuously a standard or system of farming more beneficial to the farm than the system required by the tenancy was entitled to compensation equal to the value to an incoming tenant of the adoption of that standard or system.

On the other hand, if the value of the farm deteriorated through the tenant's bad husbandry or failure to comply with the terms of the tenancy, he was liable to pay to the landlord compensation for the deterioration (ss. 9, 10).

4. Compensation for Disturbance.—If a landlord terminated a tenancy by notice to quit not given on certain specified grounds, the tenant was entitled to compensation for disturbance (s. 12). The compensation was a sum equal to the loss and expenses directly attributable to the tenant quitting the holding, with a minimum of one year's rent and a maximum of two years' rent. In order to exclude any claim for compensation under this head, the notice to quit had to be given, and state that it was given, on one of the following grounds:

(1) That the tenant was not cultivating the holding in accordance with the rules of good husbandry
(2) That he had failed to pay the rent due, or to remedy any breach of a condition of the tenancy consistent with good husbandry
(3) That he had materially prejudiced the interests of the landlord by committing a breach which was not capable of being remedied of any condition of the tenancy consistent with good husbandry
(4) That he had become bankrupt

(5) That he had refused or failed to agree to a demand by the landlord for arbitration as to the rent to be paid for the holding

(6) That he had unreasonably refused or failed to comply with a demand by the landlord to execute an agreement setting out the terms of the tenancy.

These provisions did not directly confer any security of tenure on the tenant. though indirectly they did much to protect competent tenants by penalizing any landlord who gave notice to quit without good cause.

5. Notices to Quit.—In general, no notice to quit was valid if it purported to terminate a tenancy before the expiration of 12 months from the end of the current year of tenancy (s. 25). Further, no tenancy for a fixed term of two years or more could expire automatically by effluxion of time, for unless either party gave at least a year's notice to determine it on the expiration of the term, it continued as a yearly tenancy (s. 23). These provisions generally prevented the inconveniences of an agricultural tenancy being terminated while the crops were still growing.

After 1947: The Interests of the State.—The Agriculture act, 1947, put many important changes in the law on the statute book. Those relating to landlord and tenant were consolidated with the surviving provisions of the act of 1923, and became the Agricultural Holdings act. 1948. Other provisions of the act of 1947 continue unrepealed, affecting both owner-occupiers and landlords and tenants alike. The act of 1947 had as one of its dominant notes the public interest that inefficient farming should be eradicated: the owner must comply with the rules of good estate management, the occupier with the rules of good husbandry. To achieve this, the minister of agriculture and fisheries, acting in practice through county agricultural executive committees, was given the three weapons of supervision orders, directions and dispossession orders.

Good Estate Management and Good Husbandry.—In general, by s. 10. the test of good estate management was whether the management "is such as to be reasonably adequate. having regard to the character and situation of the land and other relevant circumstances, to enable an occupier of the land reasonably skilled in husbandry to maintain efficient production as respects both the kind of produce and the quality and quantity thereof." In determining this, regard was to be had "to the extent to which the owner is providing, improving, maintaining and repairing fixed equipment on the land in so far as is necessary to enable an occupier of the land reasonably skilled in husbandry to maintain efficient production as aforesaid." The standard of good husbandry was laid down by s. 11. The occupier of an agricultural unit achieves this standard "in so far as the extent to which and the manner in which the unit is being farmed (as respects both the kind of operations carried out and the way in which they are carried out) is such that, having regard to the character and situation of the unit, the standard of management thereof by the owner and other relevant circumstances, the occupier is maintaining a reasonable standard of efficient production, as respects both the kind of produce and the quality and quantity thereof, while keeping the unit in a condition to enable such a standard to be maintained in the future." In determining this, regard was to be had to the extent to which

"(a) permanent pasture is being properly mown or grazed and maintained in a good state of cultivation and fertility and in good condition;

(b) the manner in which arable land is being cropped is such as to maintain that land clean and in a good state of cultivation and fertility and in good condition;

(c) the unit is properly stocked where the system of farming practised requires the keeping of livestock, and an efficient standard of management of livestock is maintained where livestock are kept and of breeding where the breeding of livestock is carried out;

(d) the necessary steps are being taken to secure and maintain crops and livestock free from disease and from infestation by insects and other pests;

(e) the necessary steps are being taken for the protection and preservation of crops harvested or lifted, or in course of being harvested or lifted;

(f) the necessary work of maintenance and repair is being carried out."

Supervision Orders.—If the minister was satisfied that the owner of agricultural land was not managing it in accordance with the rules of good estate management, or that the occupier was not farming his agricultural unit in accordance with the rules of good husbandry, the minister might make a supervision order in respect of the owner or occupier, as the case might be. The order gave the minister powers of inspection, direction and dispossession. and had to be reviewed every year. The owner or occupier had to be given opportunities of making representations both before the order was made and before it was reviewed; and when the order was no longer necessary, it mas to be revoked (s. 12).

Directions.—While a supervision order was in force, the minister might give directions to the person affected by the order, so as to secure good estate management and good husbandry. Such directions in practice covered a wide field, from the provision of buildings and other fixed equipment to drainage works and modes of cropping. An opportunity of making representations had to be afforded before a direction was given, and disobedience to a direction was punishable by fine (s. 14).

Dispossession.—If a supervision order had been in force for at least a year and the management of the land did not show satisfactory improvement, the minister might purchase the land compulsorily. The owner had first to be given an opportunity of making representations, and he might require the proposal to be referred to the appropriate agricultural lands tribunal for decision (s. 16). Eight of these tribunals were set up, each with a barrister or solicitor appointed by the lord chancellor as chairman, and two other members appointed by the minister, representing farmers and owners respectively (9th sched.)

There were corresponding provisions where the farming did not show satisfactory improvement after a supervision order had been in force for a year. The minister might order the tenant to give up his tenancy and the owner to farm the land himself or let it to an approved tenant: and might order an owner-occupier to let it to an approved tenant. In each case, there were similar provisions as to making representations and referring cases to the agricultural lands tribunal (s. 1;). In case of default, the minister might take possession of the land and arrange for it to be farmed (s. 18).

Landlord and Tenant.—Although the changes in the law of landlord and tenant of agricultural land made by the act of 1947 and repeated in the act of 1948 were not so revolutionary, they were far-reaching enough. Perhaps the most important was the conferment of security of tenure on agricultural tenants by enabling them (subject to important exceptions) to nullify any notice to quit served on them unless the minister (acting in practice through county agricultural executive committees) considered that it should take effect on certain specified grounds.

Security of Tenure.—The act of 1948 preserved the former provisions requiring at least 12 months' notice to quit and continuing a tenancy for a term of two years or more as a yearly tenancy, subject to notice to quit (ss. 3, 23). What was more important was that, with six exceptions, a tenant who received a notice to quit might prevent the notice from having effect by serving a counter-notice on the landlord within one month. If he did this, the notice would be ineffective unless the minister gave his consent to the notice taking effect; and only in five cases was the minister entitled to give that consent.

The six exceptions were: (1) where the land was required for some nonagricultural use for which permission had been given under the town and country planning legislation; (2) where the minister had within the previous six months certified that the tenant was guilty of bad husbandry; (3) where the tenant had failed to comply with a notice requiring him within two months to pay his rent or remedy some breach of a term of his tenancy; (4) where the landlord's interest had been materially prejudiced by a breach of some term of the tenancy which could not be remedied; (5) where the tenant was bankrupt; and (6) where the notice mas given within three months of the death of the tenant. In all these cases, the notice had to state the ground upon which it was given (s. 23). The five cases in which the minister was given a discretionary power to give or withhold his consent were (1) where the termination of the tenancy was desirable in the interests of efficient farming; (2) for the purposes of agricultural research, education, experiment or demonstration, or of the legislation relating to smallholdings or allotments; (3) where the tenancy mas created after Aug. 5, 1947, and the notice was given for a purpose specified

in the tenancy agreement for which the landlord's interest was held immediately before the creation of the tenancy, and greater hardship would be caused by the minister's withholding his consent than by his granting it; (4) where the tenancy was created before Aug. 6, 1947, and the landlord was landlord on that day, and greater hardship would be caused by the minister's withholding his consent than by his granting it; and (5) that the landlord proposed to terminate the tenancy so that the land might be used for some non-agricultural use not covered by the first of the six exceptions stated above. The minister had to give the parties an opportunity of making representations before deciding the case, and his decision was subject to appeal to the agricultural lands tribunal (s. 25).

Rent.—Another new provision enabled either party to have the amount of the rent referred to arbitration not more frequently than once every three years. Any increase or decrease authorized by the arbitrator operated as from the date when the tenancy could next have been determined by notice to quit given when the reference was demanded (s. 8). Further, the landlord might make increases of rent for certain improvements carried out by him (s. 9).

Terms of Tenancy.—There were other new provisions enabling either party to an unwritten tenancy agreement to have the terms of the tenancy put into writing, settled by an arbitrator in default of agreement (s. 5), and empowering the minister to prescribe terms as to the maintenance of fixed equipment which would be deemed to be incorporated in every tenancy agreement (s. 6).

Other Provisions.—The act of 1948 repeated a number of provisions from the act of 1923, with some amendments. Thus it included provisions as to removal of fixtures and buildings (s. 13), for compensation for high farming (s. 56), for deterioration (ss. 57–59), and for disturbance (s. 34), though there were some variations in the grounds upon which compensation for disturbance was excluded. These grounds came to be all save the first of the six exceptions from the rule that a tenant who received a notice to quit might serve a counternotice (see above: Security of Tenure). The rules as to improvements must be mentioned separately.

Improvements.—The three categories of improvements and other matters for which compensation was payable (as set out in the 3rd and 4th schedules to the act of 1948) were (1) those for which the consent of the landlord was required; (2) those for which the consent of the landlord or the approval of the minister was required; and (3) those for which neither consent nor approval was required. Various minor amendments were made to a number of items, but substantially the first category consisted of items (4)–(6), (10), (11) and (14) of the list of improvements under the act of 1923 (supra), together with the making of watercress beds. The second category substantially consisted of items (1), (2), (7)–(9), (13), (15)–(19), (22), (24) and (29), with the addition of the provision or laying on of electric light or power, or of means of sewage disposal, and the growing of herbage crops for commercial seed production. The third category substantially consisted of items (3), (12), (20), (21), (23) and (25)–(28), with the addition of mole drainage and works to secure its efficient functioning, crops (whether growing or harvested) grown in the last year of the tenancy which the tenant was not entitled to sell or remove, and seeds sown and cultivations, fallows and acts of husbandry performed on the holding at the expense of the tenant.

World Aspects.—The English system of land tenure is unique. The outward form of landlord and tenant is preserved, but the real control of the land lies with the tenant, the landlord being little more than a recipient of rent; and both landlord and tenant are subject to a degree of control by the minister which not infrequently proves both real and burdensome. On the other hand, apart from communist regimes, over the great part of the world the occupiers of agricultural land are the owners of it: peasant proprietorship is predominant, and where there is a dual interest in the land, the most common system is that of some form of métayage (see MÉTAYAGE SYSTEM). However, in some countries a tenancy system not unlike the English system has developed. In Flanders, some leases probably existed as early as the 13th century, but the earliest tenure generally adopted was métayage, which was gradually replaced by a form of lease of stock and land known as "cheptal." Standards of husbandry were high, and in the 16th and 17th centuries they were held up as a model for English farming. By the end of the 18th century, cheptal had been replaced by the landlord and tenant system. The emphyteutic tenures of the 18th century in Belgium (long leases of 27 to 99 years under which the tenant was entitled to erect buildings at his own cost) were gradually replaced by yearly tenancies or tenancies for short terms (*e.g.*, nine years, determinable by either party at three or six years). In Denmark, on the other hand, owner-occupation is the rule and tenancies the exception, though an act of 1919 vested in the state about 120,000 ac. of land suitable for small holdings, some of which was let to tenants with absolute security of tenure as long as the holding was cultivated satisfactorily. France, too, is typically a country of peasant-proprietors.

The Economic Effect of Tenure.—The line of demarcation between tenancy and owner-occupation is less well-defined than might at first appear. A tenant may be strongly protected by law and custom, an owner-occupier may be subject to extensive control by the state. Even where the ownership is unrestricted, it cannot in truth be asserted that owner-occupation necessarily ensures the most economic use of land.

The dictum of Arthur Young that "the magic of property turns sand into gold" is not an unchallengeable truth of universal application. True, the assurance that a man may reap and retain for himself all the fruits of his labours is a potent spur, but psychological, political, racial and other factors may counteract it; and for similar reasons, even unprotected tenants may bring the art of husbandry to the highest level, as in Flanders, and in England in the early 19th century. The best view seems to be that although conditions of tenure may have a considerable effect on the economic use of land, they are not decisive. Further, no entirely permanent or universal system of tenure has ever been evolved or is likely to be evolved; diversities in the economic, political and legal systems from generation to generation and country to country are too great to permit of any real degree of uniformity. (See also LANDLORD AND TENANT).

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(R. E. MY.)

THE UNITED STATES

When the English colonists landed at Jamestown and Plymouth Rock, their concepts of land tenure were strictly English. Many of them were fleeing from a feudal land system as well as from religious oppression. All rights to the land of the new world were held by the English king, who assumed ownership by right of discovery and maintained control by the sword. The king granted land to large trading companies, to proprietary and corporate groups and to prominent individuals. These in turn regranted rights in the land to settlers—grants that were frequently in family-size farms but sometimes in large plantations.

The large settlement agencies held the land under the king, while the settlers held the land under the agencies, according to the common law of England. The major right which the sovereign customarily reserved in the grant, except that the land was "to be

holden of us," was a one-fifth part of the precious metals — usually gold and silver — and a smaller portion of the base metals. The settlement agency customarily reserved an annual quitrent, and sometimes an additional portion of the metals. The settler-owner had to meet specific settlement requirements imposed in the grants and to conform to English land law. The landowner's rights in colonial America were much the same as they continued to be after the American declaration of independence, except in three major particulars.

The eldest son frequently inherited the entire estate through the practice of primogeniture; the estate could be maintained in the family name from generation to generation through the practice of entail; and the overlord reserved a quitrent in perpetuity. These differences, however, made land tenure in colonial America quite unlike the free tenure system that had developed by the end of the revolution.

Indian Land Tenure. — The colonists found that the Indian tribes had their own land tenure ideas. Early nomadic Indians conceived the earth as "mother," and in this sacred role she supplied food for her children; her bounties were free to all who would take them. Land was not owned, a condition that prevailed in most early civilizations.

Later, as the Indians settled in local communities and began to cultivate small garden plots, they remained upon the land that they cultivated and excluded others from it. Their idea of property in land was the right of possession or occupancy through use, which was usually individual and rigidly enforced. They did not transfer rights in land to another through gift, sale or inheritance. Rather, ownership of the land belonged to the tribe, conceived of as a type of communal ownership.

Most settlers recognized the ownership-occupancy rights of the Indians. Before settling on the land, title to it was acquired through purchase, gift, treaty or lease. In some cases, however, as the white man settled an area, the red man abandoned adjacent territory. In many cases the Indians' land was actually seized. In fact, land dealing with the Indians created so much trouble that the colonial assemblies passed many acts to prevent private parties from acquiring land directly from the Indians. These acts were consolidated into national legislation in 1783, and many of the general principles were followed throughout the westward march across the prairies.

The Indians' tribal concept of landownership was adhered to until 1887, when the General Allotment act inaugurated a new policy. Individual Indians were to be allotted land for their own use under arrangements that would result in fee-simple title. At that time Indians held 130,000,000 ac. of land. But their holdings dwindled away until by 1933, they held only 49,000,000 ac. An effort was then made to help the Indians regain sufficient land to become self-sustaining, and by 1952 the federal government held 59,763,707 ac. in trust for the Indians; approximately 72% was tribally and 24% privately controlled, and 4% was held for miscellaneous purposes.

The Land Tenure System at the Revolution. — Before the American Revolution, the basic form of the land system was rather fully accepted in practice, and many features had become formalized in law. In general terms, it was held that all rights in land originally reside in society. Thus, when land was turned over to private parties, society reserved such rights as appeared essential to the proper functioning of government. The three most common societal reservations were the right to tax for public revenue, the right to retake for public purpose all or part of the rights with fair compensation, and the right to adjust (under the police power) the conditions under which land was held by private parties. This meant that all private rights in land were qualified and never complete or absolute.

At the time of the revolution, general agreement prevailed that the government should alienate most of the public land to private parties under fee-simple titles. Government regulations were to be kept to a minimum, leaving the individual as much freedom as practicable in the exercise of his rights.

After the mar, the land that belonged to the British crown went to the 13 states. Land belonging to those who did not support the revolution had been confiscated earlier, and it had become state owned. No one questioned the right of each state to the unsettled land within its borders. However, seven of the states, Massachusetts, Connecticut, New York, Virginia, North Carolina, South Carolina and Georgia, claimed land to the west; all except New York held sea-to-sea grants under original charters from the English crown.

In regard to this western land several questions arose: Who would have charge of settlement of this territory? What rights would the settlers hold in the land? Who would govern this territory? What form of government would be established? The fight among the states over the western lands was long and bitter; at times it seemed that this alone would rend asunder the new nation.

A full month before the Articles of Confederation were presented for ratification, Maryland proposed that both settlement and government of the western territory should be the responsibility of the federal government. The idea was so revolutionary that the ninth Article of Confederation was amended so that no state would be deprived of its territory for the benefit of the federal government. This did not settle the conflict, however, for the matter was considered by congress before the war was over and was resolved only after thorough study and debate. New York led the way by offering to cede its western lands to the union on Feb. 19, 1780. The last cession was ratified by the Georgia legislature on June 16, 1802. This series of cessions marked the beginning of the public domain. By several large purchases (*e.g.*, the Louisiana Purchase) and annexations, this original public domain was enlarged until it included a total of 1,309 591,680 ac., or about two-thirds of the entire land area of the U.S.

The Northwest Ordinances. — The disposition of this vast land area was one of the most interesting and instructive experiences in the life of the new country. The federal government was forced into a vast land merchandising business with the basic objectives of getting the land settled quickly and the new states formed. But how was this to be done? The questions were debated no less heatedly than had been the cession of land to the federal government. As a result, the Northwest ordinances of 1785 and 1787 outlined the way the land would be alienated, the kind of tenure under which the settler would hold his land and the rules by which new states would come into the union.

The main tenure provisions of the ordinance of 1785 indicated the way the land would be alienated. It was provided that after the land was purchased from the Indians, it would be laid out in six-mile-square townships and sections of 640 ac., thus establishing the rectangular survey rather than the metes and bounds system. The first tracts surveyed would be drawn by lot for the military bounties promised soldiers and sailors under earlier legislation. Then the land would be offered for sale by whole townships and smaller lots. at one dollar per acre. Certain lands would be set aside for educational purposes, and one-third of the gold, silver, lead and copper would be reserved. The recipients of this land would hold it in fee-simple tenure and could transfer it by deeds which would be recorded locally.

Although the main features of the ordinance of 1787 were concerned with government, several provisions dealt with land tenure. The ordinance specifically provided that, in the absence of a written will, land would descend to the children in equal parts, with the widow receiving a third portion. Wills and deeds had to be duly proved and recorded within a year in order to be binding.

The ordinance also dealt specifically with two of the reserved powers. Regarding taxes, it provided that resident and nonresident owners would be taxed alike, and no tax would be imposed on land held by the federal government. Regarding the taking of private land for public use, this would be done only when necessary and then only upon full compensation.

Alienation of the Public Domain. — From the end of the war to 1800, because of the urgent need for money, the federal government sold the public domain in 36-section townships and 640 ac. sections for a minimum of one dollar per acre to be paid within a year. Disposal was slow, and revenue was less than anticipated. As a consequence, from 1800 to 1820 the minimum area

was reduced to 320 ac., and land was sold on credit at two dollars per acre, with payment extended to five years. Credit encouraged speculation, and frequent extension of the time allowed for payment spelled failure for the credit sales. This process was abolished in 1820, after 19,399,158 ac. had been sold. The 1820 act further reduced the minimum size to 80 ac. and the price to $1.25 per acre, but no credit was allowed. Many settlers. however, occupied land and established homes without acquiring title. These squatters wanted the land free of all charges, and under this pressure the revenue-producing idea fell into disuse.

The Pre-emption act of 1841 acceded to the wishes of the squatter-settler, who was given first opportunity to buy his claim up to 160 ac. This meant the substitution of private sales for public auction. In 1854, the graduation law made land available at 12½ cents per acre after it had been on the market for 30 years. This was done to hasten the sale of land in the public domain that had been passed up for better land to the west. During the eight years that this law was in effect nearly 26,000,000 ac. were sold, much of it to speculators.

But all of the public domain was not sold for immediate settlement. Between 1841 and 1871, the famed land-grants period, large areas (99,000,000 ac.) were given to the states for education and internal improvement. Especially large grants were made for the establishment of agricultural and engineering colleges. The railroads also received large grants (129,000,000 ac.) during this period.

The sales and pre-emption era ended in 1862 when the Homestead law was enacted. This law made available to settlers 160-ac. tracts of land if they would live on them and cultivate them for five years. Length of residence was soon reduced to three years, and later the commutation privilege provided that a person might buy the land at $1.25 or $2.50 per acre after meeting certain requirements which did not include residence on the land.

Several additional acts dealt with public lands. In 1877, the Desert Land act provided that a settler could buy 640 ac. of desert land for $1.25 per acre, if he would irrigate it within three years. Under the Carey act of 1894, the states acquired about 4,000,000 ac. for irrigation and settlement. Settlement of the arid west presented such formidable problems, however, that in 1902 the federal government undertook construction of reclamation projects, the cost of which, without interest charges. was to be repaid by the settlers. In 1911, the Warren act authorized the sale of surplus water for land already irrigated. As settlement moved westward the limitation of 160 ac. for homestead grants was increased to 640 ac. by the Kinkaid act (1904), which applied only to Nebraska, and later the limit was raised to 320 ac. for the other states by the Enlarged Homestead act of 1909.

Most of the better lands of the public domain were alienated by 1934. As a part of the rapidly growing conservation movement, it was decided that the grazing lands would be best conserved and most productive if retained in public ownership. As a consequence, the Taylor Grazing act of 1934, as amended, closed the public domain to private entry for all practical purposes. The 142,000,000 ac. of public land thus' retained was placed under the administration of the department of the interior.

Interest in forest land conservation antedated withdrawal of the grazing land. In 1873, the Timber Culture act allowed a farmer 160 ac. additional land if he would grow trees on one-iourth of his farm. The law did not yield anticipated results and was repealed in 1891. Large lumber companies monopolized most of 12,000,000 ac. of timber land acquired directly and indirectly under the provisions of the Timber and Stone act of 1878. By 1923, a total of 26j.500,000 ac. of the public domain had passed into private hands under the Homestead, Timber Culture, Desert Land and Reclamation acts.

The disposition of coal lands was first regulated by general laws in 1864 and 1866. Subsequently, several enactments were designed to regularize the alienation of these lands, and in 1920 a leasing policy ior such land was developed and included other minerals. Numerous acts set aside land for public parks and monuments and otherwise made special parcels of land available for public use.

Research, Education **and** Credit.—The basic land-tenure system outlined by the founding fathers endeavoured to give the farmer almost complete, but not absolute, freedom in the use and disposition of his land. The policies followed in the alienation of the public domain endeavoured to divide much of the agricultural land into family-sized units. Great faith was placed in private landownership. The individual family farmer, however, was not left entirely alone. Several far-reaching programs were developed to assist him and to promote the general welfare.

The first program, and one of prime importance, was a great publicly supported program of agricultural research. Public land at first was given free to establish the land-grant colleges, and both federal and state funds were used to carry on the various research activities in these colleges and the experiment stations. Public support of research for the farmer was expanded until it has become one of the three programs supporting the family farm system of land tenure.

The other two programs are education and credit. From a small beginning, $1,000 in 1839, to establish the forerunner of the department of agriculture, to the large land grants and the liberal appropriation of funds, public research was expanded into all the states and more than 3,000 counties.

The extension service came into being in 1914, providing for federal-state co-operation in education, home improvement and other services ior farm families. The newspaper, magazine, radio and television all keep the farmer up-to-date. Bulletins, circulars, leaflets, demonstrations, discussion groups and many other services are integrated so the farmer can get the information he needs when it will be most helpful. Adult education among farmers was made more effective by the introduction of agricultural courses into rural high schools, again with public financial support.

In 1916, the agricultural credit system was overhauled, and publicly sponsored credit for the farmer became commonplace. Farmers had testified that they could not attain landownership, conserve their farms and produce needed food and fibre for an expanding population without an ample supply of the right kind of credit. They wanted credit when it was needed, at interest rates of less than 10% per year; for terms longer than the conventional three to five years; and free of frequent and excessive renewal charges. The new credit that was evolved under the influence of public action provided for long-term loans—20 to 30 years; the amortization principle was added—calling for a small repayment each year. and a lower rate of interest was provided.

The Depression **Years.**—During the depression of the 1930s many shortcomings of the land tenure system and related institutions became obvious. More agricultural land was being rented by the operator; tenancy and sharecropping had increased from about 25% in 1880 to 42% by 1935. Absentee ownership was common in many of the best land areas. Speculation had priced good farmland out of reach of many family farmers, and there was marked evidence of the concentration of landownership in large-scale farms in several areas. Migrant farm labourers. unable to climb the so-called agricultural ladder to tenancy and on to ownership, followed the crops and received for their toil an income too low for even subsistence living.

Even for those farmers who attained owner-operatorship, the magic of landownership did not "turn sand into gold." The rich topsoil, particularly in the rolling land areas, on owned as well as rented farms, was wasting away at a terrific pace. Soil erosion was approaching a national disgrace and dust storms plagued much of the Great Plains area. The denuding of forest and grazing lands increased the incidence of floods throughout the larger river systems. It was clear that man was appropriating the bounties of nature for immediate gain, and that conservation, development and improvement of landed resources did not flow naturally from the land tenure system.

The unrestrained disposal of the public domain had resulted in unnecessary hardships for many farm families. Settlement was pushed into marginal land areas, where the farmer could not eke out an existence from the unyielding soil. Scattered settlement leit many farm families without schools, roads, hospitals, churches and other essential services. In grazing areas a family farm had

to be many times larger than the Homestead grants of a quarter or even a half or full section. As a consequence, many farms in grazing areas were plowed for wheat, and these together with the small cattle ranches fell into financial difficulties during the depression years of the 1930s.

The idea of placing all of the public domain in private hands had proved faulty. The forests were razed; the large lumber companies moved on immediately to virgin forest land; and the cut-over areas demanded special consideration. Much of the grazing land was either given over to arable agriculture or was denuded through overgrazing. Mineral lands likewise were exploited for a quick profit, and stranded population in many communities presented difficult problems.

English common law governing tenure relations that survived the revolution was not adapted to 20th-century agriculture. Probably the most obvious and widespread difficulty arose out of the faulty tenancy system. Only minor adjustments had been made in landlord-tenant relations in the U.S. during the 150 years following Cornwallis' surrender. England, on the other hand, had completely revamped its tenancy laws to ensure good farming, proper land use, maintenance of improvements and secure occupancy for the tenant farmer. In the U.S. short-term, oral leases fostered widespread mobility of tenant farmers. In 1930, only 26% of them had been on their farms for as long as five years. Tenant farmers put a larger proportion of their land in intertilled crops, kept less livestock and followed fewer soil-conserving practices than owners. In addition, the right to foreclose a delinquent mortgage, even during a severe depression, was so widely exercised that farmers in at least one of the better land areas finally banded together and prevented legal foreclosure sales. Likewise, the property tax system was not adapted to widely fluctuating farm incomes, and more than half of the farms in many communities became tax delinquent and tax titles to family farms were taken by county and state governments.

Remedial Action.—These weaknesses of the U.S. tenure system had permitted considerable damage, and the government moved in to establish several major programs. The publicly sponsored farm credit program was expanded greatly to reduce loss of ownership by family farmers. The federal treasury stood behind tens of thousands of loans to farmers so they could pay off mortgages held by private loan companies.

At the same time foreclosure moratoria laws were passed to give the farm owner a breathing spell during which time he could get his financial house in order. In addition a rural rehabilitation program was undertaken to help tenant farmers and small operators. A submarginal land purchase program was also organized to bring back into public ownership land that never should have been alienated and to make it financially possible for stranded families to locate in good land areas.

But these programs were not enough to save the disadvantaged small farmer, tenant, sharecropper and wage labourer. Under the Bankhead-Jones Farm Tenant act of 1937 the rural rehabilitation program was revamped and expanded. and a new credit program was set up to stop the drift'into farm tenancy. This tenant-purchase program made loans for land purchase available to worthy tenants, sharecroppers and labourers who could not obtain funds from established sources. The salient features of this new type of credit were: (1) loans were made up to 100% of the purchase price of the farm, which was in sharp contrast with the 50% maximum before 1933 and even the 75% maximum possible under the government guaranteed commissioner loan; (2) loans were made for 40 years at 3%, which was in sharp contrast to the 3- to 5-year loans at 6% to 10% interest prior to the first agricultural credit act of 1916; (3) variable payments were added to the amortization principle so that payments could be increased in good years and reduced in years of low farm income; (4) special guidance and supervision were supplied the tenant-purchaser as double security for the loan; and (5) the recipients were selected by local committees on the basis of their personal characteristics and not their accumulated equity.

Land tenure research and educational programs were expanded greatly, with major attention centred on ways and means of accelerating progress up the agricultural ladder to ownership, improving the tenancy system and expanding the use of relatively new devices such as co-operative grazing associations, rural zoning, conservancy districts and other types of group control over private lands.

World War II and After.—World War II brought about feverish activity to meet the increased demands for food, fibres and vegetable oils. The various tenure-improvement programs were readjusted so that each could contribute the maximum to the war effort. In addition, postwar planning activities were established in the U.S. department of agriculture and by the Association of Land-Grant Colleges and Universities. It was generally agreed that the farm tenure system should be judged in terms of its contribution to efficient production of needed farm products, conservation and development of agricultural resources, equitable distribution of farm income, reasonable security of occupancy and good community life.

The suggestions to strengthen the general farm tenure situation included expanding credit for farm enlargement and intensification, reducing concentration of ownership, a special land program for returning veterans and improving the inheritance system. The family-farm idea was to be underwritten by endeavouring to keep land prices in line with farm earnings, to protect the farmer-borrower against drastic fluctuations in farm income and to reduce current inequalities in the tax system. These groups also suggested improving the tenancy system through legislation to strengthen weaknesses in present relations and through education to attain better farming practices on tenant farms. The share-cropper's position would be clarified by conferring tenant status upon all operators sharing the crop and other produce with the landlord.

It should be noted that these suggestions stressed the continued and expanded use of research, education and credit to improve the tenure situation of the U.S. farmer. In addition, they included adjustments in the tenure system itself—in the laws governing the relationship among the various holders of rights in land.

The 1950 census of agriculture revealed significant changes and considerable improvement in the tenure situation of the U.S. farmer. The more salient statistical features of the situation at that date were: (1) the rapid decline in the number and percentage of tenant farms since 1930—from 42.1% to 26.8%; (2) the significant increase in part-owner operation, rising from 10.1% in 1940 to 15.3% in 1950; (3) the relatively high proportion of land still operated under lease, being 35.4% in 1950; (4) the high percentage of agricultural production grown on farms whose operators rent all or a part of their land (such farmers operated 54.8% of the land, produced 62.2% of the value of all crops and 48.7% of the value of livestock and livestock products); (5) the high average age of all farmers (48.3 years, with more than one-third [34.6%] being over 55 years of age); (6) the short-term occupancy, particularly among tenant farmers which averaged only six years; (7) the increase in average size of farm from 174.0 ac. in 1940 to 215.3 ac. in 1950; (8) the increased prevalence of telephones, electricity, trucks, automobiles and hard-surfaced roads among tenant as compared with owner farms.

In spite of these improvements, many weaknesses in the tenure system still persisted in the 1950s. Only a few of the recommendations of the postwar planning groups had been put into effect, and only minor adjustments had been made in the basic structure of the tenure system. Major emphasis continued to be placed upon research, education and credit. In regard to credit, a de-emphasis of publicly sponsored credit was evident and if continued would retard proposed adjustments in the credit system. Relatively full industrial employment and high farm income could keep submerged most weaknesses inherent in the tenure system. On the other hand, increased demand for farm products arising from an expanding population and higher levels of living could demand major adjustments in farm tenure arrangements.

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LAND TENURE, PRIMITIVE. For primitive as for modern societies the use of a certain area of the earth's surface "is a primary condition of anything that man can do; it gives him room for his own actions, for the enjoyment of the heat and the light, the air and the rain which nature assigns to that area, and it determines his distance from and, in a great measure: his relations to other things and other persons."

Land tenure is affected by the relative density of population. Thus, among the Andamanese, Radcliffe Brown found that "an average local group consisted of from 40 to 50 persons of all ages, the average number of local groups to a tribe being about ten. This would give the average extent of country occupied by each local group as about 16 sq.mi., but some groups certainly had a larger territory than this, and some had smaller." (*Andaman Islanders,* 1922.) The areas required by other groups of the food-gatherer type are large. Thus, in Arctic America from 70 to 200 sq.mi. are required for the support of the hunters. Pastoral nomads require from 2 to 5 sq.mi., and agriculture, in its most intensive form, with rice as the staple of cultivation, will support a population of over 1,000 per square mile.

A factor which affects the density of an agricultural population and the tenure of land is the method of cultivation employed. Communities in Assam, such as the Lusheis, practise extensive cultivation by the *jhum,* or fire and axe method, which speedily exhausts the resources of an area and compels migration. There are in that area villages with permanent fields with temporary or *jhum* cultivation subsidiary thereto. There are also permanent villages with permanent fields, and *jhum* cultivation in set rotation. (Hodson, *Naga Tribes of Namipur,* 1911). Tenure conditions deal with temporary dwellers with permanent cultivation.

In communities in Africa and India both pastoralism and agriculture are followed. The relations between the groups practising these methods engender problems of land tenure, as do the relations between sections of the community subsisting by hunting. and those practising fixed agriculture. A feature of pastoral life is the periodical movement of communities with their flocks and herds, generally over well-defined routes to definite areas which by custom they are entitled to exploit.

Simple Forms. — The study, therefore, of land tenure exhibits simple forms only in communities where a single method of economic exploitation secures the food supply, such as the Andamanese and Australian tribes. Among the former, the hunting grounds of a local group belong to the whole group and all the members have an equal right to hunt over it, and the boundaries are generally recognized. In Australia, "from time immemorial—that is, as far back as their native traditions go—the boundaries of the tribes have been where they are now fixed. Within them their ancestors roamed about hunting and performing their ceremonies, just as their living descendants do at the present day. There has never apparently been the least attempt made by one tribe to encroach upon the territory of another. Now and again they may have intertribal quarrels and fights, but there is no such thing as the acquisition of fresh territory." (Spencer and Gillen, *Northern Tribes of Australia,* 1904.)

Similarly, among the American Indians such as the Creeks, "every individual inhabitant has an equal right to the soil and to hunt and range over its region, except within the jurisdiction of each town or village, which, I believe, seldom extends beyond its habitations and sporting ground. Perhaps the Uches are to be excepted. They claim an exclusive territory by right of contract, and though they have sometimes put the Creeks in mind of this privilege, when their hunters make too free with their hunting grounds, yet the dispute seldom goes further. as the Confederacy are cautious of offending the Uches and yield. to their common interest and safety." (Bureau of American Ethnology, *Report,* 1924–25, 1928.)

Agriculture, Hunting and Pastoralism. — In East Africa the dominance of the Hamitic pastoralists over the earlier agricultural Negroid population brought two sets of interests into relationship. Thus, among the Bunyoro, cultivation is avoided by the pastoral people; "it is said to be harmful for the wife of a man belonging to the pastoral clan to till the land, as by doing so, she may injure the cattle." (J. Roscoe, *Northern Bantu,* 1915.) The king was the sole possessor and disposer of land, which was valued for its pastoral rather than for its agricultural qualities. Nevertheless, care was taken to provide some measure of security of tenure for the agriculturalists.

Common Holding and Redistribution. — Within a community land is often held in common; even, as among the Creeks, cultivated in common. Thus, "in the town plantation every family or citizen had his parcel or share according to desire or convenience, or the largeness of his family. These fields were planted and cultivated by the town. working together and attending to the several plots in turn. They harvested at the same time, but each family harvested from its own plot." (Bureau of American Ethnology. *Report,* 1924–25, p. ,336.)

Communities are known which practise the periodical redistribution of land. Thus, among the Marris in Baluchistan. land was divided every ten years. "The tribe welcomed, indeed depended upon, the admission of strangers for the maintenance of its strength, and it was not until after a man or group had been given a share of tribal land that women were given to him or them in marriage. At the time of the decennial division of land, the number of males of whatever age, in every sub-section of each section, is counted. In some cases the division takes place among the married men of the section. . . . Lots are drawn." (*Census of India,* vol. v, 1901.)

Among the Brahuis "Following the distribution of armed men among the clans and sections, came the division of the land which had been acquired under Kacchi. The share of land of each clan was proportionate to the number of armed men it had to produce, and the same system was followed in the case of each Dhagana or section until the individual was reached. Previous to this, however, a portion of land was specially set aside

for the chief, in addition to that to which he was entitled on account of his responsibility for 20 armed men No individual is allowed to part with his land, and if a section happens to be reduced to such small numbers as to be unable to undertake the burden of supplying the armed men assessed on it, a redistribution of the armed men is made among the remaining sections of the clan. A similar process is followed if a clan becomes extinct " Mention is made of redistribution of clan land among the Lhota Nagas

In Central Africa, the land held by a community is invested in the chief as its head and representative. He is the mumi-inshi ("master of the land "). He may not alienate it except by the permission of his people. He receives it with all the taboos attached to it—the sacred groves, the trees, ant-hills, pools, streams, the *matongo,* all of them uith taboos attached—and it is his to see that none is violated, and to hand them all to his successor intact Should a stranger wish to live on the land, a *lubeta* is called and the matter discussed. Many things have to be taken into consideration, including the character of the applicant There is need for some circumspection in this respect for sometimes an undesirable person gets his head in and ends by turning the rightful owner out, or at least, making himself the master. But unless patently undesirable the chief and his people are not likely to refuse him, because he adds to their number and dignity. The chief points out a place where he may live and cultivate, and informs him of taboos which he needs to know. If he oversteps the borders allotted to him he will get into trouble. (Smith and Dale, *Ila Speaking* Peoples, 1920)

Where a community or society comprises minor sub-divisions or has certain typical institutions; these often occupy land as distinct units Thus, among the Lhota Nagas "land can be held either by the village, a *morung,* a clan or an individual. The land close to a village is generally waste land, and common property, as are the rights of "poisoning" in certain pools. Every morung owns land, which is the property of the morung as a whole, and not of individuals It is worked by the boys of the morung and the produce used to buy meat for ceremonies such as the rebuilding of the morung . . . A very large proportion of the land in the Lhota country is clan land, which is held in common by all members of that particular clan or village. A man who leaves a village loses all right to clan land in the village. . . . Every year the members of the clan in a Lhota village meet and portion out land which each is to get that year, the senior men getting the bigger share. Strangely enough, this delicate operation never seems to result in a quarrel . . . When direct heirs fail the land becomes clan land. If this were to go on indefinitely the whole of the land in a village would in time become clan land and no one would then be able to buy or sell land. To prevent this, from time to time when the amount of common land becomes unwieldy, the clan meets and divides it up among the members who thus each become private owners of a portion of it. The process then begins again." Recognition of the *morung* or Man's House as a land holding unit indicates the rudiments of corporate tenure.

Among the Ila the boundaries are well recognised. "No passer-by would know these boundaries. They are purely natural—a tree, an ant heap, a certain direction; all very vague, apparently, but known to all concerned as well as if fenced in uith a stone wall. All boundaries are taboo. The chief apportions the land to his people for their fields, but does it in the presence of a company so that there may be no doubt of it. When a person has his field apportioned, he puts in a few stakes, and afterwards clears a line round it Woe to anyone who moves his neighbour's marks!" (*Ila Speaking People,* vol. i , 1920), the sentiment of the Commination service, where "Cursed is he who moves his neighbour's land mark." The sacred boundary stone, the natural landmark, the hill, the ravine, the river, acquire sanctity.

Religious Sanctity.— In Australia totem groups are associated with definite spots which are therefore sacred, and men belong to a spot because they originated there. The spot is sacred to the men because it is the place of their origin, because it is the place to which at death their spirits return, thence to be reincarnated. So, too, the Birhors of Chota Nagpur regard with reverence the hills from which the ancestor of their clans emerged. Thus the sentiment of sacredness attaches to selected spots which are distinguished from other adjoining or similar spots by the traditional sentiment whose maintenance adds to the solidarity of the society.

Religion colours the attitude of primitive man towards the land area he occupies The Ila chief manages the land of the community as its head representative. "He receives it with all taboos attached to it—the sacred groves, the trees, the ant-hills, pools, streams, the *matongo*—all of them with taboos attached—and it is his to see that none is violated and to hand them on to his successor intact." Thus the easements attached to land even in primitive communities are of very diverse origin, others related to military service, while corporate tenure is maintained side by side with individual property.

LAND TITLE: see TITLE TO LAND.

LANDUMAN, a Negro tribe numbering approximately 25,000, located principally in Guinea, along the border of Portuguese Guinea about 30 to 60 mi. inland. Their language belongs to the West Atlantic branch of the Niger-Congo language family and is most closely related to Temne and Baga. They are agricultural; corn, millet and rice are the major food crops, and peanuts are grown both for oil and as a cash crop.

Tribal organization centres in a single paramount chief. Villages are ruled by subordinate chiefs. The family unit is patrilocal; marriage is frequently polygamous. Inheritance goes to members of the mother's family. Adolescent initiation ceremonies, highly secret, introduce members of the tribe into their adult responsibilities. Burial is associated nith the same tribal secrets. Religious beliefs centre strongly around the activity of departed spirits. (W. E. WE.)

LANDWEHR, the army reserve category in German-speaking nations comprising the intermediate age classes. Originally the term (literally "territorial defense force") denoted the entire armed citizenry, akin to the Anglo-Saxon *fyrd,* or militia. During the Napoleonic wars Austria (1808) and Prussia (1813), under G. von Scharnhorst, created Landwehr units in all provinces to supplement the standing army. Many of these took part in the decisive battle of Leipzig in Oct. 1813. Subsequent Prussian and Imperial German regulations defined the Landwehr as the body of trained or partly trained men, ages from 26 or 27 to 39 or 40, who were considered available for war service outside their, home districts. Numerous Landwehr divisions were formed in World War I, primarily for garrison and occupation duties. Hitler's defense law of May 21, 1935, specified that all men would belong to the Landwehr from April 1 of the year of their 35th birthday to March 31 of the year of their 45th birthday. There were no Landwehr units designated as such in World War II; most personnel of this age group were integrated into units containing men of all ages.

In the Austro-Hungarian empire, the term Landwehr was not applied to an age category but to the territorial defense force of Austria proper as distinct from the Imperial forces of Austria-Hungary. *Honved,* a Hungarian literal translation of Landwehr, designated the similar Hungarian organization and remained thereafter the name of the Hungarian army.

The Swiss Landwehr, under revised regulations issued in 1960, consists of men between 33 and 42 They receive a small amount of "repetition" training. *See* also LANDSTURM. (P. N. T.)

LANE, ALFRED CHURCH (1863–1948), U.S. geologist and educator, was born in Boston, Mass., on Jan. 29, 1863. He was the grandson of an abolitionist and the great-great-grandson of a Concord minuteman. He graduated from Harvard college in 1883, and studied at Heidelberg, 1885–87. He received his A.M. and Ph.D. from Harvard in 1888. He was petrographer, assistant state geologist and state geologist for the geological survey of Michigan (1889–1909), professor of geology and mineralogy, Tufts college, Medford, Mass. (1909–36), resigning in 1936 in protest to a state teacher's oath, and professor emeritus (1936–48). He died at New York city on April 15, 1948.

Lane was chairman of the committee on the measurement of

geologic time of the National Research council (1922–46). During this time he originated, promoted and directed — in laboratories all over the world — chemical, physical and geological research bearing on the determination of the age of the earth. (R. L. N.)

LANE, SIR ALLEN LANE WILLIAMS (1902–) English pioneer of paperback publishing, was born at Bristol, Gloucestershire, on Sept. 21, 1902. On leaving Bristol Grammar school he was apprenticed to his publisher-kinsman, John Lane, at The Bodley Head, London, where he eventually became managing director. He left in 1936 to found Penguin Books, Ltd., and under that imprint began publishing paperback reprints at a price of 6*d*. Encouraged by the success of the experiment he began to add other series (at the same price). An early development was the creation of Pelican books, some of which were reprints and some original, on science, history, philosophy, politics, literature and the arts; and the Penguin family was later enlarged to include Penguin specials (on current affairs), Puffins (for young readers), King Penguins (illustrated in colour), the Penguin classics (new translations from Greek, Latin, French, Russian, Italian, etc.) and many other series. Lane's example was later followed by other publishers, both in Great Britain and elsewhere. He was knighted in 1952. (W. E. Wi.)

LANE, EDWARD WILLIAM (1801–1876), English Arabic scholar, whose *Arabic-English Lexicon* has not been superseded. Born on Sept. 17, 1801, at Hereford, where his father was a prebendary, he was educated at Bath and Hereford grammar schools. In 1825 he started for Egypt in search of health. There he spent three years, twice went up the Nile, proceeding as far as the second cataract, and wrote a complete description of Egypt, with a portfolio of 101 drawings. He again visited Egypt during 1833–35, living mainly in Cairo, but retiring to Luxor during the plague of 1835. Lane took up his residence in the Moslem quarter, and under the name of 'Mansur Effendi lived the life of an Egyptian scholar. His *Account of the Manners and Customs of the Modern Egyptians* appeared in 1836 and became a classic. The translation of the *Arabian Nights*, with notes and illustrations, designed to make the book a sort of encyclopaedia of eastern manners, appeared between 1838 and 1840. A useful volume of *Selections From the Kur-an* was published in 1843, but before it passed through the press Lane was again in Egypt, where he spent seven years (1842–49) collecting materials for a great Arabic lexicon, which the munificence of Lord Prudhoe (afterward duke of Northumberland) enabled him to undertake. The most important of the materials amassed during this sojourn was a copy in 24 thick quarto volumes of Sheikh Murtada's great lexicon, the *Taj el'Arus*, which, though itself a compilation, is so extensive and exact that it formed the main basis of Lane's subsequent work.

Lane returned to England in 1849 and spent the rest of his life writing his *Arabic-English Lexicon*. He was still at work on it a few days before his death at Worthing on Aug. 10, 1876. Five parts had already appeared (1863–74). A sixth part, edited by his grandnephew, S. Lane-Poole, appeared in 1877. The seventh and eighth parts appeared in 1885 and 1893, again edited by Lane-Poole, but they are incomplete, being little more than reproductions of the sketchy notes which Lane had left on this portion of the work.

The *Arabic-English Lexicon* was the first large-scale Arabic dictionary for the use of Europeans since G. W. Freytag's *Lexicon Arabico-Latinum* (1830–37). It immediately became, and remained, the standard work. It was reprinted during 1955–56. It is, in many ways, a model of how such a work should be written, and is characterized by meticulously accurate definitions. Realizing the magnitude of his task, Lane planned the work in two books; the second, the smaller by far, was to contain only very rare words and was never written. Of the first book, roughly two-thirds was completed, as far as the beginning of the letter *kaf*. After that, only sketches remain. The completion of the work, often discussed by the International Congress of Orientalists, was adjudged a matter of high priority, and Jorj Kraemer of Tiibingen began his Arabic-German-English dictionary at the letter *kaf* in order to fill the gaps in Lane's work as early as possible. The first fascicule appeared in 1958.

See S. Lane-Poole, *The Life of Edward William Lane* (1877); J. Fück, *Die arabischen Studien in Europa* (1955). (J. A. Hr. V.)

LANE, FRANKLIN KNIGHT (1864–1921), member of the U.S. Interstate Commerce commission and of Pres. Woodrow Wilson's cabinet, was born near Charlottetown, P.E.I., July 15, 1864. The family moved to California in 1871 and in 1886 Franklin graduated from the University of California.

He began his career as a newspaper reporter and continued his interest in journalism for some time. He also studied law, was admitted to the California bar in 1888 and practised in San Francisco.

Lane entered politics in 1898 when he was elected city attorney, a post to which he was twice re-elected. He ran unsuccessfully for governor of California in 1902 and for mayor of San Francisco in 1903. These campaigns brought him national recognition and in 1905 Pres. Theodore Roosevelt appointed him to the Interstate Commerce commission, where he remained throughout the administration of Pres. William Howard Taft. In 1913 he entered the cabinet of President Wilson as secretary of the interior. During his term of office the wealth of Alaska was made more accessible by the construction of a government railway (completed in 1924) between Seward and Fairbanks. He gave special attention to the Indians and opposed the policy of keeping them in perpetual tutelage. He advocated development of national resources without waste as being reasonable conservation, and earnestly urged the reclamation of land. In 1920 he resigned his post. He died at Rochester, Minn., May 18, 1921.

Lane was the author of The *American Spirit*, addresses delivered in wartime (1918).

See also A. W. Lane and L. H. Wall, *The Letters of Franklin K. Lane, Personal and Political* (1922).

LANE, SIR HUGH PERCY (1875–1915), Irish art collector, was born at Ballybrack, County Cork, on Nov. 9, 1875. After a career as an art dealer he established a gallery of modern art in Dublin, acted as adviser to the galleries at Johannesburg and Cape Town in South Africa, and was appointed director of the National gallery of Ireland in 1914. He was knighted in 1909 and died in the sinking of the "Lusitania" on May 7, 1915.

A controversy has raged over his collection of paintings, which included several fine Impressionist works. Lane bequeathed it to the National gallery, London, after withdrawing an offer of it to Dublin, but an unwitnessed codicil to his will restored the pictures to Dublin. As this was legally invalid, they are in London. and one, Berthe Morisot's "Jour d'Été," was stolen from the Tate gallery on April 12, 1956, but was returned undamaged through the Irish embassy on April 16 of the same year. (P. J. My.)

LANE, JAMES HENRY (1814–1866), U.S. soldier and politician, was born at Lawrenceburg, Ind., June 22. 1814. The son of an Indiana politician, he was admitted to the bar, served in the Mexican War, was lieutenant governor of Indiana, a Democratic representative in congress, and in 1855 emigrated to Kansas. There he soon became prominent in the Free State forces. both in a political and military way. being second in command in Lawrence during the "Wakarusa war," senator-elect under the Topeka constitution, one of the Free State leaders indicted for treason and a participant in the domestic feuds of 1856–57. After Kansas became a state, Lane was elected (1861) to the U.S. senate as a Republican. As a result of the president's favour he exercised vague military powers in Kansas during the Civil War, in spite of the protests of the governor and regular departmental commanders, In the fall of 1861 he conducted a devastating campaign on the Missouri border, and in July 1862, was appointed commissioner of recruiting. Accused of being implicated in Indian contracts of a fraudulent character, in a fit of depression he took his own life, dying near Ft. Leavenworth, Kan., July 11, 1866. Ambitious, unscrupulous, rash and impulsive, generally regarded by his contemporaries as an unsafe leader, Lane was a man of great energy and personal magnetism, having oratorical powers of a high order.

See L. W. Spring, "The Career of a Kansas Politician," in the *Amer. Hist. Rev.*, vol. iv (Oct. 1898) and the too laudatory biography by John Speer (1898).

LANE-POOLE, STANLEY (1854–1931), British historian and archaeologist, was born in London on Dec. 18, 1854, and educated at Corpus Christi college, Oxford, and Dublin university. His first post was in the coin department of the British museum (1874–92), where he compiled a catalogue in 14 volumes of the oriental and Indian coins. During this period he went on archaeological missions organized by the government to Egypt (1883) and Russia (1886). He also visited Australia. From 1895 to 1897 he was engaged on archaeological research at Cairo, under the direction of the Egyptian government. On his return to England he was appointed professor of Arabic at Trinity college, Dublin, a post which he held until 1904. His numerous publications include: *Histories of the Moors in Spain* (1887, 9th ed., 1915); *Turkey* (1888, 6th ed., enlarged, 1908); *The Barbary Corsairs* (1890, 3rd ed., 1915); *Egypt in the Middle Ages* (1901); *Mediaeval India* (1902, 9th ed., 1911); *Essays in Oriental Numismatics* (3 vol., 1873, 1877, 1892); *The Thousand and One Nights* (3 vol., 1906); *Mediaeval India from Contemporary Sources* (1916); *A Short History of India in the Middle Ages* (1917); and biographies of Lord Stratford de Redcliffe (1888), Sir G. F. Bowen (1889), Sir Harry Parkes (1894), Sir R. Church (1890), E. W. Lane (1877), Aurangzib (1892), Saladin (1898), Babur (1899) and Watson Pasha (1919).

LANESSAN, JEAN MARIE ANTOINE DE (1843–1919), French statesman and naturalist, was born at Sainte-André de Cubzac (Gironde), July 13, 1843. Elected to the municipal council of Paris in 1879, he declared in favour of communal autonomy, and joined with Henri Rochefort in demanding the erection of a monument to the Communards. After his election to the chamber of deputies for the 5th arrondissement of Paris in 1881 he gradually veered from the extreme Radical party to the Republican union, and identified himself with the cause of colonial expansion. A government mission to the French colonies in 1886–1887, in connection with the approaching Paris exhibition, gave him the opportunity of studying colonial questions, on which, after his return, he published three works: *La Tunisie* (1887); *L'Expansion coloniale de la France* (1888); *L'Indo-Chine française* (1889). In 1891 he was made civil and military governor of French Indochina; he consolidated French influence in Annam and Cambodia, and secured a large accession of territory on the Mekong river from Siam (Thailand). He was recalled in 1894, and published a defense of his much-criticised administration *(La Colonisation française en Indo-Chine)* in the following year. In the Waldeck-Rousseau cabinet of 1899 to 1902 he was minister of marine, and in 1901 he secured the passage of a large naval program. At the general election of 1906 he was not re-elected; he retired from politics in 1914. He died at Ecouen *(Seine-et-Oise)*, Nov. 8, 1919.

LANFRANC (d. 1089), archbishop of Canterbury, was born early in the 11th century at Pavia, where his father. Haribald, was a magistrate. Lanfranc studied law, and tradition links him with Irnerius of Bologna as a pioneer in the renaissance of Roman law. After his father's death he crossed the Alps to found a school in France. About 1039 he became the master of the cathedral school at Avranches, where he taught for three years. But in 1042 he entered the newly founded house of Bec. Until 1045 he lived at Bec in absolute seclusion. He was then persuaded by Abbot Herluin to open a school in the monastery. His pupils were drawn not only from France and Normandy, but also from Gascony, Flanders, Germany and Italy. Many of them afterwards attained high positions in the Church. Among them, Gilbert Crispin became famous as Abbot of Westminster, Ives as Bishop of Chartres, Anselm of Aosta as Archbishop of Canterbury and Primate of all England. and Anselm of Baggio as Pope. Lanfranc lectured on logic and dogmatic theology. H e was therefore naturally invited to defend the doctrine of transubstantiation against the attacks of Berengar of Tours. He took up the task with the greatest zeal, although Berengar had been his personal friend; he was the protagonist of orthodoxy at the councils of Vercelli (1050), Tours (1054) and Rome (1059). To his influence some attribute the desertion of Berengar's cause by Hildebrand and the more broad-minded of the cardinals. Knowledge of Lanfranc's polemics is chiefly taken from his tract *De corpore et sanguine Domini* (written after 1079) when Berengar had been finally condemned.

In the midst of his scholastic and controversial activities Lanfranc became a political force. While merely a prior of Bec he led the opposition to the uncanonical marriage of Duke William with Matilda of Flanders (1053), and incurred a sentence of exile. But the quarrel was settled, and he undertook to obtain the pope's approval of the marriage. This he accomplished at the same council which witnessed his third victory over Berengar (1059), and he thus acquired a lasting claim on William's gratitude. In 1066 he became the first abbot of St. Stephen's at Caen, founded by the duke as a penance for his disobedience to the Holy See. William adopted the Cluniac programme of ecclesiastical reform, and obtained the support of Rome for his English expedition in the character of a crusader against schism and corruption. Alexander II., the former pupil of Lanfranc, gave the Norman Conquest the papal benediction.

When the see of Rouen next fell vacant (1067), Lanfranc declined the honour, and he was nominated to the English primacy as soon as Stigand had been canonically deposed (1070). The new archbishop at once began a policy of reorganization and reform. Thomas of Bayeux, archbishop-elect of York, asserted that his see was independent of Canterbury and claimed jurisdiction over the greater part of midland England. Lanfranc, during a visit to Rome to receive the pallium, obtained an order from Alexander that the disputed points should be settled by a council of the English Church. This was held at Winchester in 1072. Through use of reputedly forged documents, the primate carried the council's verdict upon every point. Although the school of Bec was firmly attached to the doctrine of papal sovereignty, he still assisted William in maintaining the independence of the English Church; and appears at one time to have favoured a neutral attitude in the quarrels between papacy and empire. In the domestic affairs of England Lanfranc sought to extricate the Church from the fetters of the state and of secular interests. He was a generous patron of monasticism. He endeavoured to enforce celibacy upon the secular clergy. He obtained the king's permission to deal with the affairsof the Church in synods which met apart from the Great Council, and were exclusively composed of ecclesiastics. His influence shaped the famous ordinance which separated the ecclesiastical from the secular courts (*c.* 1076). But he acknowledged the royal right to veto the legislation of national synods. In the cases of Odo of Bayeux (1082) and of William of St. Calais, bishop of Durham (1088), he used his legal ingenuity to justify the trial of bishops before a lay tribunal. He accelerated the process of substituting Normans for Englishmen in all preferments of importance.

Lanfranc's greatest political service was rendered in 1075, when he detected and foiled the conspiracy which had been formed by the earls of Norfolk and Hereford. He interceded for Waltheof's life and to the last spoke of the earl as an innocent sufferer for the crimes of others; he lived on terms of friendship with Bishop Wulfstan. On the death of the Conqueror (1087) he secured the succession for William Rufus, in spite of the discontent of the Anglo-Norman baronage; and in 1088 his exhortations induced the English militia to fight on the side of the new sovereign against Odo of Bayeux and the other partisans of Duke Robert. He exacted promises of just government from Rufus, and was not afraid to remonstrate when the promises were disregarded. He died on May 24, 1089. As a statesman Lanfranc did something to uphold the traditional ideal of his office; as a primate he elevated the standards of clerical discipline and education. Of all the Hildebrandine statesmen who applied their teacher's ideas within the sphere of a national church he was the most successful.

BIBLIOGRAPHY.—The chief authority is the *Vita Lanfranci* by Milo Crispin, who was precentor at Bec (d. 1140). Milo drew largely upon the *Vita Herluini,* by Gilbert Crispin, abbot of Westminster. The *Chronicon Beccensis abbatiae, a* 14th-century compilation, should also be consulted. The first edition of these two sources and of Lanfranc's writings, is that of L. d'Ackery, *Beati Lanfranci opera omnia* (1648). Another edition, slightly enlarged, is that of J. *A.* Giles, *Lanfranci opera,* 2 vol. (1844). The correspondence between Lanfranc and Gregory VII. is in the *Monumenta Gregoriana,* P. Jaffé (ed.) (1865). Modern

works *A.* Charma's *Lanfranc (1849);* *H.* Boehmer's *Die Fälschungen Erzbsichof Lanfranks von Canterbury (1902)* and *Kirche und Staat in England und in der Normandie (1899).* Ser also A. J. Macdonald, *Lanfranc (1926)* and authorities cited in the articles on WILLIAM I and WILLIAM II. (H W C. D; X.)

LANFRANCO, GIOVANNI (1582-1647). Italian painter, one of the exponents of high baroque illusionism, was born at Parma on Jan. 26, 1582. He was a pupil of Agostino Carracci. but the decisive influence on his work was the illusionism of the domes in Parma by Correggio. He was a bitter rival of Domenichino, both at S. Andrea della Valle in Rome and later in Naples. The dome of S. Andrea (1625-28) derives directly from Correggio in its virtuoso use of figures floating in the clouds over the spectator's head. Lanfranco worked in Naples from 1633-34 to 1646, his best-known work there being the dome of the chapel of S. Gennaro in the cathedral (1641-46). He died in Rome on Nov. 30, 1647. (P. J. My.)

LANFREY, PIERRE (1828–18jj), French historian and politician, was born at Chambéry (Savoie). His father had been one of Napoleon's officers. The son studied philosophy and history in Paris and wrote historical works of an anti-clerical and rationalizing tendency. These included *L'Eglise et les philosophes du XVIII^e siècle* (1855; new edition, with a notice of the author by E. de Pressense, 1879); *Essai sur la révolution française* (1858); *Histoire politique des papes* (1860); *Lettres d'Evérard* (1860), a novel in the form of letters; *Le Rétablissement de la Pologne* (1863). His *magnum opus* was his *Histoire de Napoléon I'"* (5 vols., 1867–75 and 1886), in which he unduly minimized Napoleon's military and administrative genius. A staunch republican. he was elected to the National Assembly in 1871, became ambassador at Berne (1871–73), and life senator in 1875. He died at Pau on Nov. 15, 18j;.

His *Oeuvres complètes* were published in 12 vols. (1879 *seq.*), and his *Correspondance* in 2 vols. (1885).

LANG, ANDREW (1844–1912), Scottish scholar and man of letters, was born at Selkirk on March 31.1844. He was educated at Selkirk Grammar school, Edinburgh academy, the University of St. Andrews and Balliol college. Oxford. He held a fellowship of Merton until he married in 1875, when he removed to London. Lang was one of the greatest journalists of his time, always fresh and original, and writing from a mind overflowing with all kinds of out-of-the-way knowledge. He wrote leaders for the *Daily News,* literary and critical articles for the *Morning Post* and other papers; he also wrote articles on ballads. crystal gazing, poltergeist, totemism and many other questions for the 9th edition of the *Encyclopædia Britannica.*

He was keenly interested in Scottish history, especially in the history of the Stuarts; it would be almost fair to call him the last of the Jacobites. He had a passion for unravelling mysterious intrigues and Scottish history gave him plenty of opportunities. Among his works in this field were *The Mystery of Mary Stuart* (1901; rev. ed. 1904); *The Portuaits and Jewels of Mary Stuart* (1906); *John Knox and the Reformation* (1905); *Pickle the Spy* (189;); a *History of Scotland from the Roman Occupation to the Suppression of the last Jacobite Rising* (4 vols., 1900–07), a work containing many entertaining digressions; and other monographs on Scottish questions. He also took a keen interest in French history; he wrote a book on the "Man in the Iron Mask," which he called *The Valet's Ti-agedy* (1903), and 'a counterblast to Anatole France's work on Joan of Arc in *The Maid of France* (1908).

Lang was an incurable romantic. and this is one of the reasons for his great success in writing for children. Generations of them were delighted with the long series of fairy books. beginning with the *Blue Fairy Tale Book* (1889), and going on with the *Red, the Green* and the *Yellow,* and then with true stories equally enchanting. Lang's first ambition had been towards poetry. He published many pleasant volumes of verse, beginning with the *Ballads and Lyrics of Old France* (1872), in which he experimented in various metres. He was disappointed by the reception of his narrative poem on *Helen of Troy* (1882). His serious Homeric studies bore fruit in his collaboration with S. H. Butcher in a prose translation (1879) of the *Odyssey,* and with *E.* Myers and Walter Leaf in a prose version of the *Iliad* (1883). Of his separate books on classical subjects the best is *The World of Homer* (1910).

Lang's other main preoccupation was with myth and folklore. He made solid contributions to the subject in his *Custom and Myth* (1884); *Myth, Literature and Religion* (2 vols., 1887; rev. ed., 1899); *The Making of Religion* (1898). He died at Banchory, Xberdeenshire, on July 20, 1912.

LANG, COSMO GORDON LANG, 1ST BARON OF LAMBETH (1864–1945), archbishop of Canterbury, was born in Aberdeen on Oct. 31, 1864. Educated at Glasgow university and Balliol college, Oxford, he graduated in 1886 and two years later was elected a fellow of All Souls. In 1890 he was ordained an Anglican clergyman and was appointed curate of the parish church of Leeds. From 1893 to 1896 he was fellow and dean of divinity of Magdalen college, Oxford. and from 1894–96 vicar of the university church of St. Mary's. In 1896 he became vicar of Portsea, and in 1901 suffragan bishop of Stepney, London, and canon of St. Paul's cathedral. In 1908 he was appointed archbishop of York. His eloquence and clear common sense made him an influential member of the house of lords, and in 1909 he was appointed a member of the royal commission on divorce. He took a leading part in the support of the Prayer Book measure in parliament in 1928. On Nov. 12, 1928, he succeeded Randall T. Davidson as archbishop of Canterbury, at a critical point in the church's history, the revised Prayer Book having been twice rejected by parliament. The great feature of his career was his social work in industrial centres. He retired as archbishop of Canterbury in 1942 and died at Richmond, Surrey, on Dec. 5, 1945.

LANG, FRITZ (1890–), Austrian-U.S. motion-picture director. often called a director's director, was born on Dec. 5, 1890, in Vienna. Aus., and educated there. Having given up the study of architecture, he started to write screen plays during World War I. From Vienna he went to Berlin to work with Erich Pommer. His first film was *The Weary Death* (1921), released in the United States as *Destiny. Metropolis* (1926) was an expressionistic vision of the future, and *M,* his most famous German film, explored the compulsion to murder (1933). Lang's *The Last Will of Dr. Mabuse,* in which a madman speaks Nazi philosophy, attracted the attention of Josef Goebbels, who invited Lang to supervise German films. Lang left for Paris the same evening and later moved to the U.S. *Fury* (1936), a study of a lynch mob, is his most praised American film. Others include *You Only Live Once* (1937), *Western Union* (1940), *Hangmen Also Die* (1943), *Scarlet Street* (1945), *Clash by Night* (1952). Lang has been praised for the visual texture and intellectual rigour of his films and criticized for frequent emphasis on terror and fatality. (R. D. MACC.)

LANG, JOHN DUNMORE (1799–1878), Australian ecclesiastic and political leader, a founder of the Presbyterian Church in Australia and a figure of great influence in shaping the early colonial settlement, was born at Greenock. Scot., on Aug. 24, 1799. He emigrated to Sydney in 1822-23 as a Presbyterian minister and his first crusade was to achieve state recognition for his church. However, as an ecclesiastic Lang was primarily notable as the instigator of a movement comparable to and anticipating the 1843 Disruption of the Church of Scotland *(see* FREE CHURCH OF SCOTLAND). In politics Lang was a critic of ex-convict influence, which in the 1830s put him among the antiliberals. But this very background equipped him to lead the free-immigrant working-class movement which subsequently developed, and his election in 1850 as Sydney's representative to the local legislature dramatically proved that this element had become dominant in colonial radicalism. Lang advocated the establishment of an Australian republic and vehemently attacked the wealthier sections of the community; until his retirement from politics in 1869 he consistently upheld left-wing causes.

Of more direct help to the colonies' growth was his work in arranging immigration, preferably of upper working-class Protestants (for he was a bitter anti-Catholic). He founded the Australian college (1832-54) in Sydney, and attracted to the colony many ministers and schoolteachers who made a vast contribution to cultural development. His pen was extraordinarily fertile, producing

an excellent *Historical and Statistical Account of New South Wales* (1834), poetry, propaganda, works of travel and even anthropology.

Lang died in Sydney on Aug. 8, 1878.

See A. Gilchrist, *John Dunmore* Lang, 2 vol. **(1951).** (O. M. R.)

LANG, KARL HEINRICH, RITTER VON (1764–1835), German historian, was born on June 7, 1764, at Balgheim, near Nordlingen. At intervals from 1793 to 1801 Lang was closely connected with the Prussian statesman Karl von Hardenberg, who employed him as his private secretary and archivist, and in 1797 he was present with Hardenberg at the congress of Rastadt as secretary to the legation. He was occupied chiefly with affairs of the principalities of Anspach and Bayreuth, newly acquired by Prussia, and especially in the settlement of disputes with Bavaria as to their boundaries. He was archivist at Munich from 1810 to 1817, and devoted himself to the study of Bavarian history. He died on March 26, 1835.

Lang is best known through his *Memoiren* (2 vol., 1842) which must, however, be read with caution because of their satirical tone.

LANG, (ALEXANDER) MATHESON (1879–1948), a leading English romantic actor and dramatist during most of the first half of the 20th century, was born on May 15, 1879, in Montreal, Can. He came of clerical stock; a cousin, Cosmo Lang, was archbishop of Canterbury. He began his career as a Shakespearean actor in 1897, playing first with Louis Calvert, then joining F. R. Benson's company. He played Mountjoy in *Henry* V (his first London role) in 1900, Macduff and Bassanio in 1901–02 and Benedick—to the Beatrice of Ellen Terry—in 1903. His sonorous and passionate Othello was first seen in 1907 at Manchester and his highly romantic Romeo was a feature of the 1908 London season. For the next 30 years he toured the English-speaking world, acting also in grandiose plays by Temple Thurston, Rafael Sabatini and many others.

Lang's imposing presence, commanding features and fine voice were as well suited to Othello as to popular and picturesque characters like Mr. Wu and the Wandering Jew. His career also included several films, and he produced and dramatized many works. In 1914 he and his actress wife, Hutin Britton, inaugurated the Shakespeare seasons at the Old Vic theatre, London. Lang died at Bridgetown. Barbados, on April 11, 1948. (A. H. D.)

LANGDELL, CHRISTOPHER COLUMBUS (1826–1906), U.S. legal scholar known as the originator of the case method of teaching law, was born in New Boston, N.H., May 22, 1826, and was educated at Harvard college and Harvard law school. After a relatively obscure career as a practising attorney he became dean of the Harvard law school in 1870. During the first years of his deanship he was chiefly known for putting legal education on a university level, with a regular progression of courses, examinations and fixed degree requirements. Later he achieved distinction for his method of instruction: believing that students should be trained to use original authorities and to derive for themselves the principles of the lam, he guided them in the study of selected cases—an educational method that has imparted a peculiar vigour to the teaching of law in the United States and has exerted an influence on instruction in other subjects, notably business instruction. Langdell died in Cambridge, Mass., on July 6, 1906. The principal building of the Harvard law school is named for him, as is one of its professorships.

In a less favourable aspect Langdell is often taken as the symbol of a dryly logical mode of legal reasoning, unduly concerned with the law's internal symmetry and indifferent to its social effects. His views of proper legal reasoning were not markedly out of keeping with those of his time, while the case method: though originated by him, was a matter of gradual evolution in which others, especially James Barr Ames (*q.v.*), played an important part. His publications consisted largely of works intended for use in legal instruction; *Selection of Cases on the Law of Contracts* (1871; 2nd ed., enlarged, 1877) was the first book used as a basis for the case method. (L. L. F.)

LANGDON, JOHN (1741–1819), U.S. statesman, was born in Portsmouth, N.H., on June 25, 1741. After an apprenticeship in a countinghouse, he led a seafaring life for several years, and became a shipowner and merchant. In Dec. 1774 as a militia captain he assisted in the capture of Ft. William and Mary at New Castle. N.H., one of the first overt acts of the American colonists against the property of the crown. He was elected to the last royal assembly of New Hampshire and then to the second Continental Congress in 1775, but he resigned and in June, 1776, became congress' agent of prizes in New Hampshire, and in 1778 continental (naval) agent of congress in this state, where he supervised the building of John Paul Jones's "Ranger," and other vessels. He was a judge of the New Hampshire court of common pleas in 1776–77, a member (and speaker) of the New Hampshire house of representatives from 1776 until 1782, a member of the state constitutional convention of 1778 and of the state senate in 1784–85, and in 1783–84 was again a member of congress. He contributed largely to raise troops in 1777 to meet Burgoyne; and he served as a captain at Bennington and at Saratoga. He was president of New Hampshire in 1785–86 and in 1788–89; a member of the federal constitutional convention in 1787; a member of the state convention which ratified the federal constitution for New Hampshire; a member of the U.S. senate in 1789–1801, and its president *pro-tem.* during the first congress and the second session of the second congress; a member of the New Hampshire house of representatives in 1801–05 and its speaker in 1803–05; and governor of the state in 1805–09 and in 1810–12. He refused the naval portfolio in Jefferson's cabinet, and received nine electoral votes for the vice-presidency in 1808. He died in Portsmouth on Sept. 18, 1819.

LANGE, CHRISTIAN LOUS (1869–1938), Norwegian worker for international peace, secretary-general of the Inter-Parliamentary union (1909–33), and Nobel peace prize winner, was born in Stavanger, West Norway, on Sept. 17, 1869. He graduated in languages from the University of Oslo in 1893 and in 1919 received a doctorate for a thesis on the history of internationalism. From 1900 he served as secretary to the Storting Nobel committee in Oslo, until his appointment in 1909 as secretary-general of the Inter-Parliamentary union. It was very much the result of his efforts that this organization grew and prospered, especially during World War I, when he held it together despite great difficulties.

In recognition of his services, Lange was awarded the Nobel Peace prize in 1921 together with the Swedish statesman Hjalmar Branting. Lange was also active in the League of Nations, which he attended regularly as a Norwegian delegate, interesting himself particularly in disarmament. In 1932 he received the Netherlands Grotius medal. (O. F. K.)

LANGE, FRIEDRICH ALBERT (1828–1875), German philosopher and socialist, historically important both for his refutation of materialism and for his lasting tradition of Neo-Kantianism, was born on Sept. 28, 1828, at Wald, near Solingen, the son of the theologian, Johann Peter Lange. He was educated at Duisburg, Zurich and Bonn, where he distinguished himself by gymnastics as much as by studies. He taught in various places until 1862, when schoolmasters were forbidden political activity. He wrote *Die Leibesiibungen* (1863); *Die Arbeiterfrage* (1865); *Die Grundlagen der mathematischen Psychologie* (1865); the influential *Geschichte des Materialismus und Krttik seiner Bedeutung in der Gegenwart* (1866; Eng. trans., *History of Materialism,* new ed., 1923); J. *St. Mill's Ansichten iiber die soziale Frage* (1866); and *Neue Beiträge zur Geschichte des Materialismus* (1867). In 1866, discouraged by affairs in Germany, he moved to Winterthur, near Ziirich, to write for the democratic newspaper, the *Landbote.* He became *Privatdozent* at Zurich in 1869 and professor in 1870 but resigned because of the pro-French sympathies of the Sniss in the Franco-German War. In 1872 he became professor at Marburg, where, after establishing Neo-Kantianism, he died on Nov. 21, 1875. His *Logische Studien* were published by H. Cohen in 1877.

LANGEAIS, a town of west-central France in the *département* of Indre-et-Loire, is on the right bank of the Loire, 16 mi. W.S.W. of Tours by rail. Pop. (1954) 2,332. The 15th-century royal château was built (*c.* 1467) by Jean Bourré, governor of

Langeais, on the order of Louis XI. It is a square structure with machicolated battlements flanked by conical towers, and contains 14 furnished apartments, open to the public. Charles VIII married Anne of Brittany there in 1491. In the park are the ruins of a late 10th-century keep, the oldest in France, built by Fulk Nerra, count of Anjou. There is a church with a bell tower built between the 11th and 15th centuries. There are cave dwellings in the neighbourhood and a modern camping site beside the Loire. The town is a tourist centre for a region of numerous châteaux and various beauty spots. Its industries include mushroom cultivation and dairy farming, brickmaking, tanning and the manufacture of leather goods, heat-resisting silico-aluminum products, cement pipes, dolls and tractor plows.

LANGENSALZA, a town in the district of Erfurt, Ger., on the Salza, about 20 mi. N.W. from the city of Erfurt. Pop. (1959 est.) 16,143. It became a town in 1211 and was afterward part of the electorate of Saxony. In 1815 it came into the possession of Prussia. Near it are the remains of the old Benedictine monastery of Homburg or Hohenburg, where the emperor Henry IV defeated the Saxons in 1075. The manufacture of cloth is the chief industry; lace, machines, cigars and leather are also produced, while spinning, dyeing, brewing and printing are carried on. There is a sulfur bath in the neighbourhood.

LANGENTHAL (1,558 ft.), a town in the canton of Bern, Switz. Pop. (1960) 10,974, mainly German-speaking Protestants, who engage in agriculture and a few industries such as neaving, dyeing and machine making. It is on the railway Bern-Zurich, with branches to Huttwil, Oensingen and Melchnau.

LANGHAM, SIMON (d. 1376), archbishop of Canterbury and cardinal, was born at Langham in Rutland, becoming a monk in the abbey of St. Peter at Westminster, and later prior and then abbot of that house. He was treasurer of England (1360), bishop of Ely (1361), chancellor of England (1363) and archbishop of Canterbury (1366). He drove the secular clergy from their college of Canterbury hall, Oxford, and filled their places with monks The expelled head of the seculars was a certain John de Wiclif, who has been identified with the reformer Wycliffe. Langham was made a cardinal by Pope Urban V in 1368. Two months later he was compelled to resign his archbishopric and went to Avignon. He was made cardinal-bishop of Praeneste in 1373. In 1374 he was elected archbishop of Canterbury for the second time; but he withdrew his claim and died at Avignon, July 22, 1376. His tomb is the oldest monument to an ecclesiastic in Westminster abbey; he left the residue of his estate—a large sum—to the abbey, and has been called its second founder.

LANGHOLM, a small burgh of Dumfriesshire, Scot., on the Esk, 21½ mi. N of Carlisle by road. Pop. (1961) 2,369. Its chief industry is the manufacture of quality tweeds. Dyeing and tanning also are carried on and there are regular sales of cattle and sheep. The ancient ceremony of riding the marches (the "Common Riding") is celebrated in July. The Esk is joined in the town by the Eues and the Wauchope, noted fishing streams.

LANGHORNE, JOHN (1735–1779), English poet and translator of Plutarch, was born at Winton, Somerset, in March 1735. He became rector of Blagdon, Somerset, in 1766 and died there on April 1, 1779. The best of his poems is *The Country Justice* (3 parts, 1774–77), which anticipates George Crabbe in its sympathetic treatment of the humble and unfortunate. His translation of Plutarch's *Lives* (1770), undertaken with his brother William, was frequently reprinted. He contributed reviews of literary and agricultural books to *The Monthly Review* (1761–79), and edited the collected poems of William Collins (1765).

See H. MacDonald, "John Langhorne," in Essays *on the 18th Century Presented to D. Nichol Smith (1945).* (J. E. Bt.)

LANGIEWICZ, MARYAN (1827–1887), Polish patriot, was born at Krotoszyn, in the province of Posen, on Aug. 5, 1827, his father being the local doctor. Langiewicz was educated at Posen, Breslau and Prague, and was compelled to earn his daily bread by giving lectures. He subsequently entered the Prussian *Landwehr* and served for a year in the royal guard. In 1860 he migrated to Paris and was for a time professor in the high school founded there by Mieroslawski. The same year he took part in Garibaldi's Neapolitan campaign, and was then a professor in the military school at Cuneo till the establishment was closed. In 1862 he entered into communication with the central Polish committee at Warsaw, and on the outbreak of the insurrection of Jan. 22, 1863, took the command of the armed bands and inflicted several defeats on the Russians, which encouraged him to proclaim himself dictator (March 10). On March 18, however, his army was almost annihilated at Zagosc, whereupon he took refuge in Austrian territory and was interned at Tarnow, and afterwards at the fortress of Josephstadt, from which he was released in 1865. He then lived at Solothurn as a citizen of the Swiss Republic, and subsequently entered the Turkish service as Langie Bey. He died at Constantinople on May 11, 1887.

See Boleslaw Limanowski, *The National Insurrection of 1863–64* (Pol.) (Lemberg, 1900); Paolo Mazzoleni, *I Bergamaschi in Polonia nel 1863* (Bergamo, 1893).

LANGLAND, WILLIAM (*c.* 1332–*c.* 1400), the supposed English poet, generally regarded as the single author of the 14th-century poem *Piers the Plowman.* Its full title is—The *Vision* of *William concerning Piers the Plowman, together with Vita de Do-wel, Do-bet, et Do-best, secundum Wit et Resoun;* usually given in Latin as *Visio Willelmi de Petro Plowman, etc.;* the whole work being sometimes briefly described as *Liber de Petro Plownzan.* We know nothing of William Langland except from the supposed evidence of the mss. of the poem and the text itself.

The Vision of Piers Plowman.—The poem exists in three forms. If we denote these by the names of A-text (or Vernon), B-text (or Crowley), and C-text (or Whitaker), we find, of the first, ten mss., of the second, fourteen, and of the third, seventeen, besides seven others of a mixed type. A complete edition of all three texts was printed for the Early English Text Society as edited by W. W. Skeat, with the addition of *Richard the Redeless,* and containing full notes to all three texts, with a glossary and indexes, in 1867–85. The Clarendon Press edition, by the same editor, appeared in 1886.

The A-text dating from about 1362 contains a prologue and 12 passus or cantos (i.–iv., the vision of the Lady Meed; v.–viii., the vision of Piers the Plowman; ix.–xii., the vision of Do-wel, Do-bet and Do-best), with 2,567 lines. The B-text (*c.* 1377) is much longer, containing 7,242 lines, with additional passus following after xi. of A, the earlier passus being altered in various respects. The C-text (*c.* 1395) with 7,357 lines, is a revision of B.

The general contents of the poem may be gathered from a brief description of the C-text. This is divided into twenty-three passus, nominally comprising four parts, called respectively Visio de Petro Plowman, Visio de Do-wel, Visio de Do-bet and Visio de Do-best. Here *Do-bet* signifies "do better" in modern English; the explanation of the names being that he who does a kind action *does well,* he who teaches others to act kindly *does better,* whilst he who combines both practice and theory, both doing good himself and teaching others to do the same, *does best.* But the visions by no means closely correspond to these descriptions; and Skeat divides the whole into a set of eleven visions, which may be thus enumerated: (1) Vision of the Field Full of Folk, of Holy Church, and of the Lady Meed (passus i.–v.); (2) Vision of the Seven Deadly Sins, and of Piers the Plowman (pass. vi.–x.); (3) Wit, Study, Clergy and Scripture (pass. xi., xii.); (4) Fortune, Nature, Recklessness and Reason (pass. xiii., xiv.); (5) Vision of Imaginative (pass. xv.); (6) Conscience, Patience and Activa-Vita (pass. xvi., xvii.); (7) Free-will and the Tree of Charity (pass. xviii., xix.); (8) Faith, Hope and Charity (pass. xx.); (9) The Triumph of Piers the Plowman, *i.e.,* the Crucifixion, Burial and Resurrection of Jesus Christ (pass. xxi.); (10) The Vision of Grace (pass. xxii.); (11) The Vision of Antichrist (pass. xxiii.).

The *vision* is formless and full of digressions. It shows no French influence in its verse which is based on alliterative stresses and is unrhymed, on the other hand the use of allegory as a vehicle of satire reminds one of the *Roman de la Rose.* The book is a document of primary importance for the social history of the time. The author describes the hard condition of the poor, inveighs against clerical abuses and the rapacity of the friars; tells of the miseries caused by the great pestilences then prevalent and by the hasty and ill-advised marriages consequent thereupon; and

denounces lazy workmen and sham beggars, the corruption and bribery in the law courts, and the numerous forms of falsehood which are at all times the fit subjects for satire and indignant exposure. In describing the seven deadly sins, Glutton and Sloth are portraits rather than abstractions and great power of descriptions is shown throughout the work. The numerous allegorical personages introduced, such as Scripture, Clergy, Conscience, Patience and the like, are generally mouthpieces of the author himself though they sometimes speak purely "in character."

Skeat's View of **Langland.**—The traditional view, accepted by Skeat and Jusserand, that a single author—and that author Langland—was responsible for the whole poem, in all its versions, has been disputed Skeat's statement may be summarized as follows The author's name was William (and probably Langland), and he was born about 1332, perhaps at Cleobury Mortimer in Shropshire. His father. who was doubtless a franklin or farmer, and his other friends put him to school, made a "clerk" or scholar of him, and taught him what Holy Writ meant. In 1362, at the age of about thirty, he found himself wandering upon the Malvern hills, and fell asleep beside a stream, and saw in a vision a field full of folk, *i.e.,* this present world, and many other remarkable sights which he duly records. From this supposed circumstance he named his poem *The Vision* of *William,* though it is really a succession of visions, since he mentions several occasions on which he awoke, and afterwards again fell asleep; and he even tells us of some adventures which befell him in his waking moments. In some of these visions there is no mention of Piers the Plowman, but in others he describes him as being the coming reformer who was to remedy all abuses, and restore the world to a right condition. His conception of this reformer changes from time to time, and becomes more exalted as the poem advances. At first he is a ploughman, one of the true and honest labourers who are the salt of the earth; but at last he is identified with the great reformer who has come already, the regenerator of the world in the person of Jesus Christ; in the author's own phrase—"Petrus est Christus." If this be borne in mind, it will not be possible to make the mistake into which so many have fallen, of speaking of Piers the Plowman as being the author, not the subject, of the poem.

The author once alludes to the nickname of Long Will bestowed upon him from his tallness of stature—just as the poet Gascoigne was familiarly called Long George. Though there is mention of the Malvern hills more than once near the beginning of the poem, the poet lived for "many years in Cornhill (London), with his wife Ritte and his daughter Calote." He seems to have come to London soon after the date of the first commencement of his work, and to have long continued there. He describes himself as being a tall man, one who was loath to reverence lords or ladies or persons in gay apparel, and not deigning to say "God save you" to the sergeants whom he met in the street. insomuch that many people took him to be a fool. He was very poor. wore long robes, and had a shaven crown, having received the clerical tonsure. But he seems only to have taken minor orders, and earned a precarious living by singing the *placebo, dirige* and seven psalms for the good of men's souls. The fact that he was married may explain why he never rose in the church. But he had another source of livelihood in his ability to write out legal documents, and he was extremely familiar with the law courts at Westminster. His leisure time must have been entirely occupied with his poem, which was the work of a lifetime. He was not satisfied with re-writing it once, but he actually re-wrote it twice, and from the abundance of the MSS. which still exist we can see its development from the earliest draught (A-text), written about 1362, to its latest form (C-text), written about 1393[1]

In 1399, just before the deposition of Richard II., appeared a poem addressed to the king, who is designated as "Richard the Redeless," *i.e.,* devoid of counsel. This poem, occurring in only one RIS. [of the B-text] in which it is incomplete. breaking off abruptly in the middle of a page, may safely be attributed to Langland, who was then in Bristol. As he was at that time about sixty-seven years of age we may be sure that he did not long survive the accession of Henry IV. It may here be observed that the well-known poem entitled *Pierce Ploughman's Crede,* though excellently written, is certainly an imitation by another hand; for the Pierce Ploughman of the *Crede* is very different in conception from the subject of "William's Vision."

Professor Manly's View.—On the other hand, the view taken by Professor J. M. Manly, which has obtained increasing acceptance among scholars, is that the early popularity of the *Piers Plowman* poems has resulted in "the confusion of what is really the work of five different men," and that Langland himself is "a mythical author." The argument for the distinction in authorship rests on internal evidence, and on analysis of the style, diction and "visualizing" quality within the different texts. Whereas Skeat, regarding the three texts as due to the same author. gives most attention to the later versions, and considers B the intermediate form, as on the whole the best, Manly recognizes in A the real poet, and lays special stress on the importance of attention to the A-text, and particularly pass. i.–viii. In this A-text the two first visions are regarded as by a single author of genius, but the third is assigned to a continuator who tried to imitate him, the whole conclusion of the 12th passus being, moreover, by a third author, whose name, John But, is in fact given towards the end, but in a way leading Skeat only to credit him with a few lines. The same process of analysis leads to crediting the B-text and the C-text to separate and different authors, B working over the three visions of the A-text and making additions of his own, while C again worked over the B-text. The supposed references to the original author A, introduced by B and C, are then to be taken as part of the fiction. Who were the five authors? That question is left unsolved. John But, according to Professor Manly, was "doubtless a scribe" or "a minstrel." B, C and the continuator of A "seem to have been clerics, and, from their criticisms of monks and friars, to have been of the secular clergy," C being "a better scholar than either the continuator of A or B." A, who "exempts from his satire no order of society except monks," may have been himself a monk, but "as he exhibits no special technical knowledge or interests" he "may have been a layman." As regards Richard the Redeless, Professor Manly attributes this to another imitator; he regards identity of authorship as out of the question, in consequence of differences in style and thought, apart from the conclusion as to the authorship of *Piers the Plowman.*

See the editions already reierred to: *The Deposition of Richard II.,* ed. *T.* Wright (Camden Society), which is the same poem as *Richard the Redeless;* Warton, *Hist. of Eng. Poetry;* Rev. *H. H.* Milman, *Hist. of Latin Christianity; G.* P. Marsh, *Lectures on English; H.* Morley, *English Writers;* B. ten Brink, *Early English Literature; J. J.* Jusserand, *Observations sur la vision de P. P.* (Paris, 1879); *Les Anglais au moyen âge: L'Épopée mystique de William Langland* (1893, Eng. trans. *Piers Plowman,* revised and enlarged by another 1894) ; J. M. Manly in *Cambridge Hist.* of *English Lit.,* vol. ii. and bibliography. A long and careful summary oi the whole poem is given in Morley's *English Writers,* and is repeated in his *Illustrations of English Religion,* ch. iii.

LANGLEY, SAMUEL PIERPONT (1834–1906), **U.S.** astronomer and physicist, studied solar phenomena and pioneered in aviation. He was born at Roxbury. Mass., Aug. 22. 1834. His formal education was obtained at the Boston Latin school and at the Boston high school, from which he was graduated in 1851. He did not go to college. From 1857 to 1864 he practised the profession of civil engineering and architecture, mainly in Chicago and St. Louis.

It was on his return to Boston, in 1865, that his serious professional iife began with an assistantship in the Harvard observatory. The following year he went to the U.S. Naval academy, Annapolis, Md., where he taught mathematics. In 1867 Langley accepted the directorship of the Allegheny observatory in Pennsylvania and became professor of physics and astronomy in the Western University of Pennsylvania. In 1887 he became secretary of the Smithsonian institution in Washington. D.C. He spent the last 19 years of his life as director of the institution. establishing the Washington National Zoological park and the institution's astrophysical observatory at Wadesboro, N.C. He died at Aiken, S.C., on Feh. 27, 1906.

Langley was first of all an ardent student of solar phenomena.

[1] According to Jusserand, 1398.

Every student of astronomy is familiar with his exquisite drawing of the great sunspot of Dec. 1873. His main interest, however. was in the fundamental problem of meteorology; *i.e.,* the amount of heat the earth receives from the sun and the selective absorption of it by the earth's atmosphere. In 1881 he made an expedition to Mt. Whitney, Calif., accompanied by James E. Keeler, for the purpose of getting a clear sky and two points of widely differing elevation from which to measure the heat received from the sun.

Langley's study of the solar spectrum led him to the invention of the bolometer, a device which enabled him to extend the solar spectrum far into the infrared. Langley used this apparatus with great skill not only to detect the dark spaces in the solar spectrum known as Fraunhofer and telluric lines, but also to measure the intensity of solar radiation at various wave lengths.

While he was still at Allegheny, Langley made, in the field of aeronautics: some highly important qualitative experiments upon the "lift" and "drag" of a plane moving through the air at a measured speed. As early as 1896 Langley made a steam-driven airplane which flew a distance of 4,200 it. over the Potomac river, but it carried no pilot, nor was it provided with any means of safely leaving the ground or safely alighting. His pilotless airplanes made several other successful flights. Langley was also the first to offer a clear explanation, backed by experiment, of the manner in which birds are able to soar without appreciable motion of their wings. (H. Cw.; X.)

LANGLOIS, HIPPOLYTE (1839–1912**j,** French general, noted for his classic treatise on artillery, was born at Besançon in 1839. After passing through the École Polytechnique, he was appointed to the artillery as sublieutenant in 1858, attaining the rank of captain in 1566. He served in the army of Metz in the war of 1870.

In 1888 Langlois became professor of artillery at the École de Guerre, and worked out the tactical principles of the employment of field artillery under the new conditions of armament. His great treatise *L'Artillerie de campagne* (1891–92) is an artillery classic.

In 1907 Langlois began the publication of a monthly journal of military art and history. the *Revue militaire générale.* The most important of his other works are *Enseignements de deux guerres récentes* and *Conséquences tactiques du progrès de l'armement.* He died in Feb. 1912. in Paris.

LANGMUIR, IRVING (1881–1957), U.S. scientist won the Nobel prize in chemistry in 1932. He was born in Brooklyn, N.Y.. on Jan. 31, 1881. He studied at the Columbia school of mines, at the University of Gottingen, Ger. (Ph.D., 1906), and taught at Stevens institute. Hoboken, N.J. (1906–09). In 1909 he joined the General Electric research laboratory, Schenectady, N.Y., where he worked until his retirement in 1950. There he made many noteworthy scientific contributions. In physics he pioneered in electrical discharges in gases, in electron emission, and in the development of the mercury condensation vacuum pump. In chemistry he investigated the high-temperature surface chemistry of tungsten, formulated theories of atomic structure and adsorption *(see* CHEMISTRY: *Physical Chemistry*: *Adsorption),* and opened new fields in colloid and biochemistry through his work on molecular films.

In 1946 Langmuir's work and that of his associates led to the discovery of techniques for transforming supercooled clouds into ice crystals by cloud seeding.

His scientific achievements resulted in many technological advances that included high-power vacuum tubes, the gas-filled tungsten lamp and atomic hydrogen welding. Of his work Langmuir said, "Whatever has come in industrial applications has come incidentally from experiments followed for their interest alone." (B. VT.)

LANGNAU (2,244 ft.), a town in the canton of Bern, Switzerland, in the middle of the Emmenthal and at the junction of the railways Bern-Luzern (Lucerne) and Burgdorf-Langnau. The population in 1960 was 9,201, mostly German-speaking Protestants, and engaged chiefly in cattle breeding and cheese making.

LANGO. The Lango (sometimes incorrectly called Miro and Bakedi) are a Nilotic tribe of Uganda, combining agriculture with animal husbandry. A well-built, tall, upstanding race, they live in the marshy and lowland country north and east of Lakes Kwanya and Kioga, arriving there after a series of migrations from the north-east dating from the 17th century. They remove the lower middle incisors and in their primitive conditions are unclothed, the women only wearing small aprons of metalwork or fibre suspended from a belt. Both sexes, however, are inordinately fond of bead and wire ornaments, and cicatrise their bodies with fantastic and often charming designs.

They live in compact villages varying from ten to 150 huts, the village representing an aggregate of families which have united for mutual support. Their dome-like huts exhibit the flounced thatching typical of the Nilotics, and the diminutive bachelors' huts raised from the ground on piles are a distinctive feature of the culture. In each village there is a communal girls' hut supervised by an aged duenna.

They cultivate a large variety of millets both for food and for making the beer, which is their staple drink, and numerous vegetables are also grown in the vicinity of the village. Men and women share the agricultural duties, but men have the sole custody and management of the cattle, while women concern themselves with the domestic duties of the village. Men manufacture pots, but women make baskets and mats. Their weapons are spears and light hide shields of a rectangular pattern.

The tribe is divided into a number of exogamous clans with totemic or pseudo-totemic characteristics, inheritance and descent being through the male. Polygyny is practised. Society is also classified by a system of age-grades, which has been borrowed from their Nilo-Hamitic neighbours, probably before their final migrations. These grades have their special functions which are chiefly religious and are concerned with the magical processes of rainmaking. They are governed by hereditary clan leaders, who have gradually acquired a territorial status and might be called petty chiefs, with powers and duties in regard to all who dwell in their vicinity irrespective of clan allegiance. Above these are the chiefs, who control from three to six clan chiefs, winning their position by personal merit, generosity and ability. Their title (rwot), however, is not hereditary, and their tenure of office is precarious and depends largely on their success in war and on the conduct of their civil responsibilities.

The Lango are skilful hunters, and though all land is held communally by the tribe, or in a few cases by the clan, the whole country is divided into a number of hunting areas, in which the rights of hunting are vested in an individual and pass to his heir on his death.

They believe that every human being (and a few animals) has a guardian spirit called *winyo* or "bird" which attends him during life and has to be liberated from the corpse by certain rites. There is also the shadow-self or immaterial soul called *tipo,* which after death may be renamed *chyen* and is eventually merged into a vague entity named *jok,* found in one form or another in all the Nilotics. *Jok* and the ancestors, of whom *jok* is thus the universal sublimation, are worshipped at shrines and sacred trees by prayer and sacrifice, and *jok* manifests himself in a diversity of forms, to each of which a specific name is given as to a divinity, some of them being anthropomorphic in conception, and all having special functions and individual spheres of activity appropriate to the different needs of humanity.

See J. H. Driberg, *The Lango* (1923). (J. H. D.)

LANGPORT, a small market town in Somerset. Eng., 14 mi. E. of Taunton by road. Pop. (1951) 772. Though remains of several large Roman villas have been found in the locality, no certain trace of Roman or earlier occupation has been discovered at Langport. Yet the town is historically interesting as an ancient borough situated at the head of the Somerset marshes. protecting the first and, for centuries. the principal bridge over the Parrett, the chief river of Somerset. Founded in Saxon times as a royal borough, by 1086 Langport had 34 burgesses and, until the establishment of Bridgwater in 1200. was in direct communication with the Bristol channel. River trade made it an important market and centre of distribution, hut with the coming of the railways a

decline set in from which it has never recovered. Langport was represented in parliament in 1304 and 1306, and the first charter of 1563 recognized the great antiquity of the town and made a formal grant of a market and fairs. Incorporated in 1616. it continued under its ancient government of reeve and commonalty with two bailiffs. instead of the more common form of mayor and corporation. All rights as a borough were lost in 1886 and Langport gives its name to the rural district of which it forms the chief parish. The church of All Saints is Perpendicular with some remarkable mediaeval glass in the east window. Set upon an arch over the road is the hanging chapel built originally to serve a guild. used for a time as the grammar school and now. restored, as a masonic lodge. Langport was the scene of a battle. when Sir Thomas Fairfax defeated Lord Goring in 1645 during the Civil War, and the birthplace of Walter Bagehot (1826–77), the economist and author. (T. J. HT.)

LANGREO, a town of northern Spain, in the province of Oviedo, in very hilly country: on the left bank of the river Nalon, and on a branch railway from Oviedo to Laviana. Pop. (1950) 54,676 (mun.). In the neighbourhood large quantities of wheat, hemp, fruit and cider are produced; and there are important coal and iron mines, foundries and factories for the manufacture of cloth.

LANGRES, a town of eastern France, capital of an *arrondissement* in the *département* of Haute-Marne, 22 mi. S.S.E. of Chaumont on the eastern railway to Belfort. Pop. (1954) 5,544. Langres stands at a height of some 1,550 ft. on a promontory of the plateau de Langres, overlooking the valleys of the Marne and its tributary the Bonnelle, with fine views from its cathedral tower and ramparts. The cathedral of St. Mammès, for the most part 12th century Transitional, has a Graeco-Roman west front (18th cent.) and a fine Renaissance chapel. The church of St. Martin (13th, 16th and 18th centuries) possesses a figure of Christ of the 16th century, one of the finest wood carvings known. The ramparts are protected by several towers, mostly 16th century. The Gallo-Roman gate, one of four entrances in the Roman period, is preserved, but is walled up. The town possesses a museum of Gallo-Roman antiquities, and an important library. Langres is the seat of a bishop under the archbishop of Lyons and a sub-prefect, and has tribunals of first instance and of commerce. It manufactures well-known cutlery and grind-stones.

Langres, the ancient *Andematunum,* was capital of the *Lingoncs.* Under Roman rule it was at first to some extent autonomous, but was reduced to the rank of colony after the revolt of the chief Sabinus in A.D. ;1.

LANGTOFT, PETER (d. *c.* 1307), author of an Anglo-Norman chronicle in alexandrines, took his name from the village of Langtoft in East Yorkshire, and was a canon of the Augustinian priory at Bridlington. He acted as procurator for the prior or chapter, 1271–86, but seems later to have been in disgrace. His *Chronicle* deals with the history of England from the earliest times to the death of Edward I, and seems to have as its aim the glorification of that king. The early part relies ultimately upon Geoffrey of Monmouth and other writers, but for the reign of Edward I it is an original and valuable authority, with a strong anti-Scottish bias. The latter part of the *Chronicle* was translated into English verse by Robert Mannyng of Brunne (completed, 1328). This translation was edited by T. Hearne in 1725.

BIBLIOGRAPHY.—The complete *Chronicle* was edited *by* T. Wright for the "Rolls Series," 2 vol. (1866–68). *See* also O. Preussner, *Robert Mannyng of Brunnes Übersetzung voa Pierre de Langtofts Chronicle* (1891); M. D. Legge, "A List of Langtoft Manuscripts, With Notes on Laud Misc. 637," in *Medium Aevum,* iv (1935) and *Anglo-Norman in the Cloisters,* pp. 70–74 (1950). (D. WK.)

LANGTON, JOHN (d. 1337), chancellor of England and bishop of Chichester, was a clerk in the royal chancery, and became chancellor in 1292. Owing to the resistance of Pope Boniface VIII. he failed to secure the bishopric of Ely in 1298, although he was supported by Edward I. and visited Rorne to attain his end. Resigning his office as chancellor in 1302, he was chosen bishop of Chichester in 1305, and again became chancellor shortly after the accession of Edward II. in 1307. Langton was one of the "ordainers" elected in 1310, and lost the office of chancellor about this time. He mediated between the king and Earl Thomas of Lancaster in 1318, and attempted to do so between Edward and his rebellious barons in 1321. He died in June or July 1337 Langton built the chapterhouse at Chichester, and was a benefactor of the University of Oxford.

LANGTON, STEPHEN (d. 1228). English cardinal and archbishop of Canterbury, the first great Englishman in the primacy since Dunstan, was the son of Henry, lord of the manor of Langton-by-Wragby, Lincolnshire, but the date of his birth is unknown. He became early in his career a prebendary of York, and his brother Simon (d. 1248) was elected to that see in 1215. Stephen, however, migrated to Paris, and having graduated in that university became one of its most celebrated theologians. He spent some 25 years in Paris. This was probably the time when he composed his voluminous commentaries (many of which still exist in manuscript). He divided the Old Testament books of the Vulgate into chapters, and was probably responsible for the grouping of the historical apocryphal books. To this period belong his *Questiones,* dealing with subjects of current debate, such as the limits of obedience to episcopal authority and the papal power of dispensation. At Paris also he contracted the friendship with Lothar of Segni, the future Innocent III., which played so important a part in shaping his career. Upon becoming pope, Innocent summoned Langton to Rome, and in 1206 designated him as cardinal-priest of S. Chrysogonus. Immediately afterwards Langton was drawn into the vortex of English politics.

Pope Innocent **III.** and King John.—Archbishop Hubert Walter had died in 1205. The suffragans of Canterbury claimed a share in choosing the new primate, although that right had been exclusively reserved to the monks of Canterbury by a papal privilege; and John supported the bishops since they were prepared to give their votes for his candidate, John de Gray, bishop of Norwich. A party of the younger monks, to evade the double pressure of the king and bishops, secretly elected their sub-prior Reginald and sent him to Rome for confirmation. The rest of the monks were induced to elect John de Gray, and he too was despatched to Rome. After hearing the case Innocent declared both elections void; and with John's consent ordered that a new election should be made in his presence by the representatives of the monks. The latter, having confessed that they had given John a secret pledge to elect none but the bishop of Norwich, were released from the promise by Innocent; and at his suggestion elected Stephen Langton, who was consecrated by the pope June 17, 1207.

On hearing the news the king banished the monks of Canterbury and lodged a protest with the pope, in which he threatened to prevent any English appeals from being brought to Rome. Innocent replied by laying England under an interdict (March 1208), and excommunicating the king (November 1209). As John still remained obstinate, the pope at length invited the French king Philip Augustus to enter England and depose him. It was this threat which forced John to sue for a reconciliation; and the first condition exacted was that he should acknowledge Langton as archbishop. During these years Langton had been residing at Pontigny, formerly the refuge of Becket. He had addressed to the English people a dignified protest against the king's conduct, but he had consistently adopted towards John as conciliatory an attitude as his duty to the church would allow, and had more than once entered upon negotiations for a peaceful compromise. Immediately after entering England (July 1213) he showed his desire for peace by absolving the king.

The **Archbishop.**—Langton was associated with the baronial opposition. He encouraged the barons to formulate their demands and is said to have suggested that they should take their stand upon the charter of Henry I. It is uncertain what further share he took in drafting Magna Carta. At Runnymede he appeared as a commissioner on the king's side, and his influence must therefore be sought in those clauses of the charter which differ from the original petitions of the barons. Of these the most striking is that which confirms the "liberties" of the church; and this is chiefly remarkable for its moderation.

Soon after the issue of the charter the archbishop left England to attend the fourth Lateran council. At the moment of his

departure he mas suspended by the representatives of Innocent for not enforcing the papal censures against the barons. Innocent confirmed the sentence. which remained in force for two years. During this time the archbishop resided at Rome. He was allowed to return in 1218, after the deaths of Innocent and John. From that date till his death he was a tower of strength to the royal party. Through his influence Pandulf was recalled to Rome (1221) and Honorius III promised that no legate should be sent to reside in England during the archbishop's lifetime. In 1222, in a synod held at Oseney. he promulgated a set of constitutions still recognized as forming a part of the law of the English Church. He may be said to have accomplished the transition from the feudal church of Lanfranc to the national church of later days. He died on July 9, 1228. and was buried in Canterbury cathedral, where his tomb, unless tradition errs, may still be seen.

Dr. Gore, speaking at Canterbury at the seventh centenary celebrations in 1928 justly defined Langton's position as "mediate between excessive nationalism and excessive papalism, leaving both parties unsatisfied, but always the just moderator and harmonizer."

The authorities are mainly those ior the reign of John. No contemporary biography has come down to us. Some letters, by Langton and others, relating to the quarrel over his election are prcscrved in a Canterbury chronicle (ed. W. Stubbs in the "Rolls" edition of *Gervase* of *Canterbury,* vol. ii.). There are many references to him in the correspondence of Innocent III (Migne's *Patrologia Latina,* vol. ccxiv.–ccxvii.). Oi modern works *see* F. Hurter, *Geschichle Papst Innocenz III.* (Hamburg, 1841–44); W. F. Hook. *Lives of the Archbishops of Canterbury* (London, 1860–76); W. Stubbs's preface to the second volume of *Walter of Coventry* ("Rolls" ed.), which devotes special attention to Langton; and F. M. Powicke, *Stephen Langton* (1928). The mss. of Laneton's writings are noticed in J. Bale's *Index Britanniae scriptorum* (ed. R. *L.* Poole, 1902); his Constitutions are printed in D. Wilkin's *Concilia,* vol. ii. (London, 1737). (H. W. C. D.)

Another English prelate who bore the name of Langton mas THOMAS LANGTON, bishop of Winchester, chaplain to Edward IV. In 148.3 he was chosen bishop oi St. Davids; in 1485 he was made bishop of Salisbury and provost of Queen's college, Osiord. and he became bishop of Winchester in 1493. In 1501 he was elected archbishop of Canterbury, but he died on Jan. 27, 1501, before his election had been confirmed.

LANGTON, WALTER (d. 1321), bishop of Lichfield and treasurer of England, born probably at Langton West in Leicestershire. Treasurer from 1295 and bishop of Lichfield from 1296, he became chief adviser of Edward **1.** who made him the principal executor of his will. His position was changed by the king's death in July 1307. The accession of Edward II and the return of Langton's enemy, Piers Gaveston. were followed by the arrest of the bishop and his removal from office. His lands and hoarded wealth were seized. Though his temporalities were restored in Oct. 1308, he remained in prison till Jan. 1312, when he again became treasurer. Excommunicated by Archbishop Winchelsea, he appealed to the pope, visited him at Avignon and returned to England after Winchelsea's death (May 1313). He died in Sov. 1321 and was buried in Lichfield cathedral.

LANGTRY, LILLIE (sometimes LILY; originally EMILY CHARLOTTE LE BRETON) (1852–1929). English actress, celebrated for her beauty and known as the "Jersey Lily," was the daughter of the Rev. W. C. le Breton. dean of Jersey. where she was born on Oct. 13. 1852. In 1874 she married Edward Langtry. who died in 1897, and in 1899 she married Sir Hugo de Bathe. In 1881 Mrs. Langtry made a sensation by being the first society woman to go on the stage, making her debut at the Haymarket theatre, London. with the Bancrofts, as Kate Hardcastle in *She Stoops to Conquer.* For some time the critics did not take her seriously, but she became a very competent actress, her most successful part being Rosalind. She also toured the provinces. She turned the old Aquarium theatre in London into the lmperial theatre, modeled on a Greek temple, and opened it under her own management in 1900. Lillie Langtry also maintained a very successful racing stable at Newmarket. One of the most beautiiul women in England. she had many distinguished admirers, counting King Edward VII among them.

Mrs. Langtry died at Monte Carlo on Feb. 12, 1929.

Sec Lillie Langtry, *The Days* I *Knew* (1925). (W. J. M.-P.)

LANGUAGE may be defined as an arbitrary system of vocal symbols by means of which human beings, as members of a social group and participants in a culture, interact and communicate.

Each term in this definition needs to be examined. By "arbitrary" is meant that there is no necessary relation between any linguistic item and what it symbolizes. In English a certain animal is called *horse,* in French *cheval,* in Russian *loshad',* and no one of these words is more adequate or appropriate than any other to the reality of the animal. Even imitative (onomatopoetic) words turn out to be quite arbitrary and are always made up of ordinary sounds of the language. The English verb *purr* and the French *ronronner* can both be said to imitate the sound a cat makes when purring, but note how different they are. It is apparent that language is a "system." A baby babbles unsystematically, but when it learns to talk only certain of the possible noises are used, and they are arranged in ways that can be described in an orderly fashion. "Vocal" means that we are talking specifically about speech. Other communication systems exist, and will be mentioned below, but by the word language we shall mean spoken language. Writing will be seen to be a secondary system dependent on speech. "Symbols" are representations of things. rather than the things themselves. The word book is not a book, and the word *democracy* refers to a system of behaviour that requires many pages to describe. Human beings live in social groups and learn and participate in the behaviour patterns of their society, its culture. The behaviour consists of interaction of human beings with each other and with the environment. The interaction is largely brought about by communication, the sending of messages or the imparting of information by one individual to another.

LANGUAGE IN CULTURE

Language as defined is the unique possession of human beings. Other animals interact by means of sounds and body movements, and many also learn to understand human speech to some extent. But no other species of being has systematized its cries and utterances so that they constitute communicative symbols in the way that language does. In these terms, then, man may be described as the talking animal. In the fossil records of various manlike creatures there is obviously no indication of the noises they made, but the remains are accompanied by various kinds of artifacts—chipped stone flakes and the like. The existence of these indicates that the creatures who made them could talk, for the co-operation required to produce such artifacts includes systematic symbolic communication. By definition, then. man has always been able to talk. All other creatures have only various instinctually determined sound-making powers. But man has the power to learn the language of his group and to pass it on to others.

This ability to pass on knowledge. to transmit experience vicariously, is the basis for the development of all that array of behaviour patterns known as culture. It is the distinguishing mark of humanness. Among the lower animals, *e.g.,* the social insects, there are instances of remarkably complex behaviour. This is transmitted genetically, succeeding generations do not learn it from their elders and the patterns remain unchanged through geological ages. As one goes higher in the evolutionary scale. the role of instinctual hehaviour is reduced and learning begins to enter. The vertebrates show many instances of learned behaviour, and the mammals especially owe their biological success to their ability to learn complex patterns. All the higher mammals can do this, and the young learn from and are taught by their elders. These animals, in teaching and learning, exhibit symbolic behaviour. But the symbols — noises and body movements — never become specifically communicative. That is. they demonstrate and can be imitated but they do not tell anything in the sense of communicating specific information. Each generation must learn anew from its own experience. Among human beings. however, the noises and body movements have become more than symbolic — they have become communicative. They can actually convey specific content about behaviour. Thus the young of our species can learn all that their predecessors know and knew by being told about it, and any human being can learn about the experiences of any other.

Biological Basis of Culture. — This basis is to be sought in those activities of the human organism that are universal and necessary to the existence of all human beings. These being es-

tablished. we can see how man has developed his cultural behaviour by talking about what he does and what happens to him. Because man talks—if not aloud then to himself—about everything he observes, we must relate language to other cultural activities.

All living beings are dependent on their environment. They act on it and it acts on them. This is the first and basic activity, interaction with the environment and with other human beings. This leads to association, the grouping of human beings in various ways. Groups get their subsistence by work, which is always divided first by virtue of the fact that there are two sexes. These activities take place in the spatial (or territorial) environment and have temporal extension. All living creatures share the activities so far mentioned. Among the higher animals there is found the basic activity of learning, which is especially developed among human beings. Learning is often started by means of play, something that only the higher animals exhibit and that man has developed extensively. At the lower levels of the evolutionary scale, creatures find protection in their coloration or their armoured hides or some other built-in feature. The higher animals defend themselves by skilfully learned use of their strength. For man, defense becomes the basis for an elaborate series of cultural activities. In the process man engages in the exploitation of his environment and its resources.

Cultural Systems.— Cultural systems have been developed on the basis of these activities, and by combining them in various ways. As pointed out, human beings talk about themselves and their environment. For human beings, therefore, interaction becomes systematized as symbolic behaviour at several levels. There is first cerebration, the basic activity of the human brain. How this takes place is not known, but it predisposes human beings to interpret everything about them symbolically. The interpreting takes place by a kind of coding. Everything is differentiated from everything else by a process of isolating details: "this is A, everything else not A," and so on until a key has been provided for everything with which the society is concerned. Cerebration and coding are accompanied by what may be called emotions and valuation. Emotions are evidenced by various kinds of external behaviour affecting the set and quality of the voice. Valuation (the appreciation and definition of situations. often by what is called "hunch") is evidenced in body set and movement quality. Stemming directly from coding, and brought into play by voice and bodily movement qualities, there then arises communicative activity.

Communication.— Three systems are involved in communication. One is vocalizations, the making of various kinds of noises that are outside of language proper. Another is the system of gestures and body movements, kinesics. The third and principal one is language. Communication is a specialization of symbolic behaviour that exists coterminously with culture. The symbolic behaviour basic to it is shared, to the extent of their capacity, by other animals, but only man has systematized it in communication systems. Each of these will now be examined.

Vocalizations involve first the noises that differentiate, on the basis of voice quality, various emotionally determined communicative situations; laughing and crying come first here. Soises like laughing and crying are made by the newborn infant, but after about six weeks or so real communication begins in terms of them. Crying is employed to signal distress and hunger and the like, and is turned off when help arrives; laughing is used in pleasurable situations. Another vocalization used similarly is whispering, and another may well be shouting or yelling as such. Over-all nasalization and moaning and groaning may belong here too. Then we come to vocal qualifiers. These accompany the vocalizations we have just mentioned, and also go with language material *(see* below). The vocal qualifiers are: overloudness, oversoftness, overhigh pitch, overlow pitch, drawl, clipping (extra short enunciation), singing (spreading of all pitch extremes), monotone (reduction of pitch differences), rasp, openness (opposite of rasp) and possibly a few others. A third kind of systematized vocalization is the vocal identifiers. In the utterances *uhuh* or *ahak* meaning affirmation, "yes." there is a smooth transition between the syllables, whereas in *uh-uh* or *ah-ah* meaning "no," there is a glottal closure. This glottal closure and its absence constitute the system. There seem to be such systems among speakers of many, perhaps all, languages, but they have not yet been studied.

The system of kinesics involves units of body motion or gesture, such as an extended finger, a wink, a raising of an eyebrow; and patterns of units such as a shaking of the head accompanied by an admonitory finger and perhaps movement of the arms. Kinesic communication is more alike in different parts of the world than are languages, but even within one linguistic area there may be clear differences. In the United States the kinesics of women in the southeast is different from that elsewhere, and the kinesics of men in some parts of the southwest is at variance with other regions. Kinesic differences have long been observed in the references to impassive or stern or happy countenances, to the voluble gestures of some peoples, to the expressivity of arms or hands and so on.

In language, the principal and most complex communication system, there are systematically differentiated sounds, which are arranged into grammatically significant sequences, accompanied by elements from kinesics and vocalizations. We shall examine the details of linguistic structure below, after consideration of the content of the rest of culture, which is what language talks about.

Other Systems of Culture.— As has been indicated, man can learn about the experience of any and every human being by means of language without being present when the experience happens. His socialization as a human being is made possible by the language that he learns and that is talked at him constantly. He learns to talk about all kinds of complex cultural behaviour long before he has any direct experience of it. Let us see what are the important subjects of discourse for human beings.

Association in groups forms the basis of society (social structure, the social order), a system of cultural behaviour with many subdivisions. In every human group there is talk at some time or other about what constitutes a valid grouping. Then one discusses the basic relationships that exist between human beings and that make possible the groups. This leads to the structure and functioning of government. There is serious discussion in governing bodies, there is the giving and receiving of orders, there is the informal talk about authority by those who wield it and those who resent it. Another aspect of society is the matter of kinship and the associated subjects of status and role. Kinship systems are often studied in and of themselves. The terms are collected, their meanings are noted and analyzed and the system of relationships is explicitly worked out and stated. In English we have a kinship system that can be handled by a relatively small number of basic terms: *father, mother, parent, husband, wife, spouse, child, son, daughter, brother, sister, nephew, niece, uncle, aunt, cousin,* the prefixed terms *grand-* and *great-* and *step-*, the suffixed *-in-law* and the rare and specialized phrases *once removed, twice removed,* etc. In other languages there are often additional specialized terms, the system being different and having to be talked about differently; *e.g.,* terms for *older brother, younger brother, older sister, younger sister,* etc. Or again there may be no distinction made in a situation where we do make *one—sibling, child, uncle-or-aunt,* and so on *(cf.* the English word *cousin).* Class and caste relationships tie up with status and role in many ways; in all four areas there are large vocabularies to handle the activities. More is involved than vocabulary. Persons of different classes often speak in different ways as regards pronunciation, grammatical forms, style. There are in many languages special terms of address indicating varying class status of speakers and those spoken to. Members of castes sometimes have to speak indirectly to members of other castes. Persons of high status may not talk at all about some things that others talk of constantly. Assuming different roles at different times may involve quite differing language behaviour.

Working for a living—all the behaviour necessary to justify one's existence, such as being a school child at a certain age, a wage earner or housewife at another, a retired person late in life —gives rise to cultural systems that may be designated as operational activity. Associated with it is 'all of the behaviour labelled economic. Talking about these matters creates enormous vocabularies. Occupations, exchange units, commercial activities—all

must be named and talked about. Often, too, occupational groups develop special technical jargons.

The existence of two sexes is one of the fundamental conditioners of human behaviour. Communication, social structure, occupations — all are affected by it in obvious ways. All human groups have built up large cultural systems about these matters. Men and women, male children and female children have different rules governing their behaviour. There are such situations as descent in the female line in one place but in the male line somewhere else. This necessarily implies different connotations for terms like ancestor, and also calls for specialized vocabularies and usages. Everywhere men and women have differing roles and occupations; they use, as a consequence, different terms in different situations. In many languages such differences are slight. In English there are some expressions such as dear me! that are predominantly used by women, while others. profanity. "tough" language, may be chiefly used by men. In some languages, however. the differences are extensive and carry over even into grammatical forms. Most of the forms are the same for everybody and both sexes understand and know each other's special linguistic forms, of course, but their usage of the latter is divided. Such a language was that of the Yana Indians of California. Similar situations are reported for other parts of the world.

The two great culture-basic areas of space and time are productive of many kinds of linguistic activity. Space involves orientation and distance, the measurement of lengths (and other weights and measures), the matter of territoriality (the boundaries or limits set upon the space in which a person exercises his activities). Such references as my, your, his; this, that; near, *far;* north, east, south, west; the systems of terms for weights and measures, are based on territoriality and the use of space. Time, based on the biological fact of temporality — the passage of time, "becoming later" — similarly involves time location and change, calendrical and clock systems. notions of appropriate hours and seasons. There are time vocabularies of many kinds. In English. day may mean a definite astronomically measured technical unit, or it may mean the formal unit of the calendar, $\frac{1}{365}$ of a year, or it may be the informally apprehended period of davlight as contrasted with night. Time is talked about in different ways in different languages. In the languages of western culture time and space are often spoken of in similar ways, and are used to measure each other (a day's journey, travel time). In Navaho time is treated as if it actually were extension in space. Or time and space may be talked about in quite different terms.

Learning is the basis for the cultural system of enculturation — the whole process of becoming a well-adjusted member of one's group. One has to become aware of all the formal precepts of one's culture: what is right and what is wrong, what is considered appropriate under different circumstances, what is moral and so on. Most of this awareness is acquired explicitly by being told about it. One's elders and one's contemporaries tell one constantly what they approve and what they disapprove, using such terms as, "This isn't done," "Everybody does that," "Nobody would think of doing that." Such phrases are usually accepted without further thought. Then there is the matter of informal learning where one learns by demonstration and observation. Much of this. it is true, goes on without verbalization, but insofar as there is linguistic material accompanying the activity it too gets learned and is an integral part of the whole. Finally, there are educational systems: schools, training in ritual, technical training and the rest. These are all carried on with a teacher — one who knows—and students. The teacher, by word of mouth or in written form, tells the students what they should learn. The process is almost uholly verbalized.

Play as a basic activity gives rise to the systems of recreation. These have been little studied. Many aspects of recreation derive largely from specialized uses of language. In games the participants must know the rules and agree on them. and talk to each other. Referees and other officials use language constantly. Spectators approve, cheer, boo at mistakes. In reading or seeing a play or hearing a speech the material of the occasion is specialized, literary language. The reader or hearer judges such material by its accuracy of portrayal of the situation. The cultural activities associated with literature are based on special uses of language, and are thus systems built on the basic activities of interaction, play and such others as are involved in the specific subject matter.

The need for defense is used by human beings to develop the protection systems. These involve the evaluation of what it is right and proper to defend, the defense of the person against enemies, natural or supernatural, and the protection of the group. Military defense systems of all kinds, health protection, magic, religious ritual come under this heading. Such activities are made possible only by the constant use of language. They have their special vocabularies and usages. In all of them, the power of the word is tremendous, people everywhere being very responsive to formulaic remarks (greetings, proverbs), to commands ("Stop!," "Attention," "Danger"), to ritual. Many-aspects of science too are in this area and, as is well known, the sciences all have their special technical vocabularies and make use of special styles of speech.

The exploitation of natural resources, including the resources of the body, is the basis for the cultural systems which include artifaction (the making of products of any kind that do not exist in nature) and the whole vast complex of technology. It is believed by students of culture that man had to be able to talk before he could produce the artifacts that have been found associated with his fossil remains. This situation has grown in importance ever since, until now the ways of talking about artifacts and about how to make them constitute the bulk of the vocabulary of any language and the largest proportion of all actual speech. When a child is learning to talk or when one is learning a foreign language (see below) one constantly points to objects and has them pointed out. In all kinds of metaphors, or even in plain talk about all other areas of culture, there is constant use of vocabulary items and turns of phrase coming from technology and the allied fields ("Strike while the iron is hot," "As ye sow so shall ye reap," "A homespun fellow," "The mills of the gods grind slowly" and many more).

There are altogether hundreds of cultural systems and subsystems developed from the basic activities named, occurring in various combinations. In all of them language plays a large role. Some of the systems are closely tied up with the fundamental ones already discussed. Society and protection are intimately connected with each other and also with law and administration. These last two are fields where special vocabulary, exactness of phrase and the whole nature of the language being used are extremely important. The systems involving the use of materials in making symbols are of fundamental importance to the symbolic systems as such, especially communication. It is here that we find the graphic arts, writing and the direct reproduction of speech by recording apparatus. These are all supplements to the ordinary use of language, and writing has developed characteristics that make it much like a replica of language.

Language, then. is itself a complex system of cultural behaviour, and it is also the vehicle, tool and reflection of all other aspects of the activity of human beings.

Origin **of** Language.—Human culture necessarily depends on the ability to speak. There must then have been a time in the past when the biological ancestors of modern man had not yet developed language. Speculation on this matter has existed for ages, but linguistic scientists for the most part have not concerned themselves with it. Historical knowledge about existing languages goes back only a few thousand years at most (as will be seen later in the discussion of the historical development of languages). All languages of today are equally complex and equally adequate to express all the facets of the speakers' culture, and all can be expanded and modified as needed. There are no "primitive" languages, but all languages seem to be equally old and equally developed. There are also, as has been said, no human beings without language; nor are there any other animals that can talk. The existence of language can be dated back for perhaps a million years or more, in terms of the age of the artifacts found with fossil man. There is no way of getting data on elementary or formative stages of language since we cannot go back to a time when languages were any

different from what they are now. Hence the avoidance of the subject.

Language can be described as some kind of collective invention. A million or 1,500,000 years ago there were hominid creatures without language and hence without culture. These creatures developed so that they began to use simple tools (sticks to push things away from or toward themselves, rocks as weapons, as do present-day apes and monkeys). Following this, in one or more places, one or more individuals managed to get the idea of identifying a particular action or piece of rock or a location by a particular sequence of sounds, repeated substantially unchanged every time and recognized as a communication symbol by others. From such a situation the development of language can be envisaged. No one can say when this happened or whether it happened once or several times or whether it happened at all. We do not know whether all languages proceed from a single original source, or how long they have been developing.

Children's Language. — Children's language has been suggested as a means to the discovery of how language came into being. But it is clear that it can only show us how language is learned by children of present-day human beings from their elders who know the language. It cannot tell us anything about the development of language by adults from nonlanguage symbolic behaviour.

Children are exposed to language from birth; there is talking going on about them a great deal of the time and those who take care of them constantly talk to them as if they understood. At the age of about six weeks an infant begins to respond to the vocal qualifiers (above) used by adults, and acquires an increasingly responsive reaction to them. By six months a child begins to understand some of the intonation patterns of language *(see* the discussion of language structure below). By the age of one year the child is babbling with varying intonation patterns, accompanied by extensive kinesic and vocalizational activity. During the second year of life the babbling becomes systematic, and the child begins to imitate some of the utterances he hears. It is at this stage that he is usually reported to have said "mama" or "daddy" or the like. 11hen the age of two is reached the child suddenly begins to "make sense." He begins to utter sound sequences that sound like words or even phrases of the language. From this point the child's language develops rapidly. He says things. repeating what he hears. He is corrected. He begins to analyze his world and talk about it. By the age of three most children have enough of the sounds of the language to give a very presentable version of it. though they usually still do not know many of the grammatical forms. Between three and six these deficiencies are corrected and. everywhere in the world and for all languages, the normal child of six has acquired all the sounds and all the grammatical forms of his native language, though of course he does not have all the adult vocabulary. The acquisition of the latter continues all through life. By puberty, however, most persons have acquired, through the language, an adequate understanding of the principal cultural systems of their social group.

The ability to acquire linguistic material rapidly continues for several years. as is evidenced by the acquisition of foreign languages (including nonnative dialects of one's own language). 11omen seem to retain this ability somewhat longer than men. People learn more about their own language and learn new languages all their lives, though apparently much more slowly after 40.

THE STRUCTURE OF LANGUAGE

In defining language the phrase "vocal symbols" was used. There was mention of systematic arrangement of sounds in grammatically significant sequences and recurrent references to words, special vocabularies, turns of phrase and the like.

The use of such terms and phrases is testimony that language has a structure or a series of structures. and that this structuring can be analyzed and systematically presented. When language is spoken. as in the case of any human behaviour, what is going on is a complex series of events: things happen, that is. These happenings are on many planes of experience at once: physical (the sound waves); chemical (the body chemistry); physiological (the movements of nerve impulses and of muscles); psychological (the reaction to stimuli); general cultural (the situation of the speaker in respect to the various cultural systems of his society); linguistic (the language being spoken); and within this last the various levels into which language is analyzed.

Words and Grammatical Forms. — These elements of a language are the first to arouse interest and are also the first things that are learned by the child. The infant who is observed to say something that sounds like "mama" does not, at that time, have a system of sounds for a language, nor does he have any words or grammar. But if he is in an English-speaking environment. let us say, and his utterance is apprehended as the English word *mama* (or *mommy,* or some similar form), and the reaction to it is such that he makes the association between it and his mother, then he starts having a vocabulary.

If he then, on a subsequent occasion, says "dada" (for *daddy),* and learns a reference for it, and then makes utterances like "mama-dada" or "dada-mama," he has begun to have arrangements of words. When he devises some such arrangement as "more dada" to refer to several adult males he is formulating a grammar. The adult learner of a foreign language, and the constant learner of his native language. proceeds always by adding new words and new arrangements to his stock and putting them into utterances.

All languages have items that recur throughout utterances, and a limited (though often rather large) number of patterns for arranging these items. The linguistic scientist calls the recurring items morphs, and he groups them by various processes of classification into morphemes. These are then found to be grouped into words by certain statable patterns, and the words are grouped into phrases and other constructions (clauses, sentences). As an example, the item *boy* recurs in English by itself and in *boy-s, boy-ish, boy-hood;* similarly *-s* recurs in *boy-s, girl-s,* etc.. and *-ish* and *-hood* likewise recur. These are orthographic representations of morphs. The arrangement is always in a fixed order to form words —*boy-s* and not *s-boy, boy-ish* and not *ish-boy* and so on. In English sentences. one says *The man goes home,* or occasionally *Home goes the man,* but not *man-the home-goes.* The definition of a word differs in different languages, and the rules for arrangement of words in constructions differ. But all languages have such items and such rules. In linguistics. the analysis of morphs into morphemes is called morphemics. The study of the arrangement of morphemes is subdivided into morphology, the study of word formation, and syntax, the study of the use and order of words in constructions. Along with the arrangement of morphemes, linguists also study their shape, that is, the kinds of sounds that enter into them and in what combinations. This is called morphophonemics.

Sounds. — The sounds of a language are learned as the different forms and arrangements are acquired. As has been noted. a child does not usually have all of the sounds until the age of five and a half or six. The linguist analyzes sounds into various kinds. There are vowels and consonants, degrees of loudness (stress), various pitch heights (tone), transition phenomena between sounds (junctures). The classification of sounds is done under the heading of phonology. The actual sounds or phones that are heard are described in phonetics, and are grouped into phonemes by the processes of phonemics. In the English words *pit, lip* and *spin* the sounds represented by the letter *p* are all different: the first is followed by a puff of breath (is aspirated), the second is closed off suddenly (is unreleased). the third has no puff of breath and is also said with relatively weak muscular tension (is unaspirated and lenis). Yet to a speaker of English they are all three "the same" because the differences result automatically from their situation in the word (initial, final, after *s).* They are said to constitute one phoneme. All languages have phonemes, but they do not all have phonemes of the same kind.

Vowels are sounds having maximal sonority and made mith the least amount of obstruction of the vocal passages. Languages may have only a few vowels (there are languages with only a or 3 vowel phonemes) or they may have many (9, 10, even 12 vowel phonemes are found).

Consonants are sounds with less sonority than vowels, and made with various kinds of obstructions in the passages, such as closing off the passage or part of it with the lips or with some part of the tongue: all languages also have consonants, the number varying from a dozen or so to perhaps 50.

Stresses are differences in loudness. All languages have such differences, but in some they are significant while in others they are not. Thus in French the loudest stress is regularly at the end of a word or phrase and it can be varied only for sentence emphasis, so French has no word-stress phonemes. English, on the other hand, has four significant degrees of stress (primary on the loudest syllable, as in "higher"; secondary in various kinds of phrases, as in "the white house"; tertiary in other kinds of phrases and in certain kinds of words, as in "White House," "contents"; weak in the so-called unstressed syllables, as "higher, again"). Pitch differences also may be significant or automatic. In English the fall of pitch in "Now!" (from "pitch 4" to "pitch 1") is significant as compared with the steady pitch with final rise in "Now?" ("pitch 3" maintained, final rising contour). In other languages pitch differences may be significant within a word, but not for whole phrases (in the language of the Indians of Taos Pueblo, *cų́* [pronounced like choo, but with a nasalized vowel and with pitch falling from middle high to low] means "he passed by," while *cų̂* [same sound, but with low pitch, level or with slight rise at end] means "he sucked").

Transition phenomena are significant in all languages. They indicate ends of clauses and phrases (as the falling off into silence in English "Now!" contrasted with the rise, of pitch in "Sow?") and various other kinds of structure (English nitrate compared with *night* rate, French parent compared with par an).

Text.—The text of an utterance is made up of sentences consisting of clauses and phrases arranged according to the structural rules of the language. Each clause and phrase consists of words, again in patterned arrangements. Each word consists of morphemes (grammatically significant forms) in fixed order and arrangement. Each morpheme consists of a pattern of phonemes. Each phoneme occurs as a phone whose particular form is dictated by the pattern of sequence in which it is found. In normal speech, every utterance is accompanied by kinesic patterns and vocalizations. Together, all these form the communication context, which is located in a symbolic situation. All languages show this same over-all structure, regardless of differences in the details of pattern. It is this that leads linguists to the conclusion that all languages are equally complex and equally old.

Meaning.— The meaning of linguistic forms, as this term is generally understood, proceeds from the total context. That is, the meaning of an utterance is the result of the interrelated references of all the items in it to the rest of the cultural behaviour of the speaker and hearer. The usual way of giving the meaning of a term is to describe the object or situation referred to by other or equivalent terms. As between two languages, this is called translation.

Where the nonlinguistic cultures are similar, translation can often be exact: horse = cheval, mother-in-law = *bellemère,* etc. But where cultures differ, translation is often difficult. English brother must be translated by one of two words in Taos, depending on whether "younger brother" or "older brother" is meant, the difference in cultural behaviour between older and younger brothers being significant to the Taos.

Within a language, the statement of the meanings of linguistic forms is easy for those that have reference to a limited number of easily described extralinguistic phenomena (boy, *house,* go, ride), but difficult for those whose references are extensive and culturally widely differentiated (do, get; *democracy,* freedom, privacy). The meanings of morphemes and of rules of arrangement, moreover, can for the most part only be given in general terms. English plural means "more than one" generally but not in scissors, *trousers.* English primary stress by itself means "word of one syllable." English 2–3–1 pitch sequence means "declarative sentence" and certain kinds of questions. English open transition (as in night rate) with primary stress before it and tertiary after it means two-part unit term of various kinds.

It is sometimes supposed that the so-called languages of civilization are much more precise in their meanings than are the languages of "primitive" peoples. It is true that modern technical and scientific vocabularies seem to have great precision of reference. But a thorough examination of any number of other languages shows that where their culture demands it, in ritual, for instance, there is equal exactness and precision.

On the other hand, as has been said, large parts of all languages have only generalized or vague extralinguistic reference. This fact makes it impossible to evaluate languages as "better" or "worse" for the conduct of communication activity, since the differences of precision in different parts of the structures cancel each other out.

Language Typology.— The discussion of the different ways in which languages convey meanings and the efficiency with which they do it is often in terms of differences in structure which are designated as differences in language type. The traditional classification is into four kinds of languages: isolating, agglutinative, fusional (synthetic) and polysynthetic. Chinese is given as the typical isolating language. By this is meant that its words are uninflected (have no grammatical endings which change with changing functions in constructions). Turkish is cited as a typical agglutinative language. Here the various morphemes follow each other, often in sequences of half a dozen or more, but with each clearly retaining its own form, so that segmentation is easy. Fusional languages (the term inflected is also used) are the languages of the classical European tradition, such as Latin or Greek. Here grammatical endings are numerous, but it is not easy to isolate out the separate functions fused in each (Latin *-us* in *dominus* is said to be at once nominative and singular and masculine). Polysynthetic (or incorporating) is a term applied chiefly to certain American Indian languages which include the morphemes for what in English would be a whole sentence in one word (Taos *tinąthə̀mų̂,* "I saw the house": ti-, "I-it", *-ną-,* "in a place" [reference to the classification of "house"]; *thə́-na,* "house"; *mų̂,* "saw"). This classification does point out some predominant structural patterns, but most languages show mixtures of all these types of structure, as well as of others. Thus, much of English is of the isolating type, as in, "All the deer cut through the brush to the river in search of fish." where there is not one single inflectional ending. But English also incorporates, as in, "I house hunted yesterday," or "the man I saw yesterday's daughter" (where's refers to the whole preceding part of the sentence).

An examination of the kinds of structures found in any part of a language system might be helpful in answering the larger question of the way in which languages analyze the cultural universe about them. In the realm of phonology we know that there are languages with many phonemes and others with few; that some languages use vowels to a very large extent, with few consonants (Hawaiian has five vowels and only seven consonants, with all syllables of the shape consonant-vowel), while others have very heavy combinations of consonants (English *strengths,* glimpsed); some use stress phonemically, and also pitch, others use neither; and so on through all the possible variations. But none of this seems to have any tie-up with other aspects of structure. In morphemics, there are languages with very little inflection and others with much of it. When these are analyzed by modern methods the traditional classification loses much of its significance. Thus Chinese does indeed have no inflection, but Chinese uses stress and juncture patterns to form complex lexical items in much the same may as English. Turkish appears really to have many instances of inflectional endings being fused with others. Latin *-us* can be analyzed as *-u-* (variant of *-o-*), second declension stem vowel, and *-s,* nominative (singular), and does not include reference to masculine at all. Taos can say "house I-it-saw" as well as "I-it-house-saw."

It is not until we get to vocabulary usage and certain kinds of over-all syntactic patterns that there begins to be some appearance of correlation between linguistic structures and the treatment of the nonlinguistic universe.

Linguistic Analysis.— The linguistic analysis of the physical universe is a matter that has received some consideration from

linguists and much more from philosophers. The task is one that requires an elaborate and thorough analysis of the structure of a language and corresponding analyses of other aspects of culture before it can be handled. Speculation can at best suggest lines of inquiry.

In the languages of the western world there is a great deal of dichotomizing. Terms go in pairs, with meaning reference to opposite extremes *(good-bad, black-white, clean-dirty, strong-weak).* In the western cultures generally it has been observed that dichotomies are constantly being made in behaviour as well as in words. The question suggests itself: is dichotomizing a general cultural habit which is accurately reflected in the language, or is the linguistic habit a prior stimulus for the rest of the behaviour? It was difficult to answer such a question in the state of knowledge at the middle of the 20th century. It is true, however, that in Chinese culture there is much less dichotomizing and the language, too, has few pairs of opposites.

Another such question is suggested by the prevailing sentence structure of the languages of the western world. These have mostly sentences with an actor, an action and a goal. This leads to a kind of anthropomorphism in everything. We say: "The man runs around the lake for exercise," and "The road runs around the lake for convenience." In some languages the two sentences might be rendered: "As for the man there is running around the lake," and "In regard to the road equidistance exists relative to the lake." The two are quite diiferent. Does this mean that the ways of thinking of the peoples are different, that they really see things differently? There is contradictory evidence on such matters. As was shown above, every cultural system is intimately tied up with some part of the language.

If more were known about these connections. it might be possible to see patterns of meaning relationship that would actually indicate the extent to which language colours the analysis of one's universe.

The question is particularly important for science. In science the specific language or culture as a whole is supposed to be overcome and set aside. Scientific terminology is supposed to be internationally equivalent. But if it should be true that some languages are unable to talk easily about. say, the passage of time, certain aspects of science might not get accurately translated into that language and its speakers might be at a disadvantage. This has been alleged for some oriental languages. but there is no real evidence. The problem of the influence of language on how one sees the universe thus remained one for much investigation at mid-20th century.

HISTORICAL DEVELOPMENT OF LANGUAGES

It has been stated that the evolution of language into the kind of languages that are now spoken cannot be studied for lack of data. But existing languages can be compared, and if systematic similarities are found they can be used to reconstruct some of the older stages of the languages concerned. The branch of linguistics that concerns itself with these matters is called historical (or comparative or contrastive) linguistics.

Languages, like all activities of living beings, are subject to various kinds of pressures arising from changing circumstances. Changes in any of the other cultural systems of a people necessarily change the appropriate part of the language. Old nords and expressions go out of use or change their meaning; new words are introduced. In addition, the speakers of a language are always changing. They grow up, grow old, die, and new speakers come along. Each individual changes some or many of his ways of speaking during his lifetime; as he does this, others may imitate him, or he may imitate someone else, and the changes spread. Every new learner of a language is likely to learn it slightly differently; transmission from one generation of speakers to the next is never perfect.

As time goes on, a language becomes different from what it has been. The process is slow, but it can be observed by noting the differences between the speech of very old people and of young persons in the same community. Specific changes in vocabulary or usage often take place rather suddenly, moreover, and everybody is aware of such changes in his own speech or that of his associates.

In vocabulary (meaning not only words but also sequences of words, idioms and the like) changes take place constantly. Where writing has existed for any length of time, it is easy to trace these changes. They are of several kinds. A word "changes its meaning," that is it is used in different contexts and with different references: English *deer* now refers to a particulsr kind of animal, but the Old English word of which it is the modern form (*déor*) meant "animal" in general (as does its cognate in German. *Tier).* A word goes out of use: Old English *here* meant "army," but has been entirely replaced by the latter word. New words or expressions are created out of existing material: when ice began to be used in homes for cooling and preserving food the receptacle into which it was put began to be called an *icebox;* when mechanical or electrical ice-making machines were adapted to home use, the term *refrigerator* was applied to them and largely replaced *icebox.*

Finally, words are taken over from other languages: after the Norman Conquest of England in 1066, the speakers of English began to learn many French words. Some of these were for new things such as *chair,* a device for sitting having a back, nhereas Old English *stōl,* modern *stool,* referred to a backless chair (note that chair is now the general word for all such things), but many simply replaced existing words, as in the case of *army* replacing *here.*

The process oi taking over words from another language is knoun as borrowing, and nords so taken over are called loan words. Every language has many loan words, for no group of people has ever existed in isolation. The evidence of loan words in a language varies with the history of the contacts the speakers have had with other peoples. Where there are no written records it is often quite difficult to identify loan words, unless the source language is still spoken and direct comparison can be made. because once a word is borrowed by a language it is adapted to the native system and becomes, for the ordinary speaker, an ordinary part of the language.

The speakers of English in the period from 1066 to the middle of the 15th century took over a great many words from French, but these have all been incorporated into the language in such a way that only the student of historical linguistics is able to identify them. In the sentence just preceding there are 49 words (items separated from each other by a white space and "1066" being counted as one for this purpose); eight of them are of French or Latin origin, and not one of these could be replaced by any other word *(period, century, incorporated, lartguage, student, historical, linguistics, identify).*

Loan words are of several types. So-called popular loans are words that come into a language by being heard from bilingual or partly bilingual speakers. The monolingual speaker adapts them in sound and grammar to his own patterns and this often produces considerable change. Popular loans can often be used to date the contacts betneen peoples. The Latin word *vinum,* "mine," was adopted by the speakers of Continental Germanic (ancestral to modern German, Dutch and English) about the 2nd century A.D. It took a form that came out in Old English as *win,* Modern English *wine.* French *vin* is also from the Latin *vinum,* and is the first part of the word *vinegar* (originally, in Old French, made up of the words for "sour," "sharp" and "wine"). The fact that *wine* has an initial *w* dates it as old, since Latin v had a sound like English *w* up to the 3rd century A.D. The word *vinegar,* by its initial sound and by the second part of it, has to be dated as post-Norman Conquest.

Learned loans are introduced by writers or educated speakers and usually show much less distortion. Since the middle ages many Latin words have come into English this way. *Insulate* is direct from Latin *insulatus,* past participle of a verb *insulare* from the noun *insula,* "island." But English also has the popular loan *isle* from Old French *isle* (Modern French *île*), which is directly from Latin *insula.*

Loan blends are words or expressions that consist partly of borrowed material and partly of native. *Speedometer* is made up of English *speed,* a combining vowel *-o-* as in *thermometer* and *meter,* a Greek-through-Latin loan.

Loan translations are items that seem to be made up of native material but are based on existing phrases or words in some other language. English *calling* in the sense of profession, especially in connection with religion, is a loan translation from Latin *vocatio* which took this meaning in early Christian times. Once a loan word has come into the language it follows all the changes undergone by other words. Latin *caupo,* "itinerant peddler," came into Continental Germanic at the same time as did *vinum.* In Old English it had already changed to *céap* (at one time pronounced approximately like *chap,* but with a diphthongal vowel ending in an off-glide). This is Modern English *cheap.*

The fact that the changes in a language take place regularly and automatically is also used to identify loan words as against the native vocabulary. Historical linguists have found by comparing languages that English *break* and Latin *fragilis* both go back to an original that was something like *bhreg.* Latin *fragilis* became, by regular change, Old French *fraile* (Modern French *frêle*). This was taken into English and has become modern *frail.* The latter has to be a loan, because it does not fit the form that the original *bhreg* should have taken in English. So even if *break* did not exist, and *frail* were the only English word for fragile, weak, it could still be identified as nonnative. Note that *fragile* is a learned loan, direct from Latin *fragilis.*

The changes alluded to in the preceding discussion are summarized under the term "phonological change" in historical linguistics. The phonemes of a language change. and the system may become quite different with the passage of time. These changes are regular, and exceptions from them take place only under regularly determined special circumstances. Latin *c-* remained in French. except before *a* where it became Old French *ch* (like English *ch* in *chap,* Modern French like *sh* in *shoe),* so that *cor* became *coeur,* but *campus* became *champ.* Latin *capitalem* became an Old French word that gives English *chattel;* therefore French *capital* (and English *capital)* is a learned loan from Latin.

As phonemes change. new ones arise and old ones disappear. This often leads to changes in words that result in grammatical change. Latin *hoino* became French *on,* "one, someone"; *hominem* became *homme.* Originally the nominative and accusative of the word for "man." they have become two different words, one an indefinite pronoun, the other the noun continuing the original meaning.

As languages change, the changes may be different in different parts of the territory where the language is spoken. In fact, the changes may be slightly different even from one individual to another. As the differences develop, there arise what are called dialects. These are closely similar forms of a single language. The term dialect carries no connotation of opprobrium to the linguist, and he uses it about the standard literary language of a world capital ("the dialect of Paris") as well as about the language of some isolated mountain village. Dialects are usually so similar that speakers of contiguous ones can easily be understood by their neighbours. Over a large area, dialect A may be much like B next to it, B like C, C like D and so on, but when A and, say, M are compared they may be quite different and mutually unintelligible.

Besides geographical dialects, there are also social dialects. Persons of different social groups (classes, castes, occupations) may develop their special ways of speaking. These dialects are referred to as technical jargons when they are limited to members of some special occupation.

If the contacts between speakers of dialects become rare or cease to exist, the changes in the dialects will go on separately and eventually they will come to constitute such different systems that we now have to speak of separate languages. Such languages are known as related languages. It must be emphasized that all that is meant by the term related languages is that the languages so designated are the products of changes from a single original language. In terms of the regularity of change mentioned above, linguists are able to compare languages and, if the similarities between them are systematic, they can group them together as related.

Thus when we compare English *father, tlzin, horn,* with Latin *pater, tenuis, cornu,* we see that English has spirant sounds where Latin has stop sounds. We find this to be true of a great many words with similar meanings. Further comparison shows that where English has voiceless stops as in *ten, kin,* Latin has voiced stops (*decem, genus).* We can set up in this way a large series of correspondences and decide that English and Latin are related languages, going back to a single original language (called by linguists Indo-Hittite or Indo-European). By these systematic comparisons we can also decide that Latin *dies* and English *day,* though meaning the same, are not products of a single original. To *dies* there should correspond something beginning with *t,* and we find it in the first part of *Tuesday.* English *d,* however, sometimes corresponds to Latin *f,* and *day* is found to be connected with *fovere,* "to warm."

When comparisons of related languages are made. it is possible to surmise what the original form is likely to have been and thus to reconstruct the original. Thus, the English *kin* and Latin *genus* go back to an Indo-Hittite original of the form *gen-; dies* and *Tues-* (and Greek *Zeus* and Latin *ju-* in *Jupiter*) go back to a form *dyew-; day* and *foveo* go back to something beginning with a sound usually written *dh-.*

The reconstructions are theoretically made by comparing two languages, then two reconstructions and so on back, giving a kind of branching tree diagram. Such a diagram represents a family of related languages and can be so constructed as to give a relative chronology of development as well as shondng closeness of relationship. On the basis of such reconstructions and of preliminary comparisons. it is possible to group most of' the languages of the world into a number of related families and subfamilies. This kind of reconstruction, however, does not at present carry us further back than 6,000 to 8.000 years, and this in only a few cases where there are extensive written records. In most cases the reconstruction only goes back about 2,000 years and often even less.

Principal Language Families.— The first reconstructions were of the Indo-European, Semitic and Finno-Ugric families. For the first two there exist many ancient records of the languages, and the third contains a few languages in the orbit of European culture. Then came reconstructions of language families in the far east and in Africa and the Americas. For a long time there mas doubt that the unrecorded languages of the latter two regions could be subjected to the reconstruction techniques. But as soon as a few good descriptions of the languages began to appear, it was clear that they could be treated like any other language. Here we can only name principal families and the most widespread languages in them.

The Indo-European family is now better called *Indo-Hittite* (3500 B.c.). It includes: the *Anatolian* languages (before 2500 B.c.), Hittite, Hieroglyphic Hittite. Luwian, Lycian, Lydian, all extinct since ancient times; *Iizdo-European* proper (2500 B.c.). subdivided into Armenian (after 2500 B.c.), Indo-Iranian (after 2200 B.c.), Hellenic (2000 B.c.) and the properly European languages, *South-and-West European* (1800–1500 B.C.) (italic. Celtic) and *North European* (800–500 B.C.) (Germanic, Balto-Slavic). Also included are *Tocharian,* which may have separated before 1500 B.C., and Illyrian. which possibly goes with Hellenic. The original home of these speakers. at about 3500 B.C., may have been in south central Russia. The Indo-Iranian languages include Sanskrit, Avestan, Old Persian and the modern languages of India, Pakistan, Afghanistan, Persia and parts of the Soviet Union. Hellenic has only one principal language, Ancient Creek surviving in Modern Greek. Albanian is perhaps the modern form of Illyrian. The Italic languages are the extinct Oscan and Umbrian. and Latin, surviving in the Romanic (Romance) languages, Rumanian. Italian. Rhaetic, French, Spanish. Portuguese. Celtic includes Gaulish (extinct) and Irish, Welsh, Breton. Germanic includes the extinct Gothic. Scandinavian (Swedish. Danish. Norwegian, Faroese, Icelandic) and West Germanic (German, Dutch. English). Baltic separated from Slavic about the beginning of the Christian era. Old Prussian is extinct. Lithuanian and Latvian survive. Slavic includes the South Slavic Bulgarian, Macedonian.

Serbo-Croatian and Slovene (and the extinct Old Church Slavic); the West Slavic Czech, Slovak and Polish; and the East Slavic Ukrainian and Russian.

The *Semitic* languages are Akkadian (Babylonian, Assyrian), Aramaic, Hebrew (all extinct, though Hebrew has now been revived), and Arabic and Ethiopic (Geez, Amharic).

Hamitic (Ancient Egyptian, Coptic; Berber; Cushite) is allied to Semitic. In Negro Africa there are the *Bantu* languages. many languages in West Africa related to them; and Hottentot and Bushman.

Finno-Ugric includes Hungarian, Finnish, Estonian. With the related *Samoyedic* it forms *Uralic.*

The *Turkic* languages include Turkish; Turki, Kirghiz, Kazakh, Uzbek; Chuvash, Yakut. It is believed, though the material has not yet been sufficiently worked out, that Turkic is related to *Mongolian* and *Tungusic,* forming *Altaic.* Mongolian includes Mongol and Kalmuck. Tungusic includes Manchu and numerous languages in northeastern Asia.

Also in northeastern Asia are the Chukchean languages (Chukchi, Kamchadal, Koryak), Yukaghir, Gilyak, Ainu. Whether these are related to each other is not known.

Japanese and *Korean* may be related, and it has been suggested that they are further related to Altaic.

The languages of the Caucasus include Georgian and numerous so-called North Caucasian languages.

In India, principally in the south, are the *Dravidian* languages: Tamil. Telugu, Malayalam and a number of others.

In northeast India and extending east and southeast are the *Munda* and *Mon-Khmer* languages, the latter including Cambodian.

Andamanese, on the Andaman Islands, is not known to be related to any other language. Because of the remoteness, isolation and general cultural primitiveness of these people it has occasionally been conjectured that here might be a language that was really structurally different arid more primitive than others. Examination of the available material dispels this idea. Andamanese is a language like many others and, in fact, like any other.

The *Szno-Tibetan* family includes Tibeto-Burmese (Tibetan. Burmese) and the *Chinese* languages. *Thai* is also usually included in the group (Siamese, Laotian and others). Annamese (Vietnamese) seems to have the same kind of structure, but relationship has not been proved.

The *Malayo-Polynesian* languages include *Malayan, Polynesian, Micronesian, Melanesian.* Malayan languages are Malay and Indonesian, the various other languages of Indonesia (Bali, Javanese, etc.) and the languages of the Philippines, as well as Samoan. Melanesian are the languages of the Solomon Islands and various other islands in that region. Micronesian includes Yap, Ponape, Gilbert Island. Polynesian languages are numerous: Fijian. Tahitian, Hawaiian, the language of Easter Island and many others.

In New Guinea there are many languages whose relationships are almost wholly unknown.

The many languages of the original natives of Australia, except Tasmanian, are now believed to be more or less related.

In North America there are about 55 language families, but these can be grouped into five or six large superfamilies. *(See* AMERICAN ABORIGINAL LANGUAGES.) *Eskimoan* includes Eskimo (several varieties) and Aleut. *Algonkian* includes the languages of many Indians of northeastern and middle western North America, Passamaquoddy, Massachusetts, Mohican, Natick, Delaware, Ojibwa, Ottawa, Illinois. Miami, Shawnee and also Arapaho. Cheyenne and Blackfoot farther west, and possibly Wiyot and Yurok in California. The Nootkan languages (Nootka, Kwakiutl) and the Salish languages may be related to *Algonkian.*

The *Penutian* languages (Maidu, Chinook, Wintun, Tsimshian, Sahaptin, and many others) may be somehow related to the next group. *Aztec-Tanoan* has two main branches: *Uto-Aztecan* includes Ute, Paiute, Shoshoni, Comanche, Pima, Papago, Hopi, some languages in California and in northern Mexico and Aztec (or Nahuatl); Tanoan (all in New Mexico) includes the Tin-a languages Taos and Picuris, several Tewa languages and Jemez (Towa). Kiowa (in Oklahoma) is related to Tanoan as a whole and Zuni may be related to Kiowa-Tanoan.

The *Mayan* languages of Yucatan and Guatemala. together with Totonacan and Zoquean of Mexico, may also be related to Aztec-Tanoan and Penutian (Macro-Penutian).

In California and Arizona there are the Yuman languages. These, together with certain languages farther north (Washo, Yana. Pomo) and Tonkawa and some other extinct languages in Texas and northern Mexico (the Coahuiltecan languages) are often assigned to an over-all *Hokan* group.

The *Keresan* pueblos in New Mexico and the *Caddoan* languages (Caddo, Wichita, Pawnee) are sometimes thought to be related both to Hokan and to *Iroquoian* (Iroquois. Huron, Erie. Mohawk, Oneida, Onandaga, Cayuga, Seneca, Tuscarora. Cherokee'). All of these are then possibly further connected with *Siouan* (Omaha, Osage, Dakota. Hidatsa, Crow, Catawba). Siouan is almost certainly related to *Muskogean* (Choctaw, Chickasaw, Creek. Seminole).

In Mexico there are the *Mixtec* and *Zapotec* language groups, but their relationship and that of other Mexican Indian languages is not known.

The Chibchan family extends from Guatemala to Colombia, interspersed with other languages.

Quichuan was the language of the Inca empire, and is still widely spoken. It may be related to Aymaran.

In South America there were, and still are in Brazil, Venezuela and Colombia, many Indian languages. The *Arawakan* family in the north and in the West Indies, the *Cariban* family in the same region and the *Tupi-Guarani* languages of Brazil and Paraguay are the best known. On the whole, however, very little comparative work has been done in South America and most of the languages of the Amazon can merely be listed.

The *Araucanian* language in Chile, and the *Ona* and *Yahgan* in Tierra del Fuego may be mentioned. Their relationships are unknown.

PRACTICAL APPLICATIONS OF LANGUAGE KNOWLEDGE

With anywhere from 2,500 to 5,000 languages in the world (depending on nhat is counted as a language and not counting dialects that are clearly just that), and with each of them being the vehicle of a culture that is different in at least some ways from any other culture, it is evident that the learning and teaching of languages, their recording as written languages and by other methods and their use in various kinds of intercultural communication are matters of primary importance.

The teaching and learning of languages has been going on for centuries. Everywhere, at all times. when peoples of different languages have come in contact. somebody had to learn a foreign language. There have always been individuals nho found it interesting and congenial to do this. As far back as there are written records there are evidences of such activity and of the attempt to systematize the process in some way. Word lists with translations mere compiled, grammatical analysis was attempted A historical survey of linguistics shows the Sanskrit grammarians before 1000 B C developing a systematic grammar equal in many ways to the best modern analyses The ancient Greeks developed a grammar influenced by philosophy and passed it on to the Romans and thus to the modern western world. Greek slaves were used as language teachers by the Romans.

Latin itself was learned by various conquered peoples, sometimes in school but more frequently informally by direct contact with Roman soldiers and officials. After the middle ages much new interest in languages arose and schools taught them, following traditional Latin grammar however badly it fitted the language being taught or the language of the learner.

Experience in the first half of the 20th century showed that languages can best be learned and taught by constant and direct contact with a native speaker, but under the direction of a linguistic scientist who can devise a pedagogy to take care of the difficulties that arise from differences in structure It also became apparent that the effective teaching of languages has to be accompanied by

analysis and teaching of the other aspects of culture, including the learner's culture. This fits in with the nature and function of language.

The native speaker must be relied upon as the source of what is "correct." Normative precept has no place in such an approach, and instead observation of actual usage is basic. This means for the native language, especially when it is a standard literary language, that teaching must be based on actual usage among those who speak the particular dialect (local, class or a combination of these) that is chosen as the standard. Philosophically determined logic cannot replace scientific observation in this matter.

Writing and Recording of Languages.—The first known writing systems (Egypt, Mesopotamia, the Indus Valley) go back no further than 6000 B.C. at the earliest, their actual beginnings being unknown. Probably all these early writing systems arose from a single source. Writing in China is somewhat later. In Middle America writing developed among the Maya perhaps as early as the beginning of the Christian era.

Writing began as pictorial representation of events. Then the idea was hit upon of representing specific linguistic items (words usually) by pictures and by arbitrary symbols for words that could not easily be pictorially indicated. Very soon the arbitrary symbols were used in terms of their sound value. Then they were extended to other words that had the same or similar sounds. Once this step had been made, it was possible to devise a real alphabet with a small number of symbols representing enough of the phonemes of the language to identify linguistic items with a minimum of ambiguity.

Until modern times writing, even where it existed, was known and used by very few persons. Where literary men wrote chronicles or poetry or other kinds of literature, the material began to assume special value. It came to be considered as fixed and immutable and more valuable than ephemeral speech. Thus arose the confusion between language and writing. As written language remained relatively unchanged it came to be considered as the real language and speech was believed to be corrupted from it. Most teaching of languages and of the native language is still based on this mistaken notion. It is thus that most people are filled with fanciful ideas about "pure" language, the "real" meanings of words and so on.

Modern linguistics has shown that language is what is spoken (most of the people in the world are still illiterate) and that writing should follow usage rather than control it. The recording of speech mechanically and electrically made possible the preservation of language as it is uttered. This enables one to study language more thoroughly. It also makes possible dissemination of language in spoken form over wide areas more effectively than even printing, which in itself made possible wide coverage by literary language. Communication between peoples thus comes into existence on a scale undreamed of before.

Mass communication, including propaganda but not restricted to it, is the result of the existence of written, printed and recorded language. Widespread education, political and social pressure and speeded-up cultural change have become realities. The multiplicity of languages still retards these processes. But more and more a few dominant standard and official languages are being learned by people to whom they are not native. This points to the possibility of many languages becoming extinct in the next few generations. With fewer languages, there will necessarily be fewer cultural differences. Moreover, the dominant languages, whatever their linguistic family, become more and more translatable into each other as peoples adopt more and more cultural systems in common. It is possible that the future will thus bring important changes in the relation of language to the other cultural systems, changes which can only serve to make the function of language and understanding of its structure more important than ever.

See also articles on various languages and language families.

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(G. L. T.)

LANGUEDOC, one of the old provinces of France, the name of which dates from the end of the 13th century. In 1290 it was used to refer to the country in whose tongue *(langue)* the word for "yes" was *oc,* as opposed to the centre and north of France, the *langue d'oil* (the *oui* of to-day). Territorially Languedoc varied considerably in extent, but in general from 1360 until the French Revolution it included the territory of the following departments of modern France; part of Tarn et Garonne, Tarn, most of Haute-Garonne, Arikge, Aude, Pyrénées-Orientales, Hérault, Gard, Lozère, part of Ardttche and Haute-Loire. The country had no natural geographical unity. Stretching over the Cevennes into the valleys of the upper Loire on the north and into that of the upper Garonne on the west, it reached the Pyrénées on the south and the rolling hills along the Rhône on the east. Its unity was entirely a political creation, but none the less real, as it was the great state of the Midi, the representative of its culture and, to some degree, the defence of its peculiar civilization.

While it corresponded exactly to no administrative division of the Roman empire, Languedoc was approximately the territory included in *Gallia Narbonensis,* one of the 17 provinces into which the empire was divided at the death of Augustus. It was rich and flourishing. with great and densely populated towns, Nîmes, Narbonne, Béziers, Toulouse; with schools of rhetoric and poetry still vigorous in the 5th century. In the 5th century this high culture was an open prize for the barbarians; and after the passing of the Vandals, Suebi and Visigoths into Spain, the Visigoths returned under Wallia, who made his capital at Toulouse in 419. This was the foundation of the Yisigothic kingdom which Clovis dismembered in 507, leaving the Visigoths only Septimania —the country of seven cities, Narbonne, Carcassonne, Elne, Béziers, Maguelonne, Lodève and Agde—that is, very nearly the area occupied later by the province of Languedoc. At the council of Narbonne in j89 five races are mentioned as living in the province, Visigoths. Romans, Jews—of whom there were a great many—Syrians and Greeks The repulse of the Arabs by Charles Martel in 732 opened up the country for the Frankish conquest, which was completed by 768. Under the Carolingians, Septimania became part of the kingdom of Aquitaine, but it became a separate duchy in 817.

Until the opening of the 13th century there is no unity in the history of Languedoc. The feudal régime did not become at all universal in the district, as in the north of France. By the end of the 11th century the house of the counts of Toulouse began to play the predominant rôle; but their court had been famous almost a century before for its love of art and literature and its extravagance in dress and fashions, all of which denoted its wealth. Under Raymond of Saint Gilles, at the end of the 11th century, the county of Toulouse began its great career, but Raymond's ambition to become an Oriental prince, which led him away on the first crusade left a troubled heritage to his sons Bertrand and Alphonse Jourdain (1109–48). The latter successfully beat off William IX., duke of Aquitaine, and won from the count of Barcelona the part of Provence between the Drôme and the Durance. By the opening of the 13th century the sovereignty of the counts of Toulouse was recognized through about half of Provence, and they held the rich cities of the most cultured and wealthiest portion of France.

The prosperity of this region was ruined by the great crusade directed against the popular heresy which had developed there by the early 13th century. The whole county of Toulouse, with its fiefs of Narbonne, Béziers, Foix, Montpellier and Quercy, was in open and scornful secession from the Catholic Church, and the suppression of this Manichaean or Cathar religion was the end of the brilliant culture of Languedoc. *(See* CATHARI; INQUISITION.) The crusade against the Albigenses, as the Cathari were locally termed, in 1209, resulted in the union to the crown of France in 1229 of all the country from Carcassonne to the Rhône, thus dividing Languedoc into two. The western part, left to Raymond VII., by the treaty of 1229, included the Agenais, Quercy. Rouergue, the Toulousain and southern Albigeois. He had control as well of the Venaissin across the Rhône. From 1229 to his death in 1249 Raymond VII. worked tirelessly to

bring back prosperity to his ruined country, encouraging the foundation of new cities, and attempting to gain reconciliation with the Church. He left only a daughter, Jeanne, who was married to Alphonse of Poitiers Alphonse, a sincere Catholic, upheld the Inquisition, but, although ruling the country from Paris, maintained peace. Jeanne died without heirs four days after her husband, in 1271, and her lands were promptly seized by King Philip III. Thus the county of Toulouse passed to the crown, though Philip III turned over the Agenais to Edward I. of England in 1279 In 1274 he ceded the county of Venaissin to Pope Gregory X, the papacy having claimed it, without legal grounds, since the Albigensian crusade *(see* AVIGNON).

Such was the fate of the reduced county of Toulouse. At the division of Languedoc in 1229 Louis IX. was given all the country from Carcassonne to the Rhône. This royal Languedoc was at first subject to much trickery on the part of northern speculators and government officials. In 1248 Louis IX. sent royal *enquêteurs,* much like Charlemagne's *missi dominici,* to correct all abuses, especially to enquire concerning peculation by royal agents. On the basis of their investigations the king issued royal edicts in 1254 and 1259 which organized the administration of the province. Two *sénéchaussées* were created—one at Nîmes, the other at Carcassonne—each with its lesser divisions of *vigueries* and *bailliages.* During the reign of Philip III. the *enquêteurs* were busily employed securing justice for the conquered, preventing the seizure of lands, and in 1279 a supreme court of justice was established at Toulouse. In 1302 Philip IV convoked the estates of Languedoc, but in the century which followed they were less an instrument for self-government than one for securing money, thus aiding the *enquêteurs,* who during the Hundred Years' War became mere revenue hunters for the king. Under Charles V., Louis of Xnjou, the king's brother, was governor of Languedoc, and while an active opponent of the English, he drained the country of money. But his extortions were surpassed by those of another brother, the duc de Berry, after the death of Charles V. In 1382 and 1383 the infuriated peasantry, abetted by some nobles, rose in a rebellion—known as the Tuchins—which was put down with frightful butchery, while still greater sums were demanded from the impoverished country. In the anarchy which followed brigandage increased Redress did not come till 1420, when the dauphin, afterwards Charles VII, came to Languedoc and re-formed the administration. Then the country he saved furnished him with the means for driving out the English in the north For the first time, in the climax of its miseries, Languedoc was genuinely united to France. But Charles VII. was not able to drive out the brigands, and it was not until after the English were expelled in 1453 that Languedoc had even comparative peace Charles VII. united Comminges to the crown; Louis XI. Roussillon and Cerdagne, both of which were ceded to Aragon by Charles VIII. as the price of its neutrality during his expedition into Italy. From the reign of Louis XI until 1523 the governorship of Languedoc was held by the house of Bourbon. After the treason of the constable Bourbon it was held by the Montmorency family with but slight interruption until 1632.

The Reformation found Languedoc orthodox: persecution had succeeded. The Inquisition had had no victims since 1340, and the cities which had been centres of heresy were now strongly orthodox. But Calvinism gained ground rapidly in the other parts of Languedoc, and by 1560 the majority of the population was Protestant. This was, however, partly a political protest against the misrule of the Guises. The open conflict came in 1561, and there was intermittent civil war thenceforward until the Edict of Nantes (1598). By this, the Protestants were given ten places of safety in Languedoc; but civil strife did not come to an end. even under Henry IV. In 1620 the Protestants in Languedoc rose under Henri, duc de Rohan (1579–1638), who for two years defied the power of Louis XIII When Louis took Montpellier in 1622, he attempted to reconcile the Calvinists by bribes of money and office, and left Montauban as a city of refuge By 1629 Protestantism was crushed in the Midi as a political force After the rebellion of Henri II., duc de Montmorency, Languedoc lost its old provincial privilege of self-assessment until 1649. During Louis XIV.'s reign Languedoc prospered until the revocation of the Edict of Nantes. Industries and agriculture were encouraged, roads and bridges were built, and the great canal giving a water route from the Atlantic to the Rlediterranean increased the trade of its cities.

The religious persecutions which accompanied the revocation of the Edict of Nantes resulted in a guerrilla warfare known as the rebellion of the Camisards *(q.v.).*

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LANGUET, HUBERT (1518–1581), French Huguenot writer and diplomat, was born at Vitteaux in Burgundy, of which town h i father was governor. He received his early education from a distinguished Hellenist, Jean Perelle, and studied law, theology and science at the University of Poitiers (1536–39); then, after some travel, attended the universities of Bologna and Padua, receiving the doctorate from the latter in 1548. At Bologna he read Melanchthon's *Loci communes theologiae* and was so impressed by it that in 1549 he went to Wittenberg to see the author. Shortly afterward he became a Protestant. He made his headquarters at Wittenberg until the death of Melanchthon in 1560.

In 1557 he declined the invitation of Gustavus I to enter the service of Sweden, but two years later accepted a similar invitation of Augustus I. elector of Saxony. He showed great ability in organizing the Protestants. He represented the elector at the French court from 1561 to 1572 except when troubles in France occasionally compelled him to withdraw. In 1567 he accompanied the elector to the siege of Gotha. He delivered a harangue before Charles IS of France in 1570 on behalf of the Protestant princes, and escaped death on St. Bartholomew's day (1572) only through the intervention of Jean de Morvilliers, bishop of Orléans. He represented the elector of Saxony at the imperial court from 1573 to 1575.

Financial embarrassment and disgust at the Protestant controversies in which he was forced to participate caused him to seek recall from the imperial court. His request being granted. Languet spent the last years of his life mainly in the Low Countries. Though nominally still in the service of the elector. he undertook a mission to England for John Casimir of Bavaria and was a valuable adviser to William the Silent, prince of Orange. Languet died at Antwerp on Sept. 30, 1581. For his relations with Sidney, *see* SIDNEY, SIR PHILIP.

Collections of Languet's letters; which are important for the history of his time, are: . . . *Ad Joachimum Camerarium patrem et Joachimum Camerarium filium, medicum, scriptae epistolne* (Groningen. 1646); *Epistolae ud principem suum Augustum, Sax. ducem,* ed. by J. P. Ludovicus (Halle, 1699); and the correspondence with Sir Philip Sidney (Eng. trans. by S. A. Pears, 1845). His acknowledged work includes *Historica descriptio* (Gotha, 1567), dealing with the siege of Gotha. His fame rests on the attribution to him of the *Vindiciae contra tyrannos* (Basle, 1579; Eng. trans., 1648 and 1689). which purported to be published at Edinburgh and written by Stephanus Junius Brutus, a Celt. The work upholds the doctrine of resistance, but maintains that resistance itself must originate in properly constituted authority; that is to say, it was directed against tyranny on the one hand and the excesses of anabaptism on the other.

See P. de la Mare, *Vie d'Hubert Languet* (Halle, 1700); A. Waddington, De *Huberti Langueti vita* (Paris, 1888); G. Touchard, *De politica Huherti Langueti doctrina* (Paris, 1898). *See* further the English edition of the *Vindiciae* by H. J. Laski (London, 1924).

LANGUR or HANUMAN, the sacred Indian monkey scientifically known as *Semnopithecus entellus.* An extremely long tail, beetling black eyebrows, black ears. face. feet and hands and a general grayish-white colour of the fur are its distirictive characteristics. These monkeys roam at will in the bazaars of Hindu cities, where they help themselves freely from the stores of the grain dealers. They are also kept at various temples. The

term is often extended to embrace all the Asiatic leaf monkeys, which includes a large number of species, ranging from Ceylon, India and Kashmir to southern China and the Malay countries as far east as Borneo and Sumatra. These monkeys are characterized by their lank bodies, long slender limbs and tail, well-developed thumbs, absence of cheek-pouches, and complex stomachs.

LANG VON WELLENBURG, MATTHÄUS (1469–1540), German statesman and ecclesiastic, was the son of a burgher of Augsburg. After studying at Ingolstadt, Vienna and Tiibingen, he entered the service of the emperor Frederick III. He was a trusted adviser of Maximilian I, and was made provost of the cathedral at Augsburg and bishop of Gurk. In 1511 he was made a cardinal by Pope Julius II. and in 1514 he became coadjutor to the archbishop of Salzburg. whom he succeeded in 1519. He also received the bishopric of Cartagena in Murcia in 1521 and that of Albano in 1535. Lang's arrogance made him very unpopular in his diocese of Salzburg: in 1523 he was involved in a serious struggle with his subjects, and in 1525, during the Peasants' War. he again had to fight hard to hold his own. He was one of the chief ministers of Charles V; he played an important part in the tangled international negotiations of his time; and he was always loyal to his imperial masters. He has been compared with Cardinal Wolsey. He died on March 30. 1540.

LANIER, SIDNEY (1842–1881), U.S. poet and musician, was born at Macon. Ga.. Feb. 3, 1842. He was reared by devoutly religious parents. Robert and Mary Anderson Lanier, in all the traditions of the old south. As a child he wrôte verses and was passionately fond of music. After graduation from Oglethorpe university. near Milledgeville, Ga. (1856–60), he served in the Civil War until his capture and subsequent imprisonment at Point Lookout, where he contracted tuberculosis. In 1867 he married Mary Day, also of Macon, and in the same year he published his first book, the novel *Tiger-Lilies,* a strange mixture of German philosophy, southern traditional romance and his own war experiences. After working in his father's law office at Macon. teaching school at Prattville. Ala., and traveling for his health in Texas, he overcame his prejudice against professional music sufficiently to accept a position as first flutist in the Peabody orchestra. Baltimore, Md. (Dec. 1873). He had already published numerous poems in magazines, and now, in spite of the inroads of tuberculosis, he made desperate efforts to support his family in the environment of cultural activity that he loved. He wrote several potboilers! such as *Florida* and *The Boy's Froissart,* and he played private concerts and delivered lectures to small groups. "Corn" (1874), a poem treating agricultural conditions in the south, and "The Symphony" (1875), treating industrial conditions in the north, brought national recognition. Adverse criticism of his "Centennial Meditation" launched him on an investigation of verse technique which he continued until his death. In 1877 Lippincott and Co. published a volume of his poems, and two years later he was appointed lecturer in English literature at Johns Hopkins university. He delivered series of lectures on verse technique, the early English poets and the English novel. later published as *The Science of English Verse* (1880), *Shakspere and His Forerunners* (1902) and *The English Novel: a Study in the Development of Personality* (1883 and 1887). When. in the spring of 1881, advanced tuberculosis made further work impossible, he established camp quarters at Lynn, N.C., where he died Sept. 7. His wife three years later published an enlarged edition of his poems, and his sons brought out several posthumous volumes of his essays, lectures and outlines for poems. The complete edition of his works (10 vol.) appeared in 1945. His best prose work. *The Science of English Verse,* treats the relation of poetry to music and explains a system of superimposed rhythms in verse. His best poems, such as the "hlarshes of Glynn," treat, through elaborate imagery and complex verse music, man's approach to a state of love. As poet and man. Lanier derives his chief significance from his transitional position. Schooled in the ideals of the old south. he was confronted after the Civil War by the nevi science. industrialism, and by a rapidly widening horizon of social and artistic values. His best works reflect his struggle to readjust himself. Because he was only partially successful, some consider him largely traditional, while others consider him one of the most forward-looking poets of his time.

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LANIIDAE: *see* SHRIKE.

LANJUINAIS, JEAN DENIS, COMTE (1753–1827), French politician. was born at Rennes (Ille-et-Vilaine) on March 12, 1753. He studied law and became in 1775 professor of ecclesiastical law at Rennes. His two important works of this period. *Institutiones iuris ecclesiastici* and *Praelectiones iuris ecclesiastici,* remained unpublished because of the chaotic state of public affairs. Elected to the states-general in 1789, he demanded the abolition of nobility and helped to establish the civil constitution of the clergy. In the Convention (1792) his views became more moderate. and while adhering to his republican principles, he made repeated attacks on the Mountain. which resulted (April 15, 1793) in a demand for his exclusion from the assembly. Arrested with the Girondins, he escaped to Rennes where he drew up a pamphlet. Le *Dernier Crime dc Lanjuinais,* denouncing the constitution of 1793. He was readmitted to the Convention on March 8, 1795. He maintained his liberal and independent attitude in the *conseil des anciens,* the senate and the chamber of peers, being president of the upper house during the Hundred Days. Following the Restoration most of his time was given to religious and political subjects. He died in Paris on Jan. 13, 1827. His writings include: *Constitutions de la nation française* (1819): *Appréciation* and *Études biographiques et littéraires sur Antoine Arnauld, P. Nicole et Jacques Necker* (1823).

For the life of the comte de Lanjuinais *see* also A. Robert and G. Cougny, *Dictionnaire des parlementaires,* vol. ii (1890).

LANKESTER, SIR EDWIN RAY (1847–1929), British zoologist, outstanding for his researches in embryology and morphology. was born in London on May 15, 1847 and was educated at St. Paul's school, at Downing college. Cambridge. and at Christ Church. Oxford. In 1872 he was elected to a fellowship at Exeter college. Oxford. He was professor of zoology and comparative anatomy at University college, London (1874–90), and Linacre professor of comparative anatomy at Oxford (1890–98). In 1884 Lankester played the major role in founding the Marine Biological association, and became its president in 1892. He held the Fullerian professorship of physiology and comparative anatomy at the Royal institution. London (1898–1900), and was director of the British museum (natural history) (1898–1907). He did valuable research work on the comparative anatomy and embryology of living animals, and on paleontology. His first paper (on the fossil *Pteraspis*) was published when he was 16 years old.

There is scarcely a group of organisms which Lankester did not study, or to which he did not make a substantive contribution by his researches. He showed the affinity between king crabs, scorpions and spiders. To him are due the terms "blastopore." "invagination," "stomodaeum" and "homoplasy." A firm supporter of Darwin and natural selection, he exposed the illogicality of Lamarck's speculations. Lankester became known to the general public as a result of his vigorous personality and successful presentation of scientific subjects in a popular form. He was elected a fellow of the Royal society in 1875. He died in London on Aug. 1j, 1929.

Lankestcr's numerous publications include *Comparative Longevity* (1871); *Degeneration* (1880); *Science From* an *Easy Chair* (1908; 15th ed., 1922); *Diversions of a Naturalist* (1915; 3rd ed., 1923); and *Great and Small Things* (1923). (G. DE B.)

LANMAN, CHARLES ROCKWELL (1850–1941), American Sanskrit scholar. was born in Norwich. Conn.. on July 8. 1850. He graduated at Yale in 1871, was a graduate student there (1871–73) and in Germany (1873–76), was teacher of Sanskrit at Johns Hopkins university in 1876–80 and subsequently professor of Sanskrit at Harvard. In 1889 he travelled in India and bought for Harvard university Sanskrit and Prākrit books and manuscripts, which. with those subsequently be-

queathed to the university by Fitzedward Hall, make the most valuable collection of its kind in America.. In 1879–84 he was secretary and editor of the *Tmnsactions,* and in 1889–90 president of the American Philological Association; he was successively corresponding secretary, vice president and president of the American Oriental Society, in addition to being joint editor of its journal and proceedings for many years. In the Harvard oriental series, which he edited, he translated (vol. iv.) into English Rājaçekhara's Karpūra-Mañjarī (1900), a Prākrit drama, and (vols. vii. and viii.) revised and edited Whitney's translation of, and notes on, the *Atharva-Veda* (1905); he published *A Sanskrit Reader: with Vocabulary and Notes* (1884–88); and he wrote on noun-inflection in the Veda and on early Hindu pantheism and contributed the section on Brahmanism to *Messages of the World's Religions.*

LANNES, JEAN (1769–1809), duke of Montebello, marshal of France, was born at Lectoure (Gers) on April 11, 1769. He was apprenticed to a dyer and had little education. He joined the army and rose to the rank of *chef de brigade* during the war with Spain (1793–4). In 1795, on the reform of the army by the Thermidorians, he was dismissed from his rank. He re-enlisted as a volunteer in the army of Italy, and in the campaign of 1796 he again fought his way up to the rank of general of brigade. He accompanied Napoleon to Egypt as commander of one of Kléber's brigades. Returning to France he assisted at the 18th Brumaire and was appointed general of division, and commandant of the consular guard. He commanded the advanced guard in the crossing of the Alps in 1800, winning the battle of Montebello, from which he afterwards took his title. In 1801 Napoleon sent him as ambassador to Portugal. On the establishment of the empire he was created a marshal of France, and commanded the left of the grand army in the campaign of Austerlitz. He fought with distinction through the campaign of 1806–7 and in 1808 Napoleon made him commander-in-chief of a detached wing of the army in Spain. On Feb. 21, 1809, he captured Saragossa, after one of the most stubborn defences in history. Napoleon then created him duc de Montebello, and in 1809, for the last time, gave him command of the advanced guard. He took part in the engagements around Eckmiihl and the advance on Vienna. With his corps he led the French army across the Danube, and bore the brunt, with Massdna, of the terrible battle of Aspern-Essling (*q.v.*). During the retreat on May 22 Lannes was wounded and died at Vienna on May 31.

Lannes ranks with Davout and Masséna as the ablest of all Napoleon's marshals, and consciously or unconsciously was the best exponent of the emperor's method of making war. Hence his constant employment in tasks requiring the utmost resolution and daring, and more especially when the emperor's combinations depended upon the vigour and self-sacrifice of a detachment or fraction of the army.

LANNION, a town of north-western France, capital of an *arrondissement* in the *département* of Côtes-du-Nord, on the right bank of the Léguer, 45 mi. N.W. of St. Brieuc by rail. Pop. (1954) 5,842. Lannion is 5 mi. in direct line from the mouth of the Léguer; its port does a small trade (exports of agricultural produce, flax and hemp, imports of wine, salt. coal. timber, etc.). and there is an active fishing industry. It has much commerce in horses. grain. cattle, butter, flax and wool. The town contains many houses of the 15th and 16th centuries and the church of St. Jean-du-Baly (16th and 17th centuries). On an eminence close to Lannion is the church of Brélevenez of the 12th century. restored in the 15th century; it has an interesting 16th-century Holy Sepulchre. Some 6 mi. S.E. of the town are the imposing ruins of the Chbteau of Tonquédec (*c.* 1400) styled the "Pierrefonds of Brittany."

LANOLIN, the commercial name of a preparation which consists of ; oz. of neutral wool fat (*adeps lanae*) mixed with water. The wool fat is obtained by purification of the "brown grease," "recovered grease," or dégras extracted from raw sheep's wool in the process of preparing it for the spinner. It is a translucent unctuous substance which has the property of taking up large quantities of water, and forming emulsions which are very slow to separate into their constituents. Owing to the ease with which it penetrates the skin, wool fat both in the anhydrous form and as lanolin, sometimes mixed with such substances as petroleum jelly or fatty oils, is largely employed as a basis for ointments. It is slightly antiseptic and does not become rancid. (*See* OILS, FATS AND WAXES.)

LA NOUE, FRANÇOIS DE (1531–1591), called Bras-de-Fer. Huguenot captain, was born near Nantes in 1531. of an ancient Breton family. His first great exploit was the capture of Orleans at the head of only 15 cavaliers in 1567, during the second Huguenot war. At the battle of Jarnac in March 1569 he commanded the rearguard, and at Moncontour in the following October he was taken prisoner; but he was exchanged in time to resume the governorship of Poitou, and to defeat the royalist troops before Rochefort. At the siege of Fontenay (1570) his left arm was shattered by a bullet; but a mechanic of Rochelle made him an iron arm (hence his sobriquet, with a hook for holding his reins. When peace was made in France in the same year. La Koue carried his sword against the Spaniards in the Netherlands, but was taken at the recapture of Mons by the Spanish in 1572. He was commissioned by Charles IX, after the massacre of St. Bartholomew, to reconcile the inhabitants of La Rochelle. the great stronghold of the Huguenots, to the king. But La Noue gave up his royal commission, and from 1574 till 1578 acted as general of La Rochelle.

When peace was again concluded La Noue once more went to aid the Protestants of the Low Countries. He took several towns and captured Count Egmont in 1580; but a few weeks afterward he fell into the hands of the Spaniards, who kept him in close imprisonment at Limburg for five years. In prison he wrote his *Discours politiques et militaires* (Basel, 1587, and many other editions). La Noue wrote of mar as a human drama, before it had been elaborated and codified. In June 1585. La Noue was exchanged. In 1589, he joined Henry of Kavarre against the Leaguers. He was present at both sieges of Paris, at Ivry and other battles. He died at Moncontour on Aug. 4, 1591.

He wrote, besides the Discourses, *Déclaration pour prise d'armes et la défense de Sedan et Jamets* (1588); *Observations sur l'histoire de Guicciardini,* 2 vol. (1592); and notes on *Plutarch's Lives.* His *Correspondance* mas published in 1854. See *La Vie de François, seigneur de la Noue,* by Moyse Amirault (Leiden, 1661); Brantôme's *Vies des Capitaines français; C.* Vincen's *Les Héros de la Réforme, Fr. de la Noue* (1875); and Hauser, *François de La Noue* (Paris, 1892).

LANREZAC, CHARLES LOUIS MARIE (1852–1925), French army officer and field commander in the early part of World War I, was born at Pointe-à-Pitre, Guadeloupe, on July 31, 1852. While he was at the École de Guerre, the new French doctrine of strategy and tactics was being established, and to this doctrine Lanrezac himself contributed in his study *La manoeuvre de Lützen.* He became colonel in 1902, general of brigade in 1906 and general of division in 1911. In 1912 he commanded the 11th corps, and on April 10, 1914, succeeded Galliéni as a member of the *conseil supérieur de la guerrc* and commander designate of the 5th army.

At the outbreak of World War I. neither Lanrezac nor his superior Joffre anticipated the magnitude of the scythelike sweep of the German right wing through Belgium. Lanrezac's 1st and 3rd corps were attacked by Bülow's army in the battle of Charleroi on Aug. 22, 1914. The following day Lanrezac was obliged to order a retreat, which continued until Sept. 5. Meanwhile, on Aug. 27, he was directed to support the British by renewing the offensive at St. Quentin. Although this order provoked a violent disagreement with Joffre. Lanrezac obeyed and won a brilliant tactical success on the 29th in the battle of Guise. Nevertheless. the retreat continued and on Sept. 3 he was relieved of his command by Joffre. In 1917 he was offered the post of major general of the armies by M. Painlevé, but refused it. He died on Jan. 18, 1925.

(H. BI.; LN. MS.)

LANSBURY, GEORGE (1859–1940), British statesman, leader of the Labour party, 1931–35, was born on Feb. 21, 1859, at Halesworth, Suffolk. In 1868 the family moved to east London. Leaving school at 14, Lansbury worked on the Great Eastern railway but in 1884 emigrated to Queensland, Austr. Returning after

a year he joined his father-in-law in a timber merchant's business. He began political life as a Liberal, but in 1892 joined the Social Democratic federation started by Henry M. Hyndman (*q.v.*) and became well known as a propagandist. Later, disagreeing with its narrow Marxism, he joined the Independent Labour party. For a time a militant atheist. he rejoined the church and remained all his life an ardent Christian Socialist. He settled in Poplar and became prominent there. Elected in 1892 to the board of guardians, he. with Will Crooks, initiated a humane policy contrary to the official doctrine. In 1900 he was appointed to the Central (Unemployed) Body for London and in 1905 to the royal commission on the poor laws (*q.v.*) whose famous minority report he signed in 1909. Elected member of parliament for Bow and Bromley in 1910, he resigned in 1912 to fight a by-election as a woman's suffrage candidate and was defeated. He continued his activities as a propagandist and in local government. In 1912 he joined others in launching the *Daily* Herald and for some time was editor, keeping it alive as a weekly through great difficulties during World War I. During 1919–20 he was mayor of Poplar. He and his fellow councilors refused to raise the county rate as protest against the burden on poor boroughs of relieving the unemployed. Lanshury and others were imprisoned for a term. but the injustice was remedied. Elected again for Bow and Bromley in 1922 he held the seat till his death. He refused office in 1924, but as minister of works in the 1929 Labour government he made many reforms in London's amenities. In 1931 he led the small Labour opposition with great ability. Owing to his pacifism he disagreed with the Labour party and in 1935 resigned the leadership. A man of simple faith with a warm devotion to peace and social justice, he spent his last years in unavailing attempts by personal influence to stop the drift to war. He died in London on May 7, 1940.

(A.)

LANSDOWNE, MARQUESSES OF. The first marquess of Lansdowne. William T'etty Fitzmaurice (1737–1805), better known as the earl of Shelburne. was prime minister under George III. He was born in Dublin on May 13, 1737, the son of the Hon. John Fitzmaurice. who took the additional name of Petty on succeeding to the Irish estates of his uncle. and was created Viscount Fitzmaurice (1751) and earl of Shelburne (1753)—both in the peerage of Ireland — and Baron Wycombe in that of Great Britain (1760). William was educated privately and at Christ Church. Oxiord (1755–57), and, entering the army, served in the Seven Years' War. While abroad he was elected M.P. for the family borough of Chipping Wycombe (1760). In 1761 he was re-elected and was also returned to the Irish parliament for County Kerry, but his father's death in May of that year prevented him from sitting in either house of commons and removed him to the English house of lords. He declined office under Lord Bute but became first lord of trade in the Grenville ministry (1763). He resigned, however. a few months later and attached himself to Pitt under whom, in 1766, he served as secretary of state for the southern department. Differences with his colleagues on colonial questions caused him to resign in 1768. In 1782 he took office under Lord Rockingham as home secretary and was appointed prime minister on Rockingham's death in July, but the Fosite Whigs refused to serve under him and combined with Lord Sorth to defeat him in Feb. 1783. When the younger Pitt formed his ministry in Dec. 1783 following the dismissal of the coalition. Shelburne was left out. His arrogance and aloofness, and his popularity with the king. had alienated those with whom he had acted, and he was accused of being the king's tool as much as North had been. Pitt never even consulted him, hut Shelburne, realizing his own unpopularity. made no effort to embarrass Pitt and the breach was not permanent, for in Dec. 1784 he was created marquess of Lansdowne. He no longer took an active part in politics. and died in London on May 7, 1805. John Henry Petty (1765–1809), his son by his first marriage with Lady Sophia Carteret, succeeded as 2nd marquess. He had been M.P. for Chipping Wycombe, 1786–1802. He married Mary Arabella, the widow of Sir Duke Gifford, but the marriage was childless.

HENRY PETTY (Petty-Fitzmaurice from 1818), 3rd marquess of Lansdowne (1780–1863), son of the 1st marquess by his second marriage, served in several ministries. He was born in London on July 2, 1780, and educated at Westminster and at Edinburgh university. He sat in the house-of commons for Calne (1802–06), Cambridge university (1806–07) and Camelford (1807–09). He refused a minor post in Pitt's ministry (1804), and, attaching himself to the Whigs, became chancellor of the exchequer in the "Talents" ministry (1806–07). The death of his half brother in 1809 removed him to the house of lords as 3rd marquess of Lansdowne, and he succeeded Lord Grey as leader of the opposition in 1824. In 1827 he joined with the liberal Tories to enable George Canning to form a government, entering the cabinet without portfolio in May, and becoming home secretary in July. He resigned in Jan. 1828 when the Goderich ministry- collapsed. In Grey's reform ministry (1830–34) and also under Lord Melbourne (1834 and 1835–41) he was president of the council; and he again took that office under Lord John Russell (1846–52). In 1852 he refused Queen Victoria's invitation to form a government. but was in the cabinet without office under Lord Aberdeen (1852–55) and Viscount Palmerston (1855–58). He died at Calne, Wiltshire on Jan. 31, 1863. Lansdowne married Louisa (1785–1851), daughter of the 2nd earl of Ilchester, and was succeeded by his son Henry, the 4th marquess (1816–66). The latter. who was M.P. for Calne (1837–56) and for many years chairman of the Great Western railway. married in 1843 for his second wife Emily (1819–95). eldest daughter of the Comte de Flahault, who became Baroness Nairne in her own right in 1867. By her he had two sons. the 3th marquess and Lord Edmond Fitzmaurice (Baron Fitzmaurice of Leigh).

HENRY CHARLES KEITH PETTY-FITZMAURICE, 3th marquess of Lansdowne (1845–1927), was a leader of the Liberal Unionist party. He was educated at Eton and Balliol college. Oxford. In 1869 he married the daughter of the 1st duke of Abercorn. In Gladstone's ministries he was a lord of the treasury (1868–72), undersecretary for war (1872–74) and undersecretary for India (1880). He resigned from the India office within a few months. disapproving of the Irish Compensation for Disturbance hill. From 188; to 1888 he was governor-general of Canada. and viceroy of India (1888–93). He joined the Liberal Unionist party in 1886 and became one of its most influential leaders. He was secretary of state for war (1895–1900), and foreign secretary (1900–03). He revolutionized British foreign policy 'after the Fashoda incident and the Second Boer War had demonstrated the unpleasantness of diplomatic isolation, made an alliance with Japan in 1902 and. by the *entente cordiale* of 1904, ended the long-standing hostility to France. (*See* EUROPE: *History: Change in British Policy.*) He succeeded the duke of Devonshire as leader of the Unionist party in the lords (1903). In 1917 he joined the first coalition ministry, under H. H. Xsquith, as minister without portfolio. but resigned with him in Dec. 1916. In Sov. 1917 he published a famous letter in the ***Daily*** *Telegraph,* asking for a precise statement of the Allied peace terms with a view to the early termination of World War I. hut his belief in the possibility of a negotiated peace was not shared by the country as a n-hole. He died on June 3, 1927. He was succeeded by his son. Henry William Edmund Petty-Fitzmaurice (1872–1936). The 7th marquess. son of the 6th marquess. who mas born in 1917 and died in 1944, was succeeded by a cousin whose father was the second son of the 3th marquess.

See Lord Newton, Lord *Lansdowne* (London, 1929). (A. AL.)

LANSING, ROBERT (1864–1928), international lawyer and U.S. secretary of state under President Wilson, was born in Watertown, N.Y., Oct. 17. 1864. He graduated from Amherst college. Amherst. Mass.. in 1886, was admitted to the bar in 1889 and practised law in Watertown, 1889–92. Appointed associate counsel in the Bering Sea arbitration of 1892–93, he served frequently thereafter as United States counsel or agent before international trihunals. including the Alaskan Boundary tribunal (1903) and the Sorth Atlantic Coast Fisheries tribunal (1910). President Wilson appointed him counselor for the department of state on March 27, 1914. and secretary of state June 23, 1915. succeeding William Jennings Bryan.

As secretary of state. Lansing drafted notes upholding American rights. among them the protest of Oct. 21, 1915. against British

blockade and contraband practices. He foresaw the possibility of United States entry into the war and influenced Wilson to view the Allied cause as the cause of world democracy. As preparatory measures. he sought peace nith Mexico, worked toward Pan-American solidarity and negotiated the purchase of the Danish West Indies. As a war measure, he signed in Nov. 1917 the Lansing-Ishii agreement nith Japan, which, while recognizing Japan's "special interests in China," declared a continuance of the "open door" policy.

Following the armistice, a rift developed when Wilson ignored Lansing's advice that the president should not attend the peace conference At the conference their views diverged fundamentally To Wilson the League of Nations was essential and needed to be created immediately. To Lansing the conclusion of the peace treaty was more urgent and he considered the League had better be postponed. He also disagreed on details of the League covenant, particularly the positive guaranty of territorial integrity and political independence in article 10, and proposed a negative guaranty instead.

In Washington he exerted himself to gain senate approval of the treaty; and during nearly five months following Wilson's illness he directed foreign policy and conducted cabinet meetings. Because of these differences and because of Lansing's action nith respect to the cabinet, Wilson requested his resignation, which became effective Feb. 13. 1920. Lansing later wrote The *Peace Negotiations* (1921) and *The Big Four and* Others *of* the Peace *Conference* (1921) and practised international law in Washington. He was a son-in-law of John W. Foster, secretary of state. 1892–93. and an uncle of John Foster Dulles, secretary of state, 1953–59. Lansing died in Washington, Oct. 30, 1928. (E. L. Du.)

LANSING, capital city of Michigan, is located in Ingham county on the Grand river at the mouth of the Red Cedar. 85 mi. W.N.W. of Detroit. Pop. (1960) city, 107.807; standard metropolitan statistical area (Clinton. Eaton and Ingham counties) 298.949. (For comparative population figures see table in MICHIGAN: Population.)

The state capitol, erected in 1873–78, stands in a ten-acre park in the centre of a small plateau which! surrounded on three sides by the Grand river, marks the heart of the city. Nearby is the Stevens T. Mason state office building, completed in 1954; the Civic centre, completed in 1955; the new city hall and police building, completed in 1958; and the Lewis Cass state office building. completed in 1922. The state vocational school for boys and the state school for the blind occupy spacious grounds in the city. In Potter park is a fine. small zoo.

An important suburban community is East Lansing (*q.v.*), three miles east. with 33,000 residents, the home of Michigan State university, oldest land-grant institution in the U.S. which mas provided for by the state constitution in 1850. established in 1855 and opened in 1857. Other suburbs in the Lansing metropolitan area include Okemos. 5 mi. east, with 3.000 population; Holt. 5 mi. south, with 5,000; Grand Ledge, 12 mi. west. with 12,000; and DeWitt, 9 mi. north, with 2.500. Many residents of these communities work in Lansing or East Lansing. The suburban areas have changed radically from former agricultural communities.

Some of these suburban communities antedate Lansing. Near Holt, which was settled in 1837. was North Settlement. Its pioneers in 1844 built a dam and mill in what is now North Lansing. They were employed by James' Seymour, New York state land speculator who had become influential in Michigan affairs. Seymour took advantage of a legislative deadlock over a new site for the state capitol, then located in Detroit, offering his tiny water-power site in the wilderness. The legislature chose the site in 1837, and a two-story frame capitol was built in a clearing near Seymour's settlement.

For a time the community was named "Michigan, Michigan," but in 1848 was changed to Lansing, being derived from Lansing, N.Y., former home of North Settlement pioneers. A plank road to Detroit was finished in 1852; the city was chartered in 1859; and in 1860 it had a population of 3,074.

Industry did not gain a foothold until the Civil War era, when railroads connected the capital with the rest of the state.



MICHIGAN STATE CAPITOL AT LANSING

Wood from nearby forests went into agricultural implements. During the last quarter of the 19th century the city had become a centre of manufacture of small steam engines used primarily in farm operations. Ransom Eli Olds of Oldsmobile and Reo fame, whose father. Pliny F. Olds, operated a small engine plant, experimented with steam-powered "horseless carriages" in the late 1880s, switching to gasoline power in 1895 He founded the Olds Motor Works. temporarily (1897–1901) located in Detroit, which was the first firm to develop the assembly-line technique. Differing with his directors. Olds severed connections with the Olds Motor Works and established the Reo Motor Car Co. in 1903. Evolution of Lansing as an automotive centre continued with establishment of a Fisher Body plant, a unit of Durant Motor Car Co., and Motor Wheel Corp. With these came several forging plants, and Lansing became a leader in this field. The rapid industrial growth after 1900 mas accompanied by the growth of the city, the population increasing from about 16,000 to nearly 80,000 in 30 years.

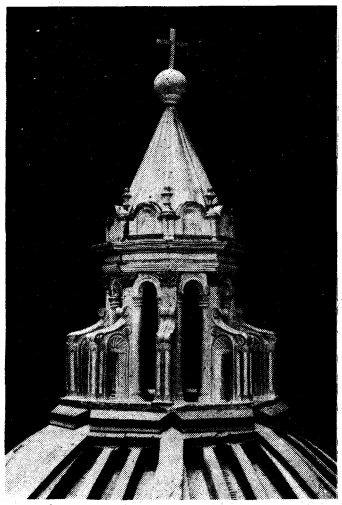
Trucks, diesel engines, hoists, pumps. oil burners, air compressors, tools, screw-machine products, awnings and tents, and aviation instruments are also manufactured and the city is a banking centre and a shopping centre for central Michigan. It is served by three federal highways, by the Grand Trunk, the New York Central and the Chesapeake and Ohio railways and by air, bus and motor truck lines.

City government is mayor-council in form, with finances administered by a city comptroller. Education, high on the list of the New Tork settlers, has been stressed. There are three public and two parochial high schools and a technical-training college. Arts, crafts, little theatre and musical groups are well established. City parks date almost from the city's founding and nearly all sports are represented by city leagues. (Ls. B.)

LANSING MAN, the term applied by American ethnologists to certain human remains discovered in 1902 during the digging of a cellar near Lansing, Kan., and by some authorities believed to represent a prehistoric type of man. They include a skull and several large adult bones and a child's jaw. They were found beneath 20 ft. of undisturbed silt. in a position indicating intentional burial. The skull is preserved in the U.S. National Museum at Washington. It is similar in shape to those of historic Indians of the region. Its ethnological value as indicating the existence of man on the Missouri in the glacial period is doubtful.

See Handbook of *American Indians* (Washington, 1907); and A. Hrdlicka, "Skeleton Remains in North America," *Bur. Amer.* Etknol., *Bulletin 33* (1907)

LANTANA, a large genus of shrubs or herbs, sometimes half-



ALINARI

MODEL OF THE RENAISSANCE LANTERN ATOP THE DOME OF THE FLORENCE CATHEDRAL. C. 1445, BY FILIPPO BRUNELLESCHI. IN THE MUSEO DELL'OPERA, FLORENCE

climbing, mostly of tropical America but also in the old norld, belonging to the verbena family (Verbenaceae). One species, L. *camara,* is a very popular florist's plant that is used as an ornamental shrub out of doors in the south and in California. Its flower clusters are one to two inches wide, flat-topped, with the flowers yellow at first, then orange or red, sometimes all three colours present in the same cluster. Propagation is easily accomplished by cuttings of softwood. Other species, especially L. *sellowiana,* are grown to a more limited extent, usually as a ground cover.

LANTERN, in its original sense. is a container to hold or protect a lamp. It may be hung from a post or wall. or carried in the hand. By extension, it came to mean an architectural form set on top of a roof, originally for the purpose of admitting light to a building.

The lantern as a lamp container is of great antiquity; elaborate examples have been found at Pompeii and Herculaneum and other classical sites.

In their essentials, all lanterns consist of some kind of cage, usually metal, with transparent or translucent sides. Historically, however, the variety of their materials has been immense—lantern cages have been made of such diverse metals as iron, silver, gold and tin, and their sides of horn, talc, bladder, oiled paper and glass.

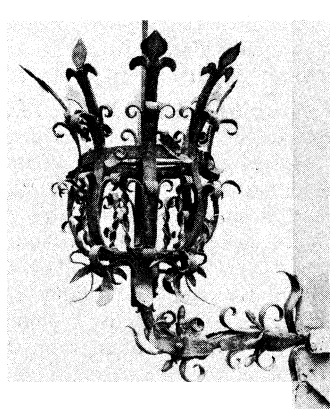
In consequence, their artistry has been equally various, ranging all the way from oriental open-work bronze and exquisitely delicate examples of Renaissance and baroque craftsmanship in gold and silver to the crude iron boxes perforated with nail holes still used in rural parts of the U.S. during the 19th century, and simple "globes" or "chimneys" with round blown-glass sides. So-called Chinese lanterns are made of pleated oiled paper, and may be folded flat when not in use.

In the 20th century, lanterns have become generally obsolete. Once used universally to light ships, houses and streets, they are now restricted largely to places and occasions where electricity is unavailable. A number of specialized lanterns have been developed, such as that of Sir Humphry Davy (*q.v.*) for use in mines, or those used for temporary warning flares on highways and railroads. The protected cage which contains the light used in a lighthouse (*q.v.*) is also known as a lantern. *(See* also LAMP; LIGHTING.)

In architecture, a "lantern" was originally a timber construction, open on all sides, placed on top of a building to admit light. Something of this idea persists in medieval examples like the lantern above the central octagon of Ely cathedral (14th century). The term "lantern," however, soon came to be applied to the open top story of towers, partly because such a construction resembled a lamp container, and partly because beacons were occasionally placed there.

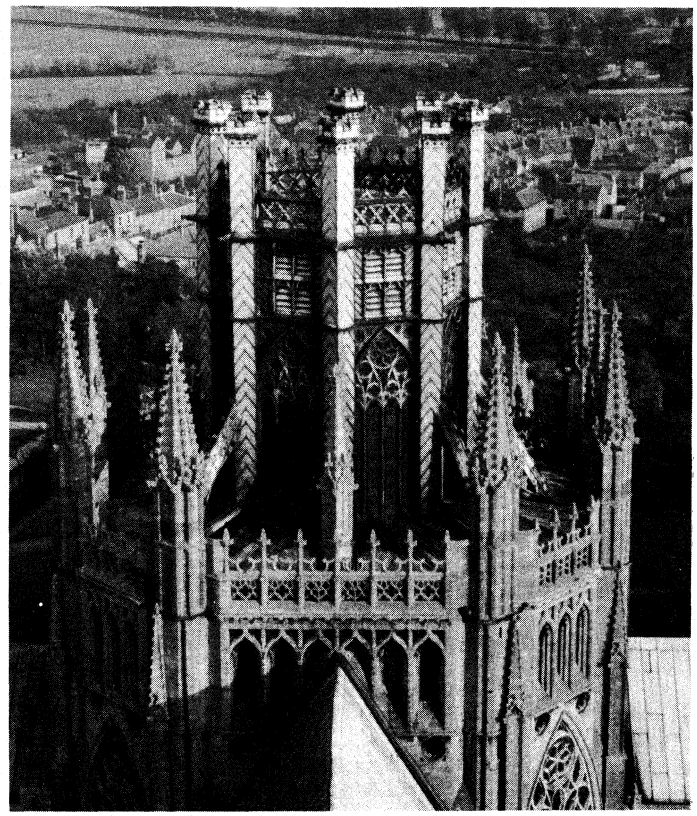
Primarily by visual association with this form. "lantern" in Renaissance architecture means a small cupolalike structure set on top of a dome.

It sometimes serves to admit light to the interior, but its more usual function is as a proportional element in the visual design. Typical are the lanterns capping the domes of St. Peter's in Rome and St. Paul's in London; the most famous U.S. example is the one on the Capitol at Washington, D.C. (AN. G.)



ALINARI

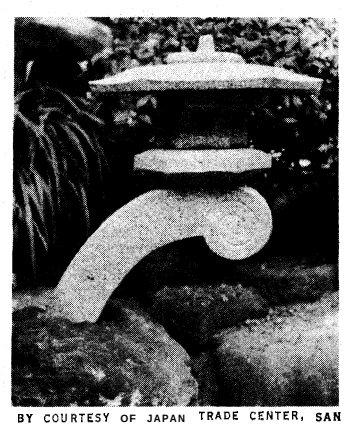
ITALIAN WROUGHT-IRON LANTERN. 17TH CENTURY



A. F. KERSTING

MEDIEVAL LANTERN ABOVE THE CENTRAL OCTAGON OF ELY CATHEDRAL. ENG.. 14TH CENTURY

LANTERN FLY, the name given to insects belonging to the homopterous division of the Hemiptera, and referable to the genus *Fulgora* and allied forms. They are mostly of large size, with a superficial resemblance to Lepidoptera due to their brilliant and varied coloration. Characteristic of the group is the presence on the front of the head of a hollow process, simulating a snout, which is sometimes inflated and as large as the rest of the insect, sometimes elongated, narrow and apically upturned. It was believed that this process, the so-called "lantern," was luminous at night, but subsequent observations have failed to establish this contention which is now generally rejected. In *Fulgora laternaria,* the lantern has been modified to produce a resemblance to the head of a miniature crocodile or reptilelike monster. The lantern flies are the larger and more conspicuous members of the family Fulgoridae. Most of the 7.000 known species are small and inconspicuous. A few are medium sized insects with broad wings, whitish or greenish in colour, and are often mistaken for medium sized moths. Since the insects do not produce light, they should be known as plant hoppers.



BY COURTESY OF JAPAN TRADE CENTER, SAN FRANCISCO

RANKEI-STYLE STONE LANTERN USED AS A LANDSCAPE FEATURE IN JAPANESE GARDENS

The most destructive pest in this group is the sugar cane plant hopper of the Hawaiian Islands which was causing an estimated damage of $3,000,000 annually to the sugar cane crop in Hawaii.

Fortunately, the entomologists of Hawaii were able to discover parasites and predators of this insect in Australia so that by 1917 the damage by the lantern fly had been practically eliminated.

(Z. P. M.)

LANTERNS OF THE DEAD, small stone structures, with windows in the upper part, in which were placed lanterns to mark, at night, the position of a cemetery. Their use, which seems limited to western and central France, is probably due to a traditional survival of primitive Celtic, rather than Christian, ideas. The lantern of the dead usually takes the form of a column or a clustered column, or a small turret. often with a conical cap and a cross at the top. The lamp was hoisted into position by means of a pulley, and at the bottom was an opening to allow access. Twelfth-century examples exist at Cellefrouin, Charente; and at Ciron, Indre. One from the 13th century is at Antigny. Vienne. At a later date lanterns of the dead were usually superseded by small chapels.

LANTHANUM [symbol La, atomic number 57, atomic weight 138.92, stable isotope La^{139} (99.911%) and a natural radioactive isotope La^{138} (0.089%)] is the second most abundant metallic element belonging to the rare-earth group. It was discovered in 1839 by C. G. Mosander; the name is derived from the Greek word, *lanthanein*, meaning "to be hidden or concealed." and thus indicates the difficulty in isolating the element. It occurs associated with other rare earths in monazite, cerite, allanite, etc.; it is always found among the fission products of uranium, thorium and plutonium. It is separated from the other rare earths and purified by the fractional crystallization of the double ammonium nitrate. It can also be separated by liquid-liquid extraction (tributyl phosphate aqueous system') or by ion-exchange methods if high purity is desired. The oxide (La_2O_3) is white and the strongest base of the group. It reacts with water to give the hydroxide and is violently attacked by strong acids giving colourless salts. Solutions of lanthanum salts show no absorption spectrum but give a brilliant spark spectrum; the salts are diamagnetic. The metal is prepared by the electrolysis of fused anhydrous halides or by the thermoreduction of the salts with alkali metals or with alkaline earth metals. It is ductile and melts at 920° C. and undergoes a transition at 868° C. The crystalline form of the high temperature phase is not known. It also exists in two allotropic forms at lower temperatures. The a-form. hexagonal close packed has a double c axis with $n = 3.770$ Å. $c = 12.159$ Å. It has a calculated density = 6.162 g. per cubic centimetre: the β-form, which exists somewhere above 300° C., has a calculated density of 6.190 and crystallizes on the face centred cubic lattice with $a, = 5.302$ Å. The metal boils at about 4,500° C. and it has a room temperature resistivity of 56.X $\times 10^{-6}$ ohm centimetres. It becomes a superconductor at about 5° K. The metal oxidizes in air. is attacked slowly by cold water and rapidly by hot water. The salts are useful in chemistry because lanthanum forms one of the strongest trivalent bases. The impure metal is frequently used in alloys such as misch metal (see CERIUM) and for a number of metallurgical operations. The oxide has found considerable application in the optical industry as a constituent' of special optical glass used for cameras and other instruments. (See RARE EARTHS.)

(F. H. SP.)

LANUVIUM, ancient city of Latium (mod. LANUVIO), about 19 mi. S.E. of Rome, on an isolated southern projection of the Alban hills. and commanding an extensive view over the low country between it and the sea. It remained independent until conquered by Rome in 338 B.C. when it received Roman citizenship. and even in imperial times its chief magistrate and municipal council kept the titles of *dictator* and *senatus* respectively. It was famous for its rich temple of Juno Sospea, the possessions of which extended as far as the seacoast. Remains of theatre and city walls exist in the modern village. and above it is an area surrounded by a portico, upon the north side of which is a rectangular building. possibly connected with the temple of Juno. There archaic decorative terra cottas (some 5th century B.C.) and later marble sculptures (A.D. 2nd century) were discovered. Lanuvium was the birthplace of Milo. and Antoninus Pius.

See *American Journal Archaeology* (Boston, 1914); *Monumenti Antichi* (Milan, 1890) and A. E. Gordon, ***The*** *Cults* of ***Lanuvium*** (Berkeley, Cal., London, 1938).

LANZAROTE, an island forming part of the Spanish archipelago of the Canary Islands (*q.v.*). Pop. (1950) 30.146; area, 323 sq.mi. Lanzarote, the most easterly of the Canaries, has a length of 31 mi. and a breadth varying from 5 to 10 mi. It is barren and mountainous. bearing everywhere marks of its volcanic origin. Montaña Blanca, the highest point (1,956 ft.), is cultivated to the summit. In 1730 the appearance of half the island was altered by a volcanic outburst. In 182 j another volcanic eruption was accompanied by earthquakes. A short distance inland is the town of Arrecife (pop. 8,929 mun.). The climate is hot and dry. Dromedaries are used as beasts of burden. A strait about 6 mi. in width separates Lanzarote from Fuerteventura.

Graciosa. a small uninhabited island. is divided from the northeastern extremity of Lanzarote by a channel 1 mi. wide, which affords a harbour for large ships: but basaltic cliffs, 1,500 ft. high. prevent intercourse with the inhabited part of Lanzarote.

LANZI, LUIGI (1732–1810), Italian archaeologist, was appointed (1773) keeper of the galleries of Florence, and studied Italian painting and Etruscan antiquities and language. His most important works are his *Storia Pittoricn della Italia* (2 parts, 1792–96; Eng. trans. by Roscoe); *Saggio di lingua Etrusca* (1789): *Saggio delle lingue Ital. antiche* (1806): and *Dci vnsi antichi dipinti volgarmente chiamati Etruschi* (1806). Lanzi perceived the Greek origin and characters of the so-called Etruscan vases. What was true of the antiquities would be true also. he argued. of the Etruscan language. and the object of the *Saggio di lingua Etrusca* was to prove that this language must be related to that of the neighbouring peoples — Romans, Umbrians, Oscans and Greeks. He died on March 30, 1810.

LAO: *see* SHAN.

LAOAG, a municipality (with administrative centre and 33 *barrios* or districts). a port for coasting vessels and capital of the province of Ilocos Norte. Luzon, Phil.. on the Laoag river. about five miles from its mouth. and 290 mi. from Manila. Pop. (1961) 50,096 (a gain of 11,627 from 1918). It lies on an extensive coast plain behind which is a picturesque range of hills, and is noted for its fine climate. The surrounding country produces palay (rice), maize (corn), sugar and tobacco. Cotton is also grown and is woven into fabrics by the native women and sold to the mountaineers who come to the town to trade. The vernacular of the area is Ilocano, a member of the Tagala group of the Austronesian (sometimes known as the Malayo-Polynesian) linguistic family.'

LAOCOON, in Greek legend a brother of Anchises. who had been a priest of Apollo. but having profaned the temple of the god he and his two sons, or one of them *(Iliou Persis* in Proclus' *Chrestomathein)* were destroyed by serpents while preparing to sacrifice a bull at the altar of Poseidon, in whose service Laocoon was then acting as priest. An additional motive for his punishment consisted in his having warned the Trojans against the wooden horse left by the Greeks. The most famous expressions in literature and art respectively of this legend are in Virgil (*Aeneid,* ii. 109 et seq.) and in the Laocoon group of the Vatican. The group of the Vatican is of interest, not only for its great merits, but from the circumstance that Lessing's *Lnocoon,* a landmark in art criticism, is written around it. Its date being fixed *(see* AGESANDER) at 40–20 B.C.. there can be no question of copying Virgil. The group represents the extreme of a pathetic tendency in sculpture (see GREEK ART).

LAODICEA, the name of at least eight cities, founded or renovated in the later Hellenic period. Most of them were founded by the Seleucid kings of Syria. Seleucus. founder of the dynasty, is said by Appian to have named five cities after his mother Laodice. Thus in the immense realm of the Seleucidae from the Aegean sea to the borders of India we find cities called Laodicea, as also Seleucia (*q.v.*). So long as Greek civilization held its ground, these were the commercial and social centres. The chief are Laodicea *ad Lycum (see* below); *Combusta* on the borders of Phrygia, Lycaonia and Pisidia; a third in Pontus; a fourth, *ad mare,* on the coast of Syria; a fifth. *ad Libanum,* beside the Leba-

non mountains; and three others in the far east—Media. Persia and the lower Tigris valley. In the latter countries Greek civilization mas short-lived, and the last three cities disappeared; the other five continued great throughout the Greek and Roman period, and the second, third and fourth retain to the present day the ancient name under the pronunciation Ladik, Ladikiyeh or Latakia (*q v.*).

LAODICEA AD LYCUM (mod. *Denizli,* q v.) was founded probably by Antiochus II Theos (261–246 B.C.) and named after his wife Laodice. Its site is close to the station of Gonjeli on the Anatolian railway. There was one of the oldest homes of Christianity and the seat of one of the seven churches of the Apocalypse. Pliny states (v. 29) that the town was called in older times Diospolis and Rhoas; but at an early period Colossae. a few miles to the east. and Hierapolis. 6 mi. to the north, were the great cities of the neighbourhood, and Laodicea was of no importance until the Seleucid foundation (Strabo. p. 578).

A favourable site was found on some low hills of alluvial formation, about 2 mi. S. of the river Lycus (Churuk Su) and 9 mi. E. of the confluence of the Lycus and Maeander. The great trade route from the Euphrates and the interior passed to it through Apamea. There it forked, one branch going down the Maeander valley to Magnesia and thence north to Ephesus, a distance of about 90 mi., and the other branch crossing the mountains by an easy pass to Philadelphia and the Hermus valley. Sardis. Thyatira and at last Pergamum. St. Paul (Col. iv. 15) alludes to the situation of Laodicea beside Colossae and Hierapolis; and the order in which the last five churches of the Apocalypse are enumerated (Rev. i. 11) is explained by their position on the road just described. Placed in this situation, in the centre of a fertile district. Laodicea became a rich city. It was famous for its money transactions (Cic., *Ad. Fam.,* ii. 17; iii, 5), and for the beautiful soft wool grown by the sheep of the country (Strabo, 578). Both points are referred to in the message to the church (Rev. iii. 17, 18).

Little is known of the history of the town. It suffered greatly from a siege in the Mithradatic war. but soon recovered its prosperity under the Roman empire. The Zeus of Laodicea, with the curious epithet Xseis, is a frequent symbol on the city coins. He is represented standing. holding in the extended right hand an eagle, in the left a spear. the *hasta pura.* Not Ear from the city was the temple of Men Karou, with a great medical school; while Laodicea itself produced some famous Sceptic philosophers, and gave origin to the royal family of Polemon and Zenon. The city fell finally into decay in the frontier wars with the Turkish invaders. Its ruins are of wide extent. The district is subject to severe earthquakes (Strabo 580; Tac. *Ann.* xiv. 27).

LAODICEA, SYNOD OF, held at Laodicea in Phrygia, at a date in the second half of the 4th century. adopted a number of canons, chiefly disciplinary, of which the most significant are those affecting the clergy. who appear as a privileged class with carefully graded orders within itself. The canons were confirmed by the Council of Chalcedon in 451.

See article "Councils and Synods, Christian," in Hastings' *Encyclopaedia of Religion and Ethics;* also Hefele, *History of Councils,* Eng. trans.. vol. ii.

LAOMEDON, in Greek legend. son of Ilus, king of Troy, and father of Podarces (Priam). Apollo and Poseidon served him for hire; when Laomedon refused to pay the reward agreed upon, Apollo visited the land with a pestilence, and Poseidon sent a sea-monster which could only be appeased by the sacrifice of one of the king's daughters. The lot fell upon Hesione; Heracles, on his way back from the land of the Amazons, offered to slay the monster and release her on condition that he should receive the divine horses of Tros. Again Laomedon broke his word; whereupon Heracles returned with a band of warriors, took Troy. and slew Laomedon and all his sons except Priam. Laomedon was buried near the Scaean gate. and it was said that so long as his grave remained undisturbed, so long would the walls of Troy remain impregnable.

See Homer, *Iliad,* v, 265, 640, vii, 452, xxi, 443: Apollodorus ii, 103 ff. Diod. Sic. iv, 32, 42, 49; Hyginus, *Fab.* Xq; Ovid. *Metam.* xi. 194.

LAON, a town of northern France, capital of the *département* of Aisne, 87 mi. N.E. of Paris on the Northern railway. Pop. (1954) 19,295. The hilly district of Laon (Laudunum) has always had some strategic importance. Laon was fortified by the Romans, and successively checked the invasions of the Franks, Burgundians, Vandals, Alani and Huns. St. Remigius. the archbishop of Reims who baptized Clovis, was born in the Laonnais, and at the end of the 5th century. he instituted the bishopric of the town. Thenceforward Laon was one of the principal towns of the kingdom of the Franks, and the possession of it was often disputed. Charles the Bald had enriched its church with the gift of numerous domains. After the fall of the Carolingians Laon took the part of Charles of Lorraine, their heir, and Hugh Capet only succeeded in making himself master of the town by the connivance of the bishop, who, in return for this service, was made second ecclesiastical peer of the kingdom.

In the early 12th century the citizens profited by a temporary absence of Bishop Gaudry to secure from his representatives a communal charter. but he, on his return, purchased from the king of France the revocation of this document; the consequence was a revolt. in which the episcopal palace was burned and the bishop and several of his partisans were put to death. The fire spread to the cathedral. and reduced it to ashes.

After 1239 the liberties of Laon were no more contested until 1331, when the commune was abolished. During the Hundred Years' War it was taken by the Burgundians. who gave it up to the English, and it was retaken by the French after the consecration of Charles VII. Under the league Laon took the part of the Leaguers. and mas taken by Henry IV. During the campaign of 1814 Gen. G. L. von Blücher successfully defended it against Napoleon. In 1870 an engineer blew up the powder magazine of the citadel at the moment when the German troops were entering the tonn. Many lives were lost; and the cathedral and the old episcopal palace were damaged.

At the Revolution Laon permanently lost its rank as a bishopric. Laon could not resist Alexander von Kluck's attack in Xug. 1914, and was held by the Germans until Gen. Charles Mangin took it in Oct. 1918, when he succeeded in breaking the German salient south of the Aisne.

The town is situated on an isolated ridge some 330 ft. above the surrounding plain and the little river of Xrdon. The suhurbs of St. Marcel and Vaux extend along the foot of the ridge to the north. From the railway station, situated in the plain to the north, a straight staircase of several hundred steps leads to the gate of the town. and all the roads connecting Laon with the surrounding district are cut in zigzags on the steep slopes, crowned by promenades on the site of the old ramparts. The 13th-century gates of Ardon, Chenizelles and Soissons, the latter in a state of ruin. have been preserved. At the eastern extremity of the ridge rises the citadel; at its apex is the parade-ground of St. Martin, and at the southern end stands the ancient abbey of St. Vincent. The cathedral of Laon, which was little damaged during World War I, is important artistically. It took the place of the old cathedral, burned in 1111 at the beginning of the communal struggles. The building is cruciform, and the choir terminates in a straight wall instead of in an apse. Of the six towers flanking the facades, only four are complete to the height of the base of the spires. two at the west front with huge figures of oxen beneath the arcades of their upper portion, and one at each end of the transept. A square central tower forms a lantern within the church. The west front. with three porches, the centre one surmounted by a fine rose window, ranks next to that of Notre-Dame at Paris in purity. The cathedral has stained glass of the 13th century and a choir grille of the 18th century. The chapterhouse and the cloister are of the 13th century. The old episcopal palace is now used as a courthouse. The front, flanked by turrets, is pierced by great pointed windows. There is also a Gothic cloister and an old chapel of two stories. of a date anterior to the cathedral. The church of St. Martin dates from the middle of the 12th century. The old abbey buildings of the same foundation are now used as the hospital. The museum of Laon has collections of sculpture and painting. In its garden there is a chapel of the Templars belonging to the 12th century.

LAOS, a landlocked kingdom situated in the Indochinese peninsula and formerly part of French Indochina, is bounded north by China, northeast by North Vietnam and east by South Vietnam, south by Cambodia and west by Thailand and Burma. Stretching more than 600 mi. from northwest to southeast, but in places barely 50 mi. wide, its area is 91,428 sq.mi.

Physical Features. — The mountainous surface of Laos, which is covered partly by tropical rain forest and partly by deciduous monsoon forest with patches of savanna interspersed with thickets and cultivated clearings, forms the shape of a hatchet. The "head" consists of complex sandstone and limestone plateaus deeply etched by rivers in forbidding gorges, with the major valleys focusing on Luang Prabang. the royal capital. The "handle" of the hatchet is part of the hill country west of the Annamese Cordillera watershed, from which short streams drain westward into the Mekong. This great, fast-flowing river, which has major rapids caused by skew strata from the Annamese chain formations, enters from the Chinese province of Yiinnan in the north and forms the western boundary of Laos for about 500 mi. The climate is the most extreme in southeast Asia and the driest in Indochina. Luang Prabang receives only 53 in. of rain annually, and there is a drought from December to February, when the Mekong is at its lowest ebb because of frozen headwaters.

The elephant (which is trained for forest work), leopard, tiger, gaur and panther roam the virgin forests near Cambodia and also the Annamese Cordillera. Lizards and crocodiles abound and there are many varieties of birds, fish and insects.

History. — Laos includes a group of clans whose progenitors moved south from Yiinnan from the 11th century onward, forming chieftancies in upper Siam. Burma and along the Mekong. By 1353 they were unified into the kingdom of Lan Xang ("million elephants"), centring on Luang Prabang, originally a Buddhist mission outpost. These Laotians were southern Mongoloids but they intermarried with a local people of Khmer type. The early Laotian kingdom had struggles with Burmese, Shan and Siamese (Thai) communities, one war causing the capital to be transferred to Vientiane (1563), after which the new and old capitals sometimes had separate kings. A continuing diift by these peoples down the Mekong led in 1713 to another Laotian principality (now the province of Champassak) being established by a brother of the Vientiane king. Drawn into a conflict between Siam and Annam, Vientiane was sacked by Siamese in 1777 and, following an abortive revolution, it was sacked again in 1827 and thereafter became part of Siam.

After the French had entered Annam (1858) they revived an old claim to territory as far west as the Mekong, so that Laos became the scene of political conflict between the French and Siamese. During the 19th century Laos was repeatedly raided from Yünnan, partly as a consequence of Franco-Chinese hostilities on the Chinese coast. French intervention in Laos was directed more against the Chinese and the Siamese than against the Laotians themselves. By the treaty of 1893 the Siamese agreed to withdraw from places east of the Mekong and later they relinquished parts of the old Luang Prabang and Champassak kingdoms which were west of the Mekong. and the British ceded to the French an area of Kengtung which became part of the province of Haut-Mekong (Houakhong, now Namtha). Laos as the name of a state dates from 1899 when the present territory became a protectorate under a French chief resident at Vientiane. Throughout the protectorate period the kingdom of Luang Prabang maintained its identity only in the provinces of Luang Prabang, Phongsaly and Houa Phanh (Samneua); other provinces continued as separate chieftaincies. However, the French treated Laos as one unit for budgetary purposes and established a single consultative assembly in 1923, thus giving it new political unity.

After the Japanese had taken Tongking in 1940, the Siamese revived claims to territories west of the Mekong and there was fighting between French and Siamese forces. The Japanese then arbitrated in favour of Siam, which, however, returned the territories to Laos in 1947. King Sisavang Vong of Luang Prabang fought the Japanese for a while, and, though finally overwhelmed, reaffirmed loyalty to France after the Japanese surrender.

The departure of the Japanese left an administrative vacuum in which nationalism flowered vigorously. The non-Communist Lao Issara (Free Laotian party) was established to resist foreign penetration, but the granting of full independence within the French union in 1950 caused the Lao Issara to break up, most of its leaders supporting a confederation of Laotian chieftains and princes under one king. Of seven ministers in the first cabinet (1953), four were former leaders of the Lao Issara. The French, with United States help. supported the royalist government, but there were great geographical difficulties in the way of bringing resources and technical aid to Laos. which was trying to solve in a few years problems accumulated during the preceding century. By 1950 a Communist-inspired party, the Pathet Lao, had come into being, which, though itself led by a prince, Souvanna Vong, urged revolution against the chieftains and princes whose supporters were so successful in the 1951 general election. The Pathet Lao joined a united front (Lien Viet) of similar revolutionary movements in Cambodia, which was promoted by the Vietminh government in North Vietnam and by the Communist Chinese, and in 1953 Vietminh forces moved into northern Laos behind the screen of Pathet Lao members.

At the Geneva conference of 1954, under United Nations auspices. France and the Vietminh agreed to withdraw military forces, from Laos, while the Pathet Lao army (as with Chinese and Vietminh help it had by then become) was to withdraw to the provinces of Phongsaly and Houa Phanh (Samneua) until party differences could be tested in a nationwide general election. The Pathet Lao, however, demanded autonomy for these two provinces



UNITED NATIONS PHOTO

SHRINE OF THAT LUANG, VIENTIANE. LAOS

and at times claimed to be the only lawful government in Laos. This led to disorganization and guerrilla activity, and an international commission with members from India, Canada and Poland was sent by the United Nations to see that the terms of the Geneva convention were observed. A *de facto* partition of the country was occurring because the royal Laotian government and the Pathet Lao failed to agree on means of implementing the earlier agreement about a general election. Laos left the French union in 1956. After prolonged haggling, in 1957 Prince Souvanna Vong transferred Phongsaly and Houa Phanh to the kingdom of Laos and agreed that his army should be integrated with the Laotian army. in return for which he and another member of the Pathet Lao became cabinet ministers. At the 1958 election the Pathet Lao was re-formed into the Neo Lao Haksat (Patriotic Front of Laos), but in 1959 the Pathet Lao army resumed its attempts to control the northern border provinces. This caused international anxiety, especially when the royal Laotian government alleged that forces from North Vietnam were attacking near the critical latitude 17° N. In the fraudulent election of April 1960 all the 59 seats were won by right-wing candidates. This was followed by the arrest and subsequent escape into North Vietnam of Souvanna Vong and his supporters and then by the seizure of Vientiane by Capt. Kong Le, a parachute battalion commander, whose forces subsequently joined with those of the Pathet Lao.

The confused situation led to tension between the United States and the U.S.S.R. because the central government of Prince Souvanna Phouma. under King Savang Vatthana. despite C.S. aid, could not control Prince Souvanna Vong during peaceful phases or defeat his Pathet Lao forces (aided by Soviet equipment) in the outbursts of guerrilla fighting. In 1960 Prince Roun Oum formed his own (right-wing) government in Savannakhet. In 1961 the re-formed international control commission found it difficult to ensure an effective disengagement, and the revival of the Geneva conference failed to establish a Swiss-type neutrality for Laos. Despite efforts to persuade the three princes (Boun Oum, Souvanna Phouma and Souvanna Vong) to form a provisional government of national union: the Pathet Lao forces in northwest Laos renewed attacks against royal Laotian troops in May 1962. Their subsequent advance toward the Thai border motivated the government of Thailand to request U.S. military aid which resulted in the dispatch of U.S. military units to Thailand.

Population.— The population was estimated at 2,277,300 in 1959 (about 25 persons per square mile); no census had been taken since 1921. The poor farming population is divided into isolated valley communities which preserve different traditions and several forms of monosyllabic tonal speech resembling southern Chinese dialects. The Lao, Neua. Dam. Dang and Lu clans, closely resembling the Thai, are culturally Buddhist but have strong animist traditions (see also SHAN). Other mountain tribes like the Lao Theung anthropologically resemble Indonesians. and the Ho. Yao and Miau (*q.v.*) clans are directly related to those of Yiinnan. Inside the northern border about 12.000 persons claim to be Chinese. and 15.000 persons of Vietnamese origin live along the eastern border. The chief towns. both on the Mekong, are Vientiane (1959 est. 60,000) and Luang Prabang (*q.v.*; 18,000). During the 1950s movements between Saigon (Cambodia) and Vientiane increased Savannakhet's population to more than 10.000.

The official language is Lao. which is related to the Thai language. French, however, is still widely used in government and commerce. Theravada (Hinayana) Buddhism is the state religion but, despite the importance of temples and priests, the upland Lao (and to a lesser extent the lowland Lao) regulate a large part of their daily activities in accordance with animistic concepts.

Administration and Economy.— According to the 1947 constitution (amended in 1952 and 1956) Laos is a parliamentary democracy with the king as head of state, supreme religious authority and commander in chief of the armed forces. The king appoints the prime minister, who is assisted by a council of ministers. The national assembly is elected every five years by universal suffrage. The administrative capital is Vientiane. The state is divided into 12 provinces (*khoueng*): Namtha (formerly Haut-Mekong), Phongsaly, Savannakhet, Samneua (formerly Houa Phanh), Luang Prabang, Xiengkhouang, Sayaboury, Vientiane. Khammouane, Saravane, Champassak and Attopeu. There are courts of first and second instance and a supreme court of appeal Laos has about 770 primary schools, 7 secondary schools and colleges and the University of Sisavang Vong in Vientiane.

Laos is a very poor country and manufactures are few (silk fabrics, leather goods. pottery, silverwork). Development plans include foreign-aided schemes for damming the Mekong near Pakse for hydroelectric power, irrigation and imprcved river transport. Although more than two-thirds of the country is covered with teak and other forest trees. lumbering is little developed and there are only about 30 sawmills. Most cultivation is on a subsistence basis on self-contained paddy farms, 1,000,000 ac. being under rice, but the average yield is the lowest in southeast Asia. Commercial plantations of coffee and tea on the Boloven plateau have been largely paralyzed since World War II. Opium poppies are grown by the mountain peoples. Social disturbances dislocated alluvial tin mining at Phontiou, whose ores are in any case difficult to refine. There is also some stock raising and river fishing.

These facts help to explain why, during the 1950s. Laos was a net food importer and the total value of imports (mainly from Thailand and France) was several times larger than that of exports. The adverse balance was offset by large foreign grants-in-aid, mostly from the United States. The unit of currency is the kip, which is nominally at parity with the riel of Cambodia and the piastre of South Vietnam, but few banks will negotiate it.

Pack-horse caravan routes are still used between Yiinnan and northern Laos. Roads are rarely macadamized and often impassable during rains; one links Vientiane with Luang Prabang, a branch running to Vinh in North Vietnam; Savannakhet is linked with Quangtri in South Vietnam, as well as Vinh. and a third road runs parallel with the Mekong to Saigon. There are only a few thousand vehicles in the country and no railways. The Mekong provides the chief means of transport, particularly for timber, but the rapids prevent large vessels being used. Savannakhet and Vientiane have airfields with connections to Bangkok and Saigon.

See also INDOCHINA.

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LAO-TSE: *see* LAO-TZU.

LAO-TZU. Probably no one except Confucius has exerted greater influence over Chinese minds throughout history than a shadowy philosopher called Lao-tzu (Lao-tze or Lao-tse), who is traditionally considered to have founded the naturalistic, quietistic philosophy called Taoism (*q.v.*). Lao-tzu is quoted in several early Taoist and other works, and the most revered Taoist canon was originally known as the *Lao-tzu,* only later acquiring the now current title *Tao-te ching,* "The Classic of the Way and Its Power."

The appellation Lao-tzu, "Master Lao," refers to a person named Lao Tan. Because of its literal meaning, western writers have often rendered Lao-tzu as "the old master." Chinese tradition holds that Lao-tzu was born about 600 B.C. in the modern Honan province, that though a recluse he became librarian (treasurer?) at the royal court of the Chou dynasty, that his younger contemporary Confucius (*q.v.*) humbly sought advice from him in 517 B.C., and that he finally abandoned the royal court and departed westward, depositing with a frontier warden his treatise on the *Tuo* (the "way"). This tradition is based primarily on an account given in the *Historical Records,* a work completed in the 1st century B.C. Later Taoist propagandists, competing for prestige with Buddhism, claimed that Lao-tzu traveled to India and converted the Buddha himself to Taoism.

Confusion about the historical identity of Lao-tzu has existed from early times. The *Historical Records,* though reporting Lao-tzu's supposed conversation with Confucius in the 6th century B.C., confusedly identifies him as Li Erh, the father of a general of the feudal state of Wei known to have been active in 273 B.C. In

addition, it inconclusively takes note of conflicting legends identifying Lao-tzu with (1) Lao Lai-tzu, a reputed contemporary of Confucius; and (2) a 4th-century Chou librarian named Tan. And 20th-century scholarship has failed to resolve the problem of Lao-tzu's historicity. Most scholars. relying upon comparisons of the *Lao-Tzu*'s style and ideas with those of other ancient Chinese works, contend that the book was probably compiled not earlier than the 4th century B.C. and not by one hand, but admit knowing nothing with any certainty about its author or authors.



BY COURTESY OF THE TRUSTEES OF THE BRITISH MUSEUM

SOAPSTONE FIGURE OF LAO-TZU, FOUNDER OF TAOISM. THE STATUE IS SAID TO SHOW THE PHILOSOPHER ON HIS RETURN FROM VISITING HSI-WANG-MU, THE WESTERN QUEEN MOTHER

The Lao-tzu or Tao-te ching exists in various recensions, 5,000-odd words in length and divided into 81 sections or chapters. The sequence of passages in the text has apparently been disrupted in its transmission from editor to editor. Epigrammatic and mostly versified, it lacks consistency of style, rhymes and ideas. It deals unsystematically with metaphysics, psychology, ethics and socio-political theories, centring upon a concept of the Tao as the all-embracing First Principle. Its language and continuity are so obscure that the Tao-te ching has been subjected to widely varying interpretations and is a perennial challenge to the imagination of orientalists. Its influence on Chinese philosophy, art and literature has been prodigious. and no Chinese work has been translated more often into western languages.

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LA PAMPA, Argentine province immediately west of the province of Buenos Aires, geographically belongs to the dry southwestern area of the Argentine pampa. although the western and southern parts of the province are broken by hills, swamps and sandy wastes with occasional wooded areas. A number of lakes are found particularly in the southeast. Rainfall is light and somewhat irregular, but the eastern half of the province is fertile and well suited for grazing. Occasional severe droughts such as occurred in 1931 make agriculture uncertain. Strong variable winds characterize the region and the temperature range is extreme! from 110° F. in the summer to severe frosts in the winter. Area jj.382 sq.mi.; pop. (1956 est.) 189.433. (1947) 169.480.

The area remained in the hands of nomadic Indian tribes until the closing years of the 19th century. Renewed efforts to extend the frontier and eliminate the Indian menace combined with the pressure of European immigration to extend some settlement into this region. Cattle, sheep, wheat, corn. linseed, barley and alfalfa have become the principal products of the territory. Railroads and several highways connect the eastern portion of the province with Buenos Aires and with Bahía Blanca, which serves as the principal port of the area. The western half, largely a broad depression filled with swamps, is sparsely inhabited and has no important towns. The capital, Santa Rosa (pop. [1956] 16,331), is approximately 450 mi. from Buenos Aires. General Pico in the northwest corner of the province was the only other town with a population over 10,000 in 1957.

From 1952, when La Pampa was advanced from territorial to provincial status, until the overthrow of Juan D. Perón (1955), the area was known by his wife's name, Eva Perón. (Js. R. S.)

LA PAZ, a department of Bolivia, bounded north by Pando, south by Oruro, east by Beni and Cochabamba and west by the republics of Chile and Peru. Pop. (1950) 948,446; area 51,732 sq.mi. The department was established in 1826 during the administration of Antonio José de Sucre. The city of La Paz, pop. (1950) 321,073, is capital of the department and site of the national government.

The department, in the north est of the country, comprises 16 provinces. Indians make up a large proportion of the population, with lesser numbers of mestizos and whites. The landscape and general character of the department display great variation as a result of its physical diversity and wide range of elevations. Within its scope is the plateau of the Altiplano, the eastern Cordillera with its enormous peaks rising more than 21,000 ft. above sea level, the lower tropical valleys of the Yungas, and the rain forests on the periphery of the Amazon basin. The department borders upon Lake Titicaca and contains a number of streams and rivers. Among them are the Desaguadero which drains Titicaca to the south, and the Choqueyapu, or Rio de La Paz.

Economic activities of the department include those of La Paz, the nation's chief industrial and commercial city, mining, livestock grazing and agriculture, the nature of the crops depending upon the elevation. Tin, gold, antimony, lead, petroleum, copper and wolfram are important mineral resources of the department. These ores are found largely in the provinces of Inquisivi, Murillo, Sur Yungas, Loayza, Los Andes, Pacajes, Aroma and Sicasica.

Lying between the city of La Paz and Lake Titicaca are the ruins of the city of Tiahuanaco, the centre of a pre-Inca state which was absorbed into the Inca empire. The ruins contain the Gateway of the Sun, the Palace of Kalasaya and numerous statues dramatizing the human figure. On the islands of Titicaca and Coati in Lake Titicaca are found many artifacts of this ancient civilization.

The department affords the best motor roads in the country and it is connected with the Pacific coast by three single-track railways: the La Paz-Guaqui line, linked to the Peruvian port of Mollendo by the Southern Railway of Peru and steamer across Titicaca, the Arica-La Paz railway, and the La Paz-Antofagasta line. International trains run to Buenos Aires and the city of La Paz is on the main air routes. (J. L. TR.)

LA PAZ, a department of El Salvador, bordering on 'the Pacific ocean. Area 464 sq.mi.; pop. (1950) 96,843. The southern coastal plain is sparsely settled; population is concentrated in the northern hilly to mountainous two-thirds of the department and in the second half of the 20th century was about 65% rural. La Paz ranks high in the country in cotton production, in fruits (bananas. plantains and pineapples) and in rice; it is also fairly important in the pioduction of coffee, raised on volcanic mountain slopes, corn, beans, .vegetables, sesame, livestock, lumber and salt. Zacatecoluca, the capital (pop. [1950] 9,190), is connected by modern highway with San Salvador, 35 mi. distant. (C. F. J.)

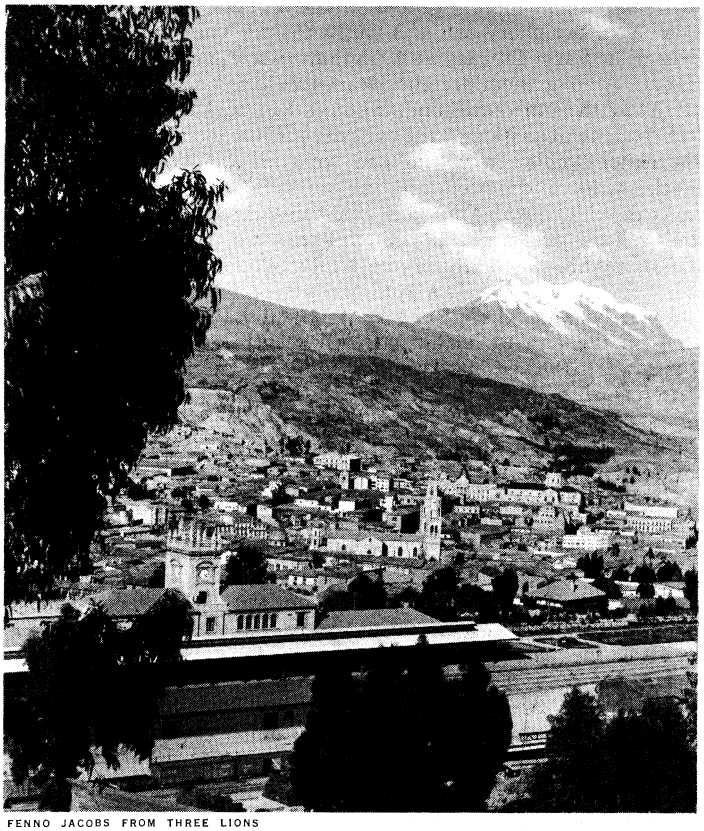
LA PAZ, a small department in southern Honduras: bordering El Salvador. Pop. (1950) 51,220, of which 75% was rural. The department consists mostly of rough to rugged mountains and the rural population and many small villages are isolated in mountain valleys. Only La Paz, departmental capital and largest town, pop. (1950) 3,877, near the northeastern corner of the department, has an all-weather highway, connecting it with Tegucigalpa, 57 mi. distant; the remainder of the department depends on pack and cart transportation. Coffee is the principal commercial crop. The department is also noted for several handcraft industries. (C. F. J.)

LA PAZ, the first city of Bolivia, capital of the department of the same name and seat of the national government. Pop. (1950) 321,073. The city. which is 42 mi. S.E. of Lake Titicaca, lies at an elevation of 12,001 ft. above sea level in a deep. broad canyon formed by erosive action of the Rio de La Paz, or Choqueyapu, a tributary of the Rio Beni and the Amazon. Rainfall is about 22 in. annually. The annual average temperature is about 49° F. with a range of 8.3° F. The location. 1,400 ft. below the surface of the Xltiplano, affords some protection from the cold highland winds. Viewed against the background of Illimani (21,zoo it.) and other great snowcapped peaks of the Cordillera Real, the scenery from La Paz has a spectacularly rugged beauty.

Founded in 1548 by Capt. Alonso de Mendoza on the site of the

Incan village of Chuquiapu, La Paz soon became an important station on the colonial trade routes. When railroads were constructed they also converged upon La Paz. The city, originally called the Ciudad de Nuestra Señora de la Paz, (City of Our Lady of Peace), was renamed La Paz de Ayacucho in 1825 in commemoration of the last decisive battle of the wars of independence in Ibero America. The national government became established there in 1898. but Sucre remains the legal capital of the country

La Paz, usually regarded as the world's highest big city, contains a number of fine buildings, both public and private. These include the government palace. the capitol, the Roman Catholic



FENNO JACOBS FROM THREE LIONS

LA PAZ AS SEEN FROM THE WESTERN SECTOR OF THE CITY. SNOW-COVERED ILLIMANI MOUNTAIN IS IN THE BACKGROUND

cathedral and bishop's palace, a museum, a military club, hotels and theatres. The streets, particularly the older ones are generally narrow and steep because of the unevenness of the canyon floor. The Plaza Murillo, named for the patriot who led the revolt against Spanish rule in 1809, is the focus of the city's activities. Industries include food processing, the manufacture of textiles. chemicals, glassware, metalware, furniture and other consumer goods.

La Paz is connected with the Pacific coast by three single-track railways. The La Paz-Guaqui line, 60 mi. long, links La Paz with the Peruvian ports of Mollendo and Matarani via the Southern Railway of Peru and steamer across Lake Titicaca. This route encompasses 511 mi. of railroad and 140 mi. across Titicaca. The Arica-La Paz railway, constructed by the Chilean government, has a total length of 278 mi., of which 150 mi. are within the frontiers of Bolivia. This is the shortest route to the Pacific. The La Paz-Antofagasta railway has a total length of 729 mi. with 453 mi. in Bolivian territory. A branch line from Uyuni to Villazón connects with the Argentine railway running to Buenos Aires. La Paz is connected with the eastern interior of the country by the branch line from Oruro to Cochabamba and the Cochabamba-Santa Cruz highway, and by a motor road and railway to the Yungas. The airport for La Paz is situated upon the plateau above the city and may be reached by road or by six miles of electric railway.

La Paz is the site of the university of San Andres. The American institute, begun there in 1912 and conducted by a faculty from the Cnited States, is supported in part by the Bolivian government.

(J. L. TR)

LAPEER, a city of southeast-central Michigan, U.S., on the south branch of the Flint river about 55 mi. N. by W. of Detroit; the seat of Lapeer county. (For comparative population figures *see* table in MICHIGAN: *Population.)* Formerly a lumbering community, Lapeer manufactures metal products, aircraft parts and insecticides, and is the centre of a rich grain and dairy cattle area. The city also serves as a resort centre for more than 100 nearby lakes. Founded in 1831, Lapeer was incorporated as a village in 1857 and as a city in 1869. In 1919 the city adopted a council-manager form of government. The name Lapeer comes from the French *la pierre* ("the stone") and probably refers to the large number of flints found in the area. The courthouse, built in 1837, was still in use in the second half of the 20th century.

LA PÉROUSE, JEAN FRANÇOIS DE GALAUP, COMTE DE (1741–*c.* 1788), French navigator who explored the Pacific ocean, was born near Albi on Aug. 22, 1741. During the war with England (1778–83) he served on the eastern coasts of Canada and in Hudson bay. On Aug. 1, 1785, he sailed from Brest in command of a French government expedition of two ships, "La Boussole" under La Pérouse himself, and "L'Astrolabe" under Paul Fleuriot de Langle, designed to complete the work of Captain James Cook in exploring the Pacific. In addition to investigations in the southern ocean and the tropical South Pacific he was to explore the coasts of North America and Asia with a view to discovering the Northwest passage from the Pacific end. The ships sailed round Cape Horn, visited the Sandnich Islands and reached Mt. St. Elias, Alaska. June 23. 1786. La Pérouse then explored southnard to Monterey in California, crossed the Pacific north of the Sandwich Islands, and reached Macao on Jan. 3, 1787.

From Manila, on April 9, 1787, he began the exploration of the coast of Asia, sailing through the Sea of Japan to the Gulf of Tatary. which separates Sakhalin from the mainland of Manchuria. He explored the strait almost to its end, and on Aug. 2 discovered the strait between Hokkaido and Sakhalin. At Petropavlovsk in Kamchatka he sent Jean, baron de Lesseps, home overland nith the dispatches. The ships sailed south to L. A de Bougainville's Navigators' Islands (the Samoan group) where, at Manua, De Langle and ten men from the "Astrolabe" were murdered.

From Samoa La Pérouse proceeded by may of Tonga and Norfolk Island to Port Jackson (Jan. 26, 1788). A letter written from Australia on Feb. 7 was the last heard of him until in 1826–27 Capt. Peter Dillon found evidence of the shipwreck of the "Boussole" and "Astrolabe" on the reefs of Vanikoro in the Santa Cruz group.

See L. M. A. D. Milet-Mureau, *Voyage de la Pérouse autour du monde,* 4 vol. (1797); Peter Dillon, *Narrative . . . of a voyage in the South Seas . . . to ascertain the actual jate of La Pérouse's expedition* (1829). (H. M. Ws.)

LAPIDARY AND GEM CUTTING. The earliest examples of gem cutting and carving known *(see* also GEM) are the ancient engraved seals! which are of two principal types, the cylindrical or "rolling" seals of Babylonia and Assyria, suggested by a joint of the bamboo or the central whorl of a conchlike shell, and the peculiar scarabaeoid seals of Egypt. *(See* also SEALS.) Recent researches make it appear that both these types were in use by 4800 B.C. or earlier, though with some variations. The jewels of Queen Zer, and other jewels consisting of cut turquoise, lapis lazuli and amethyst, found by the French mission, date from 4777 B.C. to 451j B.C. Until about 2500 B.C. the cylinder seals bore almost wholly animal designs; then cuneiform inscriptions were added. In the 6th century B.C., the scarabaeoid type was introduced from Egypt, while the rolling seals began to give place to a new form, that of a tall cone. These, in a century or two, were gradually shortened; the hole by which they were suspended was enlarged until it could admit the finger, and in time they passed into the familiar form of seal rings.

500 B.C. to Renaissance.— The date of about 500 B.C. marks

the beginning of a period of great artistic taste and skill in gem engraving, which extended throughout the ancient civilized world, and lasted until the 3rd or 4th century A.D. Prior to this period, all the work appears to have been done by hand with a sapphire point. or with a bow drill. fed with sapphire dust; then the wheel was largely employed. The Greek cutters, in their best period. the 5th and 6th centuries B.C., knew the use of disks and drills, but preferred the sapphire point for their finest work, and continued to use it for 200 or 300 years.

Engraving by the bow drill was introduced in Assyrian and Babylonian work as early as perhaps 3000 **B.C.,** the earlier carving being all done with the sapphire point, which was secured in a handle for convenient application. This handwork demanded the utmost skill and delicacy of touch in the artist. The bow drill consisted of a similar point fastened in the end of a stick, which could be rotated by means of a horizontal crossbar attached at each end to a string wound around the stick; as the crossbar was moved up and down. the stick was made to rotate alternately in opposite directions. This has been a frequent device for such purposes among many peoples, both ancient and modern, civilized and uncivilized. The point used by hand, and the bow drill were afterward variously combined in executing such work. Another modification was the substitution for the point, in either process, of a hollow tube or drill, probably in most cases the joint of a hollow reed, whereby very accurate circles could be made, as also crescent figures and the like. This process, used with fine hard sand, has also been widely employed among many peoples.

The Egyptian scarabs were an early and very characteristic type of seal cutting. The Greek gem cutters modified them by adding Greek and Etruscan symbols and talismanic signs; many of them also worked in Egypt and for Egyptians. Phoenician uork shows a mixture of Assyrian and Egyptian designs; and Cypriote seals, principally on the agate gems, that are referred to the 9th century B.C. are known.

In the later Roman period. the 3rd and 4th centuries, a great decline in the art is seen—so great that Castellani terms it "the idiotic age" Numbers of gems of this kind have been found together, as though they were the product of a single manufacturer, carved in the crudest manner, both in design and execution. The decline of the art went on until in the Byzantine period, especially the 6th century, it had reached a very low point. Most of the gems of this period show drill work of poor quality, although handwork is occasionally seen.

The Renaissance.—With the Renaissance, the art of gem carving revived, and the engravers from that time produced results that equal the best Greek and Roman work; copies of ancient gem carvings made by some of the 18th-century masters are distinguishable from true antiques only by experts of great proficiency.

Until the 14th century almost all the gems were cut en cabochon —that is, smoothly rounded, as carbuncles and agates still are— or else in the form of beads drilled from both sides for suspension or attachment, the two perforations often meeting but imperfectly. These latter may be of Asiatic origin, brought into Europe by commerce during the crusades. Some of the finest gems in the Austrian. Russian and German crowns are stones of this perforated or bead type.

An approach, or transition, to the modern facetting is seen in a style of cutting often used for rock crystal in the 10th and 11th centuries: an oval cabochon was polished flat, and the sides of the dome were also trimmed flat, with a rounded back, and the upper side with a ridge in the centre, tapering off to the girdle of the stone below.

The plane-facetted cutting is altogether modem; and hence the pictures which represent the breastplate of the ancient Jewish high priest as set with facetted stones are wholly imaginary and probably incorrect, since we have no exact knowledge of the forms of the gems. The orientals polish gems in all sorts of irregular, rounded shapes, according to the form of the piece as found, and with the one object of preserving as much of its original size and colour as possible. The greatest ingenuity is used to make a speck of colour, as in a sapphire, tone up an entire gem, by cutting it so that there is a point of high colour at the lower side of the gem.

In later times a few facets are sometimes cut upon a generally rounded stone. The cabochon method is still used for opaque, translucent and some transparent stones, as opal, carbuncle, etc.; for most transparent gems the facetted cutting is almost always employed, on account of its fine effect in producing brilliancy, by reflection or refraction of light from the under side of the gem. Occasionally the ancients used natural crystals with polished faces, or perhaps at times polished these to some extent artificially.

MODERN METHODS

Numerous facets, geometrically disposed to bring out the beauty of light and colour to the best advantage, are now cut. This is done at the sacrifice of material, often to the extent of half the stone or even more—the opposite of the oriental idea. There are various forms of such cutting, but four are specially used: the brilliant, the rose, the baguette and the table-cut. The last, generally made from cleavage pieces, usually square or oblong, with a single facet or edge on each side, and occasionally four or more facets on the lower side of the stone, is used chiefly for emeralds, rubies and sapphires; the two former for diamonds in particular. The brilliant is essentially a low, double cone, its top truncated to form a large flat eight-sided face called the table, and its basal apex also truncated by a very small face known as the culet. The upper and lower slopes are cut into a series of triangular facets. 32 above the girdle, in four rows of eight, and 24 below, in three rows, making j6 facets in all. The rose form is used for diamonds not thick enough to cut as brilliants; it is flat below and has 12 to 24, or sometimes 32, triangular facets above, in three rows, meeting in a point. Stones thus cut are also known as "roses couronnees"; others with fewer facets, 12 or even 6, are called "roses d'Anvers," and are a specialty at Antwerp. Baguettes are flat stones with four, eight, or more facets and a simple top.

Modern gem cutting and engraving are done by means of the lathe, which can be made to revolve with extreme rapidity, carrying a point or small disk of soft iron, with diamond-dust and oil. The disks vary in diameter from that of a pinhead to a quarter of an inch. Better than the lathe, also, is the dental engine. The flexibility and sensitiveness of this machine enable it to respond to the touch of the artist and to impart a personal quality to his work not possible with the mechanical action of the lathe, and more like the handwork with the sapphire point.

DIAMOND CUTTING

On account of its extreme hardness, the treatment of the diamond in preparation for use in jewelry constitutes a separate and special branch of the lapidary's art. Any valuable gem must first be trimmed, cleaved or sawed into suitable shape and size, then cut into the desired form, and finally polished upon the faces which have been cut.

The stages in diamond working are, therefore, (1) cleavage or division; (2) cutting; (3) polishing; but in point of fact there are four processes, as the setting of the stone for cutting is a somewhat distinct branch, and the workers are classed in four groups—cleavers, setters, cutters and polishers.

1. Cleaving or **Dividing.**—Diamonds are always found as crystals. usually octahedral in form, though often irregular or distorted. The problem involved in each case is twofold: (1) to obtain the largest perfect stone possible; and (2) to remove any portions containing flaws or defects. These ends are generally met by cleaving the crystal; *i.e.,* causing it to split along certain natural planes of structural weakness, which are parallel with the faces of the octahedron. The stone is first examined closely, to determine the directions of the cleavage planes, which are recognizable only by an expert. The cleaver then cuts a narrow notch at the place selected, with another diamond having a sharp point; a rather dull iron or steel edge is then laid on this line, and a smart blow struck upon it. If all has been skillfully done, the diamond divides at once in the direction desired.

When the stone is large and valuable, the cleaving is a most

critical process. Wollaston in 1790 made many favourable transactions by buying poor-looking flawed stones and cleaving off the good parts. In the case of the immense Excelsior diamond of 971 carats, which was divided at Amsterdam in 1904, and made into ten splendid stones. the most elaborate study extending over two months was given to the work beforehand, and many models were made of the irregular stone and divided in different ways to determine those most advantageous. This process was in 1908 applied to the most remarkable piece of work of the kind ever undertaken—the cutting of the gigantic Cullinan diamond of 3,106 carats. The stone was taken to Amsterdam to be treated by the old-fashioned hand method, with innumerable precautions of every kind at every step, and the cutting was successfully accomplished after nine months' work.

See DIAMOND.

This process of cleavage is the old-fashioned one, still used to a large extent, especially at Amsterdam. But a different method has recently been introduced, that of sawing, which is now generally employed in Antwerp.

After the cleaving or sawing, however, the diamond is rarely yet in a form for cutting the facets, and requires considerable shaping. This rough "blocking-out" of the final form it is to assume, by removing irregularities and making it symmetrical is called "brutage." Well-shaped and flawless crystals, indeed, may not require to be cleaved, and then the brutage is the first process. Here again, the old hand methods are beginning t~ give place t~ mechanism. In either case two diamonds are taken, each fixed in cement on the end of a handle or support, and are rubbed one against the other until the irregularities are ground away and the general shape desired is attained. The old method was to do this by hand—an extremely tedious and laborious process. The machine method, invented about 1885 and first used by Field and Morse of Boston. Mass., is now used at Antaerp exclusively.

At Amsterdam a hand-process is employed, which lies between the cleavage and the brutage. This consists in cutting or trimming away angles and irregularities all over the stone by means of a sharp-edged or pointed diamond, both being mounted in cement on pear-shaped handles for firm holding.

2. Cutting and **Setting.**—The next process is that of cutting the facets; but an intervening step is the fixing or "setting" of the stone for that purpose. This is done by embedding it in a fusible alloy, melting at 440° F., in a little cup-shaped depression on the end of a handle, the whole being called a dop. Only the portion to be ground off is left exposed; and two such mounted diamonds are then rubbed against each other until a face is produced. This is the work of the cutter; it is laborious, and requires great care and skill. The hands must be protected with leather gloves. The powder produced is carefully saved, as in the former processes, for use in the final polishing. When one face has been produced, the alloy is softened by heating, and the stone reset for grinding another surface; and as this process is necessary for every face cut, it must be repeated many times for each stone. An adjustable dop was devised in which the diamond is held by a system of claws so that all this heating and resetting can, it is claimed, be obviated, and the cutting completed with only two changes.

3. Polishing. — The faces having thus been cut, the last stage is the polishing. This is done upon horizontal iron wheels called "skaifs," made to rotate up to 2,500 r.p.m. The diamond-powder saved in the former operations, and also made by crushing inferior diamonds, here comes into use as the only material for polishing. It is applied with oil, and the stones are fixed in a dop in much the same way as in the cutting process. Again, the utmost skill and watchfulness are necessary, as the angles of the faces must be mathematically exact, in order to yield the best effects by refraction and reflection of light, and their sizes must be accurately regulated to preserve symmetry.

The rapid development of mechanical and electric devices for the several stages of diamond cutting has already greatly influenced the art. (G. F. K.)

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LAPIS LAZULI, a mineral substance valued for decorative purposes in consequence of its deep blue colour. It is opaque and takes a good polish, and since ancient times it has been much used for small ornaments and for inlaying. Its beautiful colour led to its employment, when ground and levigated, as ultramarine (*q.v.*), a valuable pigment now displaced by a chemical product (artificial ultramarine).

Lapis lazuli occurs as compact masses, with finely granular structure, its specific gravity is 2.38 to 2.45, and its hardness about 5.5, so that being comparatively soft it tends, when polished, to lose its lustre rather readily. Chemical analyses show considerable variation in composition, and thin sections under the microscope show blue particles and various minerals embedded in a white matrix. The main constituents are minerals of the sodalite group, principally lazulite, which has chemical formula: $Na_4(NaS_3Al)$-$Al_2(SiO_4)_3$, and is occasionally found as deep-blue crystals of rhombic-dodecahedron form. In addition to the blue cubic minerals in lapis lazuli the following have also been found: diopside, amphibole, feldspars, mica, apatite, sphene, zircon, calcite and pyrite.

Lapis lazuli usually occurs in crystalline limestone, and is a product of contact metamorphism near granite masses. The best known and probably the most important locality is in Badakhshan, Afghanistan. where it occurs in limestone, in the valley of the Kokcha, a tributary to the Oxus south of Firgamu. The mines were visited by Marco Polo in 1271. Another important locality is in the U.S.S.R. near the western end of Lake Baikal. Fine masses of paler blue lapis lazuli occur in the Andes, near Ovalle, Chile. In Europe it is found as a rarity in the peperino of Latium, near Rome, and in the ejected blocks of metamorphosed limestone on Monte Somma, Vesuvius. Much of the material sold as "lapis" is an artificially coloured hornstone or jasper from Germany. This shows colourless specks of clear crystallized quartz; and never the goldlike specks of pyrite, so characteristic of true lapis lazuli, and fancifully compared with stars in the deep blue firmament. (L. J. S.)

LAPITHAE, a mythical race, whose home was said to be in Thessaly in the valley of the Peneus. The genealogies make them a kindred race with the Centaurs, their king, Peirithous, being the son. and the Centaurs the grandchildren (or sons) of Ixion. The best known legends with which they are connected are those of Ixion (*q.v.*) and the battle with the Centaurs (*q.v.*). One Lapith was Caeneus, said to have been originally a girl named Caenis, loved of Poseidon, who changed her into a man and made her invulnerable (Ovid, *Metam.,* xii, 146 ff.).

In the Centaur battle, having been crushed by rocks and trunks of trees, he was changed into a bird; or he disappeared into the depths of the earth unharmed. According to some, the Lapithae are representatives of the giants of fable, or spirits of the storm; more likely they are a semilegendary, semihistorical race, like the Myrmidons and other Thessalian tribes. The Greek sculptors of the school of Pheidias conceived of the battle of the Lapithae and Centaurs as a struggle between mankind and mischievous monsters. and symbolical of the great conflict between the Greeks and Persians.

LAPLACE, PIERRE SIMON, MARQUIS DE (1749–1827), the great French mathematician and astronomer, celebrated for his work on gravitation, was born at Beaumont-en-Auge in Normandy on March 28, 1749. His father owned a small estate. At the age of 16 he went to the University of Caen, where his mathematical genius was soon recognized. In 1767 he went to Paris and was appointed professor at the École Militaire.

Shortly afterward Laplace discovered that any determinant is equal to the sum of all the minors that can be formed from any

selected set of its rows, each minor being multiplied by its algebraic complement. This theorem has been described as the most important in the subject and has been named after him. Laplace next turned his attention to celestial mechanics. In 1773 he took up one of the outstanding problems which until then had resisted all attempts at solution in terms of Newtonian gravitation: the problem of why Jupiter's orbit appeared to be continually shrinking while Saturn's was continually expanding. In a brilliant memoir (published in three parts. Academy of Sciences, 1784–86) Laplace showed that this phenomenon was not a secular inequality, as previously supposed. but has a period of 929 years. The phenomenon arises because the mean motions of the two planets are very nearly commensurable. The main object of this memoir. however, was to establish the permanence of the solar system for all time. The mutual gravitational interactions of the component bodies of the solar system were so many and varied that Newton had come to the conclusion that divine intervention was required from time to time if the system were to be preserved in anything like its present state. Despite increasing knowledge of planetary perturbations, no advance beyond this position was made until Laplace finally succeeded in showing (partly as the result of equally brilliant work by J. L. Lagrange) that, because all the planets revolve around the sun in the same direction, the eccentricities and inclinations of their orbits to each other will always remain small, provided they are small at a particular epoch, as in fact they are at present. Laplace's investigation presupposed that the solar system is isolated in space and is entirely free from diffuse matter. Moreover, it was tacitly assumed that the sun can exist indefinitely in its present physical state.

In 1787 Laplace presented to the Academy of Sciences an important memoir on the secular acceleration of the mean motion (or average angular velocity) of the moon about the earth. L. Euler and Lagrange had failed to solve this problem. After various attempts, Laplace found that, although the mean motion of the moon round the earth depends mainly on the gravitational attraction between them, it is slightly diminished by the pull of the sun on the moon. This solar action depends, however, on the changes in the eccentricity of the earth's orbit due to the perturbations by the other planets. As a result, the moon's mean motion will be accelerated so long as the earth's orbit tends to become more circular. but when the reverse occurs then this motion will be retarded. The inequality is therefore not truly secular but is of a period running into millions of years.

Summarizing the work of three generations of illustrious mathematicians on gravitation, Laplace's monumental *Mécanique céleste* appeared in five volumes between 1799 and 182 j. In 1796 he published *Exposition du système du monde,* a semipopular book which is a model of French prose. His nebular hypothesis appeared in a note in this work. In a celebrated memoir on the gravitational fields of spheroids, published in 1785, he introduced the potential function and the equation named after him, and he completed the technique of spherical harmonic analysis. Laplace is also famous for his *Théorie analytique des probabilités* published in 1812 and his *Essai philosophique* on the same subject published in 1814. The former introduced important new ideas in pure mathematics, in particular the theory of Laplace-transforms.

In 1799 when Napoleon I became first consul he appointed Laplace minister of the interior. but dismissed him after six weeks for bringing "the spirit of infinitesimals into administration" and elevated him to the senate. Later he was made a count of the empire, and after the restoration of the Bourbons he was created a marquis. He died in Paris on March 5, 1827.

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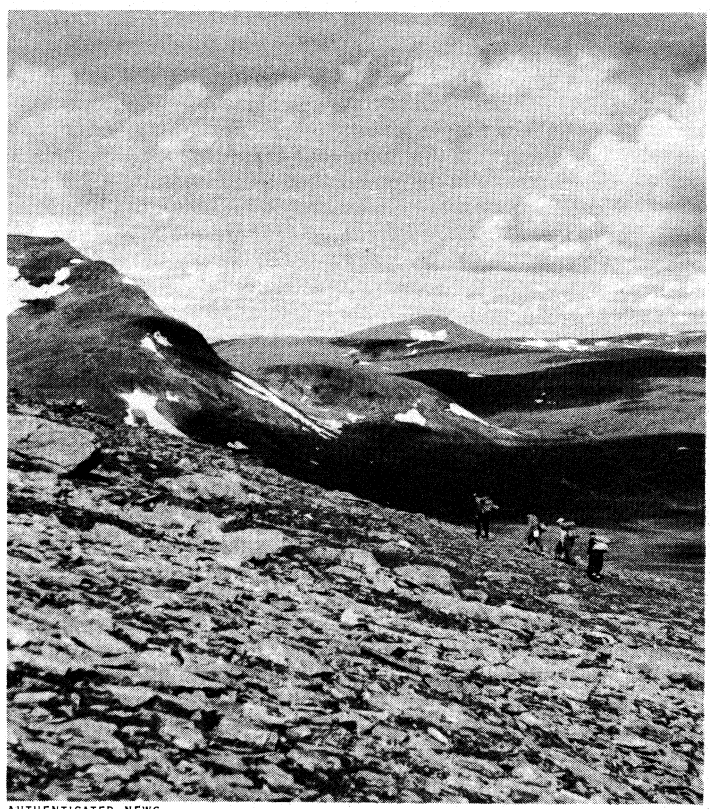
(G. J. Ww.)

LAPLACE'S EQUATION AND INTEGRAL: see SPHERICAL HARMONICS.

LAPLAND, a region of northern Europe inhabited by the Lapps. though not applied to any administrative district. It stretches across the north of Norway, Sweden, Finland and Russia, from the Norwegian coast to the White Sea.

Most of the Scandinavian portion of Lapland presents the usual characteristics of the mountain plateau of that peninsula — on the west side the bold headlands and fiords, deeply-grooved valleys and glaciers of Norway, on the east the mountain lakes and great lake-fed rivers of Sweden. All the eastern part, in Sweden. Finland and Russia, is part of the ancient worn-down Scandinavian land mass of Xrchaean rocks. comparatively low-lying and with innumerable lakes and swamps infested with mosquitoes. In the uplands of Swedish Lapland. and to some extent in Russian Lapland, the lakes afford the principal means of communication.

In Sweden the few farms are on the lake shores, and the traveler must be rowed in summer from one to another. Sailing is rarely practised. and squalls are often dangerous to the rowboats. On a few of the lakes wood-fired steam launches are used in connection with the timber trade. which is considerable. as almost the whole region is forested. Between the lakes all journeying is made on foot. In winter sledge tracks serve as roads. Much of the Kola peninsula is north of the forest belt and is tundra land with the bleak and barren Murman coast. Further west the influence of the warm Atlantic drift is sufficient to keep the ports (Vadso. Vardö. Katarina. etc.) free from ice. The heads of the Swedish valleys are connected with the Norwegian fiords by passes generally traversed only by tracks; though from the head of the Ume a driving road crosses to Mo on Ranen fiord. Each



AUTHENTICATED NEWS

CLIMBERS IN THE HIGHLAND DISTRICT OF NORRA STORFJÄLLEN, TÄRNA, SWEDISH LAPLAND

principal valley has a village at or near the tail of the lake chain, up to which a road runs along the valley. The village consists of wooden cottages with an inn, a church, and frequently a collection of huts without windows. closed in summer. but inhabited by the Lapps when they come down from the mountains to the winter fairs. Sometimes there is another church and small settlement in the upper valley, to which, once or twice in a summer, the Lapps come from great distances to attend service.

More than half of Lapland is within the Arctic circle and the climate is arctic. Temperatures are low all the year round; *e.g.,* at Karasuanda there are only five months with an average above freezing point. The hottest month is August (average 56.2° F.) and the coldest Feb. (5.2°) with temperatures frequently below

zero for long periods. In the northern parts unbroken daylight in summer and darkness in winter last from two to three months each. All preparations for winter are made during September and October, and full winter has set in by November.

Though Lapland gives little scope for husbandry, a bad summer being commonly followed by a winter famine, it has great wealth in its minerals. There are copper mines at the mountain of Sulitelma. and the iron deposits in Norrland of both magnetite and hematite with an average of 65% of iron in the ore. are among the most extensive in the world. Their working is facilitated by the railway from Stockholm to Gellivara, Kirunavara and Narvik on the Norwegian coast, which also connects them with the port of Luled on the Gulf of Bothnia. The supply of timber (pine, fir, spruce and birch) is unlimited. There is an abundance of edible berries; the rivers and lakes abound with trout, perch, pike and other fish, and in the lower waters with salmon; and the cod, herring, halibut and Greenland shark in the northern seas attract numerous Norwegian and Russian fishermen. The Lapps keep great herds of reindeer, the total number in the district being estimated at over 350,000, and their skins, meat and horns form important articles of trade. There are great numbers of birds, including grouse, capercailzie, ptarmigan, etc.. and eider down is collected off the coast.

See V. T. Homén (ed.), *East Carelia and Kola Lapmark* (New York, 1921), *Kihlman Pflanzenbiologische Studien aus Russisch Lappland, Helsingfors* (1890). (X.)

HISTORY

The people known as "Lapps"; *i.e.*, nomads, which is the name the Swedes gave them, call themselves Samelats. They were in occupation of their present territory when first mentioned in history, having come like the Ugro-Finns, and, for the matter of that, the Slavs. as colonizers rather than as conquerors. The first reliable identification of them is in Procopius (*Goth* ii, 15) where the "Skritiphinoi" exhibit certain customs characteristic of the Lapps. Brachycephalic, with high cheek bones, flat noses and chestnut hair. they are racially, linguistically and by their demonology almost as closely allied to the Karelians as these in their turn are to the Finns. By the form of their crania a Mongolian tribe, they have been driven to the furthest north by successive migrations of kindred Ugro-Finns, as of Goths and Slavs, but cherish the memory of the hospitable southern lands traversed in their pristine wanderings.

They incurred the ordinary fate of a primitive people who, driven off the main arteries of civilization. remained isolated huntsmen and fishermen. with the reindeer as the only domestic animal (apart from the dog) capable of withstanding the severity of the climate. This fact precluded town settlements, even in the 20th century, because the reindeer feeds on lichens and mosses and requires an extensive pasturage. Consequently there was little cohesion among this people; they spread over a wide area, and. without knowledge of the use of iron, fell a prey to powerful neighbours: to Norsemen in the 9th century, thereafter to the Karelians, and, in the 11th century, to the princes of Novgorod. In 1326. by a treaty between Norway and Russia, the supremacy of the former was recognized as far east as Voljo, beyond Kandalaksha on the White sea, of the latter as far as Lyngen and Målself. After the disruption of the Kalmar union (1523), Sweden began to assert its rights until. in 1595, by the treaty of Teusina, the Lapps between eastern Bothnia and Varanger became subjects of the king of Sweden. In this capacity occurred their one intervention in the affairs of Europe. when they formed part of the armies of Gustavus Adolphus. By the peace of Knarod (1613) this king gave up the Swedish claim to Finmark; in 1751. mutual renunciations brought the relations of Swedish and Norwegian (Danish) Lapland to their modern position In 1809, Alexander I of Russia obtained the cession of Finland. and added to it the whole of Finnish Lapland to the east of the Muonio and the Kongama.

At the dissolution of the union between Norway and Sweden, in 1905, the migratory rights and pasturage privileges of the Lapps were respected in the desert lands between these two countries. which arrangement was confirmed in Feb. 1917 by a congress held between Norwegian and Finnish Lapps.

Of the many masters which the Lapps have had to bear, the Swedes and Russians left the strongest imprint, forcing upon them their respective creeds; the Russians through St. Tryphon, the Greek Orthodox religion, the Swedes. through Gustavus Adolphus. the Lutheran faith. In their wake came exploiters who farmed the Lapps and even owned them. In such circumstances the philanthropic legislation of a later age could do little to arrest the gradual decline of the population. which was largely absorbed by neighbouring races and assumed Swedish, Norwegian, Finnish and Russian family names.

In Sweden the railway leading to the famous mining town of Gellivare and in Russia the Murman railway making for the ice-free port of Alexandrovsk (completed during World War I) opened up tracts of country hitherto almost inaccessible. In Sweden the Lapps have abandoned their nomadic habits; in the Kola peninsula they still live by fishing and fur trapping.

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LA PLATA, Argentine city and capital of the important province of Buenos Aires, located 3 mi. inland from the southern shore of the Rio de la Plata estuary, and 33 mi. S.E. of the city of Buenos Aires. Pop. (1960) 330,310. Major rail lines and excellent highways link it to the national capital of Buenos Aires.

The site of the city was selected in 1882, two years after the city of Buenos Aires, till then the provincial capital, had been federalized as the national capital. forcing the provincial authorities to look for a new residence. The city plan was modeled on that of Washington, D.C. A municipal library, astronomical observatory and museum were included with government buildings in the original construction of the city. The museum houses one of the most important palaeontological and anthropological collections in South America. The National University of La Plata was founded in 1897 to further the cultural life of the city. Parks, including an imposing plantation of eucalyptus trees, dot the urban area. Systematic location of public buildings and principal avenues combine with adjacent port facilities to make the city one of the most attractive for growth and commerce in Argentina.

Though its proximity to the urban metropolis of Buenos Aires has obstructed independent development, La Plata has achieved a recognized cultural and economic importance within a province dominated by the national capital. The man-made port is capable of receiving the largest vessels navigating the Rio de la Plata estuary. By 1957 the port ranked second in Argentina in tonnage received from overseas, although the total was only one-ninth that of the port of Buenos Aires. In addition to the old port of Ensenada, a large artificial basin 1,450 yd. long by 150 yd. wide has been built. Railroads and highways connect the port facilities with the grain- and cattle-producing areas of the province, and an important meat packing industry has developed. Electrical and chemical as well as industrial assembly plants have been built. The refinery centre of the Argentine oil industry also is located at La Plata, 1,050 mi. by sea from the main fields at Comodoro Rivadavia.

In 1952 the city was officially renamed Eva Perón in memory of the wife of Pres. Juan Perón. After his regime was overthrown in 1955 the city resumed its original name. (Js. R. S.)

LAPOINTE, ERNEST (1876–1941), Canadian lawyer and public official. who was long a leader of French-speaking Canadians, was born on Oct. 6. 1876, in St. Eloi, Que. Educated at Rimouski college and Laval university. Quebec, he was called to the bar in 1898 and appointed king's counsel in 1908.

Lapointe served in parliament from 1904 to 1941, and was made a member of the privy council of the United Kingdom in 1937. Minister of marine and fisheries, 1921–23, he signed a treaty with the United States in 1923 regarding the Pacific fisheries (the first time that a treaty nas signed by a Canadian with full powers from the king).

Lapointe was minister of justice. 1924–30 and again from 1935

to 1941, when he was also attorney general.

He died at Montreal, Que., on Nov. 26, 1941.

LA PORTE, a city of northwestern Indiana, U.S., about 30 mi. S.W. of South Bend, 60 mi. E. of Chicago and 12 mi. S. of Lake Michigan; the seat of La Porte county. Its manufactures include harvesters, corn pickers, hay balers, bread and meat slicers, artificial flowers, moldings, car and truck radiators, sponge rubber products and fine steel castings. The region abounds in rich farm lands and lakes, including two within the city limits. An outstanding park system gives further opportunity for recreation.

La Porte was settled in 1832 and was chartered as a city in 1852. The world's first automatic commercial telephone exchange was installed there in 1892. A collection of firearms is housed in the La Porte County museum. For comparative population figures *see* table in INDIANA: *Population.* (L. G. Sc.)

LAPPA ISLAND: *see* PATERA ISLAND.

LAPPENBERG, JOHANN MARTIN (1794–1863), German archivist and historian, did important work on the Hamburg archives and wrote a history of England up to 1154 which, according to Leopold von Ranke, first turned the attention of German scholars to English history. Lappenberg was born, July 30, 1794, at Hamburg. Intended for his father's profession, medicine, he studied in London and Edinburgh, where he became ambitious to enter English political or diplomatic service. He therefore studied law in Berlin and Göttingen, but was convinced after visiting England again that his ambition must remain unfulfilled. Returning to Hamburg, he was appointed keeper of the archives in 1823. He published copiously, contributing editions to the *Monumenta Germaniae historica* ("Adam of Bremen," "Thietmar of Merseburg," etc.) and the archives of the *Gesellschaft fur ältere deutsche Geschichtskunde;* he also worked with enthusiasm, industry and critical appreciation on the Hamburg archives and Hanseatic history. His *Geschichte von England,* 2 vol. (1834, 1837; Eng. trans., 1845, 1857) proved a useful work of research to historians as late as William Stubbs (1825–1901).

Lappenberg was government secretary to the senate, and in 1850 represented Hamburg in the Frankfurt parliament. He died in Hamburg, Nov. 28, 1865.

See E. H. Meyer, *J. M. Lappenberg* (1867).

LAPRADE, PIERRE MARIN VICTOR RICHARD DE (VICTOR DE LAPRADE) (1812–1883), French poet and critic, was born at Montbrison (Loire). After completing his studies at Lyons, he produced in 1839 a small volume of religious verse, *Les Parfums de Madeleine.* This was followed in 1840 by *La Colère de Jésus,* in 1841 by the religious fantasy of *Psyche'* and in 1844 by *Odes et poèmes.* In 1845 Laprade visited Italy on a mission of literary research and in 1847 he was appointed professor of French literature at Lyons. In 1858 he was elected to the French Academy. In 1861 he lost his post at Lyons because of a political satire in verse *(Les Muses d'État),* and in 1871 took his seat in the national assembly on the benches of the Right. He died on Dec. 13, 1883.

Laprade wrote *Poèmes évangéliques* (1852), *Pernette* (1868), *Le Livre d'un père* (1876), *Varia* and *Livre des adieux* (1878–79) and other volumes of verse, which were collected as *Oeuvres poétiques* in 1878–81 (6 vol.). His *Questions d'art et de morale* (1861) was followed by other works on .aesthetics. As a poet Laprade belonged to the school of Chateaubriand and Lamartine.

See J. Condamin, *La vie et les oeuvres de Victor de Laprade* (1886).

LAPRADELLE, ALBERT GEOUFFRE DE (1871–1955), French international lawyer distinguished for academic as well as for practical achievements, was born at Tulle, Corrèze, on March 30, 1871. He studied at the University of Paris and taught there from 1901 until his retirement in 1939. During this period he also served as legal adviser on Moroccan affairs (1913–19) and later as a general legal adviser (1919–27) to the French ministry of foreign affairs. In this capacity he participated in the nork of the peace conference in 1919 and was *rapporteur* of the committee of jurists which drafted the statute of the Permanent Court of International Justice. Neither these official activities nor his work as a consultant in such cases as that of the Hungarian optants or that of the delimitation of the frontier between Iraq and Iran (1937) prevented Lapradelle from making a substantial and important academic contribution to international law. His writing, principally in the form of articles, ranged over such questions as recognition, the Hague conferences of 1899 and 1907, the enforcement of arbitral awards and nationalization. One of his best-known works is the *Recueil des arbitrages internationaux,* of which he edited the first two volumes together with N. Politis (1922). He also founded and edited the *Revue de droit international* (1927), the *Nouvelle Revue de droit international privé* (1934) and the *Recueil général de de'cisions et conventions inte'ressant le droit international.* Lapradelle died in Paris on Feb. 2, 1955.

See C. Rousseau, *Annuaire de l'Institut de Droit International,* vol. *46,* p. 474 (1958).

LAPSE RATE OF TEMPERATURE refers to the vertical temperature distribution in the atmosphere, or the rate of change of temperature observed in passing upward through the atmosphere. The lapse rate is considered as positive when the temperature decreases upward, zero when the temperature is constant with elevation and negative when the temperature increases with elevation (inversion of temperature). Two particular lapse rates are defined in terms of the dry and of the saturation adiabatic rates of cooling *(see* ADIABATIC PROCESSES IN ATMOSPHERE). The comparison between the prevailing lapse rate in the atmosphere and the dry and saturation adiabatic lapse rates determines the vertical stability of the atmosphere, that is, the tendency of an air particle to return to its original position or to accelerate away from its original position, after being given a slight vertical displacement. For this reason the lapse rate is of prime importance to meteorologists in forecasting certain types of cloud formations, incidence of thundersturms and intensity of turbulence in the atmosphere. *See* also INVERSION OF TEMPERATURE. (H. WR.)

LA PUENTE, a residential city of southern California, U.S., 18 mi. E. of Los Angeles (*q.v.*) on the slopes of the San Jose hills. Its name goes back to the Portolá expedition of 1769 when soldiers put a "bridge over an arroyo." Members of the John Rowland-William Workman party that brought immigrants overland to southern California settled the area in the 1840s. La Puente remained a community of citrus and walnut growers and wheat farmers until 1945. Agriculture gave way to urbanization and La Puente expanded rapidly. It was incorporated in 1956. Adjacent to La Puente and the place of employment of many of its residents is the city of Industry, incorporated in 1957, a manufacturing centre for furniture, oil products, electrical gadgets and household items. For comparative population figures *see* table in CALIFORNIA: *Population.* (J. A. Sz.)

LAPWING, a large plover (*q.v.*) *(Vanellus vanellus)* with plumage largely black, bronzy green and white; a conspicuous crest; and broad, rounded wings about a foot long. Its normal range is the northern part of the old world from Europe to Siberia, with a partial withdrawal in minter as far south as northern Africa, India and Japan; but stragglers have reached North America in some numbers certain years, being noted from eastern Canada to North Carolina. The lapwing's conspicuous appearance and its call of "pee-wit," whence one of its vernacular names, make it a well-known bird.

It frequents open country, fields and farmland but winter weather may force it to mud flats on the coast. Its nest is a hollow on the ground, usually with a lining of grass stems. The eggs, pyriform in shape and buff-coloured to brownish with black spots, are usually four in number. The lapwing's food is mostly insects, worms and other invertebrates but also includes some vegetable matter, such as seeds and algae. Lapwing eggs were formerly the usual plover eggs of commerce before the bird was protected by law. (A. L. RD.)

LAPWORTH, CHARLES (1842–1920), English geologist, was born at Faringdon, Berkshire, on Sept. 30, 1842. He was educated at Culham college.

In 1864 Lapworth began to study Silurian rocks of the southern uplands of Scotland, proving that graptolites could be used as index

fossils to determine the succession of strata. In 1873 he published his first paper on graptolites, for which he established the classification used and elaborated by later workers. In 1879 he proposed the name "Ordovician" for a complex series of strata previously called Lower Silurian and Upper Cambrian by followers of Sir Roderick Murchison and Adam Sedgwick. Lapworth died in Birmingham on March 13, 1920. (C. L. FE.; M. A. F.)

LARA, a state in northwestern Venezuela, the greater part of which is mountainous. Area 7.645 sq.mi. Pop. (1950) 368.169. The Tocuyo river rises in the western part of the state and flows northeast to the Caribbean sea. The state is well served by roads, including a paved section of the Pan-American highway. The capital, Barquisimeto (*q.v.*) has always been a road centre where routes from the mountains, plains and sea converge.

Before the discovery of the area by the Spaniards, it was inhabited by advanced Indian tribes who cultivated cassava, maize and other crops. In modern times sugar cane, tobacco, cacao, maize and vegetables are raised in the warm, irrigated lowlands; potatoes, coffee and wheat, at higher elevations. Livestock is important; domestic animals include cattle, sheep and goats, all introduced by the Spaniards. There is a small amount of mining but the copper mines at Aroa, which mere once owned by Simón Bolivar, have been abandoned. Lara was long a centre of handicrafts — cotton and leather goods, multicoloured blankets. footwear and furniture. Important modern industries include the manufacture of sisal into bags, sacks and cordage. (L. WE.)

LARACHE (EL ARAISH, "The Vine--Arbours"), a port in northern Morocco, on the Atlantic coast, latitude 35° 13′ N., longitude 6° 9′ W., 43 mi. S.W. of Tangier by sea, on the left bank of the estuary of the Lukus (Lucus). The old town, surrounded by ruins, rises in terraces up to forts which dominate it on the north and south. The Spanish quarter has grown toward the port and on the coastal plateau to the southwest as well as on the northwest. Gardens and orchards stretch above the left bank of the Lukus, following the river's wide meanders. The most interesting buildings are the ancient fortress of the Kibibat ("the little domes") and the fort of La Cigogne (late 16th century) built by the Portuguese. The port has a jetty that prolongs the right bank of the river, quays with modern equipment and warehouses and a lighthouse at the end of the jetty. The water at the entrance varies in depth at high water from 10 ft. to about 20 ft., according to the magnitude of the tide.

Cork, beans, birdseed, wool. etc., are exported, and European goods imported. The town is the most important agricultural and fishing centre in northern Morocco. Pop. (1950) 41,917.

A narrow-gauge light railway connects the town with Alcazarquivir (Kasr-el-Kebir), through which passes the main highway from Casablanca to Tangier.

Larache corresponds to the ancient Lixus, of which the ruins are to be seen at Tchemmich, 2 mi. above the port on the right bank of the Lukus. The ancients placed there the garden of the Hesperides, the golden apples of which may have been oranges. It was an important Phoenician settlement and. under the Romans, an imperial colony which reached its zenith in the days of Claudius. Larache was occupied by Spain in 1610, but was later reconquered and restored to Morocco by Mulai Ismail. It was bombarded by the French in 1765 and by the Spaniards in 1860. Spain regained possession in 1912.

LARAMIE, a city of southeastern Wyoming, U.S., on the Laramie river, 50 mi. W. of Cheyenne, the seat of Albany county. Laramie came into existence in May 1868, when the Union Pacific track layers arrived. For a few months that summer several thousand persons made the new city their headquarters, their community a jumble of tents and shanties upon the treeless plain. Then most of the people moved on, leaving only a few to lay solid foundations for a permanent city. Thereafter Laramie's growth was slow but steady (for comparative population figures see table in WYOMING: *Population*). Small industries, such as an iron-rolling mill, a glass factory, a flour mill, a cigar factory, an oil refinery and a railway refrigerator-car icing plant, have come and gone. For many years the search for precious metals in the Medicine Bow mountains 30 mi. to the west provided employment. This wooded range became the centre of Laramie's recreation, offering trout fishing, boating, camping and skiing. Throughout the life of the city the railroad, cattle and sheep ranches and lumbering have furnished employment. In later years tourism and cement, forest products and aggregates plants were important industries.

Laramie attracted international attention in 1870 with the first woman jury in the U.S. In the years 1876–83, the humorist Bill Nye (*q.v.*) lived in Laramie; his Boomerang newspaper columns and books brought fame to the city.

The University of Wyoming, opened in 1887, is important in the city's economic and cultural life.

Laramie city, river, plains and mountains take their name from Jacques La Ramie. a fur trader of the region (d. *c.* 1820). The city of Laramie was chartered by Wyoming in 1873; it has a council-manager form of government, in effect since 1942.

(T. A. LN.)

LARAMIE MOUNTAINS, a range in southeastern Wyoming, U.S., a narrow and relatively low northern extension of the Rocky mountain front range of Colorado. The two are divided by the Cache la Poudre river near the Wyoming boundary. From this point the Laramie range extends north by northwest for 125 mi. into Wyoming. The range rises about 3,000 ft. from the Great Plains on the east, and 1,500 ft. from the floor of the Laramie basin on the west. Laramie peak (10,272 ft.) is the highest point on the range. Iron ore is mined at Sunrise on the eastern slope of the mountains. (H. B. **HA.**)

LARBAUD, VALÉRY (1881–1957), French novelist, critic and translator, born at Vichy, France, on Aug. 29. 1881, early showed a taste for literature, which he developed in the course of extensive travels. He died at Vichy on Feb. 2, 1957.

Larbaud's best-known book is *A. O. Barnabooth:* ses oeuvres *complètes* (1913), in which he presents the impressions and adventures of a young American millionaire: using the enthusiasms and naïvetés of this personage as a vehicle for ironical comment on the world. *Fermina Marquez* (1911) is a light novel on the sentimental life of South A'merican schoolboys in Paris. The short stories in *Amants, heureux amants* (1923) reflect the influence of James Joyce, whom he met in 1919.

Larbaud's major work of translation is his version of Samuel Butler's works, and he also introduced English authors to France through his critical essays in Ce Pice *impuni,* la *lecture,* vol. i, *Domaine anglais* (192 j). *Sous l'invocation* de *Saint Jérôme* (1946) expresses his view of the translator's art.. He published his *Journal inédit,* 2 vol., in 1954–55, his Journal *1912–1935* in 19jj.

See his *Oeuvres complètes,* 10 vol. (19jo–jj); G. J. Aubry, *Valéry* Larbaud (1949).

LARBERT, a town and civil parish of Stirlingshire, Scot., 8½ mi. S.E. of Stirling by road, on the Carron, which divides it from Falkirk. Pop. (1951) 15.788 (civil parish). 3.416 (town). The community includes Stenhousemuir (pop. [19j1] 9.313), Carron (2,409) and Carronshore (1,095). There are iron foundries, sawmills, confectionery works (in Stenhousemuir), ironworks and a caravan factory (at Carron).

The principal buildings are the church, the Bellsdyke Mental hospital and the Royal Scottish National institution for mental defectives. In the churchyard is a monument to James Bruce, the Abyssinian traveler, who was born and died at Kinnaird house, 2½ mi. N.E.

LARCENY, in law, is the unlawful taking and carrying away of things personal with intent to deprive the rightful owner of the same, and is now described by the English statute in force as "stealing."

The term "theft," sometimes used as a synonym of larceny, is in reality a broader term; applying to all cases of depriving another of his property whether by removing or withholding it, and includes larceny, robbery, cheating, embezzlement, breach of trust, etc.

Larceny is, in modern legal systems, universally treated as a crime, but the conception of it as a crime is not one belonging to the earliest stage of law. To its latest period Roman law regarded larceny or theft (*furtum*) as a delict *prima* facie pursued by a civil remedy — the *actio furti* for a penalty, the vindicutio or

condictio for the stolen property itself or its value. In later times, a criminal remedy to meet the graver crimes gradually grew up by the side of the civil, and in the time of Justinian the criminal remedy, where it existed, took precedence of the civil.

Under the common law of England larceny was a felony. It was affected by numerous statutes. A very large number of the old acts are named in the repealing act of 1827. An act of the same date removed the old distinction between grand and petit larceny. The former was theft of goods above the value of 12 pence, in the house of the owner, not from the person, or by night, and was a capital crime. It was petit larceny where the value was 12 pence or under, the punishment being imprisonment or whipping. In 1861 the Larceny Act of that year was passed, but many of its sections have been superseded by the Larceny Act, 1916.

Larceny Act of 1916.—By its first section it defines the offence of stealing (larceny). This definition makes no change in the law, but for the first time it puts into statutory form the various definitions that have been given of the offence, both at common law and in some acts of parliament. It provides:

"(1). A person steals who, without the consent of the owner, fraudulently and without a claim of right made in good faith, takes and carries away anything capable of being stolen with intent, at the time of such taking, permanently to deprive the owner thereof: Provided that a person may be guilty of stealing any such thing notwithstanding that he has lawful possession thereof, if, being a bailee or part owner thereof, he fraudulently converts the same to his own use or the use of any person other than the owner. (2). (i.) The expression 'takes' includes obtaining the possession—(a) by any trick; (b) by intimidation; (c) under a mistake on the part of the owner with knowledge on the part of the taker that possession has been so obtained; (d) by finding, where at the time of the finding the finder believes that the owner can be discovered by taking reasonable steps; (ii.) the expression 'carries away' includes any removal of anything from the place which it occupies, but in the case of a thing attached, only if it has been completely detached; (iii.) the expression 'owner' includes any part owner, or person having possession or control of, or a special property in, anything capable of being stolen. (3). Everything which has value and is the property of any person, and if adhering to the realty then after severance therefrom, shall be capable of being stolen: Provided that—(a) save as hereinafter expressly provided with respect to fixtures, growing things, and ore from mines, anything attached to or forming part of the realty shall not be capable of being stolen by the person who severs the same from the realty, unless after severance he has abandoned possession thereof; and (b) the carcase of a creature wild by nature and not reduced into possession while living shall not be capable of being stolen by the person who has killed such creature, unless after killing it he has abandoned possession of the carcase."

Forms of Larceny.—By the second section, stealing, for which no special punishment is provided under any act, is declared to be simple larceny and a felony punishable with penal servitude for any term not exceeding five years, and the offender, if a male under the age of 16 years, may be once privately whipped. Then follows a catena of sections (3–17) dealing with various forms of larceny and prescribing the punishments. They deal with larceny of horses and cattle; killing animals with intent to steal; larceny, after previous summary conviction, of dogs; larceny of wills; larceny of documents of title to lands and other legal documents; damaging fixtures, trees, etc., with intent to steal; larceny of goods in process of manufacture; abstracting of electricity; larceny of ore from mines; larceny of postal packets, etc.; larceny in dwelling-houses; larceny from the person; larceny from ships, docks, etc.; larceny by tenants or lodgers; larceny by clerks or servants. All, with the exception of larceny of dogs, after previous conviction, which is declared to be a misdemeanour punishable by imprisonment, with or without hard labour, for 18 months, are felonies, and the punishments vary from penal servitude for life in the cases of the larceny of wills or mail bags, to two years' imprisonment in the case of larceny of ore. Gas and water may also be the subject of larceny.

Questions of larceny at common law often arose where the relationship of husband and wife existed, and the matter was first dealt with by statute by the Married Women's Property Act, 1882. Now, by sec. 36 of the Larceny Act, 1916, a wife has the same remedies and redress for the protection and security of her own separate property as if such property belonged to her as a feme sole: Provided that no proceedings may be taken by a wife against her husband while they are living together as to or concerning any property claimed by her, nor while they are living apart as to or concerning any act done by the husband while they were living together concerning property claimed by the wife, unless such property has been wrongfully taken by the husband when leaving or deserting or about to leave or desert his wife. A wife doing an act with respect to any property of her husband which, if done by the husband in respect to property of the wife, would make the husband liable to criminal proceedings by the wife, is in like manner liable to criminal proceedings by her husband. The effect of this section and the proviso was considered by the Court of Criminal Appeal in Rex v. Creamer (26 Cox, C. C. 393).

At common law a joint owner of a chattel could not be guilty of larceny. Partnership property was dealt with by a statute, and now, by sec. 40 (4) of the Larceny Act, 1916.

Scotland.—A vast number of acts of the Scottish parliament dealt with larceny. The general policy of the acts was to make larceny what was not larceny at common law, *e.g.*, stealing fruit, dogs, hawks or deer, and to extend the remedies, *e.g.*, by giving the justiciar authority throughout the kingdom, by making the master in the case of theft by the servant liable to give the latter up to justice, or by allowing the use of fire-arms against thieves. The general result of legislation in England and Scotland has been to assimilate the law of larceny in both kingdoms. As a rule, what would be larceny in one would be larceny in the other.

Stolen Goods.—In English law, various points of importance arise in connection with chattels which have been the subject of larceny and have not been returned to the possession of their owner. The owner of the goods stolen has an action against the thief for the goods or their value. How far he is entitled to pursue his civil right to the exclusion of criminal prosecution does not seem very clear upon the authorities, but see Midland *Insurance Co.* v. *Smith* (1881, L.R. 6, Q.B.D., 568).

Receiving Stolen Property.—Formerly a misdemeanour at common law, this is now governed by the Larceny Act, 1916, which, by section 33, provides that every person who receives any property knowing the same to have been stolen or obtained in any way whatsoever under circumstances which amount to felony or misdemeanour shall be guilty of an offence of the like degree (whether felony or misdemeanour) and on conviction thereof liable—(a) in the case of felony, to penal servitude for any term not exceeding 14 years; (b) in the case of misdemeanour, to penal servitude for any term not exceeding seven years; (c) in either case, if a male under the age of 16 years, to be once privately whipped in addition to any punishment to which he may by law be liable. Receiving a mail bag or postal packet is made an equal felony with stealing. Every receiver may be indicted and convicted, whether the principal offender has or has not been previously convicted, or is or is not amenable to justice, and every person who, without lawful excuse, knowing the same to have been stolen or obtained in any way whatsoever under such circumstances that if the act had been committed in the United Kingdom the person committing it would have been guilty of felony or misdemeanour, receives or has in his possession any property so stolen or obtained outside the United Kingdom, is guilty of an offence of like degree.

Under the same act (sec. 42) a justice may issue a search warrant, and by sec. 43, whenever any person is being proceeded against for receiving any property, knowing it to have been stolen, or for having in his possession stolen property, for the purpose of proving guilty knowledge there may be given in evidence at any stage of the proceedings—(a) the fact that other property stolen within the period of 12 months preceding the

date of the offence charged was found or had been in his possession; (6) on certain conditions, the fact that within the five years preceding the date of the offence charged he was convicted of any offence involving fraud or dishonesty.

Restitution of Stolen Property.—For the general law as to the civil rights and liabilities of the owner and third parties in respect of stolen goods, see SALE OF GOODS, but the matter is dealt with by two acts of parliament which affect the criminal courts. Originally the law as to the restitution of stolen property was governed by sec. 100 of the Larceny Act, 1861, a section that was fully considered by the House of Lords in *Bentley* v. *Vilmont* (1887, 12 Ap. Cas. 471). That section has been replaced by sec. 45 of the Larceny Act, 1916, which provides that "If any person guilty of any such felony or misdemeanour as is mentioned in this act, in stealing, taking, obtaining, extorting, embezzling, converting, or disposing of, or in knowingly receiving, any property, is prosecuted to conviction by or on behalf of the owner of such property, the property shall be restored to the owner or his representative."

Compounding Theft.—As to compounding offences and corruptly taking rewards, compounding theft, or *theftbote* (*redemptio furti*), that is, taking back stolen goods or receiving compensation on condition of not prosecuting, is a misdemeanour at common law. It need not necessarily be committed by the owner of the goods. Under sec. 34 of the Larceny Act, 1916, it is a felony punishable by seven years' penal servitude to take money or reward corruptly for helping to recover stolen goods without using all due diligence to bring the offender to trial. By sec. 102 of the Larceny Act, 1961, to advertise or print or publish any advertisement offering a reward for the return of stolen goods, and using any words purporting that no questions will be asked, etc , renders the offender liable to a penalty of £50. This penalty must, by the Larceny (Advertisements) Act, 1870, be sued for within six months, and the assent of the attorney-general is necessary. Various acts provide for the liabilities of pawnbrokers, publicans, marine-store dealers and others into whose possession stolen goods come. (See also EMBEZZLEMENT; FALSE PRETENCES.) (W. DE B H.)

UNITED STATES

As the common law of the United States had its source in English precedents, the fundamental principles as to larceny are similar. They have, however, been altered and extended by statute and decision in every State to a widely varying degree. The common law requirement of asportation, for example, has been abolished by statute in Texas, while the courts in other States disagree as to what amounts to asportation. Legislation has dealt also with the requirement that the property be taken from the "possession" of another, but the principle is still difficult of application in some circumstances and the problem has not been consistently or even generally obviated. Various dealings with property which are not larceny, nor even criminal, at common law—such, e. g., as embezzlement, theft of growing fruit, unauthorized taking of an automobile without intent permanently to deprive the owner thereof—have been made criminal by statute to some extent in every State and have frequently been either denominated larceny or made chargeable as larceny. A distinction between grand and petit larceny is still commonly recognized in legislation as affecting the amount or character of punishment, the jurisdiction of courts, powers of arrest, or other matters, but the diacritical value varies both in the different States and in some States according to the different objectives. Thus in New York the crime is divided into grand larceny in the first degree, punishable by a maximum of 10 years' imprisonment; grand larceny in the second degree, 5 years; petit larceny, 1 year. The division points are in general $500 and $50, but theft of property of less than $50 may be grand larceny in the first degree under some circumstances. In Michigan there are no degrees of larceny and the terms "grand" and "petit" are ignored in the statutes. but the circumstances or a value of over $2j determine the punishment. American statutes making the possession of certain things unlawful—notably the National Prohibition Act declaring that no property right shall exist in unlawfully possessed liquor—give greater importance in that country than in England to the question of whether one can be convicted of larceny for the theft of chattels which are incapable of lawful possession. By strictly legalistic reasoning one inferior court came to the decision that larceny of such things is impossible, but the great weight of authority holds the taker guilty of larceny. Because there is no common law of the United States as a nation, larceny as a crime against the Federal Government is wholly statutory. Congressional legislation has been confined to particular situations such as the theft of goods in interstate commerce, or in the possession of certain officials, etc. (J. B. WA.)

LARCH, an ancient Latin name for trees of the genus *Larix* in the pine family (Pinaceae). The genus contains 10 or 12 species native to the cool-temperate and subarctic parts of the northern hemisphere. with one species (L. *griffithii*) confined to the Himalayas. Larches are deciduous and have the leaves arranged spirally and solitary on new growth, in whorls at the tips of dwarf spurs on older twigs, with 10 to 30 soft, light green needles on each spur. The related golden larch (Pseudolarix *amabilis*) is distinguishable by cones that disintegrate at maturity, whereas those of *Larix* often remain on the trees several years, then fall intact.

The wood of larch is coarse-grained, strong, hard and heavy (second densest coniferous wood), with yellowish sapwood, orange to reddish-brown heartwood and numerous small, scattered resin ducts. It is valued in the building of ships and barges, and because it is resistant to the deleterious effects of soil it is used for telephone poles, mine timbers, railroad ties and general building purposes. The trees grow on a variety of soils. from sandy loam to boggy muskeg, and from flat plains to mountainsides.

Four species of larch occur in North America, the most widely ranging one, tamarack or eastern larch (L. *laricina*). extending from Labrador to northern Pennsylvania and thence northwesterly to Yukon Territory and Alaska, where it reaches 67° N. Eastern larch has cones under one inch long. with the bracts hidden by the scales. The seeds average 318,000 per pound; the bark is gray to reddish-brown. The trunks are 12 to 36 in. in diameter and the trees are 40 to 100 ft. tall. At the southern edge of its range it is restricted to swamps and sphagnum bogs, farther north it grows better on well-drained uplands and along lakes. It is the dominant tree under forest conditions and grows in pure stands or mixed with paper birch, jack pine, aspen and black spruce. Its growth is rapid for 25 to 50 years, then slower, and trees mature in 100 to 200 years.

The western larch (L. occidentalis) is confined to the valleys and mountain slopes between 2.000 and 7,000 ft. in the "inland empire" of the Pacific northwest. Its bracts are exserted beyond the cone scales, the seeds run 143,000 per pound and the trees attain diameters of 3 to 4 ft., heights of 140 to 180 ft., or, rarely. to 8 ft. in diameter and 210 ft. tall. Seedlings may grow a foot a year for the first 4 to 10 years; thereafter the growth is slower, maturity being reached in 300 to 400 years, and trees 700 years old are known. It is an important timber tree: the lumber being used much in the same manner as Douglas fir, as well as for poles, posts and piling.

Both the subalpine larch (L. lyallii), native in the Cascade. Bitterroot and northern Rocky mountains, and the Alaska larch (L. alaskensis), extending along the coast from Cook inlet to the Yukon, are smaller trees of little economic importance.

The European larch (L. decidua, syn. L. europaea), native from the mountains of north and central Europe to Siberia, approaches the western larch in size: trees often being 3 to 5 ft. in diameter and 80 to 140 ft. tall. Mature trees have gradually tapering trunks with horizontal branches spaced irregularly and becoming somewhat drooping but ascending again at the tips. The bark is reddish-gray, smooth in young trees, rough and scarred in age. The European larch occurs in most of the hilly areas in central Europe, reaching an elevation of about 5,000 ft. in the Alps. It grows rapidly and may be cut for poles and small timber at 40 to 60 years of age. The mood of large trees is fine textured. reddish to yellow-brown, tough and resistant to splitting and highly prized

for making clinker-built boats. It is excellent for post and piling, and much of the city of Venice is reputed to be standing on piling of larch. Log houses constructed of larch gradually turn rich brown as a result of the exudation and hardening of resin under the heat of the sun.

European larch produces a fine, clear, abundant oleoresin. This pitch is collected and sold as "Venice" or "Venetian" turpentine. It is a thick, viscous fluid, deep yellow, nearly transparent, and contains about 15% essential oil of turpentine and some resin. It hardens slowly unless subjected to heat. Similar but slightly inferior pitch occurs in the wood and bark of other larches.

European larch is used in reforestation work in England and in the Cnited States, where it reproduces spontaneously in at least one locality. Several species are utilized as ornamentals, L. *decidua* var. *pendula* and the Japanese larch, L. *leptolepis,* being favourites in Britain and the United States.

Several fungus and insect pests attack and severely damage larch, the larch sawfly (*Lygaeonematus erichsonii)* being particularly destructive. Larch canker fungus (*Dasycypha calycina*) and honey fungus (*Armillaria mellea*) both take heavy toll, especially if the trees are too crowded. Control is difficult.

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LARCIUS (less accurately LARTIUS), **TITUS,** probably surnamed FLAVUS, a member of an Etruscan family *(cf.* Lars Porsena) early settled in Rome. When consul in 501 B.C., he was chosen dictator (the title and office being then introduced for the first time) to command against the 30 Latin cities which had sworn to reinstate Tarquin in Rome.

Other authorities put the appointment three years later, when the plebeians refused to serve against the Latins until they had been released from their debts. He opposed harsh measures against the Latins and also interested himself in the improvement of the lot of the plebeians. His brother Spurius is associated with Horatius Cocles in the defense of the Sublician bridge against the Etruscans.

LARD, the rendered, or melted, fats of the hog. Types are differentiated according to the rendering method. Prime steam lard is made by injecting steam under pressure into a closed vessel containing hog fats. Kettle-rendered (open system) and dry-rendered (enclosed system) lards are made by melting hog fats in steam-jacketed vessels. The resulting residue is called cracklings. Neutral lard is prepared by melting leaf fat. that which comes from around the kidneys, and back fat at about 120° F. Continuous rendering involves grinding, rapid heating, and separation of fat from the cells by centrifugation. Lard is creamy white with a wide plastic range (butterlike consistency); its specific gravity is about 0.93, its solidifying point about 27–30° C. and its melting point 33–46' C. The predominant fatty acids are oleic. palmitic and stearic. with substantial amounts of the essential fatty acids, linoleic and arachidonic. The composition varies with the diet of the hogs from which it is obtained. Lard has the highest shortening value of any plastic fat and digestibility equivalent to that of other cooking fats. It is a highly valued cooking and baking fat and is blended. frequently after modification by molecular rearrangement or hydrogenation, with other fats and oils to make large quantities of shortening. Lard and shortenings made from lard are usually protected from rancidity by antioxidants.

Lard oil is the clear colourless oil pressed from pure lard after it has been grained (crystallized) at 45° F. It is used in cutting oils, and as a nutrient for cultures in antibiotic production. The solid residue, lard stearin, is used in shortenings and as a source of saturated fatty acids. (L. R. DN.)

LARDNER, RING (RINGGOLD WILMER LARDNER) (1885–1933), U.S. author and humorist, most noted for his racy use of vernacular and the language of illiteracy. was born at Niles, Mich., March 6. 1885. He received his education at the Niles high school and the Armour Institute of Technology, Chicago. He mas a reporter on the *South Bend* (Ind.) *Times,* 1905–07, after which he spent four years in Chicago, contributing to the sports columns of various newspapers there. He was editor of the *Sporting News,* St. Louis, Mo.. 1910–11, and sports writer for the *Chicago Tribune,* 1913–19, and later was connected with the Bell syndicate. He wrote a number of books, among which are *Bib Ballads* (1915), *You Know Me, Al* (1916), *Gullible's Travels* (1917), *Treat 'em Rough* (1918), *The Real Dope* (1919), *How to Write Short Stories* (1924) and *The Love Nest* (1926).

See Donald Elder, *Ring Lardner* (1956).

LAREDO, a city of southern Texas, U.S., on the Rio Grande opposite the Mexican city of Nuevo Laredo; a port of entry and the seat of Webb county. Pop. (1960), city 60,678, of which about 85% was of Mexican or Spanish descent; standard metropolitan statistical area (Webb county) 64,791. (For comparative population figures for the city *see* table in TEXAS: *Population.*) Laredo was established in 1755 and was named for the town of Laredo in Santander, Spain. For more than 200 years it witnessed much of the violence of the southwest: Indian wars, border bandits and the influx of immigrants on their way to the California gold fields. The official. municipal, church and social affairs of Laredo from 1755 to 1846 are recorded in the Laredo archives, which were discovered in 1934 and made available largely through the efforts of Seb S. Wilcox, a local historian.

Laredo, with its adobe houses, church buildings, mission bells and plazas, has retained much of the feeling and colour of the frontier, and the influence and language of old Spain and Mexico are everywhere apparent.

It also has modern hospitals, hotels and schools, including a junior college established in 1947. The city has a considei-able export-import trade and is the commercial centre of an area of rich, irrigated farming lands and ranches; gas and oil discoveries have also given it industries. Since 1898 a popular international event, the Washington's Birthday celebration, has attracted thousands of visitors from both sides of the Rio Grande; during the first week in March Laredo sponsors the Border Olympics.

(O. Mo.)

LAREN, a town of the Netherlands, 20 mi. S.E. of Amsterdam, in the province of North Holland. It is a quaint old village, with a large colony of painters.

On June 24 the only procession in Holland takes place to St. Johns' cemetery (St. Jans-Processie).

LARES, older form *Lases,* Roman tutelary deities (etymology unknown, possibly connected with *lascivus).* They were originally gods of the cultivated fields, worshiped by each household at the *compitum* or crossroads where its allotment joined those of others. Later, they were worshiped in the houses, and the household Lar (*familiaris*) was conceived of as the centre point of the family and of the family cult. The word itself (in the singular) came to be used in the general sense of "home." It is certain that originally each household had only one Lar; the plural was at first used only to include other classes of Lares. and only gradually, after the time of Cicero, ousted the singular. The image of the Lar stood in its special shrine (*lararium*) or niche, originally in the atrium. It was usually a youthful figure, dressed in a short. high-girt tunic. holding in one hand a drinking horn, in the other a cup. Under the empire usually two of these were to be found; one on each side of the central figure of the Genius, Vesta, or some other deity. The whole group was called indifferently Lares or Penates. A prayer was said to the Lar every morning, and offerings were made at family festivals. On these occasions the Lares were crowned with garlands, and offerings of wine and incense. cakes and honey and swine were laid before them. Their worship persisted throughout the pagan period. The public Lares belonged to the state religion. .Among these must be included, especially after the time of Augustus, the *Lares compitales.* Generally two in number, they were the presiding deities of the crossroads (*compita*), where they had their special chapels. Their sphere of influence included not only the crossroads, but the whole neighbouring district of the town and country in which they mere situated. They had a special annual festival, called Compitalia, to which public games were added some time during the republican period. The colleges of freedmen and slaves. who assisted the presidents of the festival, were abolished by Julius

Caesar, but revived by Augustus, who added to these Lares his own Genius (*q.v.*).

The state itself had its own Lares, called *praestites,* the protecting patrons and guardians of the city. They had a temple and altar on the Via Sacra, near the Palatine, and were represented on coins as men wearing the chlamys, carrying lances, seated. with a dog, the emblem of watchfulness, at their feet. Mention may also be made of the *Lares grundules,* whose functions are unknown; the *viales,* who protected travelers; and the *permarini,* connected with the sea. *See* also PENATES.

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LA RÉVELLIÈRE-LÉPEAUX, LOUIS MARIE DE (1753–1824), French politician, member of the Directory, was born at hlontaign. Vendée, on Xug. 24. 1753. A deputy to the states-general in 1789, he returned at the close of the session to Angers. where he sat on the council of Maine-et-Loire, and had to deal with the first Vendéen outbreaks. In 1792 he was returned to the Convention. and on Nov. 19 he proposed the famous decree by which France offered protection to foreign nations in their struggle for liberty. Proscribed with the Girondins in 1793 he mas in hiding until the revolution of 9–10 Therniidor (July 27 and 28, 1794).

After serving on the commission to prepare the new constitution, La Révellière became successively president of the assembly. a member of the committee of public safety and president of the Directory. He was in alliance with Jean François Rewbell but the greatest of his fellow directors. Lazare Carnot, was the object of his undying hatred. He was bitterly hostile to the Christian religion, which he proposed to supplant by theophilanthropy, a religion invented by the English deist David Williams. He was compelled to resign by the revolution of 30 Prairial (June 18. 1799) and lived in retirement until his death on March 27, 1824. La Révellière's *Mémoires,* in which he took credit for the coup d'état of 18 Fructidor (Sept. 4, 1797), must be read with caution.

The *Mémoires* were edited by R. D. D'Angers, 3 vol. (1895). See also E. Charavay, La *Révellière-Lépeaux et ses mémoires* (1895); *A.* Meynier, *Un Représentant de la bourgeoisie angevine* (1905).

LARGILLIÈRE (LARGILIERRE), **NICOLAS DE** (1656–1746). French portrait and historical painter. was born in Paris, Oct. 10, 1656. At the age of three. his father took him to Antwerp where he received his training, a fact which mas to prove extremely significant. Largillikre lived during the artistic quarrel between those who took as their standard of excellence the adherence to classical models and emphasis on drawing as exemplified by Nicolas Poussin, and those who broke away in favour of the style of Rubens and an emphasis on colour. By his admiration for the Flemish masters, Largillière revealed himself as a modern and came to be looked upon as a pioneer by 18th-century artists who followed the same course.

In 1674 he went to London, where he mas an assistant to Sir Peter Lely, whose influence is clearly seen in Largillière's portrait of Jane Myddelton. Anti-Catholic feeling forced him to return to Paris. where he rapidly became established as a portrait painter. In this field Largillikre is usually considered a traditional artist: his approach to portraiture retains the formality and the allegorical conceits of the 17th century, yet his colour, which as a true admirer of the Flemish school he considered to be of the first importance, appears exceptionally vivid and sumptuous.

He painted a few still lifes and religious pictures, but excelled in official likenesses, a notable example being the *ex-voto* offered to Ste. Geneviève (St. Étienne du Mont, Paris) which contains portraits of all the leading officers of the municipality of I'aris. Among his many other portraits are those of James II and his queen, the duc de la Rouchefoucauld, and Jean Jacques Rousseau. Largillikre was highly honoured and became chancellor of the Academy in 1743. He died in Paris on March 20, 1746.

(AA. B.; X.)

LARGO (It. "broad"). musical term signifying that the style of performance is to be slow. broad and dignified. Also the name for a piece in this style. such as the famous arrangement of Handel's *Ombra mai fu,* from the opera *Serse.*

LARGO CABALLERO, FRANCISCO (1869–1946), Spanish Socialist leader, prominent during the second republic of which he became prime minister soon after the outbreak of the civil war of 1936–39, nas born in Madrid on Oct. 15, 1869. He joined the Socialist party in 1894 and distinguished himself as organizer of the Unión General de Trabajadores (U.G.T.). He was sentenced to life imprisonment for his part in the general strike of Aug. 1917 but was released on election to the *Cortes* in 1918. Minister of labour in the republican government of 1931, he introduced legislation concerning industrial relations. However, in common with other Socialists, he became disillusioned with the republican parties because of their failure to deal with agrarian reform and was personally affronted by their failure to carry out much of his labour legislation. As president of the C.G.T. and secretary of the Socialist party, he was one of the most important supporters of the rising in Oct. 1934. An unsuccessful attempt in 1935 to convict him of complicity in the revolt increased his popularity and he was hailed by the Soviet newspaper *Praada* as "the Lenin of Spain." After Feb. 1936 his intransigent attitude was a major factor in precipitating the military insurrection, while his refusal to allow Socialist collaboration simultaneously weakened the republican government's authority. He became prime minister on Sept. 4, 1936; his government, which included Communists and Anarcho-Syndicalists. fell in May 1937 as a result of internal differences which culminated in the Anarcho-Syndicalist rising in Barcelona (May 3–10. 1937). Largo Caballero went into exile in France in 1939; during World War II he was interned by the Germans in Dachau concentration camp. He died in Paris on March 23, 1946.

LARGS, a small burgh and seaside town on the Firth of Clyde, Ayrshire. Scot., 30 mi. W.S.W. of Glasgow by road. Pop. (1951) 8,605. The island of Great Cumbrae lies opposite. Largs has a long pebble beach and dry climate. The harbour is used mainly by Clyde passenger steamers and yachtsmen. From the quay a broad esplanade. 2 mi. long, runs northward around the bay. Skelmorlie aisle. in the old churchyard, was built as a mausoleum in 1636 by Sir Robert Montgomery of Skelmorlie castle, and elaborately decorated inside. Near it a mound covers remains, possibly those of the Norwegians who tell in the battle of Largs in 1263.

LARIDAE: see GULL; TERN.

LA RIOJA, western Argentine province located immediately north of the province of San Juan and bordering Chile. Area. 35,649 sq.mi. Pop. (1956 est.) 125,066; (1947) 110.746. The eastern half of the province is an arid plain while the western part is traversed north to south by part of the Andean range. The headwaters of the Bermejo river drain this western part and flow south into the province of Mendoza, while several small streams flow north into the province of Catamarca. The climate is extremely hot and dry.

Like the rest of northwest Argentina, the province was settled at the end of the 16th century by Spaniards. The capital. La Rioja. pop. (1956 est.) 26,878, located at the foot of the Sierra de Velasco, was founded in 1591 by the governor of Tucumán. Its destruction by earthquake in 1894 led to its reconstruction along modern lines. The area was of little importance during the colonial period. The province separated itself from the control of Córdoba in 1816 but there followed 50 years of civil war and unrest, furthered by the poverty and nomadic life of its inhabitants. The establishment of an effective national government in Buenos Aires in the 1860s contributed to stability in the province.

Water supply and irrigation are the major problems of La Rioja. The small streams do not provide adeyuate volume. and both agriculture and mining have been seriously restricted by the lack of water Dams erected on the Anzulón and Rioja rivers. the latter near the capital, provide irrigation and electric power for the immediate area. Only in the valleys of the Andean range is small

scale irrigated cultivation possible: some wheat, grapes, oranges. olives, tobacco and alfalfa are grown. Mining is the major industry, the deposits including gold, silver, copper, nickel, tin, cobalt, coal, alum and salt. The copper mines of Famatina at 16,400 ft. elevation are the best known. Cable cars and aerial wire transport the ore to the province's second largest town, Chilecito, pop (1956 est.) 6.911, in the valley. Highways and railroads link the two major towns of the province with Tucumán and Córdoba. (Js R. S)

LARISSA (anc. LÁRISA), the chief town of the department of Larissa in Thessaly, Greece, on the Salambria river (anc. Peneios), 35 mi. N W. of Volo, with which port, and with Athens and Salonika, it is connected by rail. Pop. (1961) 55,733. When Thessaly was dominated by a few powerful clans, Larissa was the seat of the Aleuadae who until 369 B.C. furnished the commander in chief *(tagos)* of the Thessalian levies. Their rivals, the Scopadae, held Crannon ("Old Larissa") about 14 mi. S.W. The instability of Larissa as a city-state was proverbial; in the 5th century, and under Philip V of Macedon, it was short of citizens. It supported Athens in the Peloponnesian War, and its strategic position gave it importance to. Macedonians, Romans and, later, to the Turks. From the 15th century it has been the seat of an archbishop, who has 1 j suffragans.

Until 1881. when Thessaly was annexed to the Greek kingdom, it was the seat of a pasha in the vilayet of Jannina, and a military centre During the Greek War of Independence it was headquarters of Ali Pasha Until 1920 most of the inhabitants were still Turks, though many left in 1881 and after the Greco-Turkish War of 1897.

Larissa was the site of severe fighting between the Germans and the Greek-British army in World War II.

Larissa was a common place name in Greece and western Asia Minor: probably it meant a "citadel," and was so applied at Argos Another Thessalian Larissa *(cvemaste,* "suspended," or Pelasgia) lay high on the slope of Mt. Othrys.

LARISTAN, an extensive district in the southeast of the *ostan* of Fars in Iran, extending on the south to the shores of the Persian gulf. The name has not now the political significance it had in former times when, for a long period, Laristan was a quasi-independent state. The last khan was deposed and put to death by Shah Xbbas I. The district consists largely of mountains and arid uplands with a narrow belt of coastal plain which in places is snampy and saline. It is very sparsely peopled by Iranians in the interior and Arabs in the maritime plains and is one of the least productive parts of Iran, having a most scanty rainfall which for drinking purposes is collected in cisterns. Sulfur and ironstone are found on the coast and elsenhere, and other minerals are possibly present. but almost certainly not in exploitable quantities. A noted local product is the condiment named *mahiabeh* (fish jelly), a compound of pounded small spratlike fish, salt, mustard, nutmeg, cloves and other spices, used as a relish with nearly all foods. It is someuhat similar to the compound of dried locusts. red pepper and honey uhich is made in Oman and is greatly prized.

Lar, the chief town, in 27° 43′ N.. 54° 24′ E., at an elevation of 3.000 ft.. is situated 180 mi. S.E. of Shiraz, on a caravan track from the coast at Bandar Abbas. Once a flourishing place with a population of 50,000 in the early part of the 18th century, its inhabitants now number 14,108 (1956)

LA RIVE, AUGUSTE ARTHUR DE (1801–1873), Swiss physicist. one of the founders of the electrochemical theory of galvanism. was born in Geneva, Switz., on Oct. 9, 1801, and died in Marseilles, France, on Nov. 27. 1873. He was the son of Charles Gaspard de la Rive (1770–1834), professor of pharmaceutical chemistry (1802) in the Academy of Geneva and later rector (1823). De la Rive was elected to the chair of natural philosophy in the academy in 1823 and with François Marcet he investigated the specific heats of gases and the temperature of the earth's crust, but electricity was his chief interest. His experiments on the voltaic cell. published in 1836, furthered the development of electrical theory. He shared Michael Faraday's view that voltaic electricity mas due to chemical action. He invented in 1840 the electroplating process for gold on silver and brass, for which in 1841 he received a prize of 3,000 fr. from the French Academy of Sciences. His *Traité de l'électricité théorique et appliquée* (3 vol., 1854–58) was translated into several languages, Later (1867) he carried out a series of researches on the discharge of electricity through gases, with observations on the critical pressure and the conductivity of the cathode dark space. His birth and fortune gave him considerable social and political influence and he was distinguished for his hospitality to literary and scientific men and for his interest in the welfare and independence of his native country. (D. McK.)

LARIVEY, PIERRE *(c.* 1550–1612), French dramatist, belonged to a family of Italian origin, established at Troyes, which had gallicized its name from Giunta to L'Arrivey. Pierre Larivey appears to have cast horoscopes, and to have acted as clerk to the chapter of the church of St. Etienne, of which he eventually became a canon. Larivey was not the originator of French comedy, but he naturalized the Italian comedy of intrigue in France. He adapted, rather than translated, 12 Italian comedies into French prose. The first volume of the *Comédies facétieuses* appeared in 1579, and the second in 1611. Only nine in all were printed. The licence of the manners depicted in these plays is matched by the coarseness of the expression. Larivey's merit lies in the use of popular language in dialogue, which often rises to real excellence, and which was not without influence on Molière and Regnard. Molière's *L'Avare* owes something to the scene in Larivey's masterpiece, *Les Esprits,* where Séverin laments the loss of his purse, and the opening scene of the piece seems to have suggested Regnard's *Retour imprévu.*

It is quite likely that Molière may have played in some of Larivey's pieces while he was touring the provinces. Larivey was the author of many translations, varying in subject from the *Facétieuses nuits* (1573) of Straparola to the *Humanité de Jésus-Christ* (1604) from Pietro Aretino. The nine comedies printed were: *Le Laquais,* from the *Ragazzo* of Ludovico Dolce; *La Veuve,* from the *Vedova* of Nicolo Buonaparte; *Les Esprits,* from the *Aridosio* of Lorenzino de Medicis; *Le Morfondu,* from the *Gelosia* of Antonio Grazzini; *Les Jaloux,* from the *Gelosi* of Vincent Gabbiani; and *Les Escolliers,* from the *Cecca* of Girolamo Razzi, in the first volume; and in the second, *Constance,* from the *Costanza* of Razzi; *Le Fidèle,* from the *Fedele* of Luigi Pasqualigo; and *Les Tromperies,* from the *Inganni* of N. Secchi.

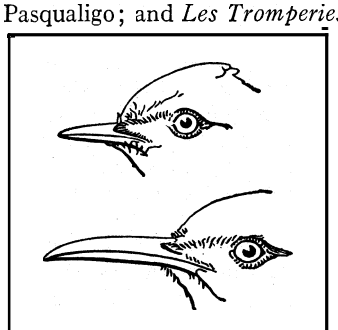


FIG. 1.—LULLULA ARBOREA (ABOVE) AND CERTHILAUDA (BELOW), LARKS WITH SLENDER BILLS, WHICH SHOW MARKED VARIATION IN LENGTH

LARK, applied with a prefix, *e.g.,* titlark, wood-lark, to a number of birds, but when used alone by Englishmen means the skylark, *Alauda arvensis.* This bird, a favourite cage-bird by reason of its beautiful song, and also esteemed for the table, inhabits the northern hemisphere of the old world from the Faeroes to the Kurile Islands, migrating southward in winter to northern India, Iran and Egypt. It has been introduced to Long Island (N.Y.), Hawaii and New Zealand, and is abundant wherever there is open or agricultural country. It nests in grass and growing corn, the eggs varying from three to five, dull gray in colour, heavily mottled purplish-brown. In the winter the birds congregate in flocks. It is resident in Great Britain throughout the year, though most numerous in the autumn. Both sexes are protectively coloured. The male mounts in wide circles as it sings. The food is injurious insects and seeds of weeds.

The mood-lark, *Lullula arborea,* is more local than the skylark and is never found far from trees. Its song is less varied but very beautiful. It is almost confined to Europe.

The crested lark, *Galerita cristata,* has a larger crest, a stronger and more curved bill and a rufous lining to the wings. It is common in France. Some of its relatives inhabit deserts and exhibit

a plumage of a light sandy hue. The harmony between plumage and soil is particularly striking in North African larks in the breeding season (see *Ibis*, supp. number, March, 1927).

The larks present a great variety of structure. The bill may be long and thin (fig. 1) or short and stout (fig. 2). The hind claw, usually long, may be reduced to moderate dimensions (fig. 3). The first primary, which is almost aborted in the skylark, is well developed in *Melanocorypha*. The most constant feature is the *podotheca* or covering of the tarsus, which is scutellate both in front and behind.

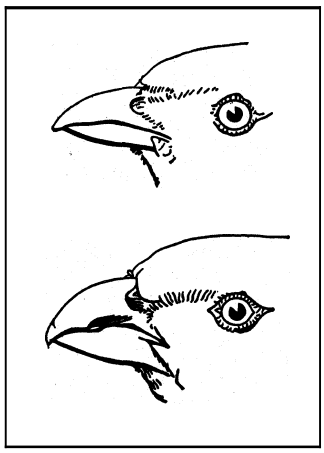


FIG. 2.—VARIATIONS IN THE FORM OF THE BILL BETWEEN MELANOCORYPHA CALANDRA (ABOVE) AND RHAMPHOCORYS CLOT-BEY (BELOW)

Only one genus, with a single species, *Mirafra horsfieldi*, inhabits Australia, and one genus, *Otocorys*, extends to America.

Among the birds popularly called larks are the mud-lark, rock-lark, titlark and tree-lark, which are pipits (*q.v.*), the grasshopper-lark, a warbler (*q.v.*), and the American meadow-lark, which belongs to the *Icteridae* (*see* ICTERUS).

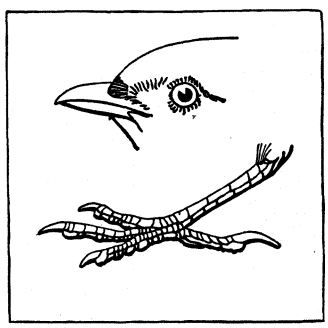


FIG. 3.—CALANDRELLA BRACHYDACTYLA, SHOWING THE HIND CLAW, REDUCED IN THIS SPECIES FROM THE USUALLY ELONGATED FORM TO A MODERATE SIZE

The true larks moult but once a year, whereas the pipits moult twice.

LARKANA (LARKHANA), a municipality, *taluka* (subdivision) and district in the province of West Pakistan. The town is on a canal 8 mi. W. of the Indus, and on the North Western railway, 200 mi. (281 mi. by rail) N.E. of Karachi. Population (1951) 33,414.

Larkana is named after the Lar people who formerly lived there. It is a trade centre, noted for the manufacture of brass and other metal wares.

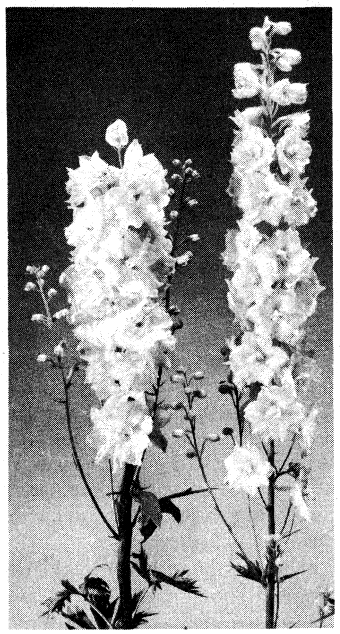
LARKANA DISTRICT, lying along the right bank of the Indus, was formed out of parts of Shikarpur (now Sukkur) and Karachi districts in 1901. Area 2,867 sq.mi.; pop. (1951) 501,904. Its estern part is mountainous (Kirthar range), but the rest is an alluvial plain, watered by canals and well cultivated, being the most fertile part of the Sind region.

The staple crops are rice, wheat, gram, rape and mustard. There are numerous rice mills. The remains of the ancient city of Mohenjo-Daro, key site for the establishment of the history of the Indus valley civilization (*c.* 3300–1500 B.C.), were found 15 mi. S. of Larkana.

LARKSPUR, the popular name for species of *Delphinium*, a genus of plants belonging to the buttercup family (Ranunculaceae). The flowers are borne in long and narrow terminal clusters and are usually strikingly showy; some shade of blue is the predominating colour, but purple, pink, rose, orange, scarlet, yellow and white also occur.

The "spur" is a backward-projecting organ formed from the uppermost one of the five large colourful sepals. The true petals are two to four in number and are relatively small. The stems vary from less than one foot to over six feet tall. The leaves are variously lobed but these lobes always run down toward the base in digitate fashion. Both annual and perennial species occur in the genus, with the latter more common.

The larkspurs are of easy cultivation but seem to thrive best on a deep well-drained and well-manured soil. The annual ones are grown from seed and are often used as border plants. The taller perennial types are increased by division of older plants or by cuttings and seeds started in the greenhouse during the winter in colder climates, or in outside beds in the fall in warmer areas. The varieties cannot usually be perpetuated with certainty by seed. Rather than offer named varieties to the trade, commercial companies often select out colour "series." The belladonna delphinium is hardy and prolific and is reasonably true as to colour. The English hybrids are large-flowered and reasonably permanent. The so-called Pacific hybrids are very popular but seem to be relatively short-lived. Double-flowered types are not uncommon and many colour forms are available.



ROCHE

LARKSPUR (DELPHINIUM)

The native species of *Delphinium* are predominantly North American, more than 75 species being recognized. Only 4 of these occur east of the Mississippi river, but the concentration of species increases westward with 29 credited to California.

Many species are poisonous to livestock, such as Geyers larkspur (D. *geyeri)* which is at the same time one of the loveliest and also one of the worst cattle-poisoning plants of the Rocky mountains. (H. D. H.)

LARNACA (anc. CITIUM [*q.v.*], Turk, TUZLA), a seaport on the southeast coast of Cyprus, 26 mi. S.S.E. from Nicosia. Pop. (1956 est.) 17,867. The oldest Phoenician settlement in prehistoric Cyprus was probably there, and many Roman remains have been found. Principal exports from Larnaca are gypsum, asbestos, terra umbra, barley, wheat, cotton and fruit.

LARNE, a municipal borough and seaport in County Antrim, Northern Ire.. 21 mi. N.N.E. of Belfast. Pop. (1951) 11.978.

Linen, radio components, paper and cement are made, and there is large-scale production of turboalternators.

Larne was the landing place of Edward Bruce when he invaded Ireland in 1315 and it was the scene of Unionist gun running in 1914. (HU. S.)

LA ROCHE, SOPHIE VON (née GUTERMANN) (1731–1807), German writer belonging to the period of sensibility. She was born on Dec. 6, 1731, in Kaufbeuren. Bavarian Swabia, the daughter of a doctor. Her engagement to her intimate friend and cousin C. M. Wieland (*q.v.*) was dissolved and in 1754 she married G. M. Franck von La Roche. From 1771 she maintained a literary salon in Ehrenbreitstein to which the young Goethe belonged (*see* his *Dichtung und Wahrheit*, book 13). Her first work, the *Geschichte des Fräuleins von Sternheim* (1771), was the first original German novel written by a woman. Indebted to Samuel Richardson, and not only for its epistolary form, the action takes place partly in England. Its heroine's melancholy moods and its "confessional" aspect as well as its social ideas won it fame. Among her other books are *Rosaliens Briefe* (1779–81), *Geschichte von Miss Lony* (1789) and *Erscheinungen am See Oneida* (1797–98), a novel set in America. All Sophie La Roche's works are imbued with the spirit of the Enlightenment and with interest in economic and social problems, including women's education; but her sensibility too often became sentimentality. She died in Offenbach am Main on Feb. 18, 1807. She was the grandmother of Bettina von Arnim and Clemens Brentano (*qq.v.*).

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(K. Sc.)

LA ROCHE, a small ancient town in the Belgian Ardennes, on a rock commanding the river Ourthe, which meanders round the little place and skirts the rock on which are ruins of the 11th cen-

tury castle. This is supposed to have been the site of a hunting box of Pippin, and certainly the counts of La Roche held it in fief from his descendants, the Carolingian rulers. In the 12th century they sold it to the counts of Luxemburg. In the 16th and 17th centuries the French and Imperialists frequently fought in its neighbourhood. La Roche is a tourist centre in fine sylvan scenery. The Diable-Chbteau is a freak of nature, the apparent replica of a medieval castle. Pop. (1955 est.) 1,839.

LA ROCHEFOUCAULD, the name of an old French family which is derived from a castle in the province of Angoumois (*département* of Charente), mhich was in its possession in the 11th century. This castle was largely rebuilt in the reign of Francis I, and is one of the finest specimens of the Renaissance architecture in France. François de la Rochefoucauld (1494–1517), godson of King Francis I, was made count in 151j. At the time of the wars of religion the family fought for the Protestant cause. François (1588–1650) was created duke and peer of France by Louis XIII in 1622. His son François was the author of the *Maxims,* and the son of the latter acquired for his house the estates of La Roche-Guyon and Liancourt by his marriage with Jeanne Charlotte du Plessis-Liancourt. Alexandre, duc de La Rochefoucauld (d. 1762), left two daughters, who married into the Roye branch of the family.

LA ROCHEFOUCAULD, FRANÇOIS, DUC DE (1613–1680), French classical author who had been one of the most active rebels of the Fronde before he became the leading exponent of the *maxime* as a literary form, was born in Paris on Sept. 15, 1613, the son of François, comte de la Rochefoucauld, and his wife Gabrielle du Plessis-Liancourt. The family of La Rochefoucauld, which had been reconciled to Catholicism after being Protestant, belonged to the ancient nobility of Angoumois, possessing estates at La Rochefoucauld, at Verteuil and at Marcillac in that province. The public life of both father and son was conditioned by the political situation in France in which the royal government mas by turns threatening and flattering the nobility. Thus in 1622 the comte de la Rochefoucauld was made governor of Poitou and created duke; but later he was deprived of his governorship. His dukedom, moreover, was not registered by the *parlement* of Paris until 1637, and this delay complicated the lawsuits about precedence in which the family was to be for years engaged (apart from its claim to be accorded the same princely privileges at court as were enjoyed by the houses of Rohan and La Trémoïlle). The prince de Marcillac, as the son was called until his father's death in 1650, was married in 1628 to Andrée de Vivonne, who bore him four sons and three daughters. He served in the army against the Spaniards in Italy in 1629 and later in the Netherlands (1635) and in Picardy (1636). In 1635, however, he came under the influence of Marie de Rohan-Montbazon, duchesse de Chevreuse, who involved him in her conspiracies on behalf of the unhappy queen of France, Anne of Austria. His comings and goings in these intrigues only succeeded in procuring for him a humiliating interview with the cardinal de Richelieu and eight days' imprisonment in the Bastille (1637), followed by two years' exile at Verteuil. In 1639 he was again campaigning in Flanders. On the death of Louis XIII, he was disappointed that Anne of Austria did not reward him according to his ambitions. In 1646, however, he was wounded at Mardyck, and Cardinal Mazarin at last allowed him to acquire the governorship of Poitou.

Meanwhile Marcillac had found a mistress more tyrannical, because more clearheaded, than Mme. de Chevreuse, namely Anne Genevibve de Bourbon-Condé, duchesse de Longueville, the sister of the great Condé. Throughout the phases of the Fronde (*q.v.*) he remained her closest adherent, whether or not his political or personal interests were served by the attachment. His own account of his role in the plotting and campaigning, too complex to be described here, can be read in his *Mémoires,* where he clearly shows himself to the best advantage. Though his rank, his intelligence and his daring made him one of the most prominent Frondeurs, his loyalty to the Condé faction made his real importance far less than that of his gifted rival the cardinal de Retz (whose death he tried to accomplish at one moment in 1651 by trapping the cardinal in swinging doors during a meeting of the *parlement*). Wounded at Lagny in 1649, he was horribly wounded in the battle of the Faubourg Saint-Xntoine in 1652 and retired from the struggle in the following year, his health ruined and his peace of mind lost.

After convalescence in Angoumois (where his house at Verteuil had been razed in 1650), La Rochefoucauld began to live increasingly in Paris from 1656 onward His last years nere consoled by lasting and intellectually stimulating friendships with Madeleine de Souvré. marquise de Sablé (1598–1678). one of the most remarkable women of the age; and the comtesse de La Fayette (*q.v.*). He died in Paris the night of March 16–17, 1680.

Publications. — As a young man La Rochefoucauld seems to have known J. L. Guez de Balzac. his neighbour in Angoumois, but at that time he probably considered literary interests beneath the dignity of a grand seigneur. Though his self-portrait was published in a collection of such pieces sponsored by the duchesse de Montpensier in 1659, he never authorized any edition of his *Mémoires,* of which mutilated and conflated versions were published surreptitiously from 1662 onward. The first edition of his *Maximes,* published in Holland as *Sentences et maximes de morale* (1664), was disavowed by him, but he authorized five editions of them, under the title *Réflexions ou sentences et maximes morales,* in 1665, 1666, 1671. 1675 and 1678.

The **Maximes.**—To Mme. de Sablé more than anyone else would appear to be due La Rochefoucauld's cultivation of the peculiarly French type of epigram known as the *maxime.* It all seems to have started with a sort of society game, in mhich moral and intellectual subjects were debated by a circle of cultivated friends and their final resolutions noted by a secretary. Brevity and pungency seem to have been the aim of the exercise. If a point of view or observation was thought unusual, its author would endeavour to make it into an epigram. In Mme. de Sablé's circle, which comprised not only members of the nobility but also men of letters from the lesser clergy and the *bourgeoisie,* the great point is that all competed on equal terms, no-one was the expert. La Rochefoucauld professed the greatest respect for Mme. de Sablé's opinion and protested that he required her approval for all his *maximes.* Interchange of epigrams went on for several years, and the reason why several *maximes* that appeared in the Dutch edition were omitted in later editions aas probably that they were considered the property of Mme. de Sablé or of Jacques Esprit, who also later published their own collections.

Despite his modesty there is no doubt of La Rochefoucauld's mastery in handling the new invention. The manuscripts (and even more the Dutch edition. apparently based on a manuscript earlier than any now extant) show how carefully he mould write up the essence of his thought in one or more paragraphs and then file it down to the point of ultimate brevity. Thus *maxime* 65 in the edition of 1678 has only one-sixth of the length of its counterpart in the Dutch edition (no. 14), from which he removed both the name of God and a quotation from Juvenal as the quality of the *maxime* came to be recognized as impersonal, impenetrable, unattached to any particular origin. Research has attempted the process in reverse, discovering beneath the impersonal *maxime* a personal reminiscence, often of the Fronde or of politics. The vigour and even violence of the original version is surprising, for example *Les crimes deviennent innocents, même glorieux par leur nombre et par leurs qualités; de là vient que les voleries publiques sont des habilete's, et que prendre des provinces injustement s'appelle faire des conquêtes. Le crime a ses heros ainsi que la vertu* ("Crimes are made innocent and even virtuous by their number and quality; hence public robbery is political talent and the nrongful seizure of a province is called a conquest There are heroes in crime as well as in virtue"; no. 4 in Dutch edition). Was it, hostile reception in the first instance or the fear of revealing a political attitude that made him abandon all this, save the unrecognizable no. 185 of 1678: *Il y a des heros en mal comme en bzen* ("Evil as well as good has its heroes")? Modern readers may forget that La Rochefoucauld's contemporaries would read past history into sentences that are non cryptic.

The Fronde indeed is one of those moments of history which seems to reveal men's motives at their worst. La Rochefoucauld's

exposure of the self-seeking that lay beneath a customary homage to morality has earned him the reputation of a cynic, but his keenest contemporaries are no less severe. The pungency and absence of explanation which the epigram entailed make his work seem more scornful than it really was. Beneath professions of idealism he discovers and brilliantly pinpoints a restless and unquenchable thirst for self-preservation. Virtue is but one ingredient among many that are unavowed: *Les vertus se perdent dans l'interêt comme les fleuves se perdent dans la mer* ("Virtues are lost in self-interest as rivers are lost in the sea"). This image of the human mind as a sea of conflicting impulses tending toward biological survival forms the climax of his most eloquent piece of writing, a long reflection that opened the first edition of 166j and was thereafter suppressed: . . . *Voilà la peinture de l'amour-propre, dont toute la vie n'est qu'une grande et longue agitation; la mer en est une image sensible; et l'amour-propre trouve dans la flux et reflux de ses vagues continuelles une fidèle expvession de la sziccession turbulente de ses pensées et de ses éternels mouvements* ("Such is the picture of self-love, whose whole life is one continuous ferment; the sea is the visible image of it, and the flux and reflux of the ceaseless waves give a true likeness of the chaotic sequence of its thoughts and of its everlasting motion"). Many of the *maximes* treat other themes with remarkable acumen. For instance there is La Rochefoucauld's distinction between what we are and what we do: *La nature fait le mérite, et la fortune le nzet en oetrvve* ("Nature gives us our good qualities, and chance sets them to work").

More than one epigram shows a respect for the power of indolence (no. 169, 266, 293), and some express an almost Nietzschean respect for strength (no. 237, 387).

La Rochefoucauld has been called an Epicurean, but his imaginative insights attach him to no doctrine. Like Montaigne and Pascal, he is aware of the mystery around us that dwarfs our efforts and mocks our knowledge, of the many things about ourselves of which we are unconscious, of the gap between thinking and being. All these insights seem common to the French classical school, of which, though disdaining the name of author, he is so brilliant a representative. They account for his fame and for his influence on a peculiar kind of writer, on Chesterfield and Hardy, on Nietzsche and Lichtenberg, on Stendhal and Sainte-Beuve and Gide.

Yet his chief glory is not as thinker but as artist. In the variety and subtlety of his arrangement of words he made the *maxime* into a jewel. He used its brevity not only to display the most intense concision but to express, with the effect of shock and surprise, a truth or an attitude from which palliation and explanation were absent. In his hands it is always clear, sometimes not as the truth but as that exaggeration that can surprise us into a new aspect of the truth. He describes and defines—there is no time for more—but of the single metallic image he makes amazing use. He handles paradox to such effect that the final word can reverse the rest: *On ne donne rien plus libéralement que ses conseils* ("We give nothing more generously than advice"); *Un homme d'esprit serait souvent embarrassé sans la compagnie des sots* ("An intelligent man would often find himself in difficulties without the society of fools"); *C'est une gvande folie de vouloir être sage tout seul* ("It is madness to want to be wise all by oneself").

There is a complete edition of the works of La Rochefoucauld ed. by L. Martin-Chauffier and Jean Marchand in the Pléiade series (1957).

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LA RBCHEFQUCAULD-LIANCQURT, FRANÇOIS ALEXANDRE FRÉDÉRIC, DUC DE (1747–1827), French social reformer, was born at La Roche Guyon on Jan. 11, 1747, the son of François Armand de La Rochefoucauld, duc d'Estissac. The duc de Liancourt became an officer of carbineers, and married at seventeen. He established a model farm at Liancourt, where he reared cattle imported from England and Switzerland. He also founded a school of arts and crafts for the sons of soldiers, which became in 1788 the École des Enfants de la Patrie. Elected to the states-general of 1789 he became president of the assembly on July 18.

When he was placed in command of a military division in Normandy he offered Louis a refuge in Rouen, but failing in this effort, assisted him with a large sum of money. After the events of Aug. 10, 1792, he fled to England, and thence to America. After the assassination of his cousin. Louis Alexandre, duc de La Rochefoucauld d Enville, in September 1792 he assumed the title of duc de La Rochefoucauld. He returned to Paris in 1799, and at the Restoration he entered the house of peers. Successive governments. revolutionary and otherwise, recognized the value of his institutions at Liancourt, and he was for twenty-three years government inspector of his school of arts and crafts, which had been removed to Châlons. He was one of the first promoters of vaccination in France. and he was an active member of the central boards of administration for hospitals. prisons and agriculture. His opposition to the government in the house of peers led to his removal in 1823 from the honorary positions he held. His works, chiefly on economic questions, include books on the English system of taxation, poor relief and education. He died on March 24, 1827.

His eldest son, FRANÇOIS, DUC DE LA ROCHEFOUCAULD (1765–1848), succeeded his father in the house of peers. The second, ALEXANDRE, COMTE DE LA ROCHEFOUCAULD (1767–1841), married a San Domingo heiress allied to the Beauharnais family. Mme. de La Rochefoucauld became *dame d'honneur* to the empress Josephine, and their eldest daughter married a brother-in-law of Pauline Bonaparte. Princess Borghese. La Rochefoucauld became ambassador successively to Vienna (1805) and to The Hague (1808–10), where he negotiated the union of Holland with France. During the "Hundred Days" he was made a peer of France He subsequently devoted himself to philanthropic work. and in 1822 became deputy to the chamber and sat with the constitutional royalists. He was again raised to the peerage in 1831.

The third son, FRÉDÉRIC GAÉTAN, MARQUIS DE LA ROCHEFOUCAULD-LIANCOURT (1779–1863), wrote on social questions, notably on prison administration; he edited the works of La Rochefoucauld. and the memoirs of Condorcet: and he was the author of some vaudevilles. tragedies and poems.

See A de Castellane, *Gentilshommes démocrates; Les deux La Rochefoucauld,* etc (1891)

LA ROCHEJACQUELEIN, DE, the name of an ancient French family of La Vendée, celebrated for its devotion to the throne during and after the Revolution.

At the outbreak of the Revolution the chief of the family was HENRI LOUIS AUGUSTE, marquis de La Rochejacquelein, *maréchal de camp* in the royal army. who had three sons named after himself—Henri. Louis and Auguste. The marquis emigrated with his second son Louis. He entered the service of Great Britain, and died in San Domingo in 1802.

HENRI, comte de La Rochejacquelein, born at Dubertien, near Châtillon. sur Sèvres, on Aug 20. 1772, did not emigrate with his father. He served in the constitutional guard of the king, and remained in Paris till the execution of Louis XVI. He then took refuge with the marquis de Lescure on his own estates in Poitou. When the anti-clerical policy of the revolution provoked the rising of the peasants of La Vendée, he became one of their leaders. After the defeat of the Vendeans by the republicans at Cholet, he became their nominal commander in chief. But he had in fact to obey his army, and could only display his personal valour in action He could not avert the mistaken policy which led to the rout at Le Mans, and was finally shot, March 4, 1794.

LOUIS, marquis de La Rochejacquelein, the younger brother of Henri, accompanied his father in the emigration, served in the army of Condé, and entered the service of England in America. He returned to France during the consulate, and in 1801 married the marquise de Lescure, widow of his brother's friend, whonas mortally nounded at Cholet Her *Mémoires* (Bordeaux, 1815) give a remarkable picture of the war and the fortunes of the royalists. In 181j the marquis endeavoured to bring about

another Vendéan rising for the king, and was shot in a skirmish at the Pont des Marthes on June 4, 1815.

His grandson, JULIEN MARIE GASTON, born at Chartres on March 27, 1833, was an active legitimist deputy in the Assembly chosen at the close of the German War of 1870–1871. He was a strong opponent of Thiers, and continued to contest constituencies as a legitimist with varying fortunes till his death in 1897.

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LA ROCHELLE, a seaport of France, capital of the *département* of Charente-Maritime, 90 m. S. by E. of Nantes on the railway to Bordeaux. Pop. (1954) 56,056. La Rochelle stands on the Atlantic coast on an inlet opening off the great bay in which lie the islands of RC and Oléron. Its fortifications have a circuit of $3\frac{1}{2}$ m. with seven gates. Towards the sea are three towers of which the oldest (1384) is that of St Nicholas. The 14th century Chain Tower is so called from the chain which closed the harbour; the entrance to the tidal basin was at one time spanned by a pointed arch between the two towers. The lantern tower (1445–76), surmounted by a spire, was once used as a lighthouse. Of the ancient gateways only one has been preserved in its entirety, that of the "Grosse Horloge," a square tower of the 1 jth century. The cathedral of La Rochelle (St. Louis or St. Bartholomew) is a heavy Grecian building (1742–1762) with an old 14th century tower, the only remnant of the old church of St. Bartholomew on the same site, destroyed in the 16th century. Externally the town-house is in the Gothic style of the latter years of the 15th century. In the old episcopal palace (which was in turn the residence of Sully, the prince of Condé, Louis XIII., and Anne of Austria, and the scene of the marriage of Alphonso VI. of Portugal with a princess of Savoy) accommodation has been provided for a library, a collection of records and a museum of art and antiquities. Of the old houses, the most interesting is one built in the middle of the 16th century and wrongly known as that of Henry II. The parade-ground, which forms the principal public square, occupies the site of the castle demolished in 1590.

Industries. — Ship-building, saw-milling and the manufacture of briquettes and chemicals, sardine and tunny-preserving and petroleum-refining are among the industries. The rearing of oysters and mussels and the exploitation of salt marshes is carried on.

The inlet of La Rochelle is protected by a mole built by Richelieu. The harbour, one of the safest on the coast, is entered by a channel 2,730 yd. long, and comprises an inner harbour, an interior dock and a larger exterior dock, outside which is the outer port. A large number of sailing ships are engaged in the fisheries, and the fish market of La Rochelle is the most important on the west coast. La Rochelle imports grain, coal. pitch, kaolin, wood and foreign wines. and its exports are French wines. oysters, pit props, etc. The harbour is, however, inaccessible to the largest vessels, for the accommodation of which the port of La Pallice was created. Lying about 3 mi. W S W. of La Rochelle, this port opens into the bay opposite the eastern extremity of the island of RC. Vessels drawing 20 ft. are able to enter during three hours of each tide. The tidal basin is now open and the outer basin breakwater is in course of construction. The outer port, protected by two jetties, has an area of 31 ac. and a depth of $18\frac{1}{2}$ ft below lowest tide-level. La Pallice has regular communication with South America, England, America, West Africa, Egypt and the far east. La Pallice imports coal, pitch, grain, dried codfish, nitrates, pyrites, jute, petroleum, gas, oil, wood pulp, phosphates. Exports are wines and brandy.

Known in the 10th century as Rupella, it belonged to the barony of Châtelaillon, which was annexed by the duke of Aquitaine and succeeded Châtelaillon as chief town in Aunis. Captured by Louis VIII in 1224, it was restored to the English in 1360, but it returned to France when Du Guesclin recovered Saintonge. During the 14th, 15th and 16th centuries La Rochelle, then an almost independent commune, was one of the great maritime cities of France. The salt-tax provoked a rebellion at Rochelle which Francis I repressed in person; in 1 j68 the town secured exemption by the payment of a large sum. At the Reformation La Rochelle became one of the chief centres of Calvinism, and during the religious wars it armed privateers which preyed on Catholic vessels. In 1571 a synod of the Protestant churches of France was held within its walls under the presidency of Beza for the purpose of drawing up a confession of faith. After the massacre of St. Bartholomew, La Rochelle was unsuccessfully besieged by the Catholic army. The peace of 1573, signed by the people in the name of all the Protestant party, granted the Calvinists full liberty of worship. Under Louis XIII it put itself again at the head of the Huguenot party. Its vessels blockaded the mouth of the Gironde and stopped the commerce of Bordeaux, and also seized the islands of RC and Oléron and several vessels. Richelieu then subdued the town. During this investment Richelieu raised the celebrated mole which cut off the town from the open sea. La Rochelle then became the principal port between France and the colony of Canada. But the revocation of the Edict of Nantes (1685) deprived it of many inhabitants, and the loss of Canada by France for a time ruined its commerce.

LA ROCHE-SUR-YON, a town of western France, capital of the *département* of Vendée, on an eminence on the right bank of the Yon, 48 m. S. of Nantes on the railway to Bordeaux. Pop. (1954) 16,735. The old castle was dismantled under Louis XIII and the town almost destroyed in 1794. Napoleon re-erected it, using the stones of the ruins, and made it the chief town of Vendée. It was called Napoleon Vendée or Bourbon-Vendée, according to the ruling dynasty of the time, till 1870 when the old name was restored. The town is the seat of a prefect and a court of assizes, and has a tribunal of first instance and a chamber of commerce. It is a railway centre and is a market for cross-bred horses and cattle. La Roche-sur-Yon has an important *haras* (depôt for stallions) and flour mills. and is famous for its dog fairs.

LA ROMANA: *see* LA ALTAGRACIA.

LAROMIGUIÈRE, PIERRE (1756–1837), French philosopher one of the liberal and free-thinking Idéologues, was born at Livignac in Rouergue, on Nov. 3. 1756. As professor of philosophy at Toulouse, he incurred the censure of the *parlement* by a thesis on the rights of property in connection with taxation, which he considered arbitrary and therefore illegal. After the French Revolution he was appointed professor of logic at the École Normale and later librarian of the Prytanée (the College Louis-le-Grand) in Paris. He became associate member of the Institut (1796). a member of the tribunate (1799). professor at the Faculté des Lettres (1811) and a member of the Académie des Sciences Morales et Politiques (1833).

Laromiguière's *Projet d'éléments de métaphysique* (1793) was well received by the followers of Condillac's philosophy, and he edited Condillac's works in 1795. He departed from Condillac's doctrine however in his view of the faculty of judgment. which he regarded as an independent property of the mind; and he published a work entitled Les *Paradoxes de Condillac* (1805). His famous *Leçons de philosophie* (1815–18) reproduced a course of lectures at the Faculté des Lettres. Against the natural scientists who were attributing all functions of the mind and all mental experiences to physiological causes, Laromiguiere maintained that some functions of the mind originate from within itself. He sought on the other hand to account for ideas in terms of established and familiar faculties and their interplay, thus depriving certain ideas — such as those of virtue. God and beauty — of their mystery. In this he stood for the protest of the philosophical Idéologues against the growing romanticism of his age. Laromiguière died in Paris on Aug. 12, 1837.

See H Taine, *Les Philosophes français classiques du XIX^e siècle* (1857); F. Picavet, *Les Idtologues* (1891); *P.* Alfaric, *Laromiguière et son école* (1929).

LARRA, MARIAN0 JOSÉ DE (1809–1837), satirist and the most famous Spanish journalist. His brief life is uniformly depressing. Five childhood years (1813–18) in exile in Bordeaux, estranged parents, an unhappy early marriage (1829), the proud consciousness of superior talents denied honourable rank in society and politics induced in him a morbid conviction of failure as man and patriot which a rejected passion (for Dolores Armijo

de Cambronero) exacerbated to suicide in Madrid on Feb. 13. 1837. Not surprisingly his work, including neoclassic verse and translated plays, is autobiographical. The figure of the lonely wanderer haunted him, and a play, Macias, and a novel, El doncel de don Enrique el doliente (both 1834), recreate the tragedy of the Galician troubadour.

In privately published journals, El duende *satírico* del dia (1828), *El* pobrecito hablador (1832) and at unprecedented salaries in the public press—Revista *española, El español, El* redactor general—he wrote the articles which made him a classic of the language and stamped the image of a disillusioned personality on the pseudonym "Figaro" which he first adopted in 1833. With mordant wit, magnificent dramatic feeling for dialogue and characterization and a rich display of the finest craft of journalism, he scarified contemporary society in its social habits, literary tastes and political ineptitudes.

See I. Sánchez Esteban, M. J. de *Larra* (1834); Carmen de Burgos, **Figaro** (1919). **(R.F. B.)**

LARSA (biblical Ellasar, modern Senkerah), an ancient town in southern Mesopotamia in 31° N. and 46° E. The town lay 15 miles south-east of the ancient Erech, on the west bank of the old Euphrates, and probably in early times on the shore of a fresh-water lake. It was one of the oldest of Sumerian cities, and though excavated by Loftus in 1854 it still awaits a modem excavator. The ruins are four and a half miles in circumference, the temple area being 220 × 320 feet, and Loftus found a large number of tablets here. Little is known at present about its relations in pre-Sargonic times but it was probably connected with Erech. During the Elamite conquest it plays a very interesting part as it formed an Elamite stronghold.

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LARTET, EDOUARD (1801–1871), French archaeologist, was born in 1801 near Castelnau-Barbarens, department of Gers, France. The then recent work of Cuvier on fossil mammalia encouraged Lartet in excavations which led in 1834 to his first discovery of fossil remains in the neighbourhood of Auch. Thenceforward he devoted his whole time to a systematic examination of the French caves, his first publication on the subject being The Antiquity of Man in Western Europe (1860), followed in 1861 by New Researches on the Coexistence of Man and of the Great *Fossil Mammifers* characteristic of the Last Geological Period. In this paper he made public the results of his discoveries in the cave of Aurignac, where evidence existed of the contemporaneous existence of man and extinct mammals. In his work in the Périgord district Lartet had the aid of Henry Christy. They published the important results of their researches as Reliquiae *Aquitanicae,* the first part appearing in 1865. The most modest and one of the most illustrious of the founders of modern palaeontology, Lartet, a foreign member of the Geological Society of London, had been made professor of palaeontology at the museum of the Jardin des Plantes a few weeks before his death, at Seissan, in January 1871.

LARYNGITIS, an inflammation of the mucous membrane of the larynx, may be either acute or chronic. It is the result of infection, chemical irritation, vocal abuse or some internal systemic disorder.

Acute Laryngitis may be independent, or an extension from nasal or bronchial mucous membrane. The chief causes are "catching cold," excessive use of the voice in speaking or singing, inhalation of irritating smoke or dust, or swallowing very hot fluids or corrosive poisons. It occurs in acute fevers such as accompany influenza, measles, diphtheria and scarlet fever. As a result of the inflammation there is a general swelling of the larynx and epiglottis, with a narrowing of the air passages, and to this the chief dangers are due. Symptoms vary with the intensity of the attack; there is first a sense of tickling, then of heat, dryness and pain in the throat, with difficulty in swallowing and a dry cough with expectoration later; phonation becomes painful, the voice husky or completely lost. As the swelling of the parts increases, difficulty in breathing develops. This occurs more rapidly in children than adults because of the small size of the child's laryngeal air passages. In favourable cases, which form the majority, the attack abates in a few days, but if the inflammation increases, oedema may develop and death occurs suddenly from an asphyxia1 paroxysm. Many cases of acute laryngitis are so slight that they cause only hoarseness and cough. In children, the question of diphtheria must always be considered. The treatment is rest; no talking must be allowed. The patient should be kept in bed, in a room at an even temperature and the air saturated with moisture. An ice bag around the throat gives much relief, while internally, diaphoretics may be given with Dover's powder if there is much pain or cough. Chemotherapy with the sulfa drugs and antibiotics such as penicillin, streptomycin or aureomycin is used in the more severe cases.

Chronic Laryngitis follows repeated attacks of the acute form and is nearly always accompanied by granular pharyngitis. It may progress to cause chronic changes of hyperkeratosis and leukoplakia. It is common in people who habitually overuse the voice, such as street venders. The constant inhalation of irritating vapours, such as tobacco smoke, may also cause it. The most prominent symptom is the voice change or hoarseness which varies according to voice use. There is usually little or no pain, only the unpleasant sensation of tickling in the larynx, with a constant desire to cough. Treatment consists of stopping the cause where known—for example, smoking or shouting—and local application of mild astringents. Of particular importance is the clearing of any nasal or sinus infection which are sources of continued reinfection of the larynx.

Tuberculous Laryngitis is secondary to pulmonary tuberculosis. The mucous membrane is invaded by tubercles which first form small masses and later caseate and break down. The first indication is hoarseness or, in certain forms, pain on swallowing. The irritating laryngeal cough, which varies from the patient's chronic, productive pulmonary cough, is a late symptom. Of greatest importance in treatment is the adequate management of the pulmonary disease. Voice rest is essential. Streptomycin has made a vast change in the course of this condition, although laryngeal tuberculosis still adds greatly to the gravity of the prognosis of the patient with pulmonary tuberculosis.

Syphilitic Laryngitis may occur in all three stages of the disease and in the inherited form. In the secondary stage, the damage is superficial and symptoms are those of a slight acute laryngitis. The injury in the tertiary stage is much more serious; deep ulcers, which in healing form strong cicatrices or scars, produce stenosis (narrowing) of the air passage, requiring surgical interference. Occasionally, a fatal oedema arises. The treatment is that of the primary condition.

Paroxysmal Laryngitis or laryngismus stridulus is a nervous affection of the larynx that occurs in infants. It appears to be associated with adenoids and rickets. The disease consists of a reflex spasm of the glottis with complete occlusion of the air passages. The attacks, which are recurrent, cause acute asphyxia. They may cease for no obvious reason, or one may prove fatal. The whole attack is of such short duration that the infant has either recovered or possibly succumbed before assistance can be called.

After an attack, careful examination should be made, and the adenoids, if present, should be removed by operation.

Other Forms of laryngitis such as those due to the fungus diseases are less common. All inflammations may cause varying degrees of oedema, ulceration, granulation tissue formation or perichondritis with ultimate destruction of parts and final healing by scar tissue formation and stenosis. Acute laryngeal oedema, or oedematous laryngitis, occurs in acute laryngitis as a complication of cellulitis of the neck and in angioneurotic oedema. A more chronic form is seen in tuberculosis and syphilitic laryngitis as well as in kidney disease and certain fevers. The mucous membrane of the epiglottis, false cords and subglottic region becomes swollen, with symptoms of hoarseness, marked stridor and increasing dyspnoea (difficult breathing) developing rapidly to become dangerous within an hour in severe cases.

Treatment is the same as that indicated for acute laryngitis;

should that not relieve the symptoms, tracheotomy must be performed immediately.

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(P. H. H.)

LA SABLIÈRE, MARGUERITE DE (c. 1640–1693), friend and patron of La Fontaine, was the wife of Antoine Rambouillet, sieur de la Sabliiire (1624–1679), a Protestant financier entrusted with the administration of the royal estates, her maiden name being Marguerite Hessein. She received an excellent education in Latin, mathematics, physics and anatomy from the best scholars of her time, and her house became a meeting-place for poets, scientists, men of letters, and courtiers, members of the court of Louis XIV. About 1673 Mme. de la Sablière received into her house La Fontaine, whom for twenty years she relieved of every kind of material anxiety. La Fontaine dedicated one of his poems to her. Another friend and inmate of the house was the traveller and physician François Bernier. The abbé Chaulieu and his fellow-poet, Charles Auguste, marquis de La Fare, were among her most intimate associates. La Fare sold his commission in the army to be able to spend his time with her. This liaison, which seems to have been the only serious passion of her life, was broken in 1679. She died in Paris on Jan. 8, 1693.

See P. Blanchemain (ed.), *Madrégaux de la Sablière* (Paris, 1879).

LA SALE (or LA SALLE), **ANTOINE DE** (*c.* 1388–1462?), French writer. was born in Provence, probably at Arles. He was a natural son of Bernard de la Salle, a famous soldier of fortune, who served many masters, among others the Angevin dukes. In 1402 Antoine entered the court of Anjou. probably as a page, and in 1407 he was at Messina with Duke Louis II, who had gone there to enforce his claim to the kingdom of Sicily. The next years he perhaps spent in Brabant, for he was present at two tournaments given at Brussels and Ghent. With other gentlemen from Brabant, whose names he has preserved, he took part in the expedition of 1415 against the Moors, organized by John I of Portugal. In 1420 he accompanied Louis III on another expedition to Naples, making in that year an excursion from Norcia to the Monte della Sibilla, and the neighbouring Lake of Pilate, the story of which forms one of the episodes of *La Salade.* La Sale probably returned with Louis III of Anjou. who was also comte de Provence, in 1426 to Provence, where he was acting as *viguier* of Arles in 1429. In 1434 RenC, Louis's successor, made La Sale tutor to his son Jean d'Anjou, duc de Calabre, to whom he dedicated, between the years 1438 and 1447, his *La Salade,* which is a textbook of the studies necessary for a prince. Between 1439 and 1442 he was again in Italy with René. After 40 years' service of the house of Anjou, La Sale left it to become tutor to the sons of Louis de Luxembourg, comte de Saint Pol, who took him to Flanders and presented him at the court of Philippe le Bon, duke of Burgundy. For his new pupils he wrote at Châtelet-sur-Oise, in 1451, a moral work entitled La *Salle.*

Me was nearly 70 years of age when he completed, in 1456, the famous *Hystoire et plaisante cronicque du petit Jehan de Saintré et de la jeune dame des Belles-Cousines, Sans autre nom nommer,* dedicated to his former pupil, Jean de Calabre. The *Réconfort à Madame de Neufville,* a consolatory epistle including two stories of parental fortitude, was written at Vendeuil-sur-Oise about 1458, and in 1459 La Sale produced his treatise *Des anciens tournois et faictz d'armes* and the *Journée d'Onneur et de Prouesse.* He followed his patron to Genappe in Brabant when the Dauphin took refuge at the Burgundian court.

La Sale is generally accepted as the author of one of the most famous satires in the French language, *Les Quinze Joyes de mariage,* because his name has been disengaged from an acrostic at the end of the Rouen ms. He has been credited with the famous collection of stories supposed to be narrated by various persons at the court of Philippe le Bon, and which was entitled the *Cent Nouvelles,* for which Louis XI was long held responsible, but modern criticism is against the attribution. The last mention of La Sale's name is in 1461. *Petit Jehan de Saintré* gives an account of the education of an ideal knight and rules for his conduct under many different circumstances. When Petit Jehan, aged 13, is persuaded by the Dame des Belles-Cousines to accept her as his lady, she gives him systematic instruction in religion, courtesy, chivalry and the arts of success. Saintré becomes an accomplished knight, the fame of whose prowess spreads throughout Europe. This section of the romance gives a very charming picture of the manners of the time. Unfortunately in the second part this virtuous lady falls a victim to a vulgar intrigue with Damp Abbé. One of La Sale's commentators, M. Joseph Niive, makes the too ingenious suggestion that the second section is designed simply to show how the hero, after passing through the other grades of education, learns at last by experience to arm himself against coquetry. *Petit Jehan de Saintré* was dedicated to the duc de Calabre. His wife, Marie de Bourbon, was one of the "Belles-Cousines" who contended for the favour of Jacques or Jacquet de Lalaing in the *Livre des faits de Jacques Lalaing* which forms the chief source of the early exploits of Petit Jehan and is usually attributed to the Burgundian herald Lefiivre. Jehan de Saintré flourished in the Hundred Years' War, was taken prisoner after Poitiers, with the elder Boucicaut, and was employed in negotiating the treaty of Bretigny. Froissart mentioned him as "le meilleur et le plus vaillant chevalier de France."

Evidence in favour of La Sale's authorship of *Les Quinze Joyes de Mariage* is brought forward by M. E. Gossart *(Bibliophile belge,* 1871, pp. 83–87). Gaston Paris *(Revue de Paris,* Dec. 1897) expressed an opinion that to find anything like the malicious penetration by which La Sale divines the most intimate details of married life, it is necessary to travel as far as Balzac.

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LA SALLE, RENÉ ROBERT CAVELIER, SIEUR DE (1643–1687), French explorer in North America, was baptized at Rouen, France, on Nov. 22, 1643. He received the best education of the period, that of the Jesuits, but acquired an enmity for the organization which influenced many of his later acts. In 1666 he emigrated to Montreal where he received a grant of land on the St. Lawrence river. An impetus to explore, however, led him constantly into the wilderness and in 1669 and 1670 he undertook explorations south of Lakes Ontario and Erie. The claim often made that he discovered the Ohio river in 1671 is not accepted by modern historians. His services and ability made him a favourite with Frontenac, the governor of Canada, and in 1674 he was sent to France as the governor's representative to defend the building of Fort Frontenac (on the site of Kingston, Ont.), which Frontenac had undertaken upon his own initiative, and also to petition for the command of the fort. His petitions were successful. In 1677 he again visited France to seek further privileges and financial assistance in extending his explorations and the fur trade westward, together with the permission to build forts. He was rewarded with a monopoly of the trade in the Mississippi valley.

In 1679, after thorough preparation, members of his expedition boarded the "Griffin," the first commercial vessel on Lake Erie, and proceeded to Green Bay, Wisconsin, where the ship was loaded with a cargo of furs and started on its return voyage, La Salle hoping the cargo would pay his creditors at Montreal. The ship was never heard from again, an inauspicious start. Unaware of this, La Salle continued down the west shore of Lake Michigan to the mouth of the river St. Joseph where Fort Miami was built. From there, joined by a party under his lieutenant, Henri de Tonti, his expedition of 34 men ascended the river and portaged to the Illinois, where near Lake Peoria they erected Fort Crevecoeur.

Preparations were here made for the voyage down the Mississippi, while Michael Accault, Father Hennepin and another *voyageur* were sent on a successful trip up that river beyond the Falls of St. Anthony in Minnesota. La Salle and four companions started on a flying trip back to Fort Frontenac to straighten out finances and bring supplies, while Tonti led a small party in search of a better site for a fort. Messengers met La Salle upon his return with the news that Fort Crèvecoeur had been abandoned and the men deserted. La Salle, fearing for Tonti's safety, rapidly canoed westward and descended the Illinois to the Mississippi without finding him. He and his men then returned on foot to Fort Miami, from where La Salle returned to Fort Frontenac for a third time. Tonti and his men, after being captured by the Indians, had meantime made their way to Green Bay.

La Salle, having been able to raise funds, returned in the spring full of courage for another attempt. Tonti rejoined him and the party of over fifty proceeded via the Chicago-Illinois portage to the Mississippi river, down which they descended without difficulty to its long-sought mouth. There on April 9, 1682, La Salle took possession of the region watered by the Mississippi and all its tributaries for King Louis of France and named it "Louisiana."

La Salle was on the verge of success. He intended to build forts and plant colonies both in the Illinois region and at the mouth of the Mississippi, through which he could control the resources of his vast empire. He hoped soon to free himself of the entanglements of Canada and become governor of an independent realm. In Dec. 1682, he began the construction of Fort St. Louis on the Illinois river, the first post of a permanent character in the Illinois country. To facilitate the transportation of supplies he sent two men to build a post on the present site of Chicago to guard the Chicago portage. Unfortunately, however, Frontenac, his loyal supporter, was recalled to France. La Salle's merchant rivals, who resented his monopoly, carried on a campaign against him, succeeding first with Frontenac's successor, and finally with the French government at home. La Salle, convinced of the hostility of the new governor, started east to treat with him, but on the way met officials sent by the governor to take over the Illinois forts. La Salle was forced to carry his troubles direct to France.

There he met with favour, and the ministry, convinced that a colony at the mouth of the Mississippi was a strategic move of first importance against Spain, with whom France was then at war, authorized and aided La Salle to attempt it. La Salle was made governor of all Louisiana and the forts in the Illinois country were restored to him and repossessed by Tonti. In 1684 La Salle left France with four ships and about 400 men to make the settlement. The naval commander, Beaujeu, however, refused to obey La Salle from the first, and before long was responsible for the loss of the main supply ship to the Spanish. In the West Indies La Salle was seized with the fever and during his long illness the expedition became completely disorganized. When he finally continued with only 180 men it was only to miss the mouth of the Mississippi by proceeding too far to the westward. He retraced his steps and, conditions on shipboard becoming desperate, disembarked his colonists on the present Matagorda bay, Texas, the inlet of which he supposed to be the western outlet of the blississippi. A short land journey soon convinced him of his mistake, and a longer land expedition to find the Mississippi was unsuccessful. Two of his remaining three ships were wrecked and the third had returned to France. The plight of the colony—reduced to 45 men—had become so desperate that La Salle and a small party made a fruitless attempt to reach Canada where their situation might be made known. Finally, in January 1687, he determined to make a second attempt and took about half the remaining survivors with him. On the way a mutiny occurred and La Salle was assassinated by one of his own men. A few reached Fort St. Louis on the Illinois river.

For sources *see* P. Margry, *Découvertes et Établissements* (1878); I. J. Cox, *Journeys of La Salle* (1922); L. P. Kellogg, *Early Narratives of the Northwest* (1917). For secondary works: F. Parkman, *The Discovery of the Great West* (1869); H. Lorin, *Le Comte de Frontenac* (189.5); G. Gravier, *Cavelier de La Salle* (1871); L. S. Hasbrouck, *La Salle* (1916).

LA SALLE, SAINT JEAN BAPTISTE DE (1651–1719), French reformer of education and founder of the Brothers of the Christian Schools, was born of an aristocratic family at Reims on April 30, 1651. After becoming a priest (1678) he devoted himself to the education of the poor, at that time much neglected. He helped to establish charity schools in his own town and subsequently formed his teachers into a religious order (1684). His schools multiplied until at the time of his death they were to be found in 22 towns of France and in Rome. La Salle also set up training colleges for secular teachers, the first of their kind; boarding schools of nonclassical type for middle-class boys; and reformatories. He was a man of refined manners, cultured mind and great practical ability, in whom personal austerity was allied with kindliness and affability. He died at Rouen on April 7, 1719, and was canonized in 1900; his feast day is May 15.

Among La Salle's spiritual writings are *Les Devoirs d'un chrétien,* 3 vol. (1703); *Recueil de différents petits traites* (1711); and two series of *Méditations* (1730–31). His pedagogical works include *Les Règles de la bienséance et de la civilité chrétiennes* (1703); *La Conduite des écoles chrétiennes* (1720); and various school manuals. Most of these have been translated into English.

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LAS BELA, a former princely state of Pakistan, in the southeast coastal area of the Baluchistan region. Politically, it constitutes one of the five districts of the Kalat division of West Pakistan province. Area of Las Bela is 7,043 sq.mi.

Two rivers from the north, the Purali and the Kud, unite to water the fertile alluvial plain of Las Bela; the Purali flows into the Arabian sea near Sonmiani. The eastern part of the state is mountainous.

Las Bela has been important in history for its situation on the Makran coastal trade route between Sind and Persia. Alexander passed through the southern part in 325 B.C. The Arab general Mohammed bin Kasim followed the same path in A.D. 111. The Persian route from India, curving somewhat to the north, was important in the medieval days of Arab ascendancy in Sind. There are traces of ancient Arab (possibly Himyaritic) occupation in stone ruins at Gondakeha on the Kud river, 10 mi. N.W. of Bela, while the Greek name "Arabis" for the Purali river is itself indicative of prehistoric connection with races of Asiatic Ethiopians referred to by Herodotus. On the coast: near the village of Sonmiani, may be traced the indentation which once formed the bay of Morontobara, noted in the voyage of Nearchus. In the 7th century A.D. Las Bela was governed by a Buddhist priest. With the influx of Arabs into Makran, Bela, under the name of Armel (Armabel), rose to importance as a link in the great chain of trading towns between Persia and Sind.

The later history of Las Bela is bound up with that of Kalat (*q.v.*) and of Baluchistan (*q.v.*) as a whole. It was regarded as subject to Kalat after 1758; but later the suzerainty became increasingly nominal: the obligation of the *jam* or chief of Las Bela to the khanate being confined to placing his 300 foot, 50 horse and 4 guns at Kalat's disposal when necessary. With the other Kalat tributaries Las Bela came under the more direct British control of Baluchistan inaugurated by Sir Robert Sandeman after 1875. Las Bela acceded to the new dominion of Pakistan on March 17, 1948, and with Kalat and two other states formed the Baluchistan States union—virtually a separate province—on Nov. 3, 1952. But in 1955, when West Pakistan was made into a single governor's province. Las Bela became a district of the Kalat division.

The population of Las Bela in 1951 was 75,769; 74,735 Moslems. The Lumris, or Lasis, from whom comes the name Las as a prefix to that of Bela, are the dominant tribe in the state. They are comparatively recent arrivals who displaced the earlier Tajik and Brahui occupants. It is probable that this influx of Rajput population was coincident with the displacement of the Arab dynasties in Sind by the Mohammedan Rajputs in the 11th century A.D.

Bela, the state capital (pop., 1951, 3,063), is prettily situated on the Purali, 350 ft. above sea level, 103 mi. N.W. of Karachi and 195 mi. S. of Kalat. (K. S. AD.)

LASCARIS, the name of a Byzantine family that came into prominence at the time of the fourth crusade. Theodore I, a son-in-law of Alexius III Angelus, became founder of the Lascarid dynasty in Nicaea after the Latin conquest of Constantinople (1204) and was crowned emperor there in 1208. He was succeeded by his son-in-law John III Vatatzes (1222–54) and by his grandson Theodore II (1254–58), whose son John IV was disinherited and blinded by Michael VIII, founder of the dynasty of Palaeologus. Other Lascarids held office under the later Palaeologi; the scholars John (Janus) and Constantine, who helped to promote the revival of Greek learning in Italy after 1453, were of the same family.

See A. Gardner, *The Lascarids of Nicaea* (1912). (D. M. N.)

LASCARIS, CONSTANTINE (d. 1493 or 1500), Greek scholar and grammarian, one of the promoters of the revival of Greek learning in Italy, was born at Constantinople. He was a member of the Bithynian family which had furnished three emperors of Nicaea during the 13th century. After the fall of Constantinople in 1453, he took refuge first in Corfu and then in Italy, where Francesco Sforza, duke of Milan, appointed him Greek tutor to his daughter. There was published his *Grammatica Graeca, sive compendium octo orationis partium,* remarkable as being the first book entirely in Greek issued from the printing press. After leaving Milan: Lascaris taught in Rome and Naples. Ultimately he settled in Messina, Sicily, where he continued to teach publicly until his death.

LASCARIS, JOANNES (JOHN) or JANUS (c. 1445–1535), Greek scholar, probably the younger brother of Constantine Lascaris, surnamed Rhyndacenus. After the fall of Constantinople he was taken to the Peloponnese, thence to Crete, and ultimately found refuge in Florence at the court of Lorenzo de' Medici, whose intermediary he was with the sultan Bayezid II in the purchase of Greek manuscripts for the Medicean library. On the expulsion of the Medici from Florence. at the invitation of Charles VIII of France. Lascaris removed to Paris (1495), where he gave public instruction in Greek. By Louis XII he was several times employed on public missions, among others to Venice (1503–08), and in 1515 he appears to have accepted the invitation of Leo X to take charge of the Greek college he had founded at Rome. Afterward (1518) Lascaris was employed along with Budaeus (Budé) by Francis I in the formation of the royal library at Fontainebleau, and was also sent in the service of the French crown to Venice. He died at Rome. whither he had been summoned by Pope Paul III, in 1535. Among his pupils was Musurus.

LAS CASAS, BARTOLOMÉ DE (1474–1566), bishop of Chiapas, known as the "Apostle of the Indies," was born in Seville of a merchant father. His youth was spent in Triana, a suburb of Seville, where he studied Latin and the humanities. Ordained to minor orders. he went to Hispaniola with the Spanish governor Nicolás de Ovando in 1502 to help indoctrinate the Indians in the Christian religion. In 1512 he was ordained priest. About 1514 Las Casas became convinced that the forced labour of Indians was an unmitigated evil. He renounced his own Indian allotment and in 1515 returned to Spain to appeal for a change in government policy toward the natives. He found a patron in Francisco Cardinal Jiménez de Cisneros, coregent of Spain for Charles V, who sent a commission to investigate the problem. Las Casas, who accompanied the commission, was dissatisfied with its half measures and returned to Spain, where he was given a grant of land in Cumaná (Venezuela) to be .colonized without conquest. The attempt proved a failure, and a revolt of the Indians in 1521 forced Las Casas to take refuge in the Dominican monastery of Santo Domingo. In 1523 he joined the Dominican order. He spent the next 12 years in Santo Domingo, beginning work on his *History of the Indies* and his *Apologetic History.*

En route to Peru in 1535 Las Casas was forced ashore in Nicaragua by unfavourable winds. From there. because of his censure of Spanish colonial methods, he had to flee to Guatemala, where he tried, unsuccessfully, to preach the faith by peaceful means, as described in *The Only Method oj Attracting All People to the True Faith* (1537). In Oct. 1540 he returned to Spain, where he wrote his *Very Brief Acconnt of the Destruction of the Indies,* attributing the evils in the colonies to the cruelty of the Spanish colonists and contributing to the promulgation of the new laws in 1542, which revoked or limited the right of Spaniards to service or tribute from the Indians. In the midst of the turmoil evoked by this legislation Las Casas was named bishop of Chiapas. Guatemala (consecrated 1544). His uncompromising attitude soon alienated every responsible sector of his diocese. and in 1547 he returned to Spain, never again visiting the new world. Las Casas spent his last years close to the court, opposing royal colonial policy and correcting his historical writings. He died at the Dominican monastery of Atocha in Madrid in 1j66

Las Casas is still a figure of controversy. His colonization attempt was a humiliating failure; his experiments to test the capacity of the natives found only a few capable of living alone as free subjects of the king: the attempt to preach the faith by peaceful means led to bloodshed in Guatemala and Florida; the radical decrees of the nen laws led to near revolt in Mexico. open rebellion in Peru and grave unrest throughout the empire. None of his plans succeeded. Yet by his monolithic stubbornness, Las Casas dramatized the plight of the Indian and made progress for their betterment possible for more reasonable men.

See L. Hanke, *The Spanish Struggle for Justice in the Conquest* of *America* (1949) (A. S TR)

LAS ,CASES, EMMANUEL AUGUSTPN DIEUDONNÉ JOSEPH, COMTE DE (1766–1842), French author whose account of Napoleon's conversations at St. Helena was an outstanding contribution to Bonapartist propaganda, was born near Revel in Languedoc on June 21, 1766. Educated at the military schools of Vendôme and Paris, he entered the navy and took part in various engagements of the years 1781–82.

Emigrating during the French revolutionary period, he spent some years in Germany and England and took part in the disastrous Quiberon expedition (1795). After some years in London he returned to France during the consulate with other royalists who rallied to Napoleon. In 1802 he published an *Atlas historique.* In 1810 Napoleon made him a chamberlain and created him a count of the empire (he was marquis by hereditary right). After Napoleon's first abdication (1814), Las Cases retired to England, but returned to France during the Hundred Days (1815).

Las Cases, who after Napoleon's second abdication had proposed that he should appeal to the British nation, accompanied him voluntarily into exile at St. Helena. where he was for 18 months his constant companion. He there recorded, day by day, all that Napoleon said—his reminiscences, his reflections, his aspirations. Some letters. however, which Las Cases wrote to friends in Europe complaining about the unfair treatment of Napoleon by the governor of the island. Sir Hudson Lowe, mere intercepted, and Las Cases was then deported from St. Helena (Nov. 1816) to the Cape of Good Hope, after all his papers had been seized.

Taken to England in Aug. 1817 and later detained in various towns in Germany or in Belgium, Las Cases was finally allowed to return to France in 1822, after Napoleon's death. He then recovered his manuscripts from the British government and, in 1823, published the *Mémorial de Sainte-Hélène,* which had a great success and earned him an enormous sum of money. The book served to revive the Kapoleonic legend and did much to win the sympathies of liberals for Napoleon's personality and program, despite its obvious prejudice in his favour as the work of an ardent admirer.

Elected deputy for Saint-Denis in 1831, Las Cases sat on the extreme left of the chamber. Elected again in 1834. he declined to take his seat, but was returned yet again in 1839 and collaborated with the opposition until his death at Passy on May 15, 1842. There is a critical edition of the *Mémorial* by M. Dunan (1951).

See Emmanuel *de* Las Cases, *Las Cases, le mémorialiste de Napoléon* (1939).

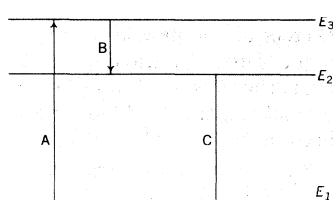
LASER, a device used for the amplification or generation of coherent light waves. the term laser being an acronym for light amplification by stimulated emission of radiation. The principle of the laser is so similar to that of the microwave maser *(see* MASER) that the former is often referred to as an optical maser. The highly parallel, intense beam of coherent radiation emitted by the laser has found important applications in communications systems and in experiments requiring an intense source of

radiation that can be focused to a fine point.

The laser, which is the first-known source of coherent light, consists of an active material between two parallel plates of an interferometer (*q.v.*). The active material is excited by an external source to invert the population of a pair of energy levels of energy difference Δ E. An electromagnetic wave of frequency $f = \Delta E/h$ (*h* is Planck's constant) will then produce stimulated emission of radiation at the frequency f. The interferometer is tuned to the frequency *f* so that it acts as a resonant cavity, and this allows energy to build up. When the rate at nhich energy is emitted into the cavity exceeds the rate at which energy is lost by absorption or transmission through the interferometer plates the laser will oscillate The amount of power emitted by the laser is limited by the rate at nhich the active material can be excited to maintain population inversion.

The laser was first proposed in writing by A. L. Schawlow and C. H Townes. These men suggested the use of a gas of alkali-metal atoms excited by a powerful ultraviolet source.

The first report of a working laser mas made by T. H Maiman. In Maiman's device, the active material is a crystal of synthetic ruby (aluminum oxide containing a small concentration of chromium ions). Radiation in the green absorption band of ruby brings the chromium ions up to an excited level E_3 (see figure). From this level. there is a very rapid nonradiative decay to a pair of intermediate levels. The laser operates between one of these levels (E_2) and the ground state (E,), which must be nearly emptied in order to obtain population inversion. The ions emit red light during this transition; when they are irradiated with red light of the same frequency they are stimulated to make the transition more rapidly and to produce an intense beam of red light. This operation requires a light source so powerful that it can operate for only a very short time, and therefore the ruby system acts as a pulsed laser. The interferometer in this case is plated on the plane-parallel faces of the crystal. The laser then tends to operate at the interferometer frequency nearest that of the centre of the emission line.



ENERGY LEVELS OF CHROMIUM IONS IN RUBY LASER E_1 GROUND STATE E_2. INTERMEDIATE LEVEL. E_3. EXCITED LEVEL GREEN LIGHT IS ABSORBED IN TRANSITION A. RED LIGHT IS EMITTED IN C

See A. L. Schawlow and C. H. Townes, Phys. **Rev.,** 112:1940 (1958); T. H. Maiman, *Nature,* 187:493 (1960). (H. J. ZE.)

LA SERENA, capital of the Chilean province of Coquimbo, is located on terrace land overlooking Coquimbo bay and just south of Elqui (Coquimbo) river. Pop. (1960) 55,708. The city is an episcopal see, a garrison and civil centre. Founded in 1543 on the north side of the river. it was named after Pedro de Valdivia's birthplace in Estremadura. Spain. Razed by the Indians in 1549 and rebuilt on the present site the same year, La Serena received city status in 1552. Pirates raided it in the 1680s; serious earthquakes struck several times, one in 1922 caused heavy damage. From 1946 to 1952, during the presidency of native son Gabriel González Videla, the city's impressive colonial-style public buildings were erected.

There is a plaza, parkway, an archaeological museum and schools of mines and agriculture. The resort city's population swells with summer vacationers. Peñuelas, 4 mi. S.W., is an exclusive beach community. Direct rail, bus and air connections exist to Santiago; interurban buses serve La Serena-Peñuelas-Coquimbo.

(J. T.)

LASHLEY, KARL SPENCER (1890–1958), U.S. psychologist, notable for his pioneer quantitative investigations of the relationship between brain mass and learning ability, was born at Davis, W.Va., on June 7, 1890. He studied at West Virginia university, the University of Pittsburgh (M.S. in bacteriology) and Johns Hopkins university (Ph.D. in genetics). where he was a collaborator of the biologist H. S. Jennings and the behaviourist psychologist J. B. Watson. Lashley taught at a number of universities, including Minnesota (1917–26), Chicago (1929–35) and Harvard (1935–55).

From 1942 to 1955, while still research professor of neuropsychology at Harvard. he was also director of the Yerkes Laboratories of Primate Biology at Orange Park, Fla. He died at Poitiers, France, on Aug. 7, 1958.

In addition to his work on the relationship between brain mass and learning, Lashley demonstrated the equipotentiality of much brain tissue in the process of learning and the incorrectness of the view that every psychological function necessarily has a specific cortical localization. He also performed research on brain mechanisms related to sense receptors and on the cortical basis of motor activities. He studied many animals, including primates. but his major work was done on the measurement of behaviour beiore and after specific and carefully quantified induced brain damage in the white rat.

Lashley was the author of *Brain Mechanisms* and *Intelligence* (1929); he also wrote more than 100 monographs and major papers in psychology, neurology and the biology of behaviour.

(L. CAR.)

LASKER, EDUARD (1829–1884), German publicist, was born on Oct. 14, 1829, at Jarotschin, Posen, being the son of a Jewish tradesman. He attended the gymnasium. and afterward the university of Breslau. In 1848, after the outbreak of the revolution, he went to Vienna and entered the students' legion, fighting against the imperial troops during the siege of the city in October. He then continued his legal studies at Breslau and Berlin, and after a visit of three years to England, then the model state for German liberals. entered the Prussian judicial service. In 1870 he left the government service, and in 1873 was appointed to an administrative post in the service oi the city of Berlin. In 1865 he was elected member for one of the divisions of Berlin in the Prussian parliament. He joined the radical or *Fortschritts* party. and in 186; was also elected to the German parliament, but he helped to form the national liberal party, and in consequence lost his seat in Berlin. n-hich remained faithful to the radicals: after this he represented Magdeburg and Frankfurt-on-hlain in the Prussian, and Meiningen in the German, parliaments. His motion that Baden should be included in the North German confederation in Jan. 1870 caused much embarrassment to Bismarck, but probably hastened the crisis of 1870. His great work was his share in the judicial reform during the ten years 1867–77. To him more than to any other single individual is due the great codification of the law. He compelled the government to withdraw or amend many proposals which seemed dangerous to liberty, but opposed those liberals who, unable to obtain all the concessions which they called for. refused to vote for the new laws as a whole. A speech by Lasker on Feb. 7, 1873, attacking the management of the Pomeranian railway and the revelations which followed led to the fall of Hermsnn Wagener. one of Bismarck's most trusted assistants. This episode is generally regarded as the beginning of the reaction against economic liberalism by which he and his party were to be deprived of their intluence. He refused to follow Bismarck in his financial and economic policy after 1878; always unsympathetic to the chancellor, he was now selected for his most hitter attacks. In 1879 he lost his seat in the Prussian parliament; he joined the *Sezession,* but was ill at ease in his new position. He died suddenly in New York on Jan. 5, 1884.

LASKI, the name of a noble and powerful Polish family, is taken from the town of Lask, the seat of their lordship.

JAN LASKI, the elder (1456–1531), Polish statesman and ecclesiastic, took orders at an early age, and in 1495 was secretary to the Polish chancellor Zawisza Kurozwecki, in which position he acquired both influence and experience, and was sent on important diplomatic missions to Rome in 1495 and again in 1500, and once on a special embassy to Flanders, of which he has left an account. On the accession to the Polish throne in 1501 of the indolent Alexander, who had little knowledge of Polish affairs and chiefly resided in Lithuania, Laski was appointed by the senate the king's secretary, in which capacity he successfully opposed the growing separatist tendencies of the grand-duchy and maintained the influence of Catholicism, now seriously threatened there by the Muscovite propaganda. In 1503 his king appointed him chan-

cellor, in which capacity Laski supported the *szlachta,* or country-gentlemen, against the lower orders, going so far as to pass an edict excluding henceforth all plebeians from the higher benefices of the church. In 1511 Laski became archbishop of Gnesen, and thus primate of the Polish Church. He carried out difficult negotiations for King Sigismund I. with the Teutonic Knights with conspicuous ability, which he also displayed at the Lateran Council convened by Pope Julius II. in 1513, where he attended to plead the cause of Poland against the Knights.

This mission was equally profitable to his country and himself, and he succeeded in obtaining from the pope for the archbishops of Gnesen the title of *Legati nati.* In his old age Laski's partiality for his nephew, Hieronymus, led him to support the candidature of John Zapolya, the protégé of the Turks, for the Hungarian crown so vehemently against the Hapsburgs that Clement VII. excommunicated him, and the shock of this disgrace was the cause of his sudden death in 1531. Of his numerous works the most noteworthy are his collection of Polish statutes entitled *Statuta provinciae gnesnensis antiqua,* etc. (Cracow, 1525–28) and *De Ruthenorum nationibus eorumque erroribus,* printed at Nuremberg.

HIERONYMUS JAROSLAW LASKI (1496–1542), Polish diplomatist, nephew of Archbishop Laski, was successively palatine of Inowroclaw and of Sieradia. On the death of Ladislaus V. (*q.v.*), Laski, contrary to the wish of his own sovereign, Sigismund I., who favoured the Hapsburgs, entered the service of John Zapolya, the rival claimant, thus seriously compromising Poland both with the emperor and the pope. Laski acted as Zapolya's envoy to Paris, Copenhagen and Munich, and finally to the Sultan, under whose protection Zapolya had placed himself. On his way to Constantinople he was attacked and robbed both of his credentials and the rich presents he was bearing to the Sultan. In spite of this, he persuaded the Sultan to recognize Zapolya, and even, on his own authority, concluded a ten years' truce between his old master King Sigismund of Poland and the Porte. He then returned to Hungary at the head of 10,000 men, with whose aid he enabled Zapolya to re-establish his position and defeat Ferdinand. He was rewarded with the countship of Zips and the governor-generalship of Transylvania. But his influence excited the jealousy of the Magyars, and Zapolya was persuaded to imprison him. On being released by the interposition of the Polish grand hetman, Tarnowski, he became Zapolya's most violent opponent. Shortly after his return to Poland, Laski died suddenly at Cracow, probably poisoned by one of his innumerable enemies.

JAN LASKI, the younger (1499–1560), also known as *Johannes a Lasco,* Polish reformer, son of Jaroslaw (d. 1523) voivode of Sieradia and nephew of Archbishop Laski, while studying abroad made the acquaintance of Zwingli and Erasmus and returned to Poland in 1526 saturated with the new doctrines Nevertheless, he took orders, and owing to the influence of his uncle obtained the bishopric of Veszprem in Hungary from King John Zapolya, besides holding a canonry of Cracow and the office of royal secretary. In 1531 he resigned all his benefices rather than give up a woman whom he had secretly married, and having incurred general reprobation and the lasting displeasure of his uncle the archbishop, he fled to Germany, where ultimately (1543) he adopted the Augsburg Confession. For the next 13 years Laski wandered through western Europe, preaching the new doctrines and urging Poland to adopt them. In 1556. during the brief triumph of the anti-Catholics, he returned to Poland, took part in the synod of Brzesc, and published a number of important polemical works.

LAS PALMAS, the capital of the Spanish island of Grand Canary, in the Canary archipelago, 28° 7′ N. and 5° 24′ W. With pop. (1960 est.) of 193,984 (mun.), it is the largest city in the Canarv islands, and is the capital of one part of the group Its bishop is subordinate to the archbishop of Seville. The palms from which the city derives its name are still characteristic of the fertile valley which it occupies. Las Palmas is built on both banks of a small river, and although parts of it date from the 16th century. it is on the uhole a clean and modern city, aell drained. and suppliecl with pure water, conveyed by an aqueduct from the highlands of the interior. Its principal buildings include a handsome cathedral, founded in the 16th century but only completed in the 19th, a theatre, a museum, an academy of art, and several hospitals and good schools. The modern development of Las Palmas is largely due to the foreign merchants, and especially to the British who control the greater portion of the local commerce. La Luz. the port, is connected with Las Palmas by a railuay 4 mi. long. It is strongly fortified. The harbour, protected by the promontory of La Isleta, which is connected with the mainland by a narrow bar of sand, can accommodate the largest ships, and affords secure anchorage in all weathers. Ships can discharge at the breakwater (1,257 yd. long) or at the Santa Catalina mole, constructed in 1883–1902. The minimum depth of water alongside the quays is 4½ ft.

The chief exports are fruit, vegetables, sugar, wine and cochineal; coal, iron, cement, timber, petroleum, manure, textiles and provisions are ordinarily the chief imports. (*See* also CANARY ISLANDS.)

LASSALLE, FERDINAND (1825–1864), German Socialist, of Jewish extraction, was born at Breslau on April 11, 1825. He took a keen interest in public affairs, and early resolved to devote himself to the realization of democratic liberty; but after studying at Berlin university, where his brilliance gained for him the name of *Das Wunderkind,* he joined the group of Young Hepelians, and settled down to a scholastic career. His meeting with the Countess Sophie von Hatzfeldt in 1846, however, plunged him into a life of activity, and his prosecution of her suit throughout the next 11 years, in a trial for separation and alimony against her husband. Edmund von Hatzfeldt-Wildenburg, constitutes one of the most dramatic episodes in Lassalle's meteoric career. His only other entrance into public life during this earlier period was in 1848, when he suffered imprisonment for his revolutionary activities. For the most part these years were spent in study and the completion of his three most famous works. In 1857, he published *Die Philosophie Herakleitos dargestellt,* a study of Heraclitus from the Hegelian point of view; this was followed in 1859 by a pamphlet on *The Italian War and Prussia's Mission,* in which Bismarck's policy is foreshadowed; while in 1861 appeared *Das System des erworbenen Rechts,* a brilliant treatise on property.

In the following year began the short-lived activity which was to give Lassalle an historical significance. At that time, when political life in Germany was paralysed by the opposition of the Prussian Liberals to Bismarck's constitutional changes, Lassalle came forward as the antagonist of both Government and Opposition. Seeing an opportunity to realize his youthful ideals, and to fight for democracy, he called on the German workers to form their own party and to concentrate on their political and economic emancipation. The two main points in his programme were universal suffrage and a form of State Socialism, but he regarded the latter as the more important, the former being merely a means to that end. For two and a half years he struggled to arouse the workers from their apathy, and by means of pamphlets and speeches, succeeded in inflaming the country, particularly in the Rhineland area, where he was received with enthusiasm. His most important publications at this time were *The Working Man's Programme* (1862), and *The Open Letter* (1863), a succinct statement of the principles which should guide the workers in their establishment of a new era. In 1863, Lassalle founded the *Allgemeiner Deutscher Arbeiterverein,* the embryo of the German Social Democratic Party, a permanent memento of his work.

He died on Aug. 31, 1864, from a wound received in a duel at Carouge, Geneva. The duel arose from a love affair, which is familiar to English readers from its treatment by George Meredith in the *Tragic Comedians.* Although a champion of the working classes, Lassalle was a great figure in society In the summer of 1864 he met in Switzerland Fraulein von Donniges, for whom he had had earlier in Berlin a passion which mas fully reciprocated. She was the daughter of the Bavarian envoy at Geneva, who would not hear of Lassalle as a suitor, and she was married, under pressure, to the Wallachian Count von Racowitza. Thereupon Lassalle challenged the father and the husband. The challenge was accepted by Racowitza, and the duel proved fatal.

Lassalle left no clear exposition of his theories, and it was only after his death that an examination of his letters and writings revealed his capacity both as a thinker and an agitator. During his years of study (1848–62), he worked out his philosophy of life, but as a propagandist he subordinated his philosophy to the needs of the moment. His investigations into the history of man led him to conceive of three stages of development: the ancient and feudal, which, through the subjection of the labourer, sought solidarity without freedom; the reign of capital and the middle classes, established in 1789, which sought freedom by destroying solidarity; and the new era, beginning in 1848, which would reconcile both by the introduction of the principle of association. But by association, Lassalle meant productive associations of working men under the benevolent guidance of the State, not the co-operative institutions which were then being organized by Schulze-Delitzsch, to which he was bitterly opposed.

But if, as a propagandist, Lassalle merely accepted the orthodox political economy, as a thinker he made several valuable contributions to economic theory. His explanation of trade cycles, or, as he called them, conjunctures, though incomplete, is yet worthy of consideration; while his discussion of property, which he maintained is an historical category, and of capital, was developed by later socialist writers. It must be admitted, however, that Lassalle's greatest work is in the political sphere, and it is as a propagandist who successfully placed a socialist programme before the German workers, and who succeeded in forming the first effective socialist party, that he will chiefly be remembered.

Lassalle's most important works, apart from those already mentioned are: *Über Verfassungswesen; Arbeiterprogramm; Zur Arbeiterfrage; Arbeiterlesebuch; Herr Bastiat-Schulze von Delitzsch, oder Kapital und Arbeit.* His *Collected Works* appeared at Leipzig (1899–1901).

The best biography of Lassalle is H. Oncken's *Lassalle* (Stuttgart, 1904); another excellent work on his life and writings is George Brandes' Danish work, *Ferdinand Lassalle,* Ger. trans., 4th ed. (1900). *See* also A. Aaberg, *Ferdinand Lassalle* (1883); C. v. Plener, *Lassalle* (1884); G. Meyer, *Lassalle als Sozialokonom* (1894); Brandt, *F. Lassalles Sozialokonomische Anschauungen und praktische Vorschläge* (1895); Seillière, *Etudes sur Ferdinand Lassalle* (1897); *E.* Bernstein, *Ferd. Lassalle und seine Bedeutung für die Arbeiterklasse* (1904). For details of his private life *see* Helene von Racowitza, *Meine Beziehungen zu F. Lassalle;* B. Becker, *Enthüllungen über das tragische Lebensende F. Lassalles;* A. Kutschbach, *Im Anschluss an die Memoiren der H. von Racowitza. See* further W. H. Dawson, *German Socialism and Lassalle* (1888); *K.* Haenisch, *Lassalle; Mensch und Politiker* (1925). (T. Kr.)

LASSELL, WILLIAM (1799–1880), English amateur astronomer whose name is linked with those of Sir William Herschel and Lord Rosse in connection with the development of the reflecting telescope, was born at Bolton, Lancashire. on June 18. 1799. Educated at the Rochdale academy, he served a seven-year apprenticeship before starting his brewery business about 1825. Lassell became interested in astronomy through his aptitude for invention. In 1844 he constructed a two-foot reflector. with uhich he discovered the satellite of Neptune in 1846. In 1848 he found (simultaneously with G. P. Bond) the eighth satellite of Saturn and, in 1851, two satellites, Cmbriel and Ariel, of Uranus. In 1861 he erected a four-foot reflector at Malta. with which he catalogued hundreds of new nebulae. He was elected a fellow of the Royal society in 1849 and was president of the Royal Astronomical society in 1870–72. He died at Maidenhead on Oct. j, 1880. (O. J. E.)

LASSEN VOLCANIC NATIONAL PARK, in northeastern California, approximately 135 mi. N.W. of Reno. Nev.. has as its principal attraction Mt. Lassen (10,457 ft.), the only volcano active within the Cnited States (excluding Alaska and Hawaii). after 1851.

Lassen's first eruptions of the 20th century began without warning on the morning of May 30, 1914. Volcanic ash, steam, and small amounts of lava were produced intermittently for a year. On May 19, 191j, larger explosions occurred and hot lava spilled a thousand feet down the mountain, melting snow and causing mudflows. Three days later a blast of hot gases blew down many trees. The last eruptions occurred in 1921. Evidence suggested the possibility of a 65-year cycle for volcanic activity in the area.

Geologically, Mt. Lassen is the most southerly major peak in the youthful volcanic Cascade range. Lassen is composed primarily of lavas. the oldest being perhaps 2.000,000 years old. The mountain is a rare dome type of volcano, whose top was formed from relatively viscous lavas. Cinder Cone: nearby. was active in 1851. and Chaos Crags is believed to be the result of volcanic activity in 1720.

An area of 105,922 ac. around Mt. Lassen was set aside as a national park by congress on Aug. 9, 1916. The park is a wildlife refuge. Mule and blacktail deer, bear. and smaller mammals may be seen. Fishing is permitted with a state licence.

The distance to the park from Redding, Red Bluff or Susanville, Calif.. is less than 50 mi. Campsites and a variety of accommodations are available in and near the park. (J. E. Cl.)

LASSO (LASSUS), ORLANDO (*c.* 1530–1594). Belgian musical composer. whose real name was probably Roland Delattre, was born at Mons in Hainault, not much earlier than 1532. He seems to have visited England in 1554 and to have been introduced to Cardinal Pole, to whom an adulatory motet appears in 1 jj6.

His first book of motets appeared at Antwerp in 1556, containing the motet in honour of Cardinal Pole. The style of Orlando had already begun to purify itself from the experimental incongruities that led Burney, who seems to have known only his earlier works, to call him "a dwarf on stilts" as compared with Palestrina. But where he is orthodox he is as yet stiff. and his secular compositions are, so far, better than his more serious efforts. In 1557, if not before, he was invited by Albrecht IV, duke of Bavaria, to go to Munich. The duke was an intelligent patron of the fine arts, a notable athlete, and a man of strict principles. Munich now became Orlando's permanent home; though he sometimes paid long visits to Italy and France. whether in response to royal invitations or with projects of his own. In 1558 he made a happy marriage by which he had four sons and two daughters. The four sons all became good musicians; and the two eldest (under the patronage of Duke Maxiinilian I, the second successor of Orlando's master) published the enormous collection of Orlando's Latin motets known as the Magnum opus musicum.

Like Haydn at Esterhaz, but in no provincial isolation, Orlando at Munich worked out his art under ideal circumstances. His duty was to make music all day and every day, and to make it according to his own taste. Nothing was too good, too severe or too new for the duke. Church music was not more in demand than secular. Instrumental music, which in the 16th century had hardly any independent existence, accompanied the meals of the court; and Orlando would rise from dessert to sing trios and quartets with picked voices. The daily prayers included a full mass with polyphonic music. Such things were possible in those days. for 16th century music was no sooner written than it could be performed, entailing as little expense and preparation as a game of billiards in a good billiard room. From Munich Orlando's fame radiated throughout Europe, and every contemporary authority attests that he was received with acclamation wherever his travels took him. Experience rapidly taught him a style as pure as Palestrina's, without narrowing his range or curbing his originality. He was omnivorous of the literary culture of the time; and during his stay at the court of France in 1571 he became a friend of the poet Ronsard.

In 1579 Duke Albrecht died. Orlando's salary had already been guaranteed to him for life, and the new duke mas very kind to him. But the loss of his master was a great grief and seems to have checked his activity for some time. In 1589, after the publication of six Masses, ending with a beautiful Missa pro defunctis. his strength began to fail; and a sudden serious illness left him alarmingly depressed and inactive until his death on June 14, 1594.

If Palestrina represents the supreme height attained by 16th century music, Orlando represents the whole century. The swiftness of his intellectual and artistic development is astonishing. His first four volumes of madrigals show but an intermittent sense of beauty. Many a number in them is a solid mass of "false relations" between twin maior and minor chords. such as make an unenviable mark of distinction between English styles and the purity of the Italians. In the Italian madrigal (as distinguished

from the *villanella* and other light forms), Orlando seldom attained or attempted a pure style, though some of his later madrigals are indeed glorious. But in his French chansons, many of which are settings of the poems of his friend Ronsard, his wit and deftness are unfailing, and it would be worth while to find appropriate but decent texts for those compositions, German, French and Italian, which modern singers cannot sing to the gross original words. In 1562 when the Council of Trent was censuring the abuses of Flemish church music, Orlando had already purified his ecclesiastical style; though he saw no reason why it should cease to be Flemish. At the same time Orlando's Masses are not among his greatest works. Perhaps the uses of Duke Albrecht's private chapel mere less favourable to finely proportioned liturgical music than the uses of metropolitan Rome. But, in any case, the music of a 16th century Mass demands, before all other technical qualities, the power of composition. No power of illustration can replace power of composition where the composer has to deal with a text of universal import. And Orlando is primarily not a composer, but an illustrator.

Palestrina and Victoria are as inveterate composers as Beethoven and Schubert. When Palestrina is uninspired his composition remains efficient; and when Victoria is uninspired his composition becomes diffuse. Dullness results in both cases. The uninspired Orlando does not become dull, though he may become very ugly. But he reveals to us that he is not normally a composer at all. Like Max Reger, he can sit down to write, with nothing in his head, and brew a kind of musical audit-ale alarming in its concentration. But for him, as for the listener, a long pull at such stuff is impossible. When inspiration comes, the gift of composition comes with it: the sections coalesce and relieve each other with incalculable variety of proportion in forms uniquely right; and the inveterate illustrator is not repressed but raised to a sublime activity. In the wonderful "Justorum animae" (Magnum opus No. 266 [301]) the rhythms of "sunt in pace" become vast like the beating of an angel's wings in space. It is one of the supreme passages in music, and is perfectly poised upon its context. Orlando can also become a composer on less powerful impulse. His high spirits will suffice, together with his Shakespearian love of puns, for which the solmization syllables "ut, re, mi, fa, sol, la" give abundant musical opportunities. It is not surprising, then, to find him enjoying caricature, and setting a whole Latin poem written exclusively in false quantities; and making a long motet out of the words "super flumina Babylonis" spelled syllabically (s, u—su; p, e, r—per—super). Even these follies become musical and when the text is itself inspired by genuine high spirits Orlando again rises to power of composition. His setting of Walter de Mapes's "Fertur in conviviis" (given in the Magnum Opus with a stupid moral derangement of the text), and most of his French chansons, are among the most deeply humorous music in the world.

If 16th-century music could have covered the range of 16th-century drama or of 19th-century symphony and opera, Orlando might more easily have proved that his humour came from a Shakespearian understanding of the sublime. His Penitential Psalms stand with Josquin Des Prés's Miserere and Giovanni da Palestrina's first book of Lamentations as artistic monuments of 16th-century penitential religion, just as Johann Bach's Matthew Passion stands alone among such monuments in later art. Yet the passage (quoted by Sir Hubert Parry in vol. 3 of the *Oxford* History of *Music*) "Nolite fieri sicut mulus" is one among many traits which are grotesquely descriptive without losing harmony with the austere depths of their context. Such music, if only from its peculiar technique of crossing parts and unexpected intervals, is exceptionally difficult to read; and thus intelligent conducting and performance of it are rare.

Orlando's works as shown by the plan of Breitkopf and Härtel's complete critical edition (begun in 1894) comprise: (1) The Magnum Opus blusicum, a posthumous collection containing Latin pieces for from 2 to 12 voices, 516 in number (or, counting by single movements, more than 700); not all of these are to the original texts. The Magnum Opus fills 11 volumes. (2) Five volumes of madrigals, containing six books, and a large number of single madrigals, and about half a volume of lighter Italian songs (villanellas, etc.). (3) Three volumes (not four as in the prospectus) of French chansons. (4) Two volumes of German four-part and five-part Lieder. (5) Serial church music: three volumes, containing Lessons from the Book of Job (two settings); Passion according to St. Matthew (*i.e.*, like the Passions of Victoria and Soriano. a setting of the words of the crowds and of the disciples); Lamentations of Jeremiah; Morning Lessons; the Officia printed in the third volume of the Patroncinium (a publication suggested and supported by Orlando's patrons and containing eight entire volumes of his works); the Seven Penitential Psalms; German Psalms and Prophetiae Sibyllarum. (6) One hundred Magnificat~(Jubilus B. M. Virginis) 3 vol. (7) Eight volumes of masses. (8) Two volumes of Latin songs not in the Magnum Opus. (9) Five volumes of unpublished works. (D. F. T.)

LASSO (Span. *lazo,* snare, ultimately from Lat. laqueus, cf. "lace"), a rope 60 to 100 ft. in length nith a slip noose at one end, used in the Spanish and Portuguese parts of America and in the western United States for catching wild horses and cattle. It is now less employed in South America than in the vast grazing country west of the Mississippi river, where the herders, called locally cowboys or cowpunchers, are provided with it. When not in use, the lasso, called rope or lariat in the west, is coiled at the right of the saddle in front of the rider. When an animal is to be caught, the herder, galloping after it, swings the coiled lasso around his head and casts it straight forward in such a manner that the noose settles over the head or around the legs of the quarry, when it is speedily brought into submission.

LASUS, Greek lyric poet, of Hermione in Argolis, flourished about 510 B.C. A member of the literary and artistic circle of the Peisistratidae, he was the instructor of Pindar in music and poetry and the rival of Simonides. He developed the structure of the dithyramb, made it more mimetic in character and enlarged its scope beyond the story of Dionysus. He also instituted prize contests.

Athenaeus (xiv, 624 E) has preserved a fragment of one of his poems, a hymn to Demeter of Hermione.

Lasus was also the author of the first theoretical treatise on music

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LAS VEGAS, a city of Nevada, U.S., 288 mi. from Los Angeles, Calif.; the seat of Clark county. A unique desert community, it is famous for "the strip," an array of luxurious resort-hotels lining both sides of the highway to Los Angeles; several blocks of "downtown" casinos flourish under state-legalized gambling. Nearby Lake Mead National recreational area, Death Valley National monument, and skiing near Mt. Charleston (11,910 ft.) provide additional tourist attractions.

Las Vegas is in a section of southern Nevada detached from Arizona territory and accepted by Nevada in 1867. Mormons from Utah were the first settlers, drawn there by the presence of artesian waters in the arid valley along the Old Spanish trail—hence the name Las Vegas, "the meadows." With the coming of the San Pedro, Los Angeles & Salt Lake railroad (now the Union Pacific). Las Vegas became a railroad town in 1905 and was incorporated in 1911. A stimulant to the economy of the area was the construction, 29 mi. E., of Hoover dam in Black canyon on the Colorado river, authorized by the Boulder Canyon Project act of 1928, which, together with nearby Boulder City became an established and popular tourist attraction.

During World War II a magnesium reduction plant was constructed by the federal government at Henderson, midway between Hoover dam and Las Vegas. There hydroelectric power was employed in processing magnesium ore from interior Nevada. Subsequently Kevada purchased the facilities and leased them to chemical, titanium, sponge and mineral-treating industries. The Las Vegas bombing and gunnery range, established at the same time, lies 40 mi. N.W.; a portion of it (Nevada test site) has been used by the Atomic Energy commission for atomic detonations.

Educational facilities at Las Vegas include Nevada Southern, a

regional division of the University of Nevada. The city has a council-manager form of government, in effect from 1943.

The population grew from less than 10,000 before World War II to 64,405 in 1960. North Las Vegas, 2 mi. N., between Las Vegas and Nellis air force base, also experienced a population boom (for comparative population figures *see* table in NEVADA: *Population*).

(A. J. PR.)

LAS VILLAS, a province in central Cuba between Matanzas and Camagüey provinces. It consists of the Trinidad mountains (which rise to 3,800 ft.) in the south, hilly sections northeast of the mountains, and plains in the north and west, including the Zapata peninsula. The northern coast contains a chain of numerous cays on a wide platform bordered by coral reefs; main ports in the north are Caibarién and Isabela. The excellent Bay of Cienfuegos is on the southern coast.

The province has the most diversified agriculture in Cuba, consisting of large production of sugar cane, tobacco, coffee, rice, and maize. Varied industries, such as alcohol distilleries, tanneries, tobacco factories and chemical plants, have been developed in the principal cities of Santa Clara, the capital, Cienfuegos, Sancti Spíritus, Sagua la Grande, and Placetas. Pop., province (1961 est.), 1,121,800; area, 8,267 sq.mi. The name was changed from Santa Clara province in 1940. (D. R. D.)

LASWARI, a village in Alwar district, Rajasthan state, about 80 mi. S. of Delhi, the scene of one of the decisive battles of India. It was fought on Nov. 1, 1803, between the British, under Gen. Gerard Lake, and the Maratha troops of Sindia, consisting of the remnants of Perron's battalions. It was one of the most evenly contested battles ever fought between the British and the Indians, and ended in a complete victory for the British. Pop. (1960) 699.

LASZLO DE LOMBOS, PHILIP ALEXIUS (1869–1937), naturalized British painter who gained international fame for his portraits of eminent men, was born in Budapest, Hung., on Jan. 6, 1869. He studied there in the Industrial Art school and at the Budapest academy under B. Székely and K. Lotz. He went in 1890 to Munich, where he was a pupil of A. Liezenmayer, and in 1891 to Paris, where he studied under J. Lefebvre and B. Constant. He was awarded gold medals at the Paris Salon in 1899 and 1900. His work afterward brought him many other awards and honours.

Among his best known subjects were King Edward VII, Kaiser William II, Theodore Roosevelt, Woodrow Wilson, George V, Pope Leo XIII and Benito Mussolini. He died in Hampstead, Eng., on Nov. 22, 1937.

See P. A. Laszlo De Lombos, *Painting a Portrait* (1934).

LATACUNGA (in local parlance, TACUNGA), a plateau town of Ecuador, capital of the province of Cotopaxi, 46 mi. S. of Quito, near the confluence of the Alagues and Cutuchi to form the Patate, the headstream of the Pastaza. Pop. (1959 est.) 23,000, largely Indian. Latacunga is on the Pan-American highway and the Guayaquil-Quito railway. It is 9,141 ft. above sea level; its climate is cold and unpleasant, because of the winds from the neighbouring snow-clad heights, and the barren, pumice-covered tableland on which it stands. Cotopaxi is only 25 mi. distant, and the town has suffered repeatedly from eruptions. Founded in 1534 it was four times destroyed by earthquakes between 1698 and 1798.

LA TAILLE, JEAN DE (*c.* 1540–1608), French poet and dramatist, was born at Bondaroy. He began his career as a Huguenot, but afterward adopted a mild Catholicism. He was wounded at the battle of Arnay-le-Duc in 1570, and retired to his estate at Bondaroy, where he wrote a political pamphlet entitled *Histoire abrégée des singeries de la ligue,* often published with the *Satire Ménippée.* His chief poem is a satire on the follies of court life, *Le Courtisan retiré;* he also wrote a political poem, *Le Prince nécessaire.* In 1572 appeared his tragedy of *Saül* (written several years earlier, probably by 1562), with a preface on *Traité de la tragédie.*

Like Étienne Jodelle, Jacques Grévin, Jean de la Péruse and their followers, he wrote for the limited audience of a lettered aristocracy. He therefore depreciated the native drama and insisted on the Senecan model.

In his preface La Taille enunciates the unities of place, time and action; he maintains that each act should have a unity of its own and that the scenes composing it should be continuous; he objects to deaths on the stage on the ground that the representation is unconvincing, and he requires as subject of the tragedy an incident really terrible, developed, if possible, by elaborate intrigue. He criticizes, *e.g.,* the subject of the sacrifice of Abraham, chosen by Théodore de Bèze for his tragedy (1551), as unsuitable because "pity and terror" are evoked from the spectators without real cause. If in *Saül* he did not completely carry out his own convictions he developed his principal character with great ability. A second tragedy, *La Famine ou les Gabéonites* (1573), is inferior, but is redeemed by the character of Rizpah. He was also the author of the two comedies, *Le Négromant* and *Les Corrivaux,* both written apparently by 1562 but not published until 1573. *Les Corrivaux* is remarkable for its colloquial prose dialogue.

His brother, JACQUES DE LA TAILLE (1542–1562), composed a number of tragedies, of which *La Mort de Daire* and *La Mort d'Alexandre* (both published in 1573) are the chief. He is best known by his *Manière de faire des vers en français comme en grec et en latin,* an attempt to regulate French verse by quantity. He died of plague. His *Poésies diverses* were published in 1572.

The works of Jean de la Taille were edited by René de Maulde (4 vol., 1878–82). *See* also T. A. Daley, *Jean de la Taille. Étude historique et critique* (1934).

LATAKIA (FR. LATTAQUIÉ), a seaport of Syria, opposite the island of Cyprus, pop. (1953 est.) 48,984. The ancient Phoenician name was Ramitha and it received the name Laodicea from Seleucus Nicator with the addition *ad mare* to distinguish it from five others. In the Roman period it was favoured by Caesar and took the name Julia. The town received the *jus italicum* from Severus. In Christian times it became the see of a bishop. In the period of the crusades it was a wealthy city, fell to Tancred (1102) and was recaptured by Saladin (1188). A Christian settlement there which had been granted certain privileges was driven forth by Sultan Kalaūn. Its fortunes, gradually receding, were at a low ebb in the 16th century, but trade (notably tobacco) brought a new revival of prosperity in the following century.

Latakia has suffered much damage from earthquakes (1170, 1287, 1822).

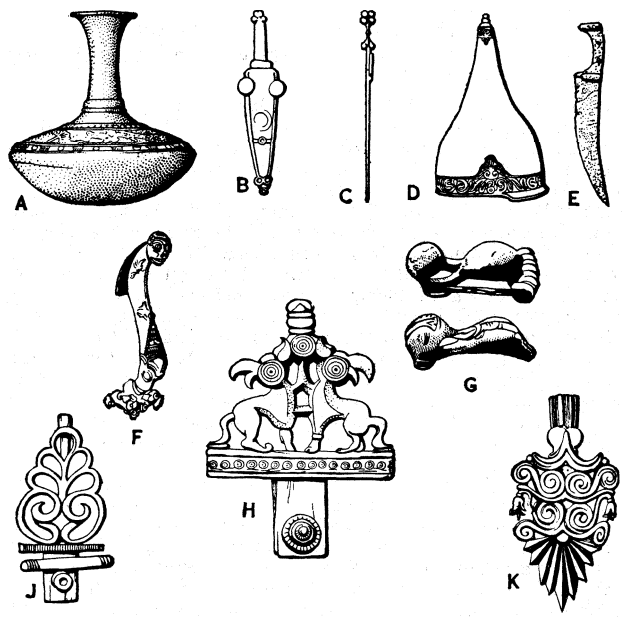
In classical times its slopes were covered with vines. It had, for those times, a good harbour and the native wine was much exported. On its looms a celebrated kind of linen was manufactured and cloaks and cloths from Laodicea commanded a good price. The chief object of archaeological interest is a triumphal arch probably of the time of Septimius Severus. Four Corinthian pillars with entablature perhaps belonged to the portico of a temple. The chief modern industry is the cultivation of Latakia tobacco and other industries include silk, oil, poultry and sponge fishing. Formerly it produced a beautiful type of rug.

During the French occupation of the country under the League of Nations mandate the littoral north of Lebanon was made into a territory of the 'Alawiyin with Latakia as centre of administration (1920) and later erected into a state (1922). The present administrative district of Latakia has a population (1960) of 524,000 and an area of 1,753 sq.mi. (E. Ro.)

LA TÈNE (THE SHALLOWS), the eponymous site for the archaeological name of the Celtic culture of the late Iron Age at the east end of the Lake of Neuchâtel (Switzerland). The finds collected there belong to an advanced stage of Celtic culture, the origin of which is a much-discussed problem. But there can be no doubt of the connection of Celtic culture with a late western species of the middle European early Iron Age. The rise of Celtic typology is a result of the reaction of this species on Graeco-Etruscan influences crossing the Alps from northern Italy and modifying the latest phase of northeast France's and southwest Germany's early Iron Age. The accumulation of early Celtic pottery and metalwork in this area gives well-established archaeological evidence of the cultural revival during the second half of the 5th century B.C. As P. Jacobsthal demonstrated, Graeco-Etruscan oenochoae, stamnoi, dishes and red-figured pottery did

not find their way to the north Alpine zone before 450 B.C. As the spreading out of Celtic peoples with a fully developed cultural pattern is chronologically fixed by Roman writers (notably Livy) in the first years of the 4th century B.C. (Rome. 390 B.C.), so the origin and formation of Celtic culture have to be traced back to the short period between 450 and 400 B.C. This is the first period of La Tkne culture, or P. Reinecke's La Tine A. It is possible to divide La Tine A into two substages: A_1, or the time of the contamination of Graeco-Etruscan imports and ideas with north Alpine tradition; and A_2, or the time of stabilization of the new pattern.

The 4th century B.C. (Reinecke's La Tine B) is the period of the extended migrations of the Celtic peoples on both sides of the Alps. La Tène culture therefore may be said to extend well into France, into the northeastern parts of the Iberian peninsula, into north and central Italy and also into Switzerland. south Germany, Czechoslovakia, Austria and Hungary. In England, the



A. E, F, G. FROM LINDENSCHMIT, "DIE ALTERTUMER UNSERER HEIDNISCHEN VORZEIT" (ZABERN); B, D, H, J, K. FROM DECHELETTE, "MANUEL D'ARCHÉOLOGIE PRÉHISTORIQUE" (LIBRAIRIE ALPHONSE PICARD); C. FROM KOSSINNA, "GESELLSCHAFT FLR DEUTSCHE VOR-GESCHICHTE."

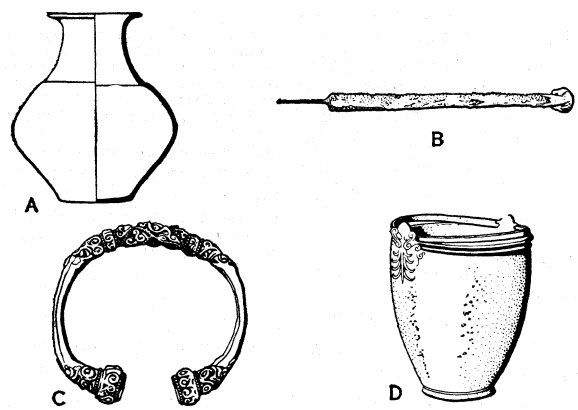
FIG. 1.— POTTERY AND BRONZE OF THE EARLIEST LA TÈNE PERIOD (C. (450–390 B.C.)

A. Lenticular pottery flask: B. Short dagger-sword; C. Long sword; D. High conic helmet; E. Heavy knife (Hiebmesser); F. & G. Mask and bird-headed fibulae; H, J, K. Girdle clasps

first real Celtic infiltrations appeared during this time. The migrations connected the Celtic peoples with many others, notably the west European stock of pre-Indo-European origin in west France and England, the Ligurians in south France, the Hamitic Iberians in Spain, the Mediterranean Etruscans in north and central Italy, the Italians in central Italy, the Venetians in northeast Italy, the Illyrians in south Germany, Czechoslovakia and Austria and the Scyths and Thracians in Hungary and in the Balkans. The reactions caused by this multiple concurrence of different cultural and ethnic provenances are a valuable help in determining the many peoples of Celtic culture existing from the late 4th century B.C. to the 2nd century B.C.—the La Tène C of Reinecke's chronology. Archaeological evidence is very scanty from the most easterly branches of Celtic culture in Greece (279 B.C., Delphi) and Asia Minor (278 B.C.). The progress of Roman power during the 2nd century B.C. (222. Cisalpine Gaul; 181, Liguria; 121, Narbonensis) is the first step in the decline of Celtic glory which was finally extinguished on the continent by Caesar (50, Gaul). Drusus and Tiberius (15, Noricum). This is Reinecke's La Tine D. Celtic (La Tene) culture as a product of a certain historical and linguistic pattern therefore can be discerned only from the second part of the jth century B.C. onward. It must be emphasized that to trace back the Celtic culture to the 6th or 7th century B.C. is a hazardous procedure.

La Tène A (450–400/390 B.C.).—The origin of Celtic culture is geographically concentrated within the above-mentioned narrow area. There are found the rich group of "chieftains' graves" in tumuli as well as the simple inhumations. The chronology is based on the Graeco-Etruscan trade associated with anthropomorphic daggers, large heavy knives (Hiebmesser) and the *certosa* fibula and its derivatives, and with the typical Marne pottery embracing *vases carénés,* pedestalled globular pots and dishes. Ornamentation is achieved by scratching or painting the surface. The short 50-year period seems to have been enough to create the typical La Tène style characterized by S-shapes. spirals and round patterns with the mechanical repeated symmetry of every ornament. The La Tene style may be defined as a reaction of northern geometrism on southern naturalism represented by palmettes on the vessels. Scythian and Hallstatt influences are of only minor importance.

La Tène B (400/390–c. 300 B.C.).—The unity of the first period is now dissolved by the Celtic migrations. Four branches of La Tkne culture therefore may be distinguished: (1) the nuclear branch in La Tkne A territory. (2) the English branch in eastern England, (3) the Franco-Italian branch and (4) the north Alpine branch.



A. FROM LINDENSCHMIT, "DIE ALTERÜMER UNSERER HEIDNISCHEN VORZEIT" (ZABERN); B. & C FROM DECHELETTE. "MANUEL D'ARCHÉOLOGIE PRÉHISTORIQUE (LIBRAIRIE ALPHONSE PICARD); D. FROM "GUIDE TO EARLY IRON AGE ANTIQUITIES" (BRITISH MUSEUM)

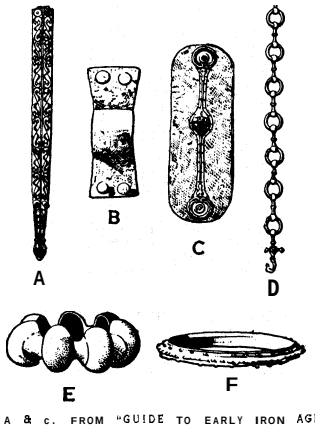
FIG. 2.— POTTERY AND METAL OF THE EARLY LA TÈNE PERIOD (C. 400–300 B.C.)

A. Large bottle-shaped urn. Rhenish; B. Short sword; C. Armlet; D. Bronze bucket found at Waldalgesheim, Coblenz

(1) The nuclear branch remained on the cultural stage of the 5th century B.C., continuing and enlarging the former standard. This is proved by the evolution of Marne pottery as well as by the local imitations of Graeco-Etruscan oenochoae by Celtic bronzesmiths. The shapes of tankards nith beak-shaped rims are accommodated to those of Marne pottery, as may be seen by the globular specimens from Waldalgesheim (Germany), Eigenbilsen (Belgium). Le Cdtillon (France) and the towered specimens from Bouzonville (Lorraine) and Hallein (Austria). (2) The English branch's pottery (belonging to early Iron Age B of local chronology) gives good information about the connections existing between Armorica (Brittany) and Britain by furnishing a rich group of pottery with scratched ornaments of La Tène style. (3) The Franco-Italian branch had not yielded sufficient material for a ell-founded diagnosis by the early 1950s, although the adaptation of aboriginal shapes of Etruscan provenance was probable. (4) For the north Alpine branch such a process is unquestionable. The first adaptation of the potter's nheel for the clumsy urns of Hallstatt tradition results in a distinguished series of flask-like vessels nith well-polished surfaces and dishes with sealed ornaments on the inner surface (Braubacher *Schalen*). The Hallstatt tradition likewise is represented by the use of embossed bronze vessels and the continuation of situla style (sword from Hallstatt, upper Austria, situla from Kuffern, lower Austria). Long iron swords, lanceheads, heavy knives, La Tène-B fibulae (with foot bent back toward the bow), torques and armlets with "seal-top" terminals are as usual in the whole region of phase B

as the flat inhumations in coffins or covering of the body by stone heaps. The enrichment of the climax of La TPne art is demonstrated by almost innumerable decorated objects (*e.g.*, helmets, sword sheaths, torques, armlets, fibulae, bronze vessels and stone stelae).

La Tkne C (**c. 300–C. 100 B.C.**).—The four different branches of phase B are continued. but there is an evident crossing process between the aboriginals and the newcomers demonstrated by pottery shapes of different kinds and the adoption of cremation by branch 4. Burial customs are consequently no longer decisive for the ethnological determination of a La TPne complex. Among the chief metal types are long iron swords with decorated scabbards and cordiform shapes, warriors' iron chains as sword belts. broad-bladed. heavy spearheads, wooden shields with iron bosses and supporters, iron scissors. iron toraues with S-curved terminals, bronze fibulae with feet clasping the bow, women's bronze chain girdles and white glass armlets with a yellow paste on the inside. Armlets of lienite are rare. The first coins were brought to the Celts through the influence of the Macedonian and Greek colonies. This is the starting point for a typical La Tène coinage imitating the southern prototypes.

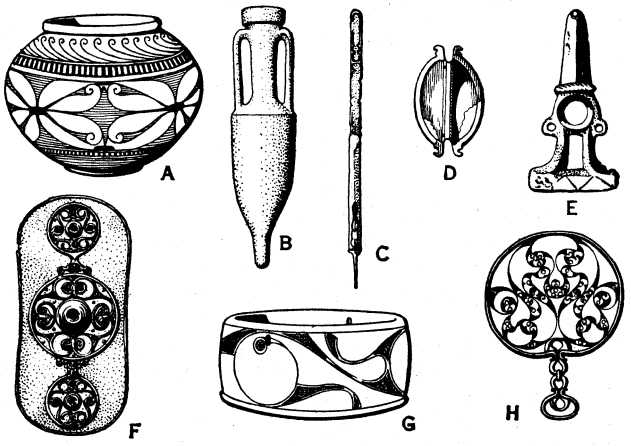


A & C. FROM "GUIDE TO EARLY IRON AGE ANTIQUITIES' (BRITISH MUSEUM); B, E, F. FROM LINDENSCHMIT, 'DIE ALTERTUMER UNSERER HEIDNISCHEN VORZEIT" (ZABERN); D. FROM DÉCHELETTE, "MANUEL D'ARCHÉOLOGIE PRÉHISTORIQUE" (LIBRAIRIE ALPHONSE PICARD)

FIG. 3.—METAL AND GLASS WORK OF THE MIDDLE LA TÈNE PERIOD (C. 300–100 B C.)

A. Finely decorated sword scabbard; B. Shield boss; C. Oblong shield: D. Chain girdle; E. Bronze armlet; F. Band-shaped glass bangle

La Tkne D (**c. 100–50/15 B.C.**).—Celtic power was now brought to an end by the perpetual pressure of German invaders from the north and by the Roman empire from the south. The Boii had to leave Bohemia, now the dominion of the Marcomanni, and



A, B, C, E. FROM DÉCHELETTE, "MANUEL D'ARCHÉOLOGIE PRÉHISTORIQUE" (LIBRAIRIE ALPHONSE PICARD); D, F, G, FROM "GUIDE TO EARLY IRON AGE ANTIQUITIES" (BRITISH MUSEUM); H. FROM "ARCHAEOLOGIA" (SOCIETY OF ANTIQUARIES OF LONDON)

FIG. 4.—POTTERY. METAL AND WOOD OF THE **LATE IA TENE PERIOD (C 100–50/15 B.C.)**

A. Painted continental pottery; B. Italian amphora; C. Long slashing sword; D. Ellipsoid iron shield boss; E. Clasp; F. Enamelled bronze shield from the Thames at Battersea; G. Wooden bowl (restored) from Glastonbury; .H. Mirror with engraved back, from Desborough, Northants

the Belgae caused a flourishing late La Tène culture in England by the transfusion of fresh Celtic blood from the continent. There the impoverishment of cultural standards is most easily recognized in the coarse, comb-lined pottery. Settlements give evidence of the typical peasant's implements: iron sickles, scythes, axes, saws, ploughshares, hammers and tweezers, the majority resulting from contact with Roman civilization. Silver coinage, based on Greek and Roman prototypes, is more abundant and a valuable source for the knowledge of Celtic personal names.

The La Tène D painted pottery seems to be a special product of branch 1. Branch 3 is enriched by early Roman pottery types (Arretine ware and Italian amphorae). Celtic culture survived only in Brittany, Wales and Ireland as the foundations of early medieval culture.

Settlements.— La TPne A and B had not furnished much material for the solution of this problem by the 1950s, but the use of open villages is probable.

La Tène itself is a fortified and garrisoned depot of the Helvetii, with selected weapons of phase C's military equipment. During the 1st century B.C. the Celts were erecting rampart fortifications on hilltops (*oppida*). The description of *murus gallicus* given by Caesar (De *Bello Gallico*) is verified by excavations on different *oppida*, the diffusion of which may be seen for the whole Celtic world north of the Alps: in Bibracte (France). Gleichberg bei Romhild (Thuringia), Manching (Bavaria). Stradonitz (Bohemia) and Oberleiserberg (lower Austria). There, in the eastern zones, *oppida* may have been built as defensive points against German raids.

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LATENT HEAT. The heat absorbed when unit mass of any substance changes its state *without* change of temperature; *e.g.,* when 1 gm. of ice at 0° C melts to form water at 0° C, 79.6 calories of heat are absorbed. Latent heat of fusion and latent heat of vaporization are the most familiar examples of the phenomenon, but a similar absorption (or liberation) of heat occurs in all changes of state, *e.g.,* sublimation, solution, dilution, expansion.

The term was introduced by Joseph Black, *c.* 1760. For details *see* the articles on HEAT; THERMODYNAMICS; STEAM: *Properties*

of Steam.

The mechanism of latent heat is explained by the kinetic theory of heat. which describes the motions of the atoms. As an example, nater is composed of atoms of hydrogen and oxygen in the ratio of two to one. These atoms are associated into groups called molecules, each group consisting of an oxygen atom and of two hydrogen atoms, one on each side, as H-0-H; the conventional chemical formula is thus written H_2O. As a result of the heat nhich water contains, within each molecule the atoms vibrate toward and away from each other like balls joined by spiral springs; the molecules themselves also rotate, bounce against and slide past one another in a random manner like rubber balls shaken in a basket. These two parts of the heat or thermal energy are referred to as kinetic energy in so far as they depend on the velocity of motion. Kinetic energy thus imparts a disruptive force to the molecules tending to make them fly apart from one another. This tendency is opposed by the forces of attraction between the molecules; and the balance between these two forces keeps the molecules separated at a certain average distance and provides a reservoir of potential energy. As contrasted with this fluid state, the molecules in ice are held relatively fixed in a regular ordered manner, analogous to a pile of uniform shot where each layer sits in the pattern of crevices of the layers immediately above and below; motion is primarily vibration or rocking which causes only momentary small displacements from these regular positions. As a result of this restricted arrangement, both the kinetic energy and potential energy are less in ice than in water; and in passing from the ordered state (ice) to the random state (liquid nater), the removal of the restrictions on motion is accompanied by a net increase in the energy content of each gram of water; and this additional energy is acquired by the absorption of heat from the surroundings. The heat thus absorbed is called the *latent heat of melting.* Similarly the *latent heat of vaporization* is due to the further removal of restrictions on motión in passing at the boiling point from the random state (liquid water) to the even more random state (water vapour) with consequent increases in kinetic and potential energy, as the average distance between molecules increases by a factor of 12.

Latent heat is measured most accurately by passing a quantity of electrical energy into a heating coil wound on a calorimeter vessel which contains a weighed quantity of the substance to be studied; and calculating the amount of heat so generated which is just sufficient to cause the change of state. A relation discovered by Frederick T. Trouton in 1884, states that the latent heat of vaporization divided by the boiling point expressed in absolute temperature is usually equal to about 21 calories per degree.

(D. H. A.)

LATERAN COUNCILS, the ecclesiastical councils or synods held at Rome in the Lateran basilica, which was dedicated to Christ under the title of Salvator, and further called the basilica of Constantinople or the church of John the Baptist. Ranking as a papal cathedral, this became a much-favoured place of assembly for ecclesiastical councils both in antiquity (313, 487) and more especially during the middle ages. Among these numerous synods the most prominent are those which the tradition of the Roman Catholic Church has classed as oecumenical councils. In the view of the Greek Church, however, the councils held in later centuries are not recognized as oecumenical, since they did not represent all Christendom.

The fourth Lateran council (twelfth oecumenical), convened by Pope Innocent III. in 1215, was the most brilliant and the most numerously attended of all, and marks the culminating point of a pontificate which itself represents the zenith attained by the mediaeval papacy. Prelates assembled from every country in Christendom, and with them the deputies of numerous princes. The total included 412 bishops, with 800 priors and abbots, besides the representatives of absent prelates and a number of inferior clerics The seventy decrees of the council begin with a confession of faith directed against the Cathari and Waldenses, which is significant if only for the mention of a transubstantiation of the elements in the Lord's Supper. A series of resolutions provided in detail for the organized suppression of heresy and for the institution of the episcopal inquisition (Canon 3). On every Christian, of either sex, arrived at years of discretion, the duty was imposed of confessing at least once annually and of receiving the Eucharist at least at Easter (Canon 21). Enactments were also passed touching procedure in the ecclesiastical courts, the creation of new monastic orders, appointments to offices in the church, marriage-law, conventual discipline, the veneration of relics, pilgrimages and intercourse with Jews and Saracens. Finally, a great crusade was resolved upon, to defray the expenses of which it was determined that the clergy should lay aside one-twentieth — the pope and the cardinals one-tenth — of their revenues for the next three years; while the crusaders were to be held free of all burdens during the period of their absence.

BIBLIOGRAPHY.—*See* Mansi, vol. xxii.; Hefele, *Conciliengeschichte,* and ed. vol. v. and viii. (by Hergenrother); and the general Church histories of the period. On the 4th Lateran Council see also INNOCENT III.

LATERITE. The name laterite (from the Latin. *later,* "a brick") was given by F. Buchanan-Hamilton (1807) to the mantle of ferruginous rock which covers large areas in southern India. Similar material from west Africa. analyzed by P. Berthier (1820), yielded 2.8% silica. 8.6% alumina. 77.2% ferric oxide and 11.4% water. Laterite is recognized today as an iron oxide-rich residual weathering product which may be derived from a wide variety of rocks weathering under strongly oxidizing and leaching conditions. It is currently being formed in tropical and subtropical regions where the climate is humid. Lateritic soils. are rich in hydrated iron. aluminum and titanium oxides. and may contain also kaolin minerals. but tend to be reduced in silica which is leached by waters passing through the soils.

Typical laterite is a porous. claylike rock containing the minerals gothite. $HFeO_2$, lepidocrocite. $FeO(OH)$, and hematite. Fe_2O_3, titanium oxides. and hydrated oxides of aluminum. The aluminum-rich representative of laterite is bauxite. The structure of laterite is frequently pisolitic (pealike). Exposed surfaces of laterite are blackish-brown to reddish in colour and commonly have a slaggy, or scoriaceous. lavalike appearance. It is commonly lighter in colour (red, yellow, and brown) where freshly broken. It is generally soft when freshly quarried but hardens upon exposure. Primary. *in situ,* laterite has been called the high-level type, whereas secondarily transported. dissolved and detrital laterite have been called the low-level type.

Laterite occurs in India. Malaya. East Indies, Australia, Cuba, the Hawaiian Islands. the equatorial regions of Africa and South America, sporadically in the United States, but also in Ireland at Antrim (*see* ROLE).

Geologically ancient deposits of laterite add greatly to the range in distribution.

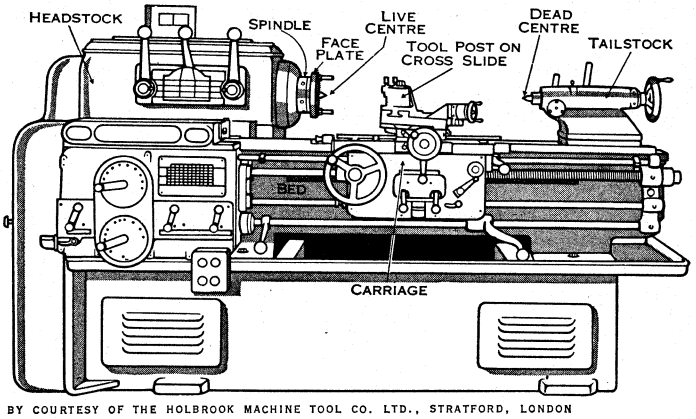
Laterite is therefore not uniquely identified with any particular parent rock. geologic age, single method of formation, climate *per se,* or geographic location. It is a rock product which is a response to a set of physiochemical conditions which include an iron-containing parent rock. a well-drained terrain. abundant moisture for hydrolysis during weathering. relatively high oxidation potential, and persistence ot these conditions over thousands of years (perhaps a geological epoch).

Laterite has been used as an iron ore and, in Cuba, as a source of nickel.

See also BAUXITE; INDIA: *The Deccan Trap.* (W. D. Ka.)

LATEX, a fluid found in the cells of angiospermous plants, consisting of an emulsion of various substances suspended in a watery medium in which salts, sugars, tannins, alkaloids, enzymes and other substances are dissolved. This lactiferous fluid circulates in branched tubes which penetrate the tissues of the plant in a longitudinal direction. It has an important function in conducting plastic substances in addition to acting as an excretory reservoir. The Para rubber tree (Hevea *brasiliensis*) is regularly tapped, the coagulated latex which it exudes being worked up into rubber. Opium is obtained from the latex of the opium poppy (*Papaver somniferum*) which contains the alkaloid morphine. See PLANTS and PLAXT SCIENCE: *Anatomy of Plants.*

LATHE, a machine tool which rotates material, usually metal or wood, between two rigid supports, called centres, so that it may be shaped with a cutting tool. Often a faceplate, or chuck, is attached to hold the work while it is faced, drilled, bored, threaded or lapped. When the cutting tool is held in the operator's hands, as is common in wood turning and some light machining, the lathe is called a speed lathe; but when the tool is rigidly clamped onto a carriage which is moved along the bed of the lathe by power, the lathe is called an engine lathe. When the carriage receives its feeding motion from an accurately formed lead screw, driven by gears from the spindle, the machine is called a screw-cutting lathe.



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PRECISION HIGH-SPEED ENGINE LATHE

The lathe, together with the drill press, is one of the earliest machine tools. French screw-cutting lathes for wood were used prior to 1569; they employed a lead screw, but the work was rotated by hand, intermittently in alternate directions, with ropes. As early as 1772 the work, on centres, was made to rotate continuously by use of a rope from a flywheel turned by hand.

In 1774 John Wilkinson, of England, built the first precision machine for boring engine cylinders. Its single cutting tool was fixed in a strong boring bar, supported at both ends, extending through the cylinder. The tool was fed slowly along the bar as it, rather than the cylinder, was rotated. Cylinders up to 50 in. in diameter for James Watt's steam engine were bored accurately on this machine.

Henry Maudslay, of London, developed in 1797 a sliding tool rest for metalwork which was moved along the lathe bed by a lead screw. Screws of different pitches were first used to obtain various tool-feeding speeds, but later a single screw was driven from the spindle and different speeds were obtained with a gear change box. About 1830 Maudslay constructed a lathe with a large diameter faceplate which operated over a pit, so that flywheels up to 40 ft. in diameter could be faced and turned and steam cylinders up to 10 ft. in diameter could be bored.

Back gears to provide a greater speed range of the spindle were added to the lathe in England in 1818, so that a three-step cone pulley with single back gears could deliver six spindle speeds. In about 1892 quick-change gears were introduced in the United States, permitting tool-feed speeds to be selected almost instantly. In 1905 the first single-pulley drive lathe, with a geared head to replace the step-cone pulley and back-geared drive, was built to permit selection of various spindle speeds by merely shifting a lever.

Lathes subsequently developed into a wide variety of sizes and types, some not more than a foot in length, for the watchmaker's trade, others, up to three feet in length, bench mounted and used for small work. The floor-mounted engine lathe, designed to handle work six inches or more in diameter, is of heavy construction, powered by built-in electric motors and provides from 24 to 56 feeds, or threads, per inch, and 8 to 24 spindle speeds to give from 20 to several thousand r.p.m. The size of a lathe is designated by the diameter of the work that it will turn or swing over the ways for chuck or faceplate work, and the diameter and length of the work piece between centres. Its power capacity is indicated by the motor size. High power is required for deep cuts at low speeds or shallow cuts at high speeds. Cutting tools are of high-speed steel, sintered carbide or ceramics.

The engine lathe has been modified to produce special parts, such as railway-car wheels, crankshafts, camshafts, pulleys and gun barrels. Speed lathes are used for wood turning, spinning lathes for forming sheet metal, and polishing lathes for polishing and buffing parts held by hand against the rotating wheel. In the vertical turret lathe a turret replaces the single tool post. Other variations are the vertical boring mill, automatic chucking lathe, and hand and automatic screw machine. *See* also MACHINE TOOLS.

See Joseph Wickham Roe, *English and American Tool Builders* (1926); Orlan Wm. Boston, *Metal Processing;* 2nd ed. (1951).

(O. W. B.)

LATHROP, FRANCIS (1849–1909), U.S. painter, illustrator and designer, was born aboard ship, near the Hawaiian Islands, on June 22, 1849, the son of George Alfred Lathrop (1819–77), who was U.S. consul at Honolulu. In 1860 Lathrop began to study with T. C. Farrar (1838–91) in New York and from 1867 studied at the Royal Academy of Dresden. During 1870–73 he studied in England under Ford Madox Brown and E. Burne-Jones, and in the school of William Morris, where he devoted particular attention to stained glass. He returned to the U.S. in 1873. Among his chief decorative works were the chancel of Trinity church, Boston, the interior of Bowdoin college chapel at Brunswick, Me., and the Metropolitan Opera house in New York city. The Marquand memorial window, Princeton chapel, is an example of his work in stained glass. His latest work was a series of medallions for the building of the Hispanic-American society in New York. Lathrop was a founder of the Society of American Artists, as well as an associate of the National Academy (1906). He died at Woodcliff, N.J., on Oct. 18, 1909.

LATI, the name given about 1,000 people, including the Lati, Laqua and Kelao, in Tongking (Tonkin) northern Vietnam, close to the Chinese frontier. They call themselves *A'Khu,* "the men." They are divided into exogamous clans, live in compact villages, practise terrace rice cultivation and rear buffaloes and poultry. Ancestor worship, animistic attitudes and food taboos with sexual taboos form elements in their religion. Residence is patrilocal, but the transfer of the bride's residence is often deferred until she is pregnant. Funerals are directed by the elders of the community, and there is a second ritual a year later. Every individual is believed to have several souls, each of which has a different fate. The language is monosyllabic in form, with tones, and a complete decimal system is used in counting. Lati, Laqua and Kelao have been provisionally grouped with the Li dialects of Hainan Island in a new linguistic stock called Kadai, which is thought to be distantly related to both Thai and Indonesian.

See P. K. Benedict, "Thai, Kadai and Indonesian: a New Alignment in Southeastern Asia," *American Anthropologist,* "New Series," vol. xliv, pp. 576–601 (1942). (HU. DE.)

LATIMER, HUGH (1485?–1555), English bishop, and one of the chief promoters of the Reformation in England, was born at Thurcaston, Leicestershire. He was the son of a yeoman, who rented a farm "of three or four pounds by year at the uttermost." The year of Latimer's birth is not definitely known. In the *Life* by Gilpin it is given at 1470, a palpable error, and possibly a misprint for 1490. He was educated at Clare college, Cambridge, graduated B.A. in 1510 and M.A. in 1514. Before the latter date he had taken holy orders. His oration, on taking his degree of bachelor of divinity, was devoted to an attack on the opinions of Melanchthon. Soon his discourses exercised a potent influence on learned and unlearned alike; and, although he restricted himself, as was his custom, to the inculcation of practical righteousness, and the censure of abuses, a rumour of his heretical tendencies reached the bishop of Ely. Latimer was prohibited from preaching in the university or in any pulpits of the diocese, and on his occupying the pulpit of the Augustinian monastery, which enjoyed immunity from episcopal control, he was summoned before Wolsey, who, however, gave him special licence to preach throughout England.

At this time Protestant opinions were being disseminated in

England chiefly by the surreptitious circulation of Wycliffe's translations of the New Testament. Latimer had a ready and iormidable wit which thoroughly disconcerted his opponents, but he had also a natural distaste for theological discussion, and the truths he was in the habit of inculcating could scarcely be controverted, although; as he stated them, they were diametrically contradictory of prevailing errors both in doctrine and practice. In Dec. 1529 he preached his two "sermons on the cards." which awakened a turbulent controversy in the university. But he was protected from his enemies by Henry VIII, who invited him to preach before him in the Lent of 1530. Latimer then wrote to the king the famous letter on the free circulation of the Bible, an address remarkable, not only for what Froude justly calls "its almost unexampled grandeur," but for its repudiation oi the aid of temporal weapons to deiend the faith. Shortly afterward Henry appointed Latimer one of the royal chaplains. He soon btcarne "weary of the court," but he gladly accepted the living of Rest Kington, Wiltshire. conferred on him by the king in 1531. Harassed by severe bodily ailments, encompassed by a tumult of religious conflict and persecution, he continued to preach the cause he had at heart. At last a sermon which he mas persuaded to preach in London exasperated John Stokesley, bishop oi the diocese, and furnished an opportunity for summoning Latimer to answer beiore the bishops in the consistory. After a tedious and captious examination, he was in March brought before convocation, and, on reiusing to subscribe to certain articles, was excommunicated and imprisoned; but by the king's intervention he was released after he had accepted all the articles except two, and confessed that he had erred not only "in discretion but in doctrine." After the consecration of Cranmer to the archbishopric of Canterbury in 1533 Latimer's position was changed. In 1531 Henry formally repudiated the authority of the pope, and from this time Latimer was the chief co-operator with Cranmer and Cromwell in advising the king on the legislative measures entailed by that repudiation.

It was, however, Latimer's preaching more than the edicts of Henry that established the principles of the Reformation in the minds and hearts of the people. His sermons are classics of their kind. Vivid, racy, terse in expression; profound in religious feeling. sagacious in their advice on human conduct. To the historical student they are of great value as a mirror oi the social and political life of the period.

In Sept. 1535 Latimer was consecrated bishop of Worcester. While holding this office he was selected to officiate as preacher when the friar, John Forest, whom he vainly endeavoured to move to submission, was burned at the stake for denying the royal supremacy. In 1539, being opposed to the "act of the six articles," Latimer resigned his bishopric, learning from Cromwell that this was the wish of the king. On this point he was apparently deceived, but as he now declined to accept the articles he was confined within the precincts of the bishop of Chichester's palace. After the attainder of Cromwell little is known oi Latimer until 1546, when, on account of his connection with the preacher Edward Crome, he was summoned before the council at Greenwich, and committed to the Tower of London. Henry died before his final trial could take place. and the general pardon at the accession of Edward VI procured him his liberty. He declined to resume his see, notwithstanding the special request of the Commons, but in Jan. 1548 again began to preach, and with more effectiveness than ever; crowds thronged to listen to him both in London and in the country. Shortly after the accession of Mary in 1553 a summons was sent to Latimer to appear before the council at Westminster. Though he might have escaped by flight, and though he knew that "Smithfield already groaned for him," he at once joyfully obeyed.

The hardships of his imprisonment, and the long disputations at Oxford, told severely on his health. but he endured all with unbroken cheerfulness. On Oct. 16, 1555 he and Ridley were led to the stake at Oxford. The motives which now inspired his courage placed him beyond the influence of iear, and enabled him to taste in dying the thrill of victorious achievement. Ridley he greeted with the words, "Be of good comiort, Master Ridley, and play the man; we shall this day light such a candle by God's grace in England as (I trust) shall never be put out." He "received the flame (as it were) embracing it. Xiter he had stroked his face with his hands, and (as it were) bathed them a little in the fire, he soon died (as it appeared) with very little pain or none."

BIBLIOGRAPHY.—Two volumes of Latimer's sermons were published in 1549. A complete edition of his works, edited by G. E. Corrie for the Parker Society, appeared in two volumes (1844–45). His *Sermon on the Ploughers* and *Seven Sermons preached before Edward VI*. were reprinted by E. Arber (1869). The chief contemporary authorities for his life are his own *Sermons,* John Stow's *Chronicle* and Foxe's *Book of Martyrs.* In addition to memoirs prefixed to editions of his sermons, there are lives of Latimer by R. Demaus (1869, new and revised ed. 1881), and by R. M. and A. J. Carlyle (1899).

EATINA, a province and its capital in the region of Lazio (Latium), central Italy. The province has an area of 2,248 sq.km. (868 sq.mi.), and a population (1951 j of 283,699. It was formed in 1934 irom Roma province and extends irom the outer suburbs of Rome southeastward to the mouth of the Garigliano, the administrative frontier between Lazio and Campania. Inland the province is dominated by the heights and foothills oi the Lepini, Ausoni and Aurunci mountains. On the side facing the Tyrrhenian sea are the lowlands, most of them reclaimed, of the Pontine marshes of Fondi and of Formia. Wheat, corn, vegetables and grapes are grown, and cattle and poultry are reared. Gaeta, Terracina and Formia are ports. There is a petroleum refinery at Gaeta and pharmaceutical and food industries are scattered in several towns. The areas around Monte Circeo and Formia are popular with tourists. The main Naples-Rome rail and highway connections pass through the province. The town of Latina (pop., 1951, 14.588) was buift in 1932 and has a carefully planned layout. Both town and province mere called Littoria until 1947.

For the classical history oi the area see LATIUM. (G. KH.)

LATIN AMERICA. As the term is generally understood, Latin America comprises the entire continent of South America, Central America and Mexico (called Middle America), and the islands of the Caribbean. "Hispanic America" has often been suggested as a more suitable designation since it specifically indicates the region's Spanish and Portuguese heritage. However, the Indian and Negro heritage, as well as American, British and French cultural and colonial influence, nullify any advantages of such a change. Despite territorial contiguity and, for much of the area, ties of a similar culture, history and aspirations for the future, the physiographic, climatic, economic; political. ethnic and linguistic differences make the term Latin America as connoting a homogeneous region iall short of a true description. Only in deference to popular usage and for lack of a better term, the area remains Latin America.

See also CENTRAL AMERICA; MIDDLE AMERICA; SOUTH AMERICA.

This article is divided into the following sections:

I. The Pre-Columbian Period
II. The Colonial Period
  A. Discovery, Conquest and Settlement
  B. Political and Religious Institutions
  C. Economic Life
  D. Social and Cultural Life
  E. Colonial Brazil
III. The Independence Movement
IV. Reaction and Anarchy, 1825–1850
V. Era of Material Progress: 1850–1914
VI. Between the Wars—1918–1939
VII. World War II
VIII. The Postwar Years
IX. Organized Labour
X. Communism
XI. Latin America in International Organizations

I. THE PRE-COLUMBIAN PERIOD

Men of Mongoloid stock entered the Americas at least 20.000 years ago, probably from Siberia by way of Alaska. They spread over North and Middle America, reached South America by nay of the Isthmus of Panamá. and between 3,000 and 5.000 years ago, reached the tip of South America. Evidence of other major migration routes such as a trans-Pacific route from Asia directly to Peru, Middle America or British Columbia is, as yet, unsatisfac-

tory. Older beliefs concerning land bridges and lost continents are now rejected.

An estimated 15,500,000 Indians inhabited Latin America when the Spaniards and Portuguese arrived at the end of the 15th century. Their cultures ranged from very primitive to highly developed. They may be divided into six major cultural groups (each composed of several language and political groups) as follows: (1) Pima-Pueblo (southwestern United States and northern Mexico); (2) Nahua-Maya (central Mexico, Yucatán and Guatemala); (3) Circum-Caribbean and Semi-Marginal (Central America south of Guatemala. Panama. northern and western Colombia, Venezuela west of the Orinoco. the Greater Antilles and the western headwaters of the Amazon); (4) Central Andean (western Ecuador: Peru and northwestern Bolivia); (5) Marginal tribes of South America (southern Chile, most of Argentina, eastern Bolivia. Uruguay, east-central Brazil northward to the Brazilian bulge); and (6) Tropical Forest and Southern Andean tribes (occupying the Lesser Antilles, the Amazon basin. the western half of the Orinoco flood plain, the Guiana highlands. and much of the east coast of Brazil south to the Uruguayan border, then nest to



FROM "HANDBOOK OF SOUTH AMERICAN INDIANS"

FIG. 1.— MAP SHOWING DISTRIBUTION OF SOUTH AMERICAN INDIAN CULTURES

Paraguay and central and northern Chile). Within these groups only the Aztec, Maya, Chibcha and Inca Indians had reached a high level of culture. The others. such as the Caribs of the \Vest Indies and the Araucanians of Chile varied from Paleolithic to late Neolithic.

Within their general culturai groupings. the numerous tribes into which the aborigines were divided continuously fought for the control of better lands. Defeated tribes retreated into less hospitable areas! were gradually exterminated, or paid tribute to their conquerors. In a sense the Spanish and I'ortuguese conquest was but another phase in the struggle for control of land and labour. Internally, the Indian tribes were divided into hierarchies of chiefs, nobles, priests. commoners, servile labourers and slaves. The idyllic life of the noble savage did not exist on the American continent; the struggle for existence and status was vicious.

Diversity marked much of Indian life. In addition to the internecine struggle, there were wide variations in physique and language. The Patagonian peoples were famed for their large stature. while the tribesmen of the western Amazon valley were short and stocky. Languages derived from many basic roots and the dialects have been estimated to number 1,700. Even the great empires were not linguistically united. The Incas forced upon the people they subdued as a lingua franca Quechua, a language they themselves had adopted from a more advanced neighbouring group they had conquered. The Aztecs governed peoples with a mélange of dialects. Tribes no more than 75 or 100 mi. apart spoke different dialects if not different languages.

In other aspects of their material culture the Indians also exhibited tremendous diversities. Buildings varied from stick and thatch hovels to the magnificent stone palaces of the Incas and the temple-topped pyramids of the Maya. Primitive tribes wore little more than breechcloths to cover their nakedness while the people of the high civilizations wore elaborate costumes, often covered with exquisite featherwork. Advanced groups wove fine cotton and woolen cloth; others contented themselves with hides and bark cloth. Techniques and artistic sensitivity in the making of pottery and statuary covered a wide spectrum of differences. And while the Maya possessed a system of writing, a vigesimal number system and a calendar more accurate than that used by the Europeans, the Incas relied on mnemonic devices to keep accounts, and the Aztecs used pictographs for writing. Other groups simply depended upon memory.

Agricultural techniques and basic crops also varied greatly. Only maize — apparently first domesticated by the Maya in Central America — mas raised throughout the new world, although the cultivation of beans and squash was widely disseminated. While North American Indians planted mainly seed crops — maize, beans and squash — the South American and \Vest Indian peoples preferred tubers such as manioc and sweet potatoes. Because of its importance in the diet of the early conquistadors. manioc has been called the bread of the conquest. The white potato, native to the Andes. was raised in large quantities in the higher altitudes n-here maize would not grow well. Perhaps the greatest deficiency in the Indian diet was the lack of a plentiful meat supply. Except for guinea pigs and dogs. which were often raised for food. only in the Andean region. where the llama and alpaca were found, was there a dependable if small source of meat. Wild game and wild fowl n-ere fairly abundant in some areas. It has been suggested that the shortage of meat might have been responsible for the widespread practice of cannibalism. Agricultural techniques ranged from fire agriculture (the milpa) in which maize was planted in burned-over forest land in a hole punched in the ground with a stick to intensive irrigated, fertilized and terraced agriculture. At best. Indian agriculture was an intensive hoe culture since there were no draft animals to draw a plow or any other implement. Through their centuries of occupation of the new world the Indians had found the most fertile and productive areas. and there the most populous empires developed. To a great extent. Spanish conquest and settlement simply followed the lines of available food, labour and cultivable land.

In addition to the more advanced peoples such as the Aztecs (*q.v.*), several groups on a lower cultural level are worth noting. The Xraucanians of Chile. a high agricultural group. were only partially conquered by the Incas. Soon after the Spanish conquest began. they acquired horses and used them to good account, tenaciously resisting the white invaders. The Puelches and Tehuelche of the La Plata region. rather primitive foodgatherers, also became horsemen and exacted a heavy toll from the Spaniards. They were not completely pacified until the 19th century. In northern Mexico the Apaches and Comanches presented a similar problem. But the neighhouring Pueblos. except for a few sharp rebellions. were generally peaceful. The Guarani of ceniral South America, just becoming agriculturalists, proved

rather docile. The Spaniards and Portuguese used them as farm labourers and slaves while the Jesuits organized them in missions. Brazilian Indians, such as the Tupi, were culturally among the most backward groups in the new world. Their low culture status undoubtedly contributed to their gradual disappearance, under the strain of working on the sugar plantations. Many Brazilian Indians fought the Portuguese to the bitter end; others aided the Europeans in establishing settlements.

In sum, several Indian peoples capitulated with hardly a struggle, while most resisted the Europeans to the best of their abilities. usually in vain. Their descendants, both pure-blooded and mixed, live scattered over the length and breadth of Latin America, in most places the aliens and dispossessed in their own land. *See* also INDIAK, LATIN-AMERICAN.

II. THE COLONIAL PERIOD

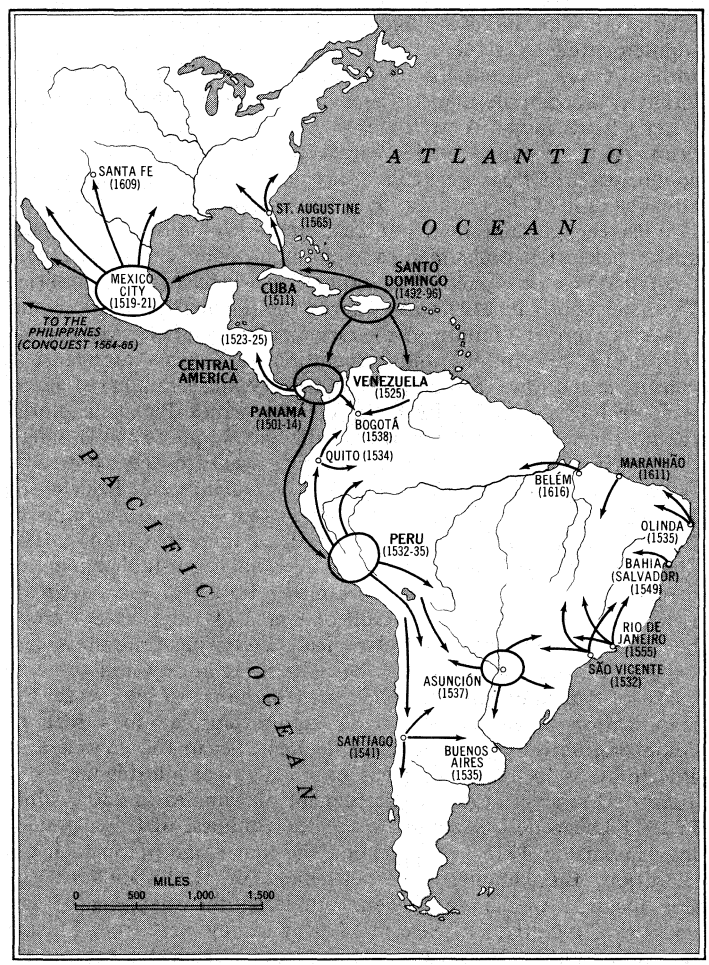
The Iberians. — Spanish and Portuguese expansion into the new world was but a facet of their dynamic national policies. Portugal was a wealthy, expanding, trading nation with a large African and island empire. The leadership of Ferdinand and Isabella, the Catholic kings, transformed Spain into a national state marked by growing royal power and centralized administration. They kindled a wave of nationalist and religious fervour that eventually led to the expulsion of the Moors and Jews and carried Spaniards beyond the peninsula. Soon they were fighting in Italy, the Netherlands and central Europe to secure the domains of Charles I (better known to English-speaking people as Charles V, the Holy Roman emperor) and Philip II and to contain Protestantism. Overseas they fought to enlarge Spain's domain and to convert the heathen Indian. As with the other nations of western Europe. Spain and Portugal were affected by the commercial revolution, and their merchants and crowns were interested in new trade contacts. An ardent, revived religious and nationalistic spirit, a drive for trade and land, a military caste seeking adventure and rewards! monarchs desirous of expanding and unifying their realms, all contributed to the Iberian conquest of the new world.

To say that "gold, glory and gospel" were the major motivations of the Iberians is a misleading oversimplification. It is true that many individuals who participated in the incredible adventure of new world conquest sought plunder, and that priests converted the heathen. But to call this the Iberians,' motivation is the equivalent of saying that western United States was settled by glory-mad cavalrymen, gold-hungry forty-niners and mountain men, and zealous missionaries. Iberians, during their 325 years of dominion, left an indelible impression upon the culture and life of the lands they occupied. Spain preserved an Indian nobility, and many Spaniards took Indian wives. As soon as the wars of conquest and plunder were over, Spaniards and Portuguese staked out land for agriculture, founded cities, opened trading posts, and prospected for mines, advancing their nations' realms. They established the church of their faith and converted millions to Christianity. The evils and cruelties of the Iberian conquest cannot be overlooked, but they were the horrors common to European colonial systems.

A. DISCOVERY, CONQUEST AND SETTLEMENT

Despite several earlier landings in the new world, Christopher Columbus (*q.v.*) is considered the discoverer because "he had the good fortune to represent a nation which was enterprising enough to follow up the explorer with the farmer, miner and priest, all equipped to create permanent homes in a new world." (Hubert Herring, A History *of Latin America,* p. 118, Alfred A. Knopf, Inc., New York, 1957.) By a combination of study, meditation, intuition and miscalculation, Columbus became convinced that land lay within a reasonable distance west of Europe. Rebuffed by several royal courts, he finally managed to enlist the aid of influential Spaniards! and Queen Isabella of Castile was persuaded to support his venture. Commercial and possibly imperial expansion were the incentives behind royal support. The method of financing the voyage is obscure. Isabella probably borrowed from the funds of the knights of the Santa Hermaudad and levied a large fine upon the town of Palos, for some unrecorded offense. to be paid by outfitting the expedition. She granted Columbus numerous high offices and commercial privileges and concessions, contingent upon a discovery. At Palos several merchants aided Columbus by recruiting crews from their regular seamen in return for a promise of a portion of his share of the profits. After a 71-day voyage, the expedition struck the Eahama Islands. Sailing southwest, Columbus then discovered Cuba and the island of Haiti (which he called Hispaniola) before returning to Spain in March 1493.

Upon Columbus' return, the Spanish crown immediately prevailed upon Pope Alexander VI to issue a series of bulls which.



FROM B. DIFFIE, "LATIN AMERICAN CIVILIZATION"; REPRODUCED BY PERMISSION CF THE STACKPOLE COMPANY

FIG. 2. — MAP SHOWING SPREAD OF SPANISH AND PORTUGUESE CONQUESTS FROM PRIMARY CENTRES

supplemented by the Spanish-Portuguese treaty of Tordesillas of 1494, defined the Portuguese and Spanish spheres of exploration and settlement. West of a line drawn from pole to pole 370 leagues nest of the Cape Verde Islands. Spain was given a free hand; Portugal had equal rights to the east. Since the line intersected the eastern bulge of Brazil, it justified Portuguese activities in the western hemisphere. (*See* TORDESILLAS, TREATY OF.)

Columbus returned to Hispaniola in Nov. 1493, to establish a permanent colony with an expedition of 17 ships. 1,500 men including 12 missionaries, seeds, livestock and farming implements. He planned to found a city to serve as a base for trade, colonization and further exploration. Columbus left the colony to explore fruitlessly the coast of Cuba seeking news of Japan. Gold discoveries and opportunities to abuse the natives soon demoralized the colonists; disease carried off many and food began to run out. Fixing an Indian tribute to be paid in gold yielded only meagre quantities. Despoiling the Indians of their food. enslaving those who resisted, and imposing forced labour to wash gold from

stream beds and grow patches of cassava (or manioc; the region's bread) neither fed the Spaniards nor produced great amounts of precious metals. The first ten years saw little beyond the establishment of a permanent settlement with its capital at Santo Domingo (now Ciudad Trujillo). Discouraged by repeated failures and poor results, the Catholic kings turned from the Indies (as the new world was called) to European affairs and gradually reduced Columbus' broad powers and monopolies. When Nicolás de Ovando arrived in 1502 to serve as governor with an expedition of 2,500 persons, including 73 families, the colony numbered only 300. In a short while over 1,000 of Ovando's group died.

During the six years of Ovando's governorship conditions were stabilized. New cities were founded, gold output expanded and food production increased under a system of forced Indian labour supplemented by slavery. With a permanent beachhead in the Indies, it was now possible (and the attrition of the Indian population of Hispaniola made it necessary) to begin the conquest of other islands in the West Indies as well as portions of the Caribbean coast. It had taken 15 years to prepare for the conquest and colonization of this vast land. Having served its purpose as the advance base of the conquest, Hispaniola sank into decadence.

With the gradual royal nullification of Columbus' rights, the crown permitted other men to explore and colonize in the Caribbean. Alonso de Ojeda led an expedition which included Amerigo Vespucci (*q.v.*) in 1499 and explored the northern coast of South America from the mouth of the Orinoco west to Lake Maracaibo. Vespucci's descriptions and recognition of South America as a continent led the cartographer Martin Waldseemiiller to name it after him in 1507. In 1500, Vicente Yáñez Pinzón explored the northern coast of Brazil from Cape São Roque to the Guianas, discovering the mouth of the Amazon, while in the same year Diego de Lepe explored the coast of the Guianas and Rodrigo de Bastidas in 1501 and 1502 the coast from Lake Maracaibo to Nombre de Dios, Panamá (just south of modern Colon). The discovery of pearls along this coast led to the establishment of a lucrative industry based on exploiting Indian divers. Juan de la Cosa in 1504 explored the Gulf of Urabá (Darién) in the crook between Panami and South America. Following Columbus' last voyage, Pinzon and Juan Diaz de Solís in 1506 explored the east coast of Yucatán and the Gulf of Honduras. Along with the stabilization of Hispaniola, these explorations led to a rash of colonizing activity. Juan Ponce de León began the conquest of Puerto Rico in 1508 and went on to discover Florida in 1513. Juan de Esquivel began the settlement of Jamaica in 1509, while in 1511 Diego de Velázquez started the conquest of Cuba. founding Havana in 1515. Thus ended the first stage of Spanish exploration, the conquest and settlement of the islands of the Caribbean. Alonso de Pineda completed the mapping of the coast of the Gulf of Mexico in 1519 by sailing west from Florida to about modern Veracruz in Mexico and discovering the mouth of the Mississippi river on the way.

By far the most ambitious colonization attempt was that of Alonso de Ojeda and Diego de Nicuesa along the coast of Panamá and northwestern Colombia in 1508–1511. After the loss of over 1,000 men and the deaths of the leaders, a united colony was finally established under Vasco Núñez de Balboa (*q.v.*) and Francisco Pizarro (*q.v.*). Balboa, following Indian stories, crossed the Isthmus of Panamá in 1513 to discover the Pacific ocean. Despite Balboa's attempts to curry royal favour, in 1514 Pedro Arias de Avila, usually called Pedrarias Davila, arrived with 1,500 men to become governor of Castilla del Oro (modern Panama and Costa Rica). Most of Pedrarias' men were dead within a year, but his energetic policy completely transformed the area. By 1519, when Pedrarias executed Balboa, allegedly for treason, exploration was pushed on the Pacific coast and the city of Panamá established at the western end of the road crossing the isthmus. The exploration of the west coast of Central America and Mexico was done by Gaspar de Espinoza (1516–19) and Andrés Niño and Gil Gonzalez Dávila (1522–23) who sailed north from Panamá as far as Nicaragua. Pedrarias then began sending men northward into Central America where he finally encountered expeditions sent south overland from Mexico by Hernan Cortés (*q.v.*).

Diego de Velázquez, conqueror of Cuba. laid the foundations for the conquest of Mexico. In 1517 and 1518 Velizquez sent out expeditions headed by Francisco Hernández de Córdoba and Juan de Grijalva which explored the coasts of Yucatán and the Mexican Gulf. Velázquez commissioned Cortés to outfit an expedition to investigate their tales of great wealth in Mexico. Spending his own fortune and a goodly portion of Velázquez', Cortés left Havana in Nov. 1515 following a break in relations with Velázquez. Landing in Mexico. Cortés freed himself from Velázquez' overlordship by founding the city of Veracruz and establishing a town council (cabildo) which in turn empowered him to conquer Mexico in the name of Charles I. Divining that Mexico was a fabulously wealthy realm held together by sheer force and that the Aztec ruler Montezuma held him in superstitious awe, Cortés pushed into central Mexico with only about 500 Europeans and several thousand Indian allies as soldiers and porters. In an incredible campaign lasting two years. Cortés took the capital city of Tenochtitlán (Mexico City) on Aug. 13, 1521. His success was the result of a combination of factors: the hatred of the conquered tribes for the Aztec overlords; Montezuma's belief that Cortés was a returning god; Cortés' personal qualities of leadership and diplomacy; European arms—crossbows, muskets and steel swords—and horses; disease; and the aid of Cortés' interpreter-mistress, Malinche.

Once in control of central Mexico, Cortés dispatched expeditions to explore northward to the Gulf of California and southeast into Guatemala and Honduras. The Gulf of California was discovered in 1532 and Lower California the next year. Not until 1539 did Francisco de Ulloa explore the gulf and prove that Lower California was a peninsula, not an island. Juan Rodriguez Cabrillo, in 1542, explored the coasts of Lower and Upper California to about 40° N. latitude.

In a search for gold and a new strait to the Pacific, Pedro de Alvarado (*q.v.*), Cortés' lieutenant, organized an expedition recruited from men disappointed in their share from the conquest of Mexico. They began the conquest of the Maya in Yucatán and penetrated south and southwestward into the present Mexican state of Oaxaca and the Pacific coast of Central America in 1523–24. The next year, Cristhbal de Olid went to Honduras, followed by Cortés in 1525. During the latter expedition Cuauhtémoc, the last king of the Aztecs. who was forced to accompany Cortés, was hanged for allegedly plotting CortCs' death. There was little gold, the land was poor, and the war was a difficult, drawn-out one that yielded little glory. Meanwhile. Pedrarias in Panama had sent expeditions into what is now Costa Rica and Nicaragua. Pedrarias' and Cortés' men soon met in armed clashes. A royal settlement relieved Pedrarias as governor of Panamá in 1526 and named him governor of Nicaragua, a post he held until his death. Later, the entire area north of Panamá was attached to Mexico as the captaincy general of Guatemala. Generally speaking, this area was neglected because of its lack of economic opportunities and with the exception of Guatemala. where a brilliant nucleus of culture flourished, it became one of the backwaters of the Spanish empire in America. During the absence of Cortés in the south, anarchy broke out in Mexico. Cortés felt compelled in 1528 to return to Spain to plead his case before the king. Mexico fell into the hands of his enemies.

Cortés' conquests as well as those of his lieutenants were carried out with a minimum of bloodshed. In contrast, the adventurers who followed, penetrating northern Mexico and governing until the appointment of a viceroy, opened a chapter of wholesale pillaging and bloodletting among the Spaniards themselves as well as the Indians. Of one of this latter group, Beltrán Nuño de Guzmán who conquered the province of Pánuco, L. B. Simpson wrote: "Flourishing provinces were permanently depopulated and the hatred and despair of the victims mounted to such a pitch that they eventually rose against the Spaniards in the wild rebellion known as the Mixton War . . ." (Lesley Byrd Simpson, Many Mexicos, p. 34, University of California Press, Berkeley, 1957.)

Much of northern Mexico and the southwestern United States owes its exploration and eventual colonization to the adventures of Alvar Núñez Cabeza de Vaca (*q.v.*). In 1536 he and three

companions were found wandering in northern Mexico, the last survivors of Pánfilo de Narvbez's expedition of 600 men shipwrecked in Florida eight years before. Cabeza de Vaca's stories led to the organization of expeditions to explore the territories he had traversed. Hernando de Soto (*q.v.*) financed by a fortune accumulated during his participation in the conquest of Peru, landed in Florida in 1539 with some 600 men and roamed over what is now the southeastern United States until his death in 1542. He discovered no wealth; the survivors sank his body in the Mississippi and straggled back to Mexico. Fray Marcos de Niza and a Negro companion of Cabeza de Vaca named Estevanico were sent by Viceroy Antonio de Mendoza in 1539 to retrace Vaca's steps in northern Mexico. Fray Marcos reported the existence of Seven Golden Cities, one of which was said to be larger than Mexico City. A 300-man expedition led by Francisco de Coronado (*q.v.*) left Compostela in western Mexico in 1540; for two years they searched in vain for a golden empire, meanwhile wandering over New Mexico, Arizona, Texas, Oklahoma, Colorado, Kansas and Nebraska. The failures of De Soto and Coronado, coupled with fruitless searches for a sea-to-sea passage via the Colorado river and the futile explorations of Rodriguez Cabrillo, dampened for the time being further interest in expansion in North America. Spanish policy turned toward settling and developing what had proved fertile and productive. exploiting the mines which were being discovered with increasing frequency and preaching the gospel. Only Florida was colonized in the 1560s to protect the Bahama channel against pirates and European interlopers.

Silver mining on the west coast of Mexico supported the establishment of several stable and prosperous communities which late in the 16th century were the scenes of renewed interest in what is now southwestern United States. Juan de Oñate, nephew of one of the conquistadors of western Mexico, finally managed to plant the first colony in New Mexico, founding San Juan in 1598, and made a series of explorations ranging from the Colorado river east into Kansas. Oñate's hopes of finding great silver mines and using the labour of the sedentary Pueblo Indians proved abortive. New Mexico remained a tiny outpost surrounded by fierce Indians until the spread of inissions over the next 200 years added this area to the cattleman's frontier.

After the voyage of Ferdinand Magellan (*q.v.*) it was recognized that the new world itself was not only a barrier to the far east (instead of being an extension of it), but also that it hid a tremendous ocean. When the Spaniards controlled the Mexican Pacific coast, they attempted to discover a strait from the Atlantic to the Pacific—a fruitless search resulting only in the exploration of the west coast from Oregon south to Panamá. They also attempted to find a dependable route across the Pacific. Acting on royal orders to annex the Philippines to the viceroyalty of New Spain (Mexico), Viceroy Luis de Velasco dispatched an expedition in 1564 under Miguel López de Legazpi with Andrés de Urdaneta second in command. Legazpi remained to conquer the Philippines. Urdaneta, discovering the Japan current, followed it to the California coast and thence south to Acapulco.

The so-called Manila galleon soon plied regularly between Manila and Acapulco to trade Mexican silver for eastern wares, particularly raw silk which was woven in Mexico. In 1583 an audiencia ("an administrative-judicial tribunal") was established in Manila subordinate to the viceroy in Mexico City. (See also PHILIPPINES: History.)

Expansion south of Panamá did not begin until after 1524, although Balboa had heard Indian tales of a land of gold to the south named Biru (Peru) nhich were substantiated by Pascual de Andagoya uho had managed to reach the equator on the Pacific coast in 1522. Francisco Pizarro and Diego de Almagro began their attempts to follow up these stories in 1524. After incredible hardships fighting adverse currents and winds, they reached a point in Ecuador about 9° S. latitude in 1527 and mere able to confirm the existence of an Indian empire. Pizarro returned to Spain and received a patent from Charles I to conquer these new lands and divide them between himself and Almagro. Pizarro, with an expedition composed of about 183 men and 37 horses re-enforced periodically by volunteers and adventurers from Panamá and Mexico, reached Cajamarca in northern Peru in Nov. 1532. In Feb. 1533 Almagro arrived with reinforcements. Atahuallpa (*q.v.*), the Inca who had just defeated his half brother, Huáscar, for control of the empire, was treacherously seized during a visit to the Spaniards' camp. Despite the payment of a ransom with a modern equivalent of perhaps $17,000,000, the Spaniards put Atahuallpa on trial for inciting rebellion, charging him, among other things, with being an idolator and bigamist. Found guilty, he was persuaded to be baptized in order to be executed by the garrote instead of by burning. Over two years of hard fighting were necessary to subjugate the empire. During this time Pizarro founded the city of Lima (1535) to facilitate bringing supplies from Panamá by sea. Almagro led an expedition to conquer Chile in 1535. Losing many of his force bf Spaniards and Indian porters on the trip south, Almagro found a land without gold, peopled by fierce Indians. Dejected, he turned north, crossing the length of the Atacama desert to reach Peru. Only a handful of his men reached Cuzco, the old Inca capital, which Almagro seized and declared to be his. In the shifting fortunes of the civil war which followed for possession of Cuzco, Almagro and then Pizarro were slain.

Deciding to enforce order in Peru and revamp Spanish-Indian relations. Charles I dispatched Blasco Núñez Vela as viceroy with a set of new regulations (the New Laws) designed to protect the Indians from excessive exploitation. Gonzalo Pizarro, a half brother of the assassinated Francisco, led a revolt in 1546 which succeeded in defeating and beheading Nuiiez Vela. Charles then sent a visitador (a combination inspector, expediter and trouble shooter), Father Pedro de la Gasca, who by adroit diplomacy undercut Gonzalo's support, defeated him and his few remaining followers and re-established royal authority in Peru in 1548.

Pedro de Valdivia. to whom Pizarro had given Almagro's concession, achieved the distinction of conquering Chile. In 1540, after terrible hardships, Valdivia's expedition reached Chile and began the slow conquest of the land from the fierce Araucanian Indians. After supporting Gasca (who reconfirmed his concession), Valdivia returned to Chile to prosecute his campaign. Chile offered neither wealthy civilizations to plunder nor mines to exploit. But the land was fertile, the Indian population ample, if warlike. Valdivia granted land in large tracts, but often the would-be conquistador had to work with his Indians—and keep his weapons handy. Valdivia founded the city of Santiago de Chile in 1541, Valparaiso in 1544, and Concepción in 1550. An expedition sent over the Andes into what is now western Argentina founded the cities of Mendoza (1561) and Tucumán in 1565.

Valdivia's most formidable opponents were the chiefs Lautaro and Caupolicán. According to tradition, Lautaro had learned Spanish military tactics while serving the conquerors as a stable boy. Lautaro defeated and captured Valdivia in 1553 and had him executed. In turn, Lautaro and Caupolicán were eventually captured and killed. Lautaro is now regarded as a Chilean national hero, immortalized in the epic poem La *araucana* by Alonso de Ercilla y Zúñiga. After a half century of war, peace was finally agreed upon when the Spaniards recognized the Bio-Bio river as the southern boundary of Chile, permitting the Araucanians to roam free to the south.

Peru served also as the nucleus for expansion eastward and northward. After the fall of the Inca empire, Francisco Pizarro commissioned Sebastián de Belalcizar to secure the kingdom of Quito (Ecuador). Belalcázar, with the aid of Almagro. carried out his commission and founded the city of San Francisco de Quito in 1534. In 1540, Gonzalo Pizarro led an expedition from Quito over the Andes into the Amazon valley in search for cinnamon. Finding themselves in sore straits, they built a number of boats to help forage for food. Francisco de Orellana took the boats and with a group of men sailed down the river to the Atlantic. Whether Orellana was carried away by the current or deserted is still a moot question. Gonzalo made his may back to Quito with a handful of survivors. Meanwhile, Belalcázar was working north from Quito, incorporating northern Ecuado- and southern Colombia into the Spanish domain. He eventually pushed his way to

the highlands of Colombia, the homeland of the Chibcha Indians. There he met two other expeditions. One, led by Nicolaus Federmann, a German in the service of the banking house of Welser *(see* VENEZUELA: *History),* had worked its way southwest from Venezuela. However, the second expedition under Gonzalo Jiménez de Quesada, who had come up the Magdalena river from the Caribbean coast, had reached the area first by a few days. The three men agreed to submit their case to the crown for judgment. Quesada was made a nobleman and alderman of the city of Santa Fe de Bogotá which he had founded in 1538; Belalcizar was made governor of Popoyán in southern Colombia; Federmann received nothing.

Federmann's presence at the conquest of the Chibcha was the result of an unusual chapter in the early history of the Indies. After the failure of Ojeda's expedition to northern South America, the area was deserted except for pearl fishers and slave hunters. Late in the 1520s Charles I mortgaged Venezuela to the banking house of Welser of Augsburg, Ger., as a hereditary fief conditioned upon their developing the area. A complex formula was set up for dividing the produce of the mines, and the Welsers could enslave all the necessary Indian labour. Ambrosius Alfinger arrived in 1528 as governor. Failing to find gold, he set the colony upon an economic base of slave trading. Killed by Indians in 1531, he was succeeded by Georg Hohermut von Speyer as governor and Nicolaus Federmann as captain general. Federmann's expedition to the highlands near Bogotá was one of several fruitless attempts by him and von Speyer to recoup the colony's fortunes. Charles I canceled the contract in 1547. With the discovery of gold in 1560 the colony was placed on a more permanent footing, although it remained basically a peaceful out-of-the-way agricultural area.

The final major area of Spanish exploration, conquest and settlement was the Rio de la Plata. Juan Diaz de Solís discovered the great estuary in 1516; hlagellan explored it in 1520; Sebastian Cabot sailing up the Paraná river in 1526 ascertained that it was not a strait to the Pacific. Cabot picked up a number of silver trinkets which had filtered eastward from Peru. Believing himself to be close to their source, he named the region Rio de la Plata ("river of silver"). A full scale attempt at colonization was made in 1535 by Pedro de Mendoza. who had received a royal patent to all lands from the Rio de la Plata to the Straits of Magellan and then west to the Pacific. Theoretically, Chile had been granted twice: first to Almagro and then to Mendoza. Mendoza's expedition of 11 ships and 1.200 men soon came to grief on the inhospitable pampas occupied by hostile natives. Santa María de Buenos Aires, named after the patroness of the voyage, was the scene of starvation and cannibalism by the whites until it was destroyed by Indian attacks. Mendoza died at sea while returning to Spain for aid. The remnants of the expedition were led northnard by Mendoza's lieutenants, Juan de Ayolas and Domingo Martinez de Irala, who founded the city of Asuncion. Ayolas was lost in an unsuccessful attempt to reach Peru. Under Irala's guidance and by virtue of the docile nature of the Guarani Indians, Asuncion prospered. Large grants of land and Indians, as well as open polygamy, made Irala quite popular and he governed until his death in 1556. Buenos Aires was refounded in 1580 by Juan de Garay to serve as a seaport for Asunción.

The settlement of Buenos Aires in 1580 marked the end of the second, or continental, stage of Spanish expansion. Spain now concentrated upon filling in the broad areas staked out during the first century and only slowly expanded the limits of its dominion. The three major areas of new expansion were northward from Mexico toward California and Texas, southward from the central valley of Chile, and into the plains surrounding the Rio de la Plata.

Frontier Missions. — Missions founded by Franciscans and Jesuits were of great importance in the later colonization movement. Inspired by a mixture of paternalism, commercialism and Christian ardour, the missionaries settled large numbers of nomadic and seminomadic Indians in villages called variously *reducciones* ("reductions"). *congregaciones* ("congregating cities") and *pueblos de indios* ("Indian villages"). There, under theocratic control, land was brought under cultivation and the frontier stabilized and moved outward, even beyond the *presidios* ("forts") set up to protect the frontier from Indian encroachment. The Indians were Christianized, but the strict control of the religious orders (who used the stocks and the whipping post) failed to prepare them for an independent life. In many instances the missions became plantations whose produce competed in the market with privately grown crops, resulting in bitter feeling between the settlers and the missions. This conflict was especially apparent in the La Plata region. Many missions established in Paraguay became the especial targets of slave raiders operating westward out of Brazil. Along the northern border of Mexico into Lower California and what is now the C.S. southwest; the missions served as a chain of outposts protecting the area against foreign encroachments and providing bases for administration. All told, the missions were successful in securing many frontier regions and bringing their neophytes, on the surface, at least, into a useful (by western standards) and Christian life.

But the indoctrination lasted only as long as the natives were under the surveillance of the fathers. Once released from discipline. they reverted to their old ways. The missions stabilized the frontier and prepared the way for further European advances but they failed to civilize the Indians.

Foundation of Brazil. — Brazil was conquered and settled by the Portuguese, whose claims were based upon the treaty of Tordesillas. No concrete evidence has yet been discovered to show that the Portuguese government was aware of the existence of Brazil before Pedro Alvares Cabral, leading an expedition to India, had been blown off his course and made a landfall on April 22, 1500.

Cabral's landfall coincided with the start of Portugal's exploitation of the India trade by way of the new-found route via 'the Cape of Good Hope. Brazil offered small inducement to Portuguese investment, its chief products being brazilwood (used for making dyes), nuts and some tropical animals as curiosities. Portugal did not neglect Brazil; Brazil was given as much attention as its comparative value merited. Several minor expeditions cut brazilwood, explored the coast, left some *degredados* ("criminals," usually convicted of minor crimes) behind, and set up transient trading posts. Food crops were planted immediately as distance precluded any significant food imports. In 1503 the Portuguese crown awarded Fernão de Noronha, a converted Jewish nobleman and merchant, a concession to cut brazilwood for three years. As a result of this action settlements near Pernambuco (Recife) and Bahia (modern Salvador) were founded, an agricultural base was established, and numbers of newly converted Jews emigrated to Brazil to escape the Inquisition's surveillance. In the words of the Brazilian historian Pedro Calmon, "To the Orient went the warriors; to Brazil the peaceable New Christians . . . . When others thought of nothing but gold mines and the profits of oriental drugs. they cultivated the earth . . . giving a purely agricultural aspect to the conquest of Brazil and determining its destiny." (Pedro Calmon, *História da civilizacão brasileira,* quoted in Bailey Diffie, *Latin American Civilization,* p. 638, The Stackpole Company, Harrisburg, Pa., 1945.)

Both Noronha and the Portuguese crown profited from the arrangement, but incursions by Spaniards, Englishmen and particularly Frenchmen dictated the necessity of defense by the mother country. Cristóvão Jaques in 1516 destroyed a French fleet leaving Brazil and established a trading post in Pernambuco which began the first cultivation of sugar cane in Brazil in 1521. Jaques' settlement was destroyed by the French in 1530. The Portuguese crown was now forced to reconsider its Brazilian policy. Towns and villages were growing in the harbours and islands along the coast; the gestation period was clearly over. Brazil now needed an aggressive policy to secure Portuguese domination and prepare for further expansion.

In 1530. Martim Afonso de Sousa was sent with a fleet to drive out the French, to set up new settlements and administrative systems, and to recommend a form of colonization adapted to Brazil's needs. He carried out his assignment in excellent order: he established Portuguese claims to northern Brazil and founded

settlements near Bahia, Rio de Janeiro and present day Santos, the latter destined to become the entryway to the rich province of Siio Paulo. Brazil's new government, however, was set up before Martim Afonso returned to Lisbon.

John III in 1533 divided Brazil into a system of *capitanias.* These were large grants of land to an individual (called a *donatário*) endowed with ample economic and political privileges in return for his pledge to secure colonists and develop his grant. These strips of land running from the Atlantic coast to the line of demarcation might be roughly compared to the English proprietary colonies in North America. except that the Brazilian *donatários* received greater feudalistic powers. Along with tax exemptions and certain monopolistic privileges, they were given the right to enslave Indians for their estates and sell a certain number in Portugal each year. The *donatários* laboured hard at peopling and developing their grants; many sold or mortgaged their property in Portugal and moved to Brazil. Enormous sums of money were spent in transporting families and opening new agricultural districts. Only the captaincies at Pernambuco and Siio Vicente were financial successes, but the primary objective of securing the coast with permanent colonies was achieved. To supply the needed unity, John III named Tomé de Sousa a captain general in 1549 to head a central government. He founded the city of Bahia as his capital and it was an immediate success. Six Jesuits accompanied Sousa and became the forerunners of a most influential group in the new country.

Agriculture was now well established, and the main products (cacao, cotton, corn, sugar cane and cattle) were grown in adequate quantities to support the home population and provide exports. Labour was a desperate problem. The settlers, interested in raising commercial crops for export, needed labourers to cut wood and to work in the fields and mills. Indian enslavement: the first expedient, was not wholly satisfactory because of the low cultural level of the Brazilian tribes. Negro slaves were introduced during the 1520s, and despite interruptions in the slave trade, they were brought over in large numbers during the entire colonial period until well into the 19th century. See also BRAZIL: History.

B. Political and Religious Institutions

Government. — Spanish governmental institutions in the Indies were the products of experience and circumstance. Although altered in several important ways in the late 18th century, the system's major lines were set as early as 1550. No critic of the Spanish colonial system can gainsay the fact that it apparently functioned no worse than other contemporary colonial administrations in maintaining law, order and respect for authority.

Power in the Spanish political system, in theory, was vested absolutely in the person of the king. In reality. the crown's power was circuinscribed by many traditional privileges enjoyed by the nobility, clergy, chartered communes and favoured occupation groups. Although there were fewer such privileges in the Indies than in Spain, they still existed.

Spanish dominions on the peninsula, as well as overseas, uere divided into kingdoms. In Spain the kingdoms possessed few rights; their Cortes ("parliaments") met for traditional ceremonies reminiscent of freer days and to vote the king taxes according to his dictates. In the Indies the kingdoms were simply administrative units. But, barring a direct royal command, distance permitted administrators in the Indies to evade enforcing unpopular royal decrees.

Orer-all administration and supervision of the Indies was the responsibility of the Royal and Supreme Council of the Indies in Madrid. This colonial office, responsible only to the king, had its origin in the work of Bishop Juan Rodriguez de Fonseca who aided Columbus in organizing his second expedition in 1493. Fonseca never visited the Indies, but he enjoyed the absolute confidence of the Spanish monarchs and informally organized an extensive bureaucracy to facilitate his work. A portion of that bureaucracy was given official status in 1503 as the Casa de Contratacion to act as the crown's agent in all commercial and financial dealings with the Indies. Fonseca died in 1524, and Charles I set up his office formally as the Council of the Indies to act as his over-all agent. The council prescribed all policies and saw to their administration. Its powers were immense. The council prepared laws and regulations concerning administration, taxation, justice, police, defense and boundaries in the name and with the approval of the king. It nominated all appointees, maintained continuous correspondence with officials in the Indies, supervised the crown's patronage of the church, acted as a court of last resort, investigated royal officials and their actions, and censored all books proposed for export to the Indies. After the death of Philip II in 1598 and the advent of less ambitious monarchs, the council exercised greater initiative. On the whole, the council was a hardworking organization. Many of the councilors lacked ability, but others who possessed vigour and were experienced in the Indies served well.

One of the council's tasks was to codify the voluminous legislation dealing with the Indies' problems. By the middle of the 17th century an estimated 400,000 edicts had been issued. Delayed by numerous setbacks, it was not until 1631 that the council issued its celebrated *Compilation* of the Laws of the *Indies,* which reduced the number of laws to about 6,400. (See INDIES, LAWS OF THE.)

Spanish government in the Indies evolved by trial and error. Columbus established the first government in the new world in Santo Domingo by virtue of his concession from the Catholic kings. Unprepared for the complexities of ruling this vast domain, Columbus was soon in serious difficulties and the crown replaced him with a royal governor. Meanwhile, the expansion of the Spanish domain was being accomplished by *adelantados* (lit. "those who go before") clothed with the power of royal concessions. Too ruthless to be trusted with government. they were gradually replaced by governors sent from the homeland. But even governors proved to be unpredictable and unreliable. At Santo Domingo an administrative-judicial tribunal called an *audiencia* was tried as early as 1511. Although more reliable than governors, the audiencias suffered from the weakness of divided authority among the oidores ("judges") of an *audiencia.* The final solution was the decision to appoint in the major administrative units a single strong executive (the governor) and an *audiencia* to act as advisors. (It should be noted, however, that the *audiencia's* prime function was as a court of law.) The governor-audiencia form of government which was initiated in the 1530s characterized Spanish America until independence.

Spain divided the Indies into viceroyalties. At first only two were set up—New Spain to administer all lands north of Panamá, plus Venezuela and the Caribbean Islands, and Peru to administer the balance of South America. Ultimately under the Bourbon kings the Indies were divided into four viceroyalties: New Spain (Mexico, Central America and the Caribbean), New Granada (Colombia, Venezuela and Ecuador), Peru (Peru, western Bolivia and Chile), and La Plata (Argentina, Uruguay. Paraguay. southern Chile and eastern Bolivia). In turn, the viceroyalties were subdivided into districts called kingdoms, and were so referred to in official documents; over each kingdom mas placed a governor and an *audiencia.*

The viceroy constituted the king's alter ego. He was paid a munificent salary and lived sumptuously. Appointments mere usually for three years but actually were held at the king's pleasure. As chief executive, the viceroy was empowered to supervise the execution of all laws and edicts in the viceroyalty. Hence the bureaucracy and the police power were under his direction.. Any feudalistic tendencies that might have existed were now effectively checked. As governor of the district in which the viceregal capital was located, he sat as president of the *audiencia* which might advise him but could not curb him. He had complete powers of patronage over the church, supervised the administration of Indian tribute grants, oversaw the treatment of the Indians to prevent abuses, filled many civil and judicial offices. and took whatever measures might be necessary to meet emergencies. He also was responsible for supervising the defense of his realm in general and protecting his district in particular. The viceroy's power, however, was hemmed in nith restrictions. Primarily his

job was to supervise the execution of policies and laws drawn up in Spain. Important subordinates were appointed and removed by the king; he had little room for discretion since almost every directive was ringed with minute administrative regulations; all larger matters of policy and major projects had to be referred to Madrid. Although it possessed only advisory powers. the *audiencia* could still place annoyances in the viceroy's path. And. in common with other officials, the oidores could communicate directly with Madrid to give their version of the viceroy's activities.

Districts distant from the viceregal capital which posed special problems were organized as captaincies general. Captains general were responsible to their respective viceroys and received their instructions from Madrid through them, but they acted in their respective districts much like the viceroys in their capitals. For practical purposes the captain general was virtually autonomous. He mas appointed directly by the king, had the right of direct communication with him and enjoyed a great deal of independence because of the distance from the capital. An *audiencia* was assigned to each captaincy general to exercise judicial and advisory powers. and the captain general sat as its president. The offices of viceroy and captain general reflect a characteristic of Spanish government in the Indies: the distrust of officials and the division of authority and responsibility to curb them.

A third type of district was one having neither a viceregal nor a captaincy-general's capital located in its territory. The governor's power in all civil matters was then placed in the hands of tlie president of the *audiencia*—hence, the term *presidencia* for such a district—whose actions were subject to review by the viceroy. Military jurisdiction in these districts was usually placed under a separate official: often the viceroy or captain general. *Presidencias* mere usually located in isolated regions where emergency situations were less likely to occur.

Audiencias, it must be remembered, were primarily judicial organs. They were the supreme court for all minor cases in their district (appeal could be made to the Council of the Indies only in cases involving over 10.000 pesos); they exercised original jurisdiction in all cases involving crown interests; and they had special authority in cases involving Indians as well as an obligation to protect Indians. They also acted in a surrogate capacity. Audiencias were often empowered to investigate the affairs of royal officials, and they could try viceroys, captains general and their own presidents. *Audiencias* were supreme in judicial matters, and even the viceroy could not interfere.

Local administration was carried out by two types of officials: governors and corregidores, who possessed similar powers. Local administrative units were not set up in any systematic way; they simply evolved. Generally speaking. a governor had jurisdiction over a fairly large territory, often near the frontier, having its origin in a grant to an *adelantado.* Governors possessed executive and judicial powers and the responsibility for organizing local defense. *Corregidores'* districts were smaller. and their duties included the local administration of government and justice, supervision of Indian forced labour on public projects, and the collection of taxes and Indian tribute money for the crown. In remote and poor districts similar duties nere performed by an official called an alcalde *mayor.* There were two types of *corregidores:* (1) the *corregidor de indios,* appointed by the viceroy, who lived in an Indian tonn and supervised Indian affairs; and (2) the *corregidor* de *españoles,* appointed by the crown. nho resided in a Spanish town and oversaw the work of the town council.



MODIFIED FROM M. W. WILLIAMS, "THE PEOPLE AND POLITICS OF LATIN AMERICA'

FIG. 3.— MAPSHOWING POLITICAL ORGANIZATION OF LATIN AMERICA IN 1784

Complaints of venality and corruption were frequently directed against the *corregidores* who. while quite important in their districts, were poorly paid. The *corregidores de indios* were often accused of mulcting their poor charges. A classic accusation ran: "They sold stockings to Indians without shoes and saddles to Indians without horses."

'Government on the communal level was carried on by the *cabildo* ("town council"), an institution of great antiquity. The *cabildos* were charged with the prosaic tasks of levying local taxes and administering public services. *Regidores* ("council members") were elected by property holding citizens at first. Later, the crown sold those offices and many became hereditary. Crown interests were looked after by the *corregidor* who sat with the *regidores* and often completely dominated the council. In matters of great importance a *cabildo abierto* ("open council meeting") could be called in which all property owners in the community participated. Traditionally, historians have held the *cabildo* to be an institution whose powers consisted of supervising street cleaning and the activities of beggars. Others now contend that the *cabildo* was an instrument by which the colonials were able to thwart royal edicts and its importance increased with its distance from the capital, since there the viceroy or captain general attended all *cabildo* meetings. In any case. during the conflicts which led to the wars of independence it was a decisive instrument in the hands of the dissidents. Further research is necessary to fix its exact role.

Three other types of local government existed. First, during the 16th century groups of Indians were granted to Spanish conquistadors as a reward. Called encomenderos, they were permitted to collect tribute from these Indians in return for protecting. Christianizing and civilizing them. (See *Land and Labour,* below.) In man): instances these Spaniards simply assumed the powers previously held by the Indian village chiefs, including the administration of justice. The powers of the encomendero declined with the disappearance of the encomienda in the late 16th and 17th centuries. His duties were then assumed by the *corregidov de indios.* Second. in order to facilitate their rule, the Spaniards, in many instances recognized the traditional chiefs or caciques who were given much power in ruling their villages. Third, there were the newly formed Indian towns which were given governmental structures similar to the *cabildo* with the *corregidor de indios* overseeing their work. Another type of Indian settlement was the missions whose government was an absolute theocracy run by the fathers.

A new government institution, the *intendencia,* was introduced in Spanish America in the 1780s to centralize and improve local administration. *Intendencias* superseded *gobiernos* and *corregimientos:* 200 of the old officials were replaced by 12 *intendentes.* Working through *subdelegados* (in charge of districts). the *intendentes* had executive, judicial and military power. Their major responsibilities were tax collections, monetary disbursements and encouragement of economic activities.

Two other Spanish governmental practices are noteworthy. An inspection called a *visita* could be started secretly to investigate general conditions and specific complaints. On the basis of the *visitador's* recommendations. officials might be dismissed and prosecuted or royal policy revamped. The second unique institution was the *residencia,* a judicial review of an official's conduct at the end of his term of office. Inviting the public, the *residencia* tribunal investigated any charge, and if convinced of its truth, it could recommend heavy fines: confiscation of property or imprisonment.

Despite criticism, the Spanish accomplishment of ruling the Indies for 325 years is only matched by its achievement of having conquered it,

Church.—For the Spaniards the spread of the conquest was synonymous with spreading the gospel. As early as 1493 in the bull awarding the Spanish kings the right to colonize the Indies, the papacy enjoined them: "And in addition we order you in virtue of holy obedience to send to the aforementioned islands and mainland learned. God-fearing, experienced. and skilled missionaries who will exert all their powers in instructing the inhabitants in the Catholic faith and imbuing them with good morals." *(Inter catera,* May 3, 1493.) But early attempts at conversion were neither successful nor fervent. The job was placed in the hands of encomenderos given the right to collect tribute from the Indians in return for protecting and Christianizing them. While the number of conversions cannot be estimated, the system in the West Indies, at least, can be judged a failure in that the Indians there were exterminated by the severity of the encomenderos' demands. Attempts by horrified priests to save the remaining Indians of the region came too late.

In the Spanish dominions the church and the state were closely tied one to the other. The system known as the *patronato real* ("royal patronage of the church") was based upon two papal grants of power to the kings of Spain. The first bull, promulgated on Nov. 16, 1501, granted the Castilian crown the privilege of collecting all tithes in the Indies on the condition that the crown be responsible for the maintenance of the church and conversion of the Indians. To facilitate episcopal organization Pope Julius II issued the second bull on July 28, 1508, granting Ferdinand the patronage of the church in the Indies including control over all clerical appointments. the founding and erection of all ecclesiastical buildings, financial aid, ecclesiastical government, and communication between Rome and the clergy. In essence the Roman Catholic Church became the Spanish national church.

Large-scale conversions of Indians began with the conquests of the mainland. The priests accompanying the early expeditions righteously destroyed temples and idols and denounced heathenism; wholesale conversions began when missionaries arrived from Spain. Taking full advantage of real and imagined resemblances between the Indian religions and Christianity, the fathers presented their faith in a favourable light. Indians accepted baptism with great zeal. Some, in fact, were baptized several times, being quite carried away by the rites as well as the tokens given them by the fathers. Bishop Zumárraga of Mexico City wrote in 1531 that some 1,500,000 had been accepted into the faith by the Franciscans alone. Despite the efforts of the fathers to master Indian languages and translate Catholic belief into understandable terms, it is highly doubtful that the Indians fully appreciated Christian beliefs. They grasped the idea of monotheism and the promise of afterlife, but fitted these beliefs into older conceptions. Even today while those of European background adhere to orthodox practices, the Indians often worship the old gods in private. Ancient rituals, feasts and celebrations blended into the new religion,

Philip II established the Inquisition in the Indies in 1569 to protect his subjects from heretics, Jews and Moslems. Despite stringent immigration laws excluding these people as well as newly converted Christians, many managed to enter the Indies often to escape the Inquisition in Spain. It was to the Jews and new Christians that the Inquisition directed its attention. The Protestants were mainly captured seamen and adventurous merchants. While all the notorious methods of the Inquisition were used, the actual number of burnings at the stake were few—probably about 100 in Mexico City and Lima together during the entire colonial period. In addition to its religious and moral purposes, the Inquisition also had the political function of defending the state, whose stability was identified with religious orthodoxy. In its role as political censor the Inquisition impeded the dissemination of the new ideas of rationalism by books and in university teaching. How effective the Inquisition was is a moot question. While the *familiars* were not able to interdict the spread of liberal ideas, they most certainly made their dissemination difficult.

During the early years the church was represented by regular clergy (usually Franciscans; Dominicans! Xugustinians and Jesuits,) imbued with a burning desire to spread the gospel. Once the initial missionary stage passed in a given area, seculars replaced the regulars. A marked degeneration in the character of the clergy was then often noted, and many clerics became interested in building sinecures for themselves. Some. in fact, became rather efficient exploiters of Indian labour and extortioners of the Indians' scant earnings for the performance of the sacraments. Still, the church was often the only buffer between rapacious whites and the natives.

The Jesuits constituted a group of clerics of exceptional importance. Carefully selected novices were trained under severe discipline and members frequently distinguished themselves. Their most notable accomplishments were opening and staffing numerous schools and colleges, writing great numbers of historical and regional studies, and generally dominating the colonies' intellectual life. They also carried out the pioneers' task of securing frontiers and subduing the natives by introducing civilization and Christianity under the tight, well-ordered mission system. The order became wealthy, owning large estates and many slaves. Following the examples of Portugal and France, Charles III expelled the Jesuits in 1767 in fear of their growing power. In retrospect, their influence upon colonial life was not as large as might be supposed. In education they worked largely with the elite, and their literary labours were usually in Latin, not the vernacular. While many teachers were lost and the quality of theological education declined as a result of the expulsion, the schools were now marked by a greater secularism and the introduction of the ideas of the Enlightenment. Perhaps their most ephemeral work was among the Indians on the missions. Because they failed to give their charges training in responsibility or more than a superficial veneer of Christianity, the Indians soon reverted to barbarism when the missions were disbanded.

As an institution, the church became quite wealthy; in Mexico it was estimated that it owned half of the land and held many mortgages. Allied with the most conservative elements in society, the church became a bastion of royalism and until well after the era of independence, a stormy petrel of Latin American politics.

C. Economic Life

Land and Labour. — Legalisms and Christian theology pressed the Spaniards hard in justifying their conquest and expropriation of Indian land and labour. Despite the grant of the rights of dominion by the papal bulls of 1493, a rationalization was also necessary. Unlike the English, Spanish legal practices scrupulously protected Indian property rights; the greatest debates concerned the question of the political rights of non-Christians conquered by Christians.

Columbus faced the problem of determining the Indians' legal status immediately after establishing the first settlements in Santo Domingo. He attempted to assuage his disappointment at finding neither gold nor the Indian spice trade by sending Indians to Spain to be sold as slaves. Isabella refused to allow the enslavement of her "subjects and vassals" and forbade the trade. Unfortunately, the royal resolution was sapped by the prospect of the profits to be made by licensing the Indian slave trade. For years the crown vacillated, but eventually a number of practices evolved. Slavery could be imposed upon Indians only for rebellion, cannibalism, and resistance to Spanish occupation and Christianization. These criteria were often disregarded. After the promulgation of the New Laws of 1542 the practice of enslaving Indians declined and most Indian slaves were emancipated. In the Caribbean area emancipation came too late; the Indians had died off. Negro slaves and the evolution of systems of servile and forced Indian labour replaced Indian slavery.

Imposition of forced labour upon Indians dates from Columbus' demand that they deliver gold or other goods to Europeans as tribute, a practice developed during the reconquest of Spain from the Moslems. But the demand for labour, only partially satisfied by slavery, led to the introduction of a new system. Indians were "commended" to a Spaniard, called an encomendero, who was responsible for protecting, Christianizing and civilizing them in return for a tribute (due to the crown but assigned to the encomendero) collectible in gold, in kind or in labour. As it evolved, the system yielded chiefly labour for the encomenderos to work their landed properties. Fearful lest the encomenderos emerge as a new feudal class! the crown attempted to restrict and abolish the system. Despite widespread resistance, delays and compromises, the encomienda system gradually died out. To fill the need for labour, a new system appeared called the *repartimiento* ("division"). Labour levies were placed upon Indian villages for men to work for the public interest. This concept included not only work on roads and churches, but labour on plantations and in the mines owned by Europeans. They were paid modest cash wages from which the crown's tribute and the church's tithe were deducted. As the Spaniards secured control of more and more Indian land, converting whole villages to tenancy, the *repartimiento* succumbed, to be replaced by peonage — a system by which debt (often inherited) tied the worker to the landlord until it was paid. With the landlord keeping the records, few peons ever worked their way out of debt.

Spanish control of the land evolved in a more straightforward manner. An encomienda was not a land grant; it gave the holder a right only to collect the tribute, often in labour, from a group or village of Indians. Generally speaking, Spanish law recognized villages, sites of fixed residence and lands under permanent cultivation as private Indian property. Hence, lands of nomads or seminomads. or those practicing shifting agriculture, were considered open lands which could be granted by the crown or claimed by individuals prepared to pay for the patent. In addition, European agricultural techniques, particularly the use of the plow and the introduction of livestock, made vast areas which were useless to Indians valuable to Europeans. Spanish control of the land was achieved basically by laying claim to and occupying or being granted unused lands and securing control of the cultivated lands where Indian titles were recognized by purchase or marriage. Encomenderos often purchased Indian lands. Unfortunately, many times Europeans used bribery, fraud or force. Indian land was frequently lost to Spaniards who had superior knowledge of and ability to manipulate land law. By acquiring empty lands and keeping a steady pressure upon Indian landowners of the settled regions, Spanish domination became an established fact. Bit by bit the Indian villages were incorporated into Spanish holdings and villagers became tenants on their ancient holdings. The encomienda, the *repartimiento,* and eventually peonage supplied the Spanish land owner with his needed labour.

Mining. — One widely held misconception concerning the economic life of Spanish America is that the basis of the wealth of the Indies was the plunder obtained from the Indians. Plunder amounted to about 25,000,000 pesos: according to the estimate of Baron Alexander von Humholdt. a sum exceeded by the output of the new mines opened by the Spaniards in the 10 years following 1545. Indian mines are a long-standing fiction. Indian cultures were still in the Stone Age, and except for some copper diggings, there was no organized underground mining. While the Incas smelted some copper ore, almost all the gold and silver came from panning stream beds or the discovery of nuggets. Spanish prospectors and Indians bringing curious rocks to the Spaniards were the discoverers of the mines of Spanish America. Fabulous Potosi in Bolivia, for example, was found in 1545 by a shepherd who pulled out a clump of grass as he fell and saw nodules of silver clinging to its roots.

Fixing the exact value of the output of precious metals in the Spanish and Portuguese colonies is impossible because of the unreliability of the statistics available, gaps in the record, and, of course, widespread smuggling activities. Humboldt's estimates are the best available. He sets the total output for the separate colonies for the years 1492 to 1803 as 4,851,200,000 pesos of gold and silver for the Spanish dominions and 855,500,000 pesos for Portugal's — a grand total of 5,706,700,000 pesos. Output during the first half century after 1492 was small, but it continually rose. In fact. for the first 30 years the yield of the pearl beds off the coast of Venezuela was larger after 1492 than the wealth derived from mines and plunder. In the long run the output of Latin American mines was prodigious, approximating 90% of the world's silver and gold output by 1800. It rose steadily from the time of discovery until the wars of independence brought the industry to a halt.

A significant factor in the American mining industry was the introduction of European methods of mining and treating ore. Much of the silver was extracted with the use of mercury by a local invention called the patio process perfected in Pachuca, Mexico) in 1557 by Bartolomé de Medina. Silver was by far the most important of the precious metals, gold being only a fraction of

the value. Among the largest and most famous of the silver producers were the mines of Cerro Gordo de Potosi (discovered in 1545) in Bolivia; and in Mexico. Zacatecas (1546), Real del Monte, Pachuca (1552) and Guanajuato (1558). Most of the other silver producers, nith a few exceptions. were new veins or lodes opened in the older districts, although in the 17th century San Luis Potosi and Bolaños were discovered in Mexico. Gold came mainly from the Ouro Preto region of Brazil. with significant quantities from the Choco and Antioquia regions and the Cauca river valley in New Granada and placers in the central valley of Chile. Brazil was the largest gold producer in Latin America until the middle of the 18th century when New Granada's output increased and remained greater than Brazil's until the end of the colonial period.

The mining industry has often been listed as a cause of decadence but the truth is that it stimulated'the economies of Latin America by providing a market for the products of farm, ranch and workshop—food for the miners, horses for the mines and carts to carry bullion. It also provided the colonies with the wherewithal to pay for needed imports and royal taxes. The great cities of the colonial period with their celebrated religious and secular architecture mere ordinarily supported by the mines. At the same time it was one of the bases of the commercial revolution that transformed western Europe.

Agriculture. — During the colonial period, agriculture flourished in Latin America. From the first, the Spaniards encouraged food production. The crorrn ordered seeds, livestock and farm equipment to be included in Columbus' second expedition. Spanish conquests spread as the food base expanded. Settlers opening new areas were subsidized until their farms came into production. Cattle ranches and cultivated fields backed up the frontier marked out by the conquistador and miner. For every fortune amassed in mining or commerce, there were several made in raising cattle, sugar or cacao. About 90% of the people derived their livelihood from agriculture.

Indian contributions to the new world's larder were as important as were those of the Spaniards. Indigenous crops included maize, potatoes, yams, manioc (the "bread" of the early conquistadors), squashes, pumpkins! certain beans, chile peppers, cacao, vanilla, nuts and melons. Medicinal crops of the new world were cinchona (quinine), coca (cocaine), ipecac, sarsaparilla and cascara. Tobacco was in a class by itself. With the exception of maize, these products were cultivated by the Indians only in certain localities; the Spaniards carried them, or knowledge of their use, to all parts of the Indies, as well as to Europe. The European contribution included the cereal grains — wheat, rice, barley, rye and oats — innumerable garden vegetables; fruits (bananas, oranges, lemons, limes, peaches, plums, apricots, apples, pears, cherries, grapes); sugar cane; coffee; the *coco* palm; and silk culture. Equally important was the importation for work and food of horses, donkeys, cattle and oxen, sheep, goats, hogs and chickeris to supplement the Indian's llama and wild turkey. Besides meat, they provided eggs, dairy products and textile fibres. The Spaniards also introduced the plow drawn by a draft animal, the wheel, iron tools (including spades, saws and nails), and knowledge of digging deep wells and pumping water. As a result, the larder of the Americas was increased and the area that could be exploited for food was expanded.

Despite the advances made in agriculture, certain natural and man-made factors limited Latin America's capacity to produce food. Much of the land was nonarable; many areas had no market, domestic or foreign, for their produce; poor transportation cut off many areas; the social outlook induced landowners to raise only enough of a surplus to satisfy their need for cash; and, finally, the concentration of land in the hands of an aristocracy more interested in the social value of a large acreage than the economic value of its output permitted much good land to lie fallow.

Commercial agriculture yielded large profits. Although most farm products were either consumed by the grower or marketed locally, agricultural exports were of significant value. They comprised sugar, tobacco, hides, coffee, cotton, cacao, vanilla, rice, indigo, cochineal and logwood. For example, by the end of the 18th century, La Plata was shipping over 1,000,000 hides a year.

Manufacturing. — Most of the manufactured goods needed in colonial Latin America, except those of high quality or requiring scarce materials, were produced by local artisans and craftsmen. High prices for imported goods constantly stimulated colonial manufactures. Spanish policy was directed more toward keeping trade in Spanish merchants' hands than in promoting home manufacturing at the colonies' expense. Since Spain was barely self-sufficient in manufactures, it was believed that export of manufactured goods would only raise prices. Furthermore, many of the manufactured goods sent to the colonies were purchased abroad. Keeping these imports small, it was believed, would keep precious metals in Spain.

When the Spaniards conquered the high culture areas of the mainland. they found Indian artisans of great skill who were immediately employed under European direction. The techniques of both cultures soon blended. New products to satisfy European desires included glass, metal and leather goods, gunpowder and soap. The Indians' skill in weaving cotton, alpaca and llama wool was applied to sheep's wool, linen and silk. In time large establishments were set up to weave cloth (called *obrajes*), cast cannon and church bells, and build ships. Supplemented by a widespread home industry, these workshops supplied almost all the colonies' needs for products as diverse as cloth, clothing, shoes, saddlery, furniture, ceramics, building supplies, ships, naval stores and supplies, cooking utensils and iron tools. The processing of food in Latin America (*e.g.,* flour milling, dairying, meat salting, sugar refining, tobacco curing and cigar making) was for home consumption or export. The few restrictions imposed were upon manufacturing competitive specialties. Their object was to limit, not prohibit, production, and they were frequently violated with the approval of local officials. Colonial manufacturing supplied the people aith most of their daily necessities.

Commerce. — Among the pre-Columbian Indians, trade was but a minor activity limited by the lack of a money system, the absence of roads and draft animals, and by hostile tribes. As sailors, the Indians were woefully backward. It was the Spaniards who linked the Indies with each other and nith Europe. By introducing a medium of exchange, a central government and single language, transportation systems by seaworthy ships and by roads for animal-drawn wheeled vehicles, Spain created American commerce.

Spain imposed few restraints upon trade among and within its American kingdoms, and these were chiefly to require licences, the payment of taxes and inspection to control the movement of bullion and the slave trade. Trade among the kingdoms in local merchandise was small and limited to specialties. It was naturally restricted because the kingdoms produced similar export items; their exports had a market in Europe, not America; and transportation was costly. In any event, the restrictions placed upon a small number of products were often overlooked. The local public market was an active and important centre of colonial life. Trade was freely carried on to feed the numerous cities, supply the haciendas, and provision the mining districts. Imported articles had to be distributed and products for export collected. These shipments from the ports of entry to the market could be very long, *e.g.,* from Panamá to Chile.

Overseas trade was, perforce, wholly European in origin. One of Columbus' objectives was to open a trade route with the far east. Spain set up numerous minute regulations concerning foreign trade, but, viewed against the background of the times, its restrictions were not unreasonable. Unlike other European nations, Spain was sparing in the authorization of monopolies in the Indies trade. Columbus had been given concessions, not a monopoly, and a decree of 1495 opened trade with new lands on condition of securing a licence. During the first years of the 16th century, licences mere given to Italian and German as well as Spanish merchants, reflecting the cosmopolitan interests of the Spanish crown. The Casa de *Contratación* ("house of trade"), set up in 1503, regulated the American trade. The *Casa* acted as the crown's agent for dealing with trade, navigation, immigration and tax collections, sat as a court of admiralty, and maintained the archives of the Indies.

From its beginnings trade between Spain and the Indies was large. Fleets of from 15 to 30 vessels were not uncommon. This wealth attracted interlopers and pirates; ships and bullion were lost. The wars of Charles I forced him to modify earlier policies. As early as 1522 ships were taxed to cover the cost of patrol vessels; in 1526 they were required to sail in groups; in 1538 foreigners were barred from the Indies' trade. A system of more or less regularly convoyed fleets was established in 1543. Freedom to sail unprotected had become freedom to be captured. An earlier policy of restricting the ports in Spain and the Indies between which trade could be carried was further tightened: fleets left Seville and Cádiz, one part going to Veracruz for the Mexican trade, the other to Cartagena (modern Colombia) and Nombre de Dios (after 1584 to Porto Bello), Panamá, from which goods were transshipped to Lima; after great fairs, the ships reassembled at Havana and ,returned to Spain. These ports were the natural entrepôts. The major drawback of the system was its rigidity. Trade was monopolized by the guild merchants of a few cities who fought to defend their vested interests, and it led to the neglect of northern Mexico and La Plata. A booming contraband trade developed in the Caribbean and La Plata regions. During the 18th century the commercial controls were revamped. Regular convoys, disrupted during the War of the Spanish Succession (1701–13), were finally discontinued in 1740. With the decline of piracy, a growing number of fast register ships were allowed to sail alone. Regular packet sailings were inaugurated in 1764.

Spanish and Portuguese successes in Middle and South America attracted the attention of the nations of northern Europe. Piratical activities were paralleled by expeditions to found settlements or seize established colonies. Spain and Portugal successfully repulsed several major French, Dutch and British expeditions. But by the mid-17th century the interlopers were more successful, and Spain soon lost Jamaica, the Lesser Antilles, the Guiana coast, Belize and Louisiana. However, repeated attempts to seize Panama and the northern coast of South America failed. Where the Spaniards and Portuguese had firmly established themselves and their cultures, northern European incursions were failures.

After the Seven Years War (1756–63) Charles III issued a series of regulations which liberalized the old trade system. Between 1765 and 1789 Spain opened trade between all major American and Spanish ports with only the formality of registering and paying a small duty. In essence any Spaniard might trade directly from any part of Spain with any part of the Indies. Rio de la Plata was organized as a viceroyalty in 1776 to promote its hide exports and combat smuggling. Finally, the *Casa de Contratación* was abolished in 1790. Trade between Europe and the Indies increased, contraband declined as did prices, and the Indies were better served. By the end of the colonial era, Spain's American provinces were more prosperous than ever before.

Spanish tax policy in the Indies evolved without plan. At first, tax rates were low and exemptions many. Later, as the wealth of the colonies grew and the motherland's needs became more insistent, the tax burden mounted. The major sources of revenue were the *quinto* ("royal fifth'!) deducted from all newly mined gold and silver, a multitude of trade taxes and the Indian tribute. About half of the taxes collected were used to pay the costs of government in the Indies. Certainly, their taxes were not as heavy as those in Spain itself, and they are not considered—except for the Indian tribute—a basic cause of colonial dissatisfaction.

D. Social and Cultural Life

Spanish America was a complex mixture of races and classes. Highest social status was held by the peninsular-born Spaniards (*peninsulares* or *gackupines),* particularly those with noble blood or appointed to an official or church position. Second place was held by the creoles. pure whites born in the Indies, uhose occupations ranged from landowners to artisans. Many *peninsulares* in the Indies also were artisans and small merchants, but they considered themselves superior to the creoles by virtue of their European birth. Although legally equal, creoles found themselves systematically excluded iroin all positions of poner, for crown policy was to prefer Spaniards over creoles. In any event, the two antagonistic groups constituted the dominant class. Next in the hierarchy were the mestizos of mixed Indian and white blood. Emancipated from paying tribute and the Indian village, they found jobs as artisans, muleteers and overseers. In economic status some overlapped the lower creoles, and the more successful even managed to buy "certificates of whiteness." Beneath the mestizo was the pure Indian. Although Indian nobles possessed some status as rulers of their people, they found little acceptance among the whites. Indian commoners were the farm labourers and casual workers, except for the *mansos,* "untamed, non-Christian" nomads. At the bottom of the social ladder mas the Negro, generally a slave. Some mulattoes and freed Negroes managed to reach a status equal that of the mestizo.

Education and Culture.—Schools in the European sense did not exist in the Indian cultures. Children learned by working along with their parents. Schools were set up by the Spaniards at first to facilitate prosyletizing activities, and throughout the colonial period the church maintained schools for training a few Indian children. Only sons of privileged families were educated. Illiteracy may have been as high as 90%. Universities were not neglected. As early as 1538 the Dominican school at Santo Domingo was accorded university status by a papal bull. The first true universities were those of Mexico (1553) and San Marcos (Lima, 1572) authorized by the king in 1551. All told, colonial Spanish America boasted some 25 institutions of higher learning of varied calibre that trained ecclesiastics, lawyers and doctors. Curriculum and faculty were only occasionally brightened by the presence of an original scholar such as the Mexican Carlos de Sigiienza y Góngora (1645–1700). Late in the 18th century, scientific and philosophic ideas derived from the Enlightenment appeared in various universities. The Mexican School of Mines (1791) was the first technical school in the new world.

Spanish America inspired and spawned a host of writers. The Spanish conquest was one of the best-reported events in history. Two outstanding works were Fray Bartolomé de las Casas' (1474–1566), *History of the Indies,* a remarkable account for its time which included eye-witness testimony and information gleaned from the participants and primary sources now lost; and Bernal Diaz del Castillo's (1492–1584) *True History* of *the Conquest* of *New Spain,* in which an old campaigner set down in stirring language his experiences in that fantastic adventure. Among the many studies of Indian life, the monumental *Royal Commentaries of the Incas* by Garcilaso de la Vega, El Inca (1539–1616), the son of a Spanish officer and an Indian princess, is recognized as the best survey of the lives of the Incas. The most eminent writer of the colonial period was, surprisingly, a woman, Sor Juana Inés de la Cruz (1651–95) "the tenth muse:" who from behind the walls of a convent in Mexico City wrote love lyrics collected as *Sacred and Profane Poems.* Possibly the outstanding scientist mas Sigiienza y Góngora, world-famed as an astronomer and mathematician who also dabbled in history, poetry and philosophy.

E. Colonial Brazil

By 1550 Brazil was securely Portuguese but prey to a growing number of predators. A French force occupied an island in the bay of Rio de Janeiro in 1555, and an expedition led by the governor general of Brazil, Mem de Sá, was necessary to drive them out. To secure the area De Sá founded Rio de Janeiro in 1565. French and English encroachments continued for the rest of the century but enjoyed little permanent success. However, Portugal herself fell under Spanish rule in 1580 when Philip II seized the vacant throne. Brazil was a fine addition to Philip's empire: its 17,000 Europeans controlled about an equal number of Indians and Negro labourers who turned out 180,000 arrobas (one arroba = 25.36 lb.) of sugar a year. In Bahia alone there were over a hundred citizens with fortunes of $100,000 in modern purchasing power. Twenty years later the population was estimated at 25.000 whites, 18,000 Indians, and 14,000 Negro slaves and the capital investment at $22,000,000. Philip left Brazilian affairs in Portuguese hands; the Brazilians used their opportunity to push westward across the line of demarcation and trade with the Spanish colonies.

Under Spanish rule Brazil acquired Spain's enemies, and in 1630 the Dutch managed to establish themselves in Pernambuco. During the Dutch occupation, which lasted until 1654, Brazil's sugar economy boomed with Dutch capital and new markets. Despite being granted full equality with Netherlanders and full liberty of conscience, the Brazilians never accepted the foreign heretics. Expulsion of the Dutch plunged Brazil into a depression because of the loss of sugar markets and the competition of cheaper West Indies sugar.

Peopling Brazil was a difficult task. Forests taxed the strength of the most ambitious and with the stubborn Indian resistance. one *donatário* was moved to write the king: "The land you granted us in leagues we have had to conquer in inches." But the restless Brazilian frontiersmen continued to push north and south. as well as westward. The 17th century witnessed a tremendous burst of activity as the northern edge of the Brazilian bulge was settled to eliminate French and Dutch interlopers and Manaus, a thousand miles up the Amazon, was first settled in 1660. At the same time a wave of settlement moved up the Rio São Francisco as the Indians were driven out and cattle ranchers moved in. A third area of expansion was São Paulo in the south. Cut off by an escarpment from the coast where São Vicente cultivated sugar, São Paulo found wealth by taking advantage of its position of easy access to the interior. Large slaving expeditions from São Paulo filled the demand for slaves with Indians when the African supply of Xegroes was insufficient. These expeditions, whose members were called *paulistas* or *bandeirantes,* penetrated as far west as Paraguay, raiding the Jesuit missions and forcing the fathers to move west. Attempts by Portuguese Jesuits to control slavery proved unavailing. and the order in Brazil even had Negro slaves of its own. It was due to the activities of the *paulistas* that Brazil was able to claim her present southwestern boundaries far to the west of the line of demarcation. By the 1730s settlements extended as far south as Rio Grande do Sul, and by the 1780s as far west as the present Brazilian border. Of particular importance was the founding of Tabatinga on the upper Amazon which fixed Brazil's claims there. Negro slaves were of prime importance, and by the end of the colonial period. they numbered about 1,000,000, constituting the backbone of plantation labour. Brazilian Negroes were not always docile. Several large revolts and the setting up of slave kingdoms in the jungle called *quilombos* (one had 20,000 people) marked the colonial era. *Paulistas* made excellent slave catchers and broke up the runaways' *quilombos.*

Sugar remained the major Brazilian agricultural export during the colonial period until gold was discovered in the state of Minas Gerais by *paulistas* in 1692. Diamonds were discovered in 1729. An estimated $1,000,000,000 in gold and 3,000,000 carats of diamonds were exported. The rush peopled large sections of inland Brazil and supported the badly slumping economy by providing a medium of exchange, Following the gold rush. Brazil experienced a number of other booms in cotton, tobacco and coffee. The output of each rose and fell precipitously. Like the Spanish colonies. Brazil mariufactured most of its own needs, importing only luxury goods. Brazilian manufactures were much like those of Spanish America. except that output was smaller because of lower purchasing power. In 1785 the Portuguese attempted to halt all manufacturing in Brazil in order to divert labour into sugar raising. While not completely successful. the order aroused discontent with Portuguese rule. Portugal's commercial policies never were as comprehensive as Spain's. Anglo-Portuguese treaties gave British goods special status although they had to be carried in Portuguese bottoms. Some foreigners were licensed for the Brazilian trade. but trade with nations other than Portugal was generally forbidden. Portugal also used a convoy system, which was not abolished until 1801. Several monopoly companies were set up to encourage the development of certain sections of Brazil.

Brazilian society was rent by a dual division: landowners and landless: whites and coloured. Landowners ruled their large estates as petty kings. while the landless had many obligations but few rights. Many Europeans who did not own land owned slaves, hiring them out and living on the slaves' earnings. Since the Brazilian Indians were nomadic and warlike, they were accorded few rights. To the end of colonial days Indian and Negro slavery flourished, A large group of mixed bloods appeared very early, for Indian and Negro women readily accepted the whites and miscegenation was a characteristic of the Portuguese colonist. Many mulattoes were rather well off, being recognized, educated and endowed by their fathers. Education mas the prerogative of a small group. many of whom attended the excellent Jesuit schools. However. Brazil never had a university. and rich young men went to Portugal to complete their education. In letters Brazil lagged behind Spanish America. Two writers. both Jesuits, José de Anchieta and Antonio de Vieira. are noteworthy. The greatest handicap to literature was the lack of a printing press; the first one was not set up until 1808.

Church and state were closely allied in Brazil, the crown having rights of patronage similar to those enjoyed by the Spanish kings. Not until 1550 was a hierarchy established in Portuguese America. From the very beginning the power of the Jesuits was great until their expulsion in 1753, although they were not able to suppress Indian slavery.

Brazilian government functioned on two sharply divided levels. The central government had little control over local affairs. Portugal never evolved an administrative system as highly centralized as Spain's, although the India council in Lisbon and its successors, the Overseas council and the marine and overseas ministry. had similar powers. A central government was provided in 1549 by a captaincy general with its capital at Bahia. In 1572 a secondary capital for the south was established at Rio de Janeiro, which became the capital in 1763. A viceroy was appointed in 1640, although the country's title was not officially changed for a century. Constant threats of invasion, Indian and Negro revolts and troubles with Spain along the borders, kept Brazil on a semi-military footing. While the *scnado da câmara* ("city council"), resembling the Spanish *cabildo,* administered the cities. the power in town and country was wielded by administrative and military officials called *capitaes móres* who, because of virtual isolation and their control of the militia, were veritable autocrats in their districts.

By the 19th century, Portugal had staked out a magnificent empire in South America but one marked by an inefficient government and serious social and economic imbalances.

III. THE INDEPENDENCE MOVEMENT

The outbreak of the wars of independence is ascribed to several causes of differing importance and urgency. Most downtrodden of the Latin Americans were the Indians who, sunk in hopelessness, waited in vain for a leader and a slogan. But the most basic cause of the revolution was the antagonism between the creoles and the *peninsulares* derived from the latter's snobbishness. aggressiveness and preferment in appointments to positions of status and prestige. Keeping the creoles loyal was the key to maintaining Spanish rule, but they were becoming conscious of being Americans. Spain's control of American political and economic life was also resented. although the stricter regulations were evaded and economic controls had been relaxed. These long standing annoyances were aggravated by more immediate predisposing causes. After 1780. as Spanish America became more prosperous. the creoles began to chafe at Spanish direction and the emptiness of the few honours—*e.g.,* membership in the gaudily costumed militia — given them. Young creoles completing their education abroad returned with new ideas of freedom and liberty derived from John Locke, the American Revolution. and the enlightenment which mixed with Cathoiic doctrines sanctioning opposition to tyranny. England looked with approval upon plans to overthrow the Spanish regime and its restrictive trade policies. Even the Jesuits. disaffected after their expulsion from Spain and the Indies in 1767, criticized Spain, as did the Freemasons. The church itself tried to perform its political function of supporting the monarchy through the Inquisition and the schools, both of which combatted the more unsettling ideas of the enlightenment. However, the new outlook which questioned poverty, servility and autocracy in government and economics found supporters among young creoles, some clerical professors and many of the lower clergy who were creoles or

mestizos of poor social origins. Supporters of independence could be found on all levels among the religious, but their number was greatest in the lower ranks.

Napoleon contributed the immediate cause of the revolt by invading Spain. *(See* SPAIN: *History.)* Napoleon's move was precipitated by a palace revolution in which Prince Ferdinand deposed his father, Charles IV, and Manuel de Godoy, the prime minister and queen's lover. But Napoleon forced both monarchs to resign and placed his brother Joseph Bonaparte upon the Spanish throne in 1808. French troops drove the Spanish guerrilla forces back to Cadiz where they formed a central junta ("committee") to act as Spain's government.

Napoleon's agents carried the news to the Indies. *Peninsulares* and creoles rejected Joseph. But with Ferdinand in exile and Joseph in Madrid, who possessed the power to issue orders? Creoles claimed that as "kingdoms." sovereignty had devolved upon the Indies. *Peninsulares* held that the organs of government in the Indies should continue as before, taking orders from Cádiz, since they were "kingdoms" only for administrative purposes. In time the creoles learned that in order to exercise sovereignty they would have to win independence.

While the Indians nished to rid the new world of those who interfered with their traditional way of life. the creoles, at first, had no clearly defined goals. They wished to better conditions without destroying the fabric of society. Aside from high-sounding generalities concerning the rights of man, their leaders advanced political principles only under the spur of expediency. At the beginning the creoles wished equality within the empire, local autonomy and further relaxation of economic regulations. But faced with the fear of an Indian social war and the *peninsulares'* intransigence, the patriot forces were soon fighting for political and economic independence under a creole oligarchy. Freedom meant national independence, not political or social liberty.

Revolts against Spanish rule had occurred several times before in the Indies. Tumults protesting administrative actions or tax exactions had occurred from time to time, such as the Revolt of the Comuneros in 1781 in New Granada. Tupac Amaru II (José Gabriel Condorcanqui), a descendant of the royal Incas, led the mistreated Indians of Upper Peru (modern Bolivia) in a social war marked by massacre and butchery. The revolt was crushed in 1783 and the principals barbarically executed. A more portentous revolt was led by Francisco de Miranda. A Venezuelan creole with an unbelievable background as soldier, traveler, raconteur and roue. Miranda settled in London and the British government gave him a pension to organize a revolt against Spanish rule. After a fiasco in 1806. he returned in 1810 when the creoles of Caracas set up an independent junta; he mas proclaimed commander in chief but capitulated in July 1812. Miranda was turned over to the Spaniards by a group of his officers: including Simón Bolivar, who believed he had betrayed them. Miranda died in prison in Cadiz in 1816.

Mexico.—News of Ferdinand's abdication precipitated a delicate political situation in Mexico. Not trusting the viceroy José de Iturrigaray, the peninsular *audiencia,* on Sept. *15,* 1808, deposed him, arrested the creole leaders, and set up their own appointee as viceroy. Meanwhile, in Spain. the Cadiz junta voted to set up a regency to rule in Ferdinand's name and called a *Cortes* to write a new constitution. In Sept. 1810 a viceroy appointed by the regency arrived. A constitution influenced by liberal ideas of the Enlightenment was promulgated in Cadiz in 1812.

A creole "literary club" in the provincial capital of Querétaro plotted a revolt for Dec. 1810. Informed that the plot had been discovered, one of the members. Fr. Miguel Hidalgo y Costilla (*q.v.*), a creole parish priest at the village of Dolores, with virulent hatred of Spain and a library which had caused him trouble with the Inquisition, called together his Indian parishioners and dedicated them to the revolt with "the cry of Dolores": "Long live our Lady of Guadalupe (the patron saint of Mexico); Death to the Spaniards." The date, Sept. 16, 1810, is Mexico's Independence day. Soon Hidalgo led an army of 60,000 natives whom he could barely control. At Guanajuato, after the city surrendered, they slaughtered creoles and *peninsulares* alike. Shocked by the social mar, creoles and *peninsulares* closed ranks. Failing to take hlexico City, Hidalgo retreated northward and after a few successes was captured. defrocked, and shot on July 31, 1811. The Indian as a social group never again entered any of the wars for Latin American independence. Fr. José Maria Morelos, a mestizo. then took over Hidalgo's army. Morelos demonstrated unsuspected ability. He seized much of Mexico; organized the semblance of a government, despite squabbles; and called a convention at Chilpancingo in 1814 which drafted a constitution and formally declared Mexico independent. A royalist army under Agustin Iturbide, a creole. defeated Morelos who was captured and shot on Dec. 22, 1815. The patriot army collapsed; most of the leaders still alive accepted an amnesty. Only Vicente Guerrero, an Indian, remained in the field with a guerilla force. Félix Fernández, destined to be first president of Mexico under the name Guadalupe Victoria, hid out alone in the mountains of Veracruz. Mexico entered five years of relative peace.

Restored to his throne in 1814, Ferdinand VII had rescinded the liberal constitution of 1812, but was forced to promulgate it again in 1820 after a successful liberal revolt in Spain. The reactionary *peninsulares* hatched a plot to provide Iturbide with an army ostensibly to wipe out Guerrero but really to have him declare Mexico independent and free from the liberal constitution. Iturbide betrayed his supporters by issuing on Feb. 24, 1821, his three-point Plan de Iguala calling for: (1) adherence to Roman Catholicism; (2) independence. preferably under a monarchy; and (3) equality between those born in America and Europe. Joining forces with Guerrero, the Army of the Three Guarantees entered Mexico City on Sept. 27, 1821. At the same time: the captaincy general of Guatemala also declared its independence and was annexed to Mexico, only to break away in 1823. A revolution begun by a radical reformer was consummated by reactionaries out of fear of a too-liberal Spain and seized by an adventurer who was all things to all men.

Spanish South America.— In the 14 years of hard fighting necessary to emancipate South America, Simón Bolivar (*q.v.*) and José de San Martin (*q.v.*) played leading roles. Bolivar. a wealthy Venezuelan creole, was tutored by an ardent disciple of Rousseau who according to legend induced him to swear to emancipate his homeland. Bolivar was in the forefront of the patriot organization which declared I'enezuela independent on July 5, 1811, and welcomed the return of Francisco de Miranda. After the capitulation of Miranda in 1812. Bolivar recruited a few hundred men in New Granada and crossed the Andes into Venezuela where he was hailed as *El Liberfador* ("The Liberator"), in Jan. 1814. Defeated again, Bolivar returned to New Granada to become commander of another hopeless struggle.

April of 1815 found Bolivar in Jamaica. There, in his famous *Jamaica Letter,* he pledged himself to continue the struggle and to lead his compatriots to learn to govern themselves. With Haitian aid he returned to the fray. But after fulfilling his promise to Pres. Alejandro Petion of Haiti of declaring all slaves free, he left just ahead of the Spanish troops.

The Liberator's ultimate attempt was in Jan. 1817, when he established his headquarters at Angostura (now Ciudad Bolivar) on the Orinoco. He was joined by the horsemen of the Orinoco plain commanded by José Antonio Páez and several thousand adventurers released by the end of the Napoleonic wars. Two years were spent training an army. Convinced that he could not take Caracas, Bolivar conceived the plan of crossing the Orinoco plains, scaling the Andes, and falling upon the unsuspecting Spanish garrisons in New Granada. The plan worked. Defeating the royalists at Boyacá (Aug. 7, 1819), Bolivar took Bogota. Returning to Angostura in Dec. 1819, he declared the union of Venezuela, New Granada and Ecuador into a new state, Gran Colombia. Bolívar defeated the royalists in Venezuela decisively on June 24, 1821, at Carabobo. Gn Aug. 30, 1821, a convention meeting at Cúcuta, Venez., adopted a constitution dictated by Bolivar establishing a highly centralized government to rule Gran Colombia from Bogota. However, separatist sentiment plagued the new nation from the start.

Bolivar turned south in Dec. 1821, toward Ecuador where a

band of patriots had declared independence in 1809 only to be crushed. Earlier. his lieutenant, Gen. Antonio José de Sucre, had liberated Guayaquil and, in the battle of Pichincha, May 24, 1822, defeated the royalists near Quito. Bolivar, joining Sucre, persuaded Ecuador to accept union with Gran Colombia. He then marched to Guayaquil to meet with José de San Martin concerning the liberation of Peru, the last royalist bastion.

San Martín represented the War of Independence in the south. The La Plata revolution had had an unusual course. In 1806 and again in 1807, a British force attempted to occupy and annex Buenos Aires, only to be expelled by the creole militia, under the command of Santiago de Liniers, after the viceroy fled. Incensed at the viceroy's desertion, the *porteños* (people of Buenos Aires) in a *cabildo abierto* elected Liniers their commander. and he was named acting viceroy by the crown. Liniers tolerated British merchants and contraband trade; his successor, Viceroy Baltásar de Cisneros, wished neither. Mariano Moreno presented the creoles' arguments to Cisneros: either free trade or face growing contraband and revenue loss since Spain was blockaded by the British. The viceroy accepted reluctantly. At the news of Ferdinand's abdication, another *cabildo abierto* on May 22, 1810, organized a provisional junta to rule in the king's name.

From 1810 to 1816 the junta struggled with varying success to govern the region. Republican fought monarchist and *porteño* fought provincial while the periphera! areas broke away. Aiter repulsing a small *porteiio* force, José Gaspar Rodriguez Francia, in 1813, declared Paraguay free of both Spain and Buenos hires. Uruguay's independence was harder to come by. Viceroy Francisco Javier de Elio settled in Montevideo after the formation of the *porteño* junta and was supported by Portuguese troops from Brazil. José Gervasio Artigas had to fight royalists. Brazilians and *porteños* to free *La Banda Oriental* ("the east bank" of the La Plata, modern Uruguay) which did not become independent until 1828. Manuel Belgrano managed to hold the western provinces of La Plata under the junta, but his campaign into Upper Peru in 1813 met defeat. With the United Provinces of Rio de La Plata seeming ready to dissolve, a congress was called in 1816 at Tucuman, which declared independence (July 9, 1816), wrote a constitution, and elected Juan Martín de Pueyrredon supreme director.

After Belgrano's defeat. José de San Martin was appointed his successor. San Martin, the son of a Spanish officer, was born in northern Argentina. After 22 years' service with Spain. he transferred to the *porteiio* army. A deep believer in independence, he was also an avid monarchist. To secure Argentina's independence, San Martín decided upon an audacious plan to drive the royalists out of Peru: cross the Andes, liberate Chile, then sail north and free Peru! Chile had been the scene of an unsuccessful revolt. Bernardo O'Higgins, Juan Martinez de Rozas and the three Carrera brothers had led a revolt in 1814, defeated as much by dissension among themselves as by Spanish power. San Martin needed three years to prepare for the invasion. Deceiving the Spaniards as to his route, San Martin crossed the Andes with cannon and supplies, and entered Santiago after winning the battle of Chacabuco, Feb. 12, 1317. O'Higgins declared Chile independent on Feb. 12. 1818; the last royalist forces were routed at the battle of Maipo, April 5, 1818. O'Higgins assembled a fleet under Lord Thomas Cochrane (later earl of Dundonald), an English sailor of fortune. Cochrane landed San Martín's 6,000 men near Lima in Sept. 1820, but the city was not taken until July 1821. when he declared Peru independent. But a stalemate ensued. Except for Lima, which was not enthusiastic for independence. the Peruvian creoles were staunchly royalist. At this point San Martín turned to Bolivar for help, meeting him in Guayaquil in July 1822.

What transpired during the interview of Guayaquil will never be known; the talks were held in secret. The most probable reconstruction is that San Martín offered to serve under Bolivar and advised him that Peru would only be stable under a monarchy. Bolivar, in an exuberant mood, turned down both proposals. Sending Bolivar a horse and brace of pistols as a token of his esteem. San Martín returned to Buenos Xires and sailed for Europe where he died in exile:

Bolívar journeyed south to deliver the final blow at royalist power. To the north, Gran Colombia was breaking apart; in Peru the royalists outnumbered Bolivar's forces. Bolivar arrived in Peru in 1823. but the honour of commanding the army went to Antonio José de Sucre who defeated a larger and better armed royalist force at Ayacucho, Dec. 9, 1824. While Bolivar organized the Peruvian government, Sucre mopped up royalist opposition in Upper Peru. Despite Bolivar's personal plea to unite Peru and Upper Peru, a new nation was formed out of the latter named República Bolivar, and declared independent in 1825. Later it became Bolivia. Bolivar agreed to write its constitution, and Sucre was elected the first president.

Bolivar's last five years were unhappy ones. As San Martin before him, he failed to establish a responsible government for Peru. Returning to Bogotá to save Gran Colombia from disintegrating, he soon discovered that only with the spell of a personal appearance could he have his way. Grail Colombia dissolved in 1830. Dying of tuberculosis, Bolivar left Bogotá to go into exile but died at Santa Marta on the coast. His legendary last words were: "Those who have served the revolution have plowed the sea."

Securing recognition as independent states took varying degrees of time. Spain did not recognize Mexico until 1839 and Honduras, the last, in 1895. Cuba and Puerto Rico remained as colonies until 1895. The United States and Great Britain recognized all the independent states during the mid-1820s. and in 1823 they received the protection of the Monroe Doctrine and the British fleet.

Brazil. — In contrast to Spanish .America; Brazil achieved independence with little bloodshed. Brazilian independence had its precursor, too. Joaquim José da Silva Xavier, a Jack-of-all-trades from Minas Gerais, nicknamed after his last occupation, *Tiradentes* ("toothpuller"), led a *mineiro* revolt against high taxes and low wages, only to be captured and beheaded in 1792. Brazilians had grievances similar to those of Spanish Americans; in addition, Brazil was a vigorous expanding country, conscious of its nationality, tied to a decadent state.

Napoleon's invasion of Portugal in 1807 forced the royal family to flee to Brazil. Prince Regent John, determined to make something of his new homeland. rebuilt Rio de Janeiro and started the first printing press! the first bank. museum, library and medical schools. He permitted trade with England, and soon the English dominated the economy. John VI was proclaimed king of the United Kingdom of Portugal. Brazil and Algarves in 1816, placing the two nations on a plane of equality. Despite the court's dissipation, John earned the Brazilians' respect by hard work and his love of the country.

A revolt in Lisbon in 1821 forced John to return, leaving his 23-year-old son Dom Pedro as regent. When Dom Pedro; too, was ordered to return, Brazilians pleaded with him to remain. On Sept. 7, 1822, on the banks of a small stream. the Ipiranga, he tore the Portuguese emblem from his uniform shouting: "Independence or death" (the "cry of Ipiranga"). Portuguese garrisons in the north put up a short resistance. Independence was consummated on Dec. 1, 1822. when Pedro I was crowned emperor of Brazil. Portugal recognized Brazilian independence in 1825.

The Heritage **of** the Wars **of** Independence. — Many of the problems which beset Latin America in achieving independence still plague the region today: poverty, economic colonialism, overly large estates, semiservile labour, disease and malnutrition, illiteracy, poor transportation and communication, rigid class distinctions. governmental inefficiency and instability. Public spirit and discipline left with crown officials and garrisons. Political responsibility and maturity were absent everywhere. Personal allegiance to political bosses became the order of the day, while the masses remained apathetic. Mines and banks could not operate, but large landholdings became larger. Church-state struggles after the end of the royal patronage added to the unrest. Worst of all was the neglect of the basic problem of all Latin America: the rural labourer: usually an Indian, and the land. In essence, the wars of independence failed to do more than oust *peninsulares* in favour of creoles and some mestizos.

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(M. D. Be.)

IV. REACTION AND ANARCHY, 1825–1850

For a quarter of a century after 1825 the new republics were plagued by social and economic paralysis and political chaos. Deeply imbedded prejudices and customs remained, as did a colonial mentality and an intellectual dependence upon Europe. Latent social disorganization was everywhere in evidence. Different civilizations and stages of culture existed side by side.

The working groups, "a melancholy sea of illiterates," had no sense of their stake in good government. African slavery remained in either legal or extralegal form. The large Indian population, accustomed to servitude, showed a strong desire to isolate itself from Europeanized sectors, thereby surrendering any political privileges they might have claimed as citizens. Mestizos and mulattoes, more aggressive than the Indians but distrusted by the creoles, were essentially a frustrated and unruly lot. Their prototype was the gaucho (cowboy) of Argentina and *llaneros* (plainsmen-cowboys) of Venezuela and like them the mestizos and mulattoes often welcomed the opportunity to join private armies in order to strike out against their supposed oppressors. The privileged groups were the only social elements with permanent standards and values. They were blind to the evils that their systems might bring to societies that had not elaborated acceptable substitutes for the displaced Spanish and Portuguese kings and the weakened Roman Catholic Church. The members of the privileged elements (the elites of land and church and the intellectuals) were individualistic to the point of being anarchistic. The laws they wrote were to be applied to others, not to themselves. It is with the failure of the privileged groups to couple liberty with law in mind that the tumultuous quarter-century after independence should be viewed.

Political Groups and Issues.—Within the larger framework of extreme individualism two groups vied for power. Between 1825 and 1850 each group assumed that the primary problem of the new republics was a political one. One group, generally referred to as liberals, was led by the intellectuals of the cities; the other group, commonly designated conservatives, was directed by the aristocrats of the countryside. Those who looked to the intellectuals were in general oriented toward northern Europe and the United States, and were anticlerical. They favoured a federal type of government with narrowly delimited executive power, and they were so strongly committed to liberty and the right of individuals that they professed to prefer disintegration to tyranny. Those who accepted the leadership of the landed elites were essentially Spanish in their outlook and encouraged the church to continue as the interpreter of the social value system. They desired efficient, centralized states directed by strong executive to such an extent that they seemed to favour tyranny to disintegration.

Before 1830 the landed elites had established their ability to neutralize the intellectuals. Their victory over the intellectuals was one of the rural areas over the urban centres, or, as the Argentine president, Domingo Faustino Sarmiento said, "of thirteenth century feudalism over nineteenth century liberalism." The success of the elitists did not mean either the total defeat of the intellectuals or the resolution of the differences that had separated the contenders for power. The intellectuals retained sufficient influence to keep alive islands of radicalism that prevented the aristocratic elements from achieving completely the social rigidity their system demanded. Arrangements were made and compromises were reached on basic issues. The Conservative political leadership was able to reaffirm the area's attachment to its Spanish-Catholic heritage but the intellectuals continued to encourage the flow of ideas from abroad, and by 1850 France had become a cultural prop for all of Latin America. By mid-century, too, even the Liberals had generally conceded that a strong executive was absolutely essential to orderly government; when representatives of the Liberals did attain power it was not unusual for them to be forced to disregard democratic forms. It often appeared that liberalism was invoked in order to impose tyranny. The new states, defeated in their efforts to win for themselves the religious patronage that the Spanish and Portuguese crowns had enjoyed, had accepted the privilege of presentation of lists from which the Vatican selected the high ecclesiastical officials to serve in the republics. The anticlericals, meanwhile, intensified their efforts to circumscribe the church's temporal activities—the registration of births and deaths, participation in marriages, control of cemeteries, leadership in education, participation in politics and economic activities—which gave that institution such strength and influence as to make it a constant threat to the viability of any administration.

The importance of the issues that were delineated and then compromised by the contending power groups should not be discounted but they alone do not explain the state of Latin America after three decades of independence. There were other considerations

of equal or greater significance.

Violence. — In the political area, probably the most far-reaching development before 1850 was the elevation of violence to the level of a political fundamental. In order to seize the initiati e from the intellectuals. the landholding elites had recourse to the military forces that had been nurtured to maturity during the wars of independence. Their victory, thus, was one of violence, and success through violence engendered more violence. Armies soon came to serve a dual political function. They acted as the final arbiters of political matters and they provided the guarantee that the privileged groups could fight among themselves over their political. social and economic preferences without creating a power vacuum into which the masses might rush.

Once force was injected into politics the juridical concept of representative democracy was ignored. Facts prevailed against constitutions — sometimes against their letter, usually against their spirit. Differences were settled by the breaking of heads rather than the counting of them. Bullets replaced ballots Those nho rose to power tended to monopolize it to such a degree that quite often their holds could be ended only by the bloody remedy of revolution. There was no place in such political systems for the popular masses, who constituted as much as 90% of the population in certain of the republics. They were, in effect, driven into a political wilderness.

Caudillism.—Violence paved the way for the *caudillos,* ("men on horseback"). They were violent men of destiny who broke all the bonds of national and social order. They were individualists who could not be restrained by party or ideology. To them electoral platforms were written to satisfy a formality and not a necessity. In the words of the Argentine sociologist Carlos Bunge, they were "rulers by the will of men without sill." Some *caudillos* were generals from the wars of independence, uho, in the course of the 15-year-long struggle for freedom, first lost contact with the people and then developed a proprietory interest in the states that their swords had helped to create. They were the liberators who turned upon the liberated. Some of the *caudillos* were mere adventurers who profited from the widespread disorder of the day Many uere *hacendados* ("large landowners") who took to the field to redress grievances against the central government or in response to the need of property owners for protection that the states did not provide. Once in possession of an army it was but a short step to using it for the purpose of achieving high public office.

The *caudillos* bore a striking resemblance to Max Weber's "charismatic leader." They regarded themselves as indispensable and in office they exercised personal authority regardless of the representation of collective interests. Since the objectives of the *caudillos* were primarily personal they were forded to rely upon their personal magnetism to win followings. They had to be *muy hombre* ("very much a man"). Personalism in politics, consequently. became a fetish. Political parties were little more than *ad hoc* associations of friends. strong in victory, only to disintegrate in defeat. Prior to 1850 Chile and Colombia offered the only exceptions to the rule. If personalism nas one of the strengths of the *caudillos* it was also one of their major weaknesses Because their regimes were built on personalism. they were seldom able to consolidate their poner sufficiently to pass it on to chosen successors. The opposition understood this phenomenon and was secure in the knowledge that sooner or later pouer might be expected to revert to it.

An often' overlooked characteristic of the *caudillos* was their ideological and philosophical sterility. Although acts of brutality and destruction of property usually nent along with the seizure and consolidation of power by *caudillos,* no *caudillo* before 1850 ever threatened a basic principle of the elite system of values Except in Haiti, they invariably paid lip service to the republican system of government. All spoke of government by the people and no one of them felt secure until he legalized his administration by holding an election. They were no more successful than nere regularly elected officials in bringing order out of political chaos They added nothing new to the church-state issue They aere economic traditionalists at least to as great an extent as were those who opposed them. By the time they achieved power they were generally rich in land and the constitutions they wrote reflected their property-owner mentality. Thus it was that in every major political. social or economic area the *caudillos* tempered their actions with enough discretion always to make themselves appear safe. Each one stopped short of revolutionizing the existing social and economic systems.

Not one of the republics of Latin America was spared the price of political tumult born of *caudillism.* Argentina fell into the hands of "bloody" Juan Manuel de Rosas, who was raised to power by a combination of reactionary churchmen, wealthy landowners and the Gauchos of the Argentine pampas. Brazil experienced over a decade of civil war after 1835 led by *caudillos* who threatened to divide Brazil as the Spanish area had been splintered earlier. Mexico barely survived the machinations of the superficially brilliant Antonio López de Santa Anna, who tempered tyranny with treason. The Central American federation collapsed in a fit of quarrels kept alive by petty tyrants. Colombia, Bolivia, Peru, Ecuador and Uruguay were surrendered to war lords and adventurers. Paraguay and Venezuela enjoyed rather prolonged periods of paternalistic dictatorship punctuated by blood baths perpetrated upon the citizenry by power-hungry politicians in military uniforms. Haiti, neglected by Europe and shunned by a race-conscious United States, stumbled from one despot to another and the Dominican Republic was shaken by the onslaught of "the Haitians," the aggressiveness of its own strong men and the ambitions of Spain. Only Chile, after a period of extreme anarchy, in the 1820s evolved a political system that fettered the man on horseback. There the landed oligarchy, comprised of not more than a few hundred families. seized power and through a combination of aristocratic supervision and autocratic administration guaranteed its control. The military forces were brought under civilian leadership. The president was given extensive control over a highly centralized government. The church was given full partnership with the state; the franchise was limited by property and literacy qualifications to the point where not more than 10% of the population could qualify for the vote. The requisites for office holding eliminated all but a few thousand.

The Economics of Anarchy. — Although violence and *caudillism* were essentially political phenomena, no major area of activity was spared the pervasive anarchy they generated. Particularly did the disorderliness of the 1825–50 period add to the economic problems inherited from the mother countries and the wars of independence. The crucial economic problem of the new republics was the system of land tenure, the peculiar feature of which was the large estate or the *latifundio.* Rooted in the colonial period. the *latifundio* was consolidated during the years after independence as the republics recklessly distributed their public domains to political favourites, and then protected the new holdings with tax systems that taxed the product of the land but not the land itself, and legal systems that provided for primogeniture and debt slavery or peonage. Once in debt the Indian was obligated to the *patrón* until the money was repaid. Since he ordinarily found it impossible to regain solvency, if he ever enjoyed such a blissful state. his labour obligations tended to become permanent. There was no place in such a tenure system for the growth of a property-owning middle class such as appeared in the United States before 1850.

To the heavy burden of the *latifundios* and peonage were added other economic problems of somewhat lesser long-range consequence but immediately important to the struggling nations. First Spain's colonial policy, and after independence the fact that the new republics were outside the well-established international trade routes, served to isolate Latin America from Europe and thus to prolong the times needed for European traders and financiers to acquire a somewhat realistic working knowledge of the republics. Violence also delayed the rehabilitation of many of the mines that suffered from destruction and neglect during the war years— mines that might have provided the means of earning an important part of the foreign exchange that Bolivia, Peru, Colombia and Mexico needed so desperately. Finally, the recurrent political plots and uprisings strengthened the well-developed propensity

that domestic capitalists had for investing in rural properties because of the indestructibility of land and the prestige associated with it in agricultural communities.

Learning and the Arts.— The ravages of civil war left little time, money or inclination for developing learning or the arts. Antagonism of the new governments to the clergy resulted in the neglect and disappearance of many colonial educational institutions and the loss of educational and professional services of the religious teaching orders. Meanwhile, the new republics. concerned with other problems and lacking in financial resources, did little to promote public education. Only Chile, which in the 1840s combined stability and wealth. was able to give impetus to learning at all levels. The arts suffered from the general decline of wealth. Almost no new churches and very few public buildings were constructed. There was little demand for art other than religious art. Literature fared somewhat better because it was made to serve political ends. Men of letters were generally on the side of justice. by ahich was meant justice for the privileged groups. Often from homes in exile—Chile and Uruguay were the favourite refuges from Argentina—writers carried on their campaigns against tyranny. The school-teacher president of Argentina. Domingo Faustino Sarmiento, spent many of his most productive years fighting the tyrant Rosas from across the Andes in Chile. Esteban Echeverria described the crimes of Rosas and articulated the needs of his homeland from Uruguay. Through the efforts of Echeverria, the Chilean. José Victorino Lastarria, and others. romanticism was accepted in poetry and then spread to drama and the novel.

V. ERA OF MATERIAL PROGRESS: 1850–1914

For a quarter of a century after independence was achieved the conviction persisted that the problems of the inchoate republics could be resolved if only workable political systems could be found. The small politically articulate element of society threw vast amounts of effort into what proved to be a fruitless search for exclusively political solutions to the dilemmas of the area. An enormous amount of property was destroyed as opposing elements uncompromisingly supported either arbitrary or rational politics as the most direct means of attaining their objectives through constitutionalism. The price was so great, the mounds so deep, that many of the republics still have not fully recovered. But as early as the 1840s in Chile and by the 1850s and 1860s in Argentina, Brazil and Mexico, many within the responsible elements of society had agreed that the purely political approach had failed. They looked to Great Britain and the United States for alternatives and the experiences of those countries taught that the successful functioning of democratic representative government, the ultimate goal of the Latin American republics, was closely related to economic progress and that order was requisite to both. The leadership grasped at the economic approach as the way out. Economic development became an obsession in several of the republics. It dominated the era from 1850 to World War I as completely as politics had dbminated the antecedent era.

Latin America turned to economic solutions to its problems just as the world economy under European leadership was fostering a high degree of regional and international specialization. The basic effect of this development was to divide the world into industrialized nations on the one hand and nonindustrialized countries on the other. Latin America fell into the latter category. Mining traditionally oriented toward export, was now greatly expanded. Agriculture was commercialized and given the same orientation. Enormous acreages were put to the plow for the first time in Argentina, Brazil and Uruguay. Barbed-wire fences, blooded bulls and refrigeration combined to transform cattle raising into a highly complex, modern enterprise. At the end of the century bananas became the economic backbone of several of the Caribbean republics.

Prolonged cycles of good markets enriched landowners to the point where many of them could afford to live in the capital cities or in Europe. Absentee landlordism, with all of its abuses, became prevalent in such countries as Argentina, Brazil, Chile and Uruguay. As the tempo of international trade increased nations became the slaves of their mines and fields as minerals, livestock, cereals and coffee provided the means of payment for imports of machinery and tools and the soft goods to which an expanding consumer class had become accustomed. Prior to World War I the dependence of the republics upon export markets did not often give rise to serious problems because the consumption of primary products by the manufacturing nations showed a strong tendency to expand and Latin America was ordinarily able to dispose of all it produced for export.

Foreign Capital and Technicians.— The orientation of their economies to overseas markets made the republics more economically dependent upon Europe and the United States. The shift to large-scale commercial agriculture was financed through foreign-controlled banking institutions. The modernization of mines, beyond the economic capacity of domestic capitalists to carry out, fell to foreign investors. Commercial agriculture and modern mining involved the expansion of transportation and public utilities nhose development was assumed by foreign capitalists and foreign technicians.

Foreign capital could enter the republics without serious restraints of any kind, and the foreign investor showed a distinct preference for those states where the leadership displayed a reasonable capacity to maintain order. Thus it mas that foreign venture capital went primarily into Brazil, where a respected monarch (Pedro II) moderated the differences of disparate groups; into Argentina, where a landowning aristocracy firmly controlled the government; into Chile, where power was shared by the landowners and the entrepreneurs of commerce and mining; and into Mexico, where Porfirio Diaz's policy of "bread or the club" had brought order and stability out of extreme chaos.

Great Britain was easily the largest supplier of funds in South America as its capital went into commerce, utilities, railroads, shipping, mines and agriculture. By 1914 Argentina was an economic colony of Great Britain. "Take Canada from us. but not Argentina," cried one Englishman. The United States did not become a creditor nation until World War I, but before that time United States private capital began flowing into the Caribbean and Central American agriculture and Mexican mines, railroads and petroleum fields. By 1914 the United States was the largest foreign investor in Middle America. Foreigners had approximately $8,500,000,000 invested in Latin America when World War I broke out; one-third in Argentina, one-fourth in Brazil and one-fourth in Mexico. In many enterprises, including railroads, mining and bananas, the investment of foreigners greatly exceeded that of the nationals.

Technicians and managers, ordinarily from Great Britain and the United States, poured into the republics to fill a scientific and technological void left by the exclusively humanistic training that the institutions of higher learning continued to impart. Foreign engineers directed the construction of railroads and ports, and they supervised the work of thousands of native labourers.

Immigration.— The economic expansion induced by foreign capital and technicians provided job opportunities in field and factory for millions of unskilled and semiskilled labourers from Europe. Steamships disgorged most of their human cargo at Rio de Janeiro and Santos (the port for São Paulo) in Brazil, Buenos Aires in Argentina and Montevideo in Uruguay.

Underpopulation had been a recognized problem in Latin America ever since the independence era. In 1823 Brazil, comprising approximately half the South American continent, had then 4,700.000 inhabitants. Uruguay had a population of only 60,000 nhen it began its struggle for freedom from Spain. As late as 1852 Argentina's population mas about 1,200,000. In a bid for immigrants, several states rewrote their constitutions to provide for freedom of worship for non-Catholics. The Argentine theorist, Juan Bautista Alberdi at mid-century declared that "to govern is to populate." The Argentine constitution of 1853, which he fathered, enjoined upon the government the responsibility of promoting European immigration. What Alberdi had in mind was the filling in of the great expanses of his country with landowners, not farm hands, for at the time he wrote there was no real

shortage of workers in the republic.

A new dimension was given to the problem of underpopulation as a result of the course that economic development took after 1850. With ready markets in Europe for their products, landholders not only were discouraged from parting with their holdings but bid prices up in enlarging them. They wanted farm hands, railroads, better port facilities and more public utilities. Also, the growth of retail trading and the beginning of the factory system required many more workers than could be provided locally.

Although several of the republics desperately sought immigrants after 1850, they did not at first find it easy to attract the restless from Europe. Most of them preferred the United States, with its abundance of cheap land and its rapidly growing industrial system. Latin America's reputation for political and economic instability was disturbing to potential settlers from abroad. *Latifundism* tended to exclude the newcomers from the ownership of land. Much of the area where lands were available was in the tropics and there was little industrial growth anywhere. Transportation and communications were poor; educational and medical facilities primitive. Brazil tolerated Negro slavery until 1888 and Europeans were reluctant to work alongside cheap labour. As late as the 1870s, in both Argentina and Chile, marauding Indians periodically encroached upon unsettled areas.

There were countervailing forces. Political discontent, famine and grinding poverty in Europe drove many to take refuge wherever they could find it. In the republics there mas some house cleaning as groups determined to promote material progress gained ascendancy and demanded order. So Europeans emigrated: at first in small numbers as traders and miners from the British Isles, and as farmers, mostly from Switzerland and the German principalities, and later in swarms from Italy, Spain and Portugal.

Latin American statistics on immigration are notoriously unreliable. According to those that appear most trustworthy, the swarming to Argentina began in the 1880s. In the single year 1889 the number of newcomers entering the republic reached 219,000. (Figures for departures are not available.) Between 1857 and 1900 Argentina had a net inflow of 1,200,000 (equal to the total population of the nation in 1852). The peak year in Argentina was 1913 when 302,000 entered and 157,000 departed. By 1911 Argentina had received 4,660,500 immigrants: for a net gain of 2,610,000, most of whom were still alive when World War I broke out. Of those who remained between 1857 and 1914, Italians numbered about 1,200,000 and Spaniards about 1,000,000.

The impact of the immigrants upon Argentina was profound. The nation's population expanded to 10,215,787 by 1924. The population of the rich pampas increased 625% and the republic's total agricultural acreage increased 60 times between 1865 and 1914. The immigrants helped to introduce farm machinery and the mechanical arts, and to hold the frontier against the Indians until they were finally subdued by General Julio Argentino Roca in the late 1870s. They also added to Argentina's contacts with Europe. Their labour raised land values and made railroad building feasible. They popularized dairy products and vegetables in the Argentine diet, and mongrelized the Argentine language. The Italian immigrants, who ran the country stores and victimized the gauchos, became the whipping boys of Argentine literature, while the shiftless gaucho assumed the role of a national hero. The flood of immigrants made Argentina more racially European than any other republic of Latin America with the possible exception of Uruguay. But, in the final analysis, the immigrants' greatest influence was probably felt in the city of Buenos Aires. Unable to buy land and unwilling permanently to accept the hard terms of rural employment and tenancy, they flowed into the capital city. There they entrenched themselves in the retail trade, small factories, the building trades and in the maintenance department of public utility companies. In the burgeoning capital the rootless thousands, caught between the old world and the new world, quickly developed social types that were new to Argentina and added to the European content of its way of life.

Those who emigrated to Uruguay came from the same places and at about the same time as did those who made their way to Argentina, and the contributions of the two groups were basically the same. By 1889, Montevideo with a total population of 214,000 contained 100,000 foreign born. By 1900 the newcomers possessed more than half of the declared national wealth.

Chile did not have a shortage of labour but actually exported labour throughout the 19th century. The only land the republic had to give away was heavily wooded and in areas where the rainfall was far greater than advisable for profitable agriculture. But the stability of the republic early made it attractive to German settlers. Moving into the forested regions around Valdivia and Puerto Montt as early as the 1840s, and later occupying part of the island of Chiloé, the Germans, although always constituting a relatively small portion of the total population, were able to put their imprint on much of the area south of the Bio Bio River. Yet by the middle of the 20th century the Germans of the area played an economic, educational and military role in the region out of all proportion to their numbers.

The most dependable figures available indicate that between 1851 and 1888 an average of about 10,000 newcomers a year entered Brazil and that the flow of immigrants reached its peak during the decade following the abolition of slavery. Approximately 2,500.000 *émigrés* from Europe entered Brazil between 1888 and 1914. Over 50% went to the state of São Paulo; the states of Rio de Janeiro and Rio Grande do Sul were other important recipients. As in the case of Argentina. Italy provided the largest single bloc of newcomers but in Brazil the Portuguese rather than the Spaniards held second place. Although the Germans never entered Brazil in large numbers — probably not more than 100.000 by 1914 — they prospered and had large families, and by 1924 numbered 360.000. Their influence in the state of Rio Grande do Sul was and is as pronounced as that of the Germans in southern Chile. In general, they showed less adaptability than did the Germans who came to the United States because they were concentrated in remote and thinly populated areas and were left to organize their own economic, social and educational life. Japanese emigration to Brazil began in 1908. Only a few thousand entered the republic before World War I but between 1920 and 1940 approximately 200,000 followed; they engaged in all types of agriculture and trade.

Over-all, the role of the immigrant in Brazil was similar to that of their counterparts in Argentina and Uruguay. Their labour made possible large-scale commercial agriculture — in Brazil it was coffee. They became the principal source of labour in the cities of São Paulo and Rio de Janeiro. It may be said without qualification that those areas of Brazil where the immigrant went have prospered much more than have those regions where he refused to settle. The city of São Paulo, the Chicago of Latin America, is the handiwork of the newcomers and their descendants and the greatest monument to the immigrant in Brazil.

Migration to the other republics, mhen of numerical significance at all. was for the most part non-European. By 1875 more than 74.000 Chinese had entered Peru to work on the sugar plantations, in the guano deposits, and on railroad construction projects. Lima still has a large Chinatown. In 1861 there were nearly 35,000 Chinese in Cuba, which at the time was still a colony of Spain. By 1899 the number of Chinese in Cuba had declined to less than 15.000. Negroes from the British West Indies entered Panamá in large numbers during the construction of the Panama canal. They mere also brought into the coastal areas of Honduras. Nicaragua, Guatemala and Costa Rica when the banana was commercialized, about 1900.

Haiti, with one of the densest populations in the western world, traditionally has exported labour. principally to the Dominican Republic and Cuba. In periods of prosperity the Haitian workers have been welcomed; in depressions they have often been made to bear the brunt of attacks of Dominican and Cuban demagogues beating the drums of nationalism. Mexicans, like Haitians, have emigrated. The ability of the United States to absorb Mexican stoop labour has served as an excellent safety valve for Mexico as it seeks to industrialize in an effort to provide jobs for its ever-growing labour force.

Technological Change and Economic Development.— Aided by capital, technicians and labour from abroad the economic

and technological advances of the 1850–1914 period were spectacular given the area's inheritance from the colonial era and the anarchic quarter-century following independence. Railroads mere laid from mines and farming centres to the ports. In all, 60.000 mi. of railroads were built by 1914. including 21.800 (1914) in Argentina; 15.800 (1913) in Mexico; 15.435 (1913) in Brazil; 5,000 (1913) in Chile; and 1,656 (1913) in Peru. River steamboats were put on the Magdalena, Orinoco, Amazon, São Francisco, Jacui and La Plata-Paraná river systems. Old port facilities were renovated, as in Rio de Janeiro and Veracruz. and new ones were built. The port of Buenos Aires was dug out of the mud of the Rio de la Plata. Rosario. Argentina, became one of the greatest grain-shipping ports in the world soon after a port was completed there after 1900. Steamship lines were subsidized in an effort to increase contacts with Europe and the United States. Before the end of the century hundreds of vessels flying British, French, Italian, German and United States flags were carrying raw materials, finished products and immigrants to all parts of the area but particularly to Argentina and Brazil. Private and public capital combined to put over 100,000 mi. of telegraph lines in operation by 1914. The area had submarine cable connections with Europe by 1876 and with the United States by 1894 The first telephone systems were introduced in the 1880s. The first modern water and sewer systems were begun in the 1850s. Gas began to replace nhale oil for public lighting in the 1850s and by the 1890s electricity in turn had begun to supplant gas. During the era public transportation in the larger cities passed through three phases. Beginning with horse-drawn coaches it progressed to horse-drawn streetcars and to electric trolleys. Before 1910, Buenos Xires had in operation an excellent cross-town subway.

As a result of economic development during the era, Argentina became one of the world's biggest breadbaskets. Brazil strengthened its claim to the title of "coffee king." Chile became a leading exporter of natural nitrates. Mexico became one of the world's largest producers of petroleum by 1911. The total international trade of the area rose from slightly over $1.000 000,000 annually in the early 1890s to $1,800,000,000 in 1907, and $3,100,000,000 in 1913. In the latter year Latin America accounted for 6.5% of the world's imports and 7.9% of its exports. The growth of trade and commerce in the more advanced countries gave a strong impetus to banking and insurance, a development which did not come about until after World War I in such countries as Colombia and Venezuela and the Central American republics.

Consequences of Economic Change.— In the republics that had by 1914 established their leadership in the technological fields, the economic transformation brought nearer into balance the wealth, income and population of the rural areas and the urban centres. The added importance given to land by the commercialization of agriculture was counterbalanced by the fact that the cities were the first to feel the effects of economic expansion because the industrial and commercial sectors, centred in the cities, received the greatest share of the capital and skills from abroad. The new and relatively well-paid management element associated with transportation and finance mas essentially urban. The urban centres were the chief benefactors of the growth of both internal commerce and international trade. Villagers and those newly arrived from Europe, discontented nith the terms of employment and tenancy in the rural areas, took advantage of cheap modern transportation to move into the cities and Latin America, at this time, entered a sustained period of rapid urbanization. Buenos Aires trebled its population between 1895 and 1914, as did Montevideo between 1887 and 1914. São Paulo's population spurted from 65.000 to 350,000 between 1890 and 1910. During the same years Pôrto Alegre grew from 52,000 to 130,000. Chile's population was 43% urban that year. On the other hand, the Indian countries, such as Paraguay, Bolivia. Ecuador. Nicaragua and Honduras remained overwhelmingly rural, as did Brazil, where in 1914 at least 85% of the population was rural.

Two new social-economic elements emerged in the cities. They were the entrepreneurs, managers and technicians of industry and commerce, who were added to the middle groups of society, and the urban industrial working class.

The Politics of **Progress.**—By the outbreak of war in Europe in 1914, the economic transformation and the growth of cities had had a significant impact upon the political life of the republics. In Uruguay, Argentina, Chile and Mexico the new social-economic groups of the cities were making common cause nith dissatisfied intellectuals and professionals against the political hegemony of the old elites. The intellectuals had good reason to welcome the new groups as political allies. The alliance of the intellectuals with the elites originally had been dictated by economic necessity rather than ideological compatibility and consequently when their earnings eroded rapidly under the inflationary pressures that accompanied heavy investment in long-range enterprises, there was little left to keep the old working relationship alive. On the other hand, the intellectuals had much in common with the new business elements. Both groups were centred in the cities, were oriented overseas, supported rapid technological development, tended to be anticlerical, favoured public education as a means of limiting the influence of the church, and opposed the use of force in politics.

The urban labouring groups provided the popular support for the new middle sector politicians who opposed the entrenched leadership. Politically immature and organizationally weak, urban labour came under the influence of the middle sectors after a brief and stormy association with leaders who had been brought up in the traditions of anarcho-syndicalism then prominent in southern Europe. Political affiliations with the middle groups gave labour a certain respectability; in turn, worker militancy and intractability gave the new political forces an aggressiveness they nould not otherwise have had.

The leaders of the new urban political alliance lacked practical experience in the formulation of policies but this did not deter them. They promised economic progress and social democracy. To the political and moral abstractions which the intellectuals had fought for during the independence wars, the new politicians added the demand that a greater share of the material and cultural benefits of 20th century technology be made accessible to a greater part of the population.

Nationalism and a New Type of Militarism.— Political nationalism and a more professionalized military class were important by-products of the political thinking that resulted from the impouring of tens of thousands of hardworking immigrants, the construction of railroads and investment in industry. Politicians began to envisage the day when their countries would teem nith productive citizens and the empty spaces and corners of the republics would be needed to provide living space for growing populations. National boundaries, consequently, had to be guaranteed and, when possible, expanded. Although most international disputes were settled without resort to force, military establishments mere strengthened in almost every republic often in order to back up the claims of politicians.

The new emphasis upon the army as an instrument of national policy and defense rather than as a police force, its historical role following the wars of independence, had at least two important consequences. A costly arms race developed, and the republics, feeling that the stakes were rising, turned increasingly to military professionalization. Added responsibilities plus the scientific training that was a part of professionalization made the armed forces attractive for the first time to the sons of intellectuals and those belonging to the middle groups of commerce and industry. Those who were attracted into military sertice near the end of the 19th century did not reach policy-making ranks until after World War I and when they did the armed forces took on a new significance. The rise of modern armies equipped with costly armament, meanwhile, marked the death knell of the provincial caudillo who had only his personal fortune with which to outfit his private army and keep it in the field.

Catholicism and **Anticlericalism.**—Between 1850 and 1914 the position of the Catholic Church in Latin America became increasingly unstable. Severe anticlerical laws were put in force, for example, in Mexico, Venezuela, Chile and El Salvador. In several countries church and state were separated and at the same time the church was burdened uith strict state control. Although

retaliatory vengeance for clerical political activities continued to be a cause for assault upon the church, a greater consideration as the century grew to a close was the emergence of social-economic groups in the cities whose members attacked the church as an obstacle to economic and social progress. Under the new leadership, anticlericalism to a degree became, according to J. Lloyd Mecham, a political philosophy and a plan of action pointing the way to the modern world. The great mass of the people were unaffected by the attacks upon the church. Communities went along as before. They retained their patron saints, whose names were sometimes added to the names of the towns. Families had saints which they honoured. Other saints were expected to protect certain occupations or guard specialized groups.

Education and the Arts.—In the rush to modernize, learning was left behind. There were numerous exponents of educational reform but few projects got beyond the planning stage because leaders in education seldom possessed the capacity for political leadership that would have enabled them to translate their theories into practice. But in any event to incorporate a large mass of indigenous peoples mould have been a herculean task. The Catholic Church continued to dominate education, despite steadily growing support in favour of public instruction. Between 1850 and 1914 the Catholic University of Chile, in Santiago, founded in 1888, was probably the outstanding addition to the church's list of institutions of higher learning.

Only Argentina, Chile and Uruguay, each of which had homogenous: largely European populations, made major achievements in public education between 1850 and 1914. In response to the demands for a more responsible citizenry and the requirements of the new technical age, but above all because of the driving determination of Pres. Domingo Faustino Sarmiento to create a literate nation, Argentina moved ahead rapidly to become the educational leader of Latin America, a position that it has never relinquished. Matriculation in Argentine normal schools increased from less than 1,300 to more than 7,200 between 1890 and 1912 and in the same period enrollment in public and private elementary schools rose from about 300,000 to 720,000. Enrollment in the University of Buenos Aires reached 4,600 in 1915. The University of La Plata, founded at the turn of the century, became one of the great institutions of the area before Juan Perón dispersed its faculty during the decade after 1946. Although Chile failed to maintain the very fine record it had set in the 1840s *(see* CHILE: *History)* it ranked along with Argentina in the prewar period as a leader in the field of public instruction. By 1908 enrollment in public elementary schools stood at 240,000 and 18,700 in public secondary schools by 1910. Uruguay placed the emphasis upon elementary instruction while establishing the principle of free and obligatory education under secular control at all levels.

Although important changes did take place, the economic-technological transformation stopped considerably short of generating a social revolution. Inequities became more pronounced as industry and commerce gave rise to more and greater fortunes than farms and mines had ever supported. Gaudy homes went up in exclusive residential districts. Conspicuous consumption was appreciably more evident in the cities than it had been on the haciendas. Novelists geared their writings to the new rich who wished to read of themselves in glittering palaces and traveling abroad. Portrait painting was popularized as the number of those who could afford such luxury multiplied. Academies of arts were founded and national museums were established. History societies flourished, as the new nationalism aroused interest in the past, and archives were searched for evidence to support boundary claims. A few cities, notably Rio de Janeiro and Buenos Aires, supported operas. The demand for newspapers grew as learning slowly filtered down to the urban working elements and immigrants bought foreign-language newspapers in order to keep abreast of developments in Europe. But the rigid system of social classes remained largely intact. "The darker one's skin the lower one's social position" remained the rule. Although gradations were aronounced. the essential division in the social hierarchy was between the dominating privileged classes and the people. The Indians were left to vegetate on the outskirts of civilization in peasant communities that lived by aboriginal or medieval cultural patterns. The interpreters of society either ignored the masses or treated them in a residual manner. Many Brazilians wrote against slavery, but they attacked that institution on moral rather than social grounds.

The End of an Era.—Well before World War I there were many indications that large parts of Latin America were breaking with their Spanish and Portuguese pasts and moving toward their goals of becoming mature, modern nations. Slavery as a legalized institution in the western hemisphere mas finally ended in 1888 when Brazil decreed the emancipation of approximately 850.000 Negroes then held in bondage within its borders. The following year Brazil forswore monarchism. which had become an anachronism in the nen world. in favour of republicanism, thus bringing its political system into line with the other hemisphere nations.

The republics established an enviable record for the peaceful solution of controversies, especially in the settlement of boundary disputes. The more recalcitrant cases were submitted to arbitration and before World War I arbitration had for practical purposes become a part of international law as it applied in Latin America.

The modern political limits of the area were drawn when Cuba won its freedom from Spain (1899) and became an independent republic in 1902, and the number of nations was raised to 20 when Panama separated from Colombia and achieved sovereign status in 1903.

All the republics were invited to the second Hague Peace conference held in 1907. Although the position taken by the Latin American delegates against armed intervention for the collection of debts was accepted only after significant modification the conference was important because it was the first of world-wide scope in which the Latin American republics participated. They nere coming of age.

As the 20th century began, the republics were deeply conscious of the fact that their future was clouded by an ominous shadow cast over them by the United States. The "Colossus of the North" controlled Cuba through the Platt amendment. It had created Panamá. Pres. Theodore Roosevelt's big stick policy had not only sanctioned interventions in Latin America but had claimed for the United States a monopoly of the right to engage in it, thereby making the United States not only the policeman of the hemisphere but its judge as well. President Taft's dollar diplomacy was followed by the sending of marines into the Caribbean and Central America. President Wilson did little to quiet the fears of the Latin American leaders when he intervened in the internal affairs of Mexico by more or less openly calling for the overthrow of Dictator-Pres. Victoriano Huerta. By 1914 the United States furnished 32% of the imports of the entire area and took 36% of the exports of the republics. (For the Pan American Union *see* below under *Latin America in International Organizations.)*

World War I.—Distrust of the United States had much to do with the official attitudes of the Latin American republics in World War I. Despite great sympathy on the part of the privileged groups for France. only eight of the countries declared war against Germany, and only two, Cuba and Brazil, offered military aid. Seven of the eight republics that declared war were dominated financially by either the United States or Great Britain. Only Brazil made its choice with comparative freedom. Five of the republics broke relations. and seven, including Argentina, Chile, Colombia and Mexico, remained neutral. Mexico nas actually pro-German. Early in the war international trade was brought to a near halt. but by the end of the conflict the republics were supplying food and strategic materials in abundance. The foreign commerce of the 20 republics rose to $3,900,000,000 in 1918 after having fallen to $2,200,000,000 in 1914. The fact that under the stress of war the Allies failed to provide the manufactured goods to which the population had become accustomed gave a fillip to domestic manufacture of consumer goods.

VI. BETWEEN THE WARS—1918–1939

By the end of World War I it was quite apparent that the 20

republics were in widely varying states of development and that the differences among them were actually increasing. Bolivia, Ecuador, Paraguay, Peru, Venezuela. and the Caribbean and Central American republics, except Costa Rica, lived in the mid-19th century. They were politically immature. plagued by meaningless revolutions, economically backward and burdened with foreign debts. and generally lacking in social anareness.

Colombia nas in a category by itself. It was dominated by a narrow oligarchy that at times had shown unusual administrative skill, but the structure of the country retained most of its colonial features and the nation mas just beginning to enter international markets. As of 1960 Colombia still remained an enigma. With tremendous potential compared to many of its neighbours, it was nearly prostrate from civil strife that bordered on anarchy.

By 1920 Argentina, Chile, Costa Rica, Uruguay and Mexico were clearly in the vanguard, and Brazil joined them in the 1930s. It is nith these six republics, containing tno-thirds of the land area and two-thirds of the population, and annually producing approximately two-thirds of the gross product of the 20 republics that the remainder of this article is primarily concerned. Between 1918 and 1960 it was in these republics that one found most of the region's dynamism, its new self-confidence. its desire to create and its very conscious groping for self-expression. It was to the six republics that. for one reason or another. the other republics looked, when they looked at all, for leadership.

Political Recognition of the Popular Masses.—During the century after independence the leaders of Latin America had at first sought essentially political and then economic solutions to the problems of the republics. Between World War I and World War II the leadership in the more progressive republics not only merged politics and economics but added a social ingredient to their ideology. Social-economic problems were made the fundamental political problems. Democracy. which earlier had been thought of primarily as a theory of government and which in practice was more nominal than real, was expanded to include economic and social democracy. The exaggerated individualism of the 19th century gave way to an emphasis upon social solidarity. The concept of the state as a passive organism, limited largely to maintaining order and collecting taxes, was supplanted by a concept of the vital state that would provide leadership in the economic and social fields as well as in the political. Politicians spoke more of social justice, less of legal justice; more of social equality! less of political equality; and the masses came to prefer good government to self-government as they knew it.

There was a twofold explanation for the new concern with the issue brought to the surface by the transformation of the pre-World War I era. The urban working groups, aroused by the knowledge that the stirrings of European workers immediately after the war had won official recognition of their problems, demanded action on their behalf. The middle sector politicians, in their struggle for power with the old elites, had been forced to go to the workers for electoral support. Once the workers were brought into the political arena their social anxieties, frustrations and discontents could no longer go unheeded.

Under the influence of the new political philosophy the traditional concept of the role of private property in society was challenged. The Mexican constitution of 1917 for example, defined private property in terms of social function. The Chilean constitution of 1925 established the superiority of the state over private property.

By 1930 there were numerous indications of the growing concern over working conditions and the welfare of workers. Article 123, often called the Magna Carta of Mexican labour, of the constitution of 1917 not only enjoined the state to foster a strong Mexican labour movement but recognized labour as a status! a way of life, for which the minimum essentials must be guaranteed. By the end of the 1920s Uruguay had adopted legislation providing for the eight-hour day, minimum wages, equal pay for equal work, protection on the job, and fixing the terms under mhich minors might be employed and workers might be separated from their jobs. Article 56 of the Uruguayan constitution of 1934 made the state responsible for promoting the organization of trade unions, enacting standards for the recognition of their juridical personality, and promoting the creation of tribunals of conciliation and arbitration. The Costa Rican constitution of 1925 contained elaborate guarantees to both urban and rural labour. The Chilean labour code of 1931 embodied radical principles and general practices regarding labour. In Brazil. Pres. Getulio Vargas put many social measures into law: a minimum wage, old-age pensions, accident insurance, workers' savings banks, vacations with pay, cheap housing. As early as 1925 the Chilean government wrote an imaginative program of social security, including an elaborate structure of social security funds to which workers, employers and the state contributed. Uruguay carried on public works programs as insurance against unemployment. In Mexico, Pres. Lázaro Cárdenas spoke of "land for those who worked it."

Material gains and social welfare for the workers were often delayed and seldom measured up to expectations, but the self-respect and the sense of belonging to the nation that the new official attitude gave the labourers in Mexico, Uruguay and Chile, was immediate and profound. On the other hand, the failure of Argentina's "don't-touch-agriculture" leadership of the 1920s and the 1930s to give recognition to the workers prepared them mentally for the acceptance of Perón's quasi-Fascist administration in the 1940s.

State Interventionism.—In the 1930s the national governments in several of the more advanced states rejected the laissez-faire doctrines of the 19th century. They broadened their economic responsibilities in search of faster and better ways of fulfilling the social obligations they had assumed. The governments justified their action on three grounds: (1) Industry could not survive without protection from outside competition and only the state could provide that protection; (2) Since the accrual of domestic private capital was slow, the state, with its ability to accumulate capital relatively rapidly through taxation and foreign loans. must intercede in the industrial sphere; and (3) Solicitation for the labouring classes required that the state exercise some control over the prices of necessaries.

The economies that the governments sought to vitalize were reeling from repeated blows. The international economy had been severely jolted by World War I and had not been reconstructed in the uncertain political and economic environment of the 1920s. Economic nationalism in Europe had placed at a disadvantage countries; such as those of Latin America, that depended upon the export of primary products. The fact that each republic continued to rely on one or two basic exports had weakened further their bargaining position in the new world economy. The economic dislocations and problems of the 1920s were heightened by the depression of the 1930s, which saw the drying up of foreign loans, the complete collapse of the world economy, and widespread defaulting on debts. Chile's and Bolivia's exports dropped 80% between 1929 and 1932.

There were many instances in the 1930s of states investing directly in economic enterprises, as, for example, in Uruguay and in Mexico following the nationalization of the railways and the expropriation of the foreign-owned oil properties. But before World War II the general practice was for governments to limit their intervention to placing restrictions on imports, using exchange controls, licensing arrangements, imposing embargoes in order to promote domestic manufactures, and creating autonomous and semiautonoinous institutes to assist designated sectors of the economy. The manufacturing sector of the economies made significant advances in the 1930s, probably as much because of the impetus given by the depression, when the foreign exchange situation left no alternative to domestic production of a wide range of manufactures, as to state promotion and planning. While manufacturing made appreciable gains there was a marked decline in capital invested in transportation as revenues dropped and funds for upkeep and replacements were not forthcoming from other sources. Agriculture, still the principal source of foreign exchange for a majority of the republics, was neglected.

Social Mobility.—The interwar years produced social mobility and social ferment on an unprecedented scale. Increased opportunities for learning, coupled with the growing demand for intel-

lectual and technical skills in the public and private bureaucracies and in education, permitted many persons from the lower groups to achieve middle sector status. Employment opportunities in factories, commercial establishments, public utilities and the building trades attracted hundreds of thousands from the rural villages into the burgeoning cities.

In Uruguay, Argentina. Chile and Costa Rica, where the populations were overwhelmingly European, there was little change in the ethnic composition of the social groups or the cities. But in Mexico the middle classes, the skilled working classes and the cities all experienced a heavy Indian infiltration, and in Brazil there was a noticeable Africanization of the major industrial and commercial centres. Labourers who had become members of the middle class, and farm hands who had become industrial workers experienced the frustrations inherent in passing from one social-economic group to another. The new social milieu placed those who knew the lower levels of society from first-hand experience beside those who had only a paternalistic interest in or a theoretical understanding of the working element. Those who depended upon labour leaders to defend their interests often worked for individuals who had an abhorrence for the labour movement. Those nho had never owned property and were little concerned with property rights or infringements upon private enterprise were thrown together with persons strongly committed to the defense of private property and personal initiative. The clashes that resulted from the coming together of two essentially different cultures were often bitter and there was much pulling and hauling as groups fought for advantage. But there was also a sharpening of the focus on the goals and aspirations of the people as they struggled with the crisis of growth, and there was no turning back of the clock as the workers retained, at least in principle, the gaios they won.

The Family in a Changing Society.——Under the pressures of modern life the family. which traditionally had served a political as well as a social role. began to weaken. This was particularly true in the cities where private dwellings began to give way to cramped apartments. Economic pressures forced many middle-class women to find employment outside the home; increased education and job opportunities for girls gave them a new freedom. Modern means of transportation encouraged young people to travel and make associations outside the family. Cinemas, clubs and public parks bid against the family for the leisure time of its members. Youths left their homes to go into education, business and the professions, and returned home with information that permitted them to reach decisions independently of the older members of the household. The new independence helped to weaken allegiance to the family as a political unit and there was a strong tendency to transfer this allegiance to political parties. Political parties provided a common ground for those who had similar objectives based on education and occupational interest and on social relationships outside the home.

The New Militarism.— The role of the military establishment undernent basic modifications between the two wars. The young men who had entered the armies at the turn of the century had now come to power. They were from the same social-economic groups as the new civilian leadership; as the economic and political influence of the middle sectors rose, the officers' inclination to associate themselves with the old elites declined. The officers, meanwhile, had learned to accept the working elements, if not always to trust them. Like the middle sector leadership. the officers of the armed forces supported nationalism as a means of achieving rapid industrialization.

Professionalization of the military forces did not have the effect of keeping them out of politics. but it did lead to a new concept of the military's role in government and society. Under the influence of the new concept the officers tended to discard their historical subservience to an all-powerful strong man. Instesd. they organized in such a way that when intervention took place it mas in the name of the armed forces rather than of an individual, and government was by juntas in which all branches of the armed forces were represented. While the earlier military leaders had been content to declare for the general will, the new military statesmen felt compelled to define the content of the will. Most of the Caesar-statesmen who won recognition during the 1930s showed a distinct preference for Nazism and Fascism.

Nationalism.— As a result of both external and internal developments during the 1920s and early 1930s, cultural nationalism was given wide play in the Latin American area. France, to which Latin America traditionally had looked for cultural inspiration, failed after the war to regain its cultural hegemony in the western world. At the same time the depression served to diminish the stream of immigrants from Italy, Spain and Portugal This development served to loosen the area's ties with the Mediterranean region and the separation became more complete as those who had migrated before 1920 adapted themselves to their new surroundings. Simultaneously, financial leadership in the world passed from Great Britain to the United States, whose people were considered cultural barbarians by the Latin American elites. These conditions were made-to-order for the new middle sector political leaders who were bidding for power against the old elites. They argued that since Europe was losing its cultural position and Latin American ties with the area were weakening, the old elites, "who lived with their feet in America and their heads in Europe," should be repudiated. They also contended that the decadent neo-European culture the elites had imposed upon Latin America could not nithstand the increased pressures of an economically dominant United States. Finally they declared that since in the new order each social sector was worthy of representation in government it must be assumed that each group had something worthwhile to contribute to the national personality. It followed from these arguments that Latin America was obliged to look inward and search out the best that each of its social groups had to offer, and then to integrate the whole into a culture that would be truly representative of the national essence.

In the 1920s intellectuals had taken the lead in promoting the nationalization of their cultures and they had directed their appeals to the learned components of society. With the onset of the great depression, the states, at the same time that they expanded their social and economic responsibilities, seized the leadership from the intellectuals and cultural nationalism was promptly merged with and subordinated to economic nationalism. The integrated nationalism was brought down to the masses in concrete and politically charged form. As such it was soon raised to the level of a major political ideology and there it has remained. The glorification of a narrow and perverted nationalism was used to unite all elements in the swelling resentment against the exactions of economic imperialism. It was used to cultivate the national spirit while undermining the atomistic assumptions of liberalism. It served as a vehicle for the adoration of collective poner. In its more virulent form the new nationalism became anti-imperialism and more specifically anti-United States. At first it was directed against United States political intervention and cultural infiltration of the republics. Later it was manifested in attacks upon U.S. investors, who. it was generally charged, were depleting the area of its irreplenishable natural resources and discriminating against national employees.

VII. WORLD WAR II

The Good Neighbor policy *(see* below under *Latin America in International Organizations)* had convinced the Latin American republics of the sincerity of the United States. When the second global war broke out all of them except Chile and Argentina were prompt to throw their support to the Allies. By the end of Jan. 1942, nine of the nations had declared war on the members of the Axis and nine others had severed relations with the enemy. The war declarations became unanimous when the Fascist-oriented leadership in Argentina finally declared war in March 1945, and thereby qualified for a seat in the Cnited Nations.

As in World War I, Latin America's contribution to the Allied cause was largely in the form of foodstuffs and strategic materials. Brazil, however, sent an expeditionary force to the Mediterranean theatre and a Mexican air force squadron fought in the Pacific theatre.

The Allied demands for foodstuffs and minerals resulted in

nearly full employment in Latin America during the war years and lifted the gross product of the area to unprecedented heights. Increased industrial production for domestic consumption mas achieved by placing added burdens on existing plants and equipment because the wartime economies of the Allies did not provide for the export of capital goods, except in most unusual circumstances. There was a moratorium on strikes. Labour-employer issues and social welfare demands were reduced to a secondary position as politicians, for example, in Mexico, Chile and Brazil, and Communists and Communist sympathizers everywhere called for an end to class conflicts in the face of the grave threats from abroad. The United States, whose overriding consideration was strategic, helped to maintain stability in the area by providing incumbent regimes with military and economic aid.

VIII. THE POSTWAR YEARS

Industrialization was a principal obsession of the peoples of Latin America after World War II and heavy industry became the symbol of national progress. Figuratively speaking, the fiery furnaces of real and anticipated iron and steel plants fused the goals of the working elements and the hopes of the privileged groups into a national will, the expression of which was reflected in all major areas of human activity. Latin America had been formulating its new views on industrialization for some time before they found expression after the defeat of Germany. The extractive and processing industries that had been promoted so assidously before World War I and during the 1920s had not lived up to expectations. They drained off natural resources without providing real impetus to other sectors of the industrial economy. Industrial production, even at the expanded rate of the war years, had not brought the hoped-for economic emancipation since the machines, and many of the raw materials and the fuels needed for the production of semi-durable goods, had to be imported. World War II had shown the inconvenience of dependence upon the outside world for spare parts and machine tools. Finally, it had become evident that the great powers were, in fact, great manufacturers. This meant that if the republics were to gain world-wide recognition and respect they must have steel plants and make machines.

State Intervention and the Military. — The clamour for rapid industrialization invited increased state intervention in economic life. Domestic private investors could provide only a small part of the necessary capital. Foreign investors were reluctant to enter the "politically charged" power and transportation fields, particularly when the threat of expropriation was ever present. Nationalists, furthermore, successfully prevented the investment of foreign capital in a large number of activities closely related to natural resources. The national governments, on the other hand, could and did raise capital through taxation and, under favourable circumstances, by borrowing abroad. Public investment as a percentage of private investment rose rapidly after the war and stood at 41% for Latin America as a whole in 1950 and then declined to 29% by 1956. In the latter year the U.S. figure nas 2%. In the mid-1950s personnel in government-run industrial operations amounted to well over 10% of all industrial employment in a number of the republics. Examples of government participation in industrial enterprises are numerous. In Brazil, Volta Redonda, the largest iron and steel plant in Latin America is government controlled. The Brazilian government constructed numerous hydroelectric facilities; Petrobras is a government-controlled petroleum monopoly. In Argentina, the government controls the railroads and the petroleum industry. In Chile the central government has a direct interest in the production and sale of natural nitrates and controls the iron and steel plant near Concepción. A saturation law gives a government agency power to exclude further investment in areas where production is deemed sufficient. In Colombia the iron and steel plant at Paz del Río had the unqualified support of the government. In Mexico the government through Pemex operates a petroleum monopoly and the railroads are nationalized. The Nacional Financiera, most of whose stock is onned by the Mexican government, is the channel for negotiating and administering loans obtained from abroad and is the principal source of funds for industrial development in the country. In Uruguay the government controls the production of electricity and operates the telephones, railroads. the port of Montevideo, insurance banks and the meat-packing industry; it also imports and distributes coal, distills alcohol and manufactures all cement used for public norks. In Bolivia the central administration produces and markets most of the tin, which earned about 59% of the nation's foreign exchange in 1956.

Military officers have in general supported state intervention and have profited from it. Their scientific training and administrative experience have given them skills that are in short supply in the area. Those skills, combined with the influence that the armed forces enjoy, have opened the way to high positions in the semiautonomous and autonomous institutes set up by the states to promote industrial growth. In a majority of the countries officers holding such positions receive some credit applied to their military service because such posts have been decreed to be of military interest. This development strongly suggests that even if the military services withdraw from direct participation in politics they will continue to exercise considerable influence over economic and social programs.

Economic Diversification. — Industrial development has contributed appreciably to diversification within those sectors of the economies producing for internal consumption. The more highly industrialized countries are today producing a major share of their textiles. appliances, pharmaceuticals, and building materials, and are moving ahead in the manufacture of industrial chemicals. In the mid-1950s the share of the value of industrial production by sectors for the entire Latin American area was foodstuffs 32%; textiles 16%; metallurgical and mechanical industries 15%; footnear and clothing 7%; chemicals and pharmaceuticals 6%; others 24%. About 15% of the total labour force was in manufacturing as opposed to about 50% in agriculture, and 25% in the services. The republics have not enjoyed the same success in modifying the composition of their exports. For the most part they continue to export the same primary materials that they exported before World War II and their foreign exchange earnings continue to come from a single commodity. Comparison of figures for 1938 and 1956 reveals that in the latter year 16 of the republics continued to rely upon the same commodity as they did in 1938, and that in 1956 nine of the republics were more dependent upon a single export commodity than in 1938. The latter group consisted of Brazil. Colombia and Haiti (coffee); Chile (copper); Ecuador and Panamá (bananas); Peru (cotton); Uruguay (wool); and Venezuela (petroleum). In the 1934–38 period agriculture accounted for 65% of all foreign exchange earned by the republics compared with 63% in the 1952–55 period.

Foreign Trade. — To a greater extent than in the case of the countries that have reached a higher level of industrial development, the economies of the Latin American republics have remained geared to overseas markets. Throughout the 1950s it was common in many of the countries for the value of exports to run one-fourth to one-third of gross national production. This situation, generally considered unfavourable by the leadership of the republics, has tended to increase Latin America's share of world trade. In 1913 the area accounted for 6.5% of total world imports and 7.9% of total world exports. By 1950 imports had risen to 8.6% and exports to 11.4% of the world totals. Latin America's trade increased about threefold while total world trade was doubling and Europe's position as a world trader was declining. In 1957 the United States took approximately 50% of all exports from Latin America and supplied about 60% of all goods imported by the republics. Argentina. Brazil, Chile, Venezuela, Mexico, Cuba and Colombia, in the 1950s, ordinarily accounted for over 80% of all imports and approximately 85% of all exports from the area Despite the republics' efforts to industrialize. the trend between World War II and 1950 uas for imports of consumer goods to rise faster than the imports of capital goods As the 1950s drew to a close the Central American republics and the South American nations worked desperately to create common markets in the hope of increasing intra-Latin American trade and strengthening their world bargaining position.

Foreign Investment. — The disastrous experiences of the depression and the conduct of nationalistic governments in the late *1930s* made foreign investors most reluctant, after World War II, to send capital to Latin America in the form of portfolio investments. On the other hand, there has been since the mar a relatively heavy flow of private capital into the area as a result of direct investments by foreign enterprises. Between *1945* and *1950* private capital went primarily into petroleum, but since *1950* investors have shown increased interest in manufactures and the extraction of minerals other than petroleum. In *1956* the book value of United States investments in Latin America was $7,408,-*000,000,* of which $1,800,000,000 was invested in Venezuela, $1,-*200,000,000* in Brazil, $770,000,000 in Cuba, and *$675,000,000* in Mexico. Two thousand business establishments were involved and they produced goods to the value of *$2,800,000,000* for use in Latin America, *$2,100,000,000* for export (equal to about 30% of all Latin American exports), and employed *625,000* persons.

Latin American governments in general have welcomed foreign investors since World War II but have insisted that since foreign investors will not put their capital into the development of those sectors basic to long-range growth, such as power and transportation, aid in these areas must come from international lending agencies. The International Bank for Reconstruction and Development (I.B.R.D.) and the Export-Import bank, an independent agency of the United States government, have sought to co-operate with the governments in carrying out the improvements essential to over-all economic growth. Between *1948* and the beginning of Oct. *1958,* the I.B.R.D. made loans totaling $890,000,-000 in the Latin American republics, — about a quarter of all the development lending done by the bank. The Export-Import bank between Feb. *1934* and Dec. *1958* authorized credits to Latin America in excess of *$3,600,000,000.* The International Finance corporation, an affiliate of the I.B.R.D., was established in July *1956;* its total disbursements in the Latin American area in *1957* were about $5,000,000. After many years of agitation by the Latin American republics, the United States government, in *1959,* approved an Inter-American Development bank. This agency was capitalized at $1,000,000,000, of which *$450,000,000* was contributed by the United States.

Urbanization. — After World War II, three factors combined to produce a major urbanization movement: industrial and commercial expansion, a population explosion that was annually adding over 2.5% to the total number of inhabitants and the advantages afforded by the cities. In *1925* Latin America's population was 33% urban; in *1960* it was *45%* urban. Argentina, with over *62%* of its people living in cities in *1960,* was the most urbanized of the republics but other countries showed a pronounced trend toward urban concentration. During the decade after World War II Colombia's urban population increased 58%, Venezuela's 57%, Panamá's 54%, and Mexico's *50%.* Nearly everywhere the tendency was for the largest cities to grow faster than the smaller ones. The population of São Paulo, Brazil, increased from 2,017,-*025* in 1950 to *3,315,553* in *1958.* Buenos Aires grew from 2,981,-*043* in 1947 to *3,553,439* in *1956.* The population of Caracas, Venezuela, increased *41.4* per cent between *1950* and *1955.*

Centralization of Power. — One of the profound effects of state intervention in the social and economic fields has been the general strengthening of the already strong central government at the expense of the states and municipalities. In *1960* only Brazil and Argentina showed any tendency to move in the other direction. In *1956* the United States government was responsible for 65% of all public expenditures (federal, state. county and municipal); the corresponding figure in Argentina was 78% *(1953);* in Chile, 96% *(1952);* in Mexico, 79% *(1951);* in Peru. 97% *(1953);* and in Venezuela, *84%* (1953–54). Among the major countries only Brazil, where the figure was 50% (1954), was below the United States. In several of the smaller nations the state as a separate entity does not exist at all and the municipality thus serves as the only buffer between the central government and the individual. In many cases, the states and municipalities have been largely stripped of their power to tax and are consequently dependent upon subsidies from the central authority. In *1950* it was estimated that, on the average, cities other than state capitals in Brazil raised by direct taxation only *10* cents (U.S.) per inhabitant for education, hygiene, transportation and other services.

The Presidency.—Historically, the tendency in Latin America has been toward the concentration of power in the executive branch of government, a tendency which was not ordinarily deterred by any theoretical balance of power or by federalism. The strengthening of the central governments at the expense of the states and municipalities in most instances has encouraged the trend toward the strong president. Since World War II only in Brazil, Chile and Costa Rica have the legislative branches presumed to exercise some of their constitutional prerogatives. Elsenhere the legislatures have been little more than rubber stamps. The chief executive, also, generally participates in, if he does not actually make, judicial appointments, and thus is able to exercise considerable influence over the judiciary. Moreover, programs of social legislation, which have tended to place social interests above the rights of individuals as private citizens, have been more closely linked nith administrative law than with private civil law. This innovation gives the executive branch poner to regulate the rights of individuals by administrative acts and thus to reduce the power of the regular courts.

The Electorate. — Although nearly all power continued to gravitate to the executive branch of government, elected presidents, as of *1960,* could claim to speak for a larger share of the population than ever before, because the expansion of the electorate has been one of the major political phenomenon of the postwar era. In a drive for general enfranchisement, property requirements have been removed in most instances; age and literacy have been reduced, and in some cases discontinued; and women have been granted the right to vote. These measures have been highly successful in broadening popular participation in politics. In Brazil the number of eligible voters multiplied ten times between *1930* and *1955,* reaching about 16,000,000 in the latter year. In Chile the number of registered voters quadrupled between 1937 and *1958.* In Mexico the number of votes cast in *1958* was three times as great as in *1940.* In Bolivia voters cast *955,912* ballots in the presidential election of *1956* compared with only *126.000* in *1951.* In Venezuela approximately 40% of the total population qualified to vote in the *1958* election. In Argentina *9,000,000* out of a total population of about *20.000.000* voted in the elections of *1958.*

Political Parties. — Personalism and the political influence that the family traditionally exercised have given the erroneous impression that organized political parties are either nonexistent or are of recent origin in the Latin America area. It is true that in several of the republics major and even dominant parties date from World War II. But it is also true that by the mid-19th century two relatively homogeneous party traditions had emerged, represented by the Liberals and the Conservatives. The Liberal and Conservative parties of Colombia and Chile all date from before *1850* In the late 19th century nationalist parties arose with programs for national development. The still active Socialist party of Argentina had elected national congressmen before World War I. Parties with middle class leaders and depending upon the electoral support of labour groups were active in Argentina, Chile and Uruguay before *1920.* These older parties were organized from the top down and consequently lacked local spontaneity. More recently organized parties have shown this same weakness.

Since World War II all types of party systems have been used. In *1960* a single party held an effective monopoly on public power in Mexico and Paraguay, and the Dominican Republic. Uruguay and Colombia had effective two-party systems, Multiparty arrangements existed in Argentina, Bolivia, Chile. Costa Rica, Cuba, Guatemala. Panamá, Peru and Venezuela. In Brazil and Chile it has been usual for at least ten parties to send representatives to the national congress. There have been four active parties in Venezuela since *1945.*

Most of the existing parties are pragmatic. They are more interested in commanding votes than minds, and make no major ideological demands upon their membership. The Argentine Radical party and the Chilean Radical party, both of nhich have at times enjoyed considerable electoral success, are representative of

pragmatic parties. There have been many ideological parties but they have not been notably successful in winning popular support. Of the ideological parties, the Communist organizations (the name varies from country to country) have shown great ability to survive under many circumstances. The Socialist party of Argentina has been too doctrinaire to win widespread popular support. Since World War II the Church-oriented Social Christian parties have been influential on the local level and have shown some strength at the national level. Nationalist parties typically have been narrowly based and have appealed to a small sector of society. Quasi-Fascist parties — Peronista in Argentina. Integralista in Brazil, Nacista in Chile and Sinarquista in Mexico have had large followings at times. The agrarian-populistic Aprista parties, the chief prototype of which is Alianza Popular Revolucionaria Americana (Apra) of Peru (*q.v.*) have indigenous roots. The Apristas seek far-reaching social and economic reform and the integration of the lower classes into the political process. Acción Democrática, since World War II the predominant civilian party in Venezuela, is often considered to be an Xprista party.

The Roman Catholic Church. — The Roman Catholic Church exerts a profound influence over the people of Latin America, 93% of whom consider themselves Catholic, although only about 10% actually practise their faith. The church has used its influence to keep divorce from being legalized in 11 of the 20 republics, including Brazil, Chile, Colombia and Venezuela, and to participate officially in the marriages of Catholics. The church, as of 1960, was subsidized by the state in nine of the countries and legally participated in politics in Costa Rica. Panamá, the Dominican Republic, Peru, Chile and Uruguay. It directed more than 300 publications with a combined circulation of 4,500,000. It ran at least 10 universities and 8.000 elementary schools and high schools (colegios) with a total enrollment of approximately 2,000,000. In addition, religious instruction nas provided for in the public school curricula in Guatemala and Brazil. Jn 1956 Bolivia authorized the nation's first Catholic teachers college.

As indicated in the section dealing with the 19th century, the church's influence did not prevent it from coming under persistent and often violent attacks from anticlericals. After World War II, however, there was a notable lessening of tension, and in the early 1960s there was no major antichurch movement anywhere in Latin America, except in Cuba.

Three developments since World War I appear to have contributed significantly to the change. (1) National governments became stronger. This meant they could be somewhat more tolerant of the opposition and that the opportunities were reduced for the church on its own account. or in conjunction with foreign elements, to create political stability. (2) The middle sectors became politically powerful at the expense of the old allies of the church. In the light of this development the church re-examined the ideology of constitutional democracy that such groups advocated. By 1960 its stated position was that any privileges that might accrue through co-operation with dictators in the Latin American area would soon be more than offset by hatred against the church. In giving practical application to this new position, the church, between 1955 and 1959, co-operated with liberal democratic groups in the overthrow of the Argentine dictator, Juan Perón, the Colombian military chief, Rojas Pinilla, and the Venezuelan tyrant. Marcos Pérez Jiménez. (3) The Communists established their ability to create ideological confusion in the minds of the members of both the lower classes and the intellectual middle class. This development was of great concern to the church, whose first reaction, apparently, was to combat Communism by closer supervision. In pursuit of this policy six members of the Latin American hierarchy were raised to the rank of cardinal in 1946, and three more mere added in 1953. But, beginning in the mid-1950s, the church chose to combat Communism by emphasizing social and economic reform, including, at least in Colombia, land reform. This new policy placed the church very near that of the centre groups in the social and economic areas.

Education. — It may be stated categorically that the schools have been the stepchildren of the social and economic planners. Since World War II, literacy rates have risen slowly in some republics, not at all in others and in Chile they may actually have declined. The average public school elementary teacher, except in Uruguay. Argentina Costa Rica and Chile. was poorly educated, inadequately paid and lacking in status. In the late 1950s the share of the fiscal revenues going to education was smaller than immediately folloning the war.

The public neglect of schools accounts, in large part for the fact that developments nhich might be expected eventually to produce basic changes in educational thinking have been slow in appearing. and the direction that some of them will finally take is not yet clear. To the extent that educational trends, or nhat appeared to be trends, were discernible in the early 1960s they generally reflected the social and economic thinking that has been popularized since 1920. A reaction against the traditional scholastic system in education, dating from the early decades of the century, had continued. Under the impact of expanding commerce. industry and public affairs, education had ceased to be a luxury and had become a necessity. Having become a necessity, education had been made increasingly a public responsibility. This, in turn. had tended to place a greater emphasis upon the social function of the school and also to provide greater educational opportunities for girls from norking-class homes It has also resulted in considerably greater stress on vocational education and on-the-job training in technical skills Except at the university level. nhere public institutions generally were superior, private schools continued to be preferred by those families nho could afford to send their children to them. Quite often public officials who proclaimed public education to be the salvation of their countries sent their own offspring to private schools This situation had in it seeds of public strife. Children of the present leadership group are receiving crthodox training in private schools while their contemporaries and future political opponents in public schools are being instructed by teachers who have shown a tendency to accept radical solutions and have shown faith in the telescoping of social and economic processes.

As has been the case historically, educational opportunities at every level nere, in the early 1960s, far greater in the urban centres than in the rural areas. Despite this, no major city in Latin America possessed classrooms for as much as 70% of its school-age population. Meanwhile, the advantages afforded in the cities served to attract the best young minds from the farms and villages and once in the cities the youths showed little inclination to return to the backward areas whence they came What education was available in the rural districts nas often determined in the capital cities and usually had little relevance to the needs of the students. The final and perhaps most obvious tendency was for educational planning, administration and financing. as was the case with many other social and economic activities, to come under the control of the central governments.

From the above presentation certain broad generalizations may be drann regarding Latin America in the early 1960s There mas more government by law and by the people. Appreciable progress had been made toward institutionalizing the electoral process. Issue-oriented political parties had grown in strength These trends were in part counterbalanced by more demagoguery directed to persons whose minds were ruled by their immediate needs; the concentration of power in the central government at the expense of the states and municipalities; and the general failure to make inroads on the extended powers of the executive branch of government, a situation conducive to the continuance of dictatorship in the republics.

In the social-religious area the problems of the underprivileged had been given recognition; the norker had been given some cause to have self respect and to feel that he was a part of the nation; people of colour had penetrated the privileged classes without producing significant social clashes; and the Catholic Church had found it easier than formerly to live at peace with the political leadership On the debit side. however, little had been done to create a responsible labour movement; education had failed to keep pace with progress in certain other areas; and a large part of the loner classes continued to live marginal existences

In the economic area, industry and commerce had reduced some-

what the dependence upon foreign private capital. But industrial expansion had often been at the expense of agriculture; factories had failed to absorb all those entering the labour market; industry had not measurably improved the living levels of the working groups. and increased industrialization, far from making for self-sufficiency, had, by increasing the need for raw materials, fuels and capital goods, tied the republics ever closer to the world trading community.

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IX. ORGANIZED LABOUR

Organized labour in Latin America has been deeply influenced by the economic. social and political milieu in which it has developed. However. influences coming from outside the area partially explain the wide extent of trade unionism and the complexity of Latin American labour and social legislation, in what is still one of the economically underdeveloped regions of the 'world.

Although the history and present status of the labour movement varies considerably from one Latin American country to another, organized labour possesses certain general characteristics throughout the area. It is highly political in nature; it is subject to a wide degree of government control; and it has tended to follow a general pattern insofar as structure and organization are concerned.

The highly political nature of the Latin American labour movement is explained by several factors. First. in many countries it was established by immigrant workers who brought radical political ideas with them to their new fatherlands; in others the impetus for establishing unions first came from radical-minded politicians of the middle class and intelligentsia. The second factor leading to the politicalization of Latin American labour was the weak position of the unions in their early years. This led them to look for both political and financial support from outside elements. They needed the aid of sympathetic politicians to protect them from retaliation from employers and hostile government officials, and to obtain the passage of laws nhich would permit the legal organization of unions and the improvement of the situation of the workers. At the same time, the poverty of the workers and their inexperience with paying regular dues, made it necessary for unions to seek financial help from outside to pay for headquarters, full-time officials and other needs.

For their part, many politicians realized the political potential of the labour movement. It could not only supply votes in countries where governments are changed by elections, but could also be of key importance through the strike weapon or even the bearing of arms in countries in which regimes generally change by more violent methods.

There are few unions in Latin America which are not controlled by or associated with one or another political group. Before World War I anarchosyndicalism tended to be the dominant political influence, although the Socialists and other groups also played a role. Since World War I, the Socialists. Communists and various indigenous national revolutionary parties have been the principal groups having hegemony in the labour movement.

Government Controls.— One effect of the politicalization of labour has been the weaving of a considerable web of government controls over the unions. Even those politicians most sympathetic with labour have realized it as a potential danger to themselves if the unions got into hands of leaders of a rival party. They have therefore sought to establish a wide degree of control over the potentially revolutionary workers' groups. Governmental controls have varied greatly from country to country, but certain types are almost universal. In order to be able legally to deal with employers and governmental bodies, unions must receive governmental recognition. Frequently, in order to get such recognition, the unions must adopt a structure prescribed by law. and must permit the government to fix their jurisdiction. Once legally recognized. most Latin American unions are subject to more or less strict government controls over elections, finances and collective bargaining activities. Frequently, elections are not valid unless certified by the appropriate ministry of labour official. Some governments have allocated to themselves the right to veto the election of union officials.

Most Latin American unions are forbidden to spend their money on certain types of activities such as political campaigns and money-making enterprises. Most unions have to submit to the ministry of labour an accounting of how they have spent their funds, and in some countries. must submit in advance a detailed budget. Most governments reserve the right to veto any expenditures deemed to be against the law. In most cases. Latin Ameri-

can labour laws provide for extensive government control over collective bargaining. Unions and employers must submit to government conciliation and mediation. Frequently, particular groups of workers (such as government employees, workers in public utilities and agricultural labourers) are forbidden to strike, and thus are forced to submit to compulsory arbitration.

Organizational Structure. — The organizational pattern of the Latin American labour movement has tended to follow a common process of evolution, largely resulting from the economic milieu in which the unions operate. When industrialization is in its infancy, and there are only a handful of establishments in any one field, groups of unions in a given town tend to join in establishing a city central labour body. These local bodies join to form national labour confederations. With the intensification of industrialization, the local central labour groups become less important, and workers in a given industry — textiles, shoes, metallurgy, etc.—form national unions, which become the basis for national labour confederations.

Historical Background. — The first workers' organizations to appear in Latin America were generally mutual benefit societies, formed to provide their members mith protection against sickness and old age, and to care for families of deceased members. Perhaps the first of these was the Typographers' union of Buenos Aires, established in the 1850s. In the 1860s and 1870s there were numerous mutual benefit societies in Mexico.

During the last two decades of the 19th century organizations more nearly resembling trade unions appeared in several Latin American countries. "Societies of resistance" were established among miners and craftsmen in Chile. among a variety of workers in Argentina, Uruguay and Brazil. In some cases! the old mutual benefit groups were converted into resistance societies, or the newer organizations arose with their aid. In most cases the resistance societies were under anarchosyndicalist influence. The extreme individualism of anarchosyndicalist philosophy seemed to be particularly congenial to the small craftsmen who made up most of the membership of the resistance groups.

During the decade and a half before World War I resistance societies and mutual benefit groups both appeared in Mexico; Ecuador, Bolivia and other Latin American countries. Labour relations generally were marked by violence during this period, both because of bitter resistance by employers and government officials to the spread of the labour movement, and because of the belief of the anarchosyndicalists in direct action. There were particularly violent strikes among the dock workers and nitrate miners of Chile, textile workers and miners in Mexico, and numerous groups of workers in Argentina. There were half a dozen nation-wide general strikes in Argentina during this period.

World War I stimulated the industrialization of Latin America, and with it, the growth of trade unionism. Although the 1920s brought certain setbacks to the labour movement, they marked the vast extension of the influence of the unions in revolutionary Mexico. With the great depression, which again gave great impetus to industrialization, and saw an increase in the social and political transformation of the Latin American countries, trade unionism grew apace. The general desire for social peace during World War II allowed the unions to make further gains, more or less pacifically. By the end of the war, most organizable workers — those in transportation, public utilities and manufacturing — were in unions.

The spread of dictatorships in the late 1940s and early 1950s was catastrophic for the labour movements of several nations. However, with the reversal of this trend, starting with the overthrow of Perón in 1955, the unions again grew rapidly in the more democratic atmosphere which succeeded the overthrow of dictatorial regimes in Peru. Colombia, Honduras, Venezuela and Cuba.

Hemispheric Labour Groups.––From the early years of the labour movement in Latin America, attempts have been made to bring together all the organized workers of the area. The first effort was an anarchosyndicalist union conference in Buenos Aires in 1907, which established a loose confederation.

At the end of World War I the American Federation of Labor (A.F. of L.) and the *Confederacidn Regional Obrera Mexicana* sponsored the Pan American Federation of Labor (P.A.F.L.). It included a scattering of labour groups in countries around the Caribbean. and held several congresses, the last in 1927. However, after Samuel Gompers' death in 1924, the A.F. of L. lost most of its interest in the P A.F.L. After 1927 the P.A.F.L. was little more than a paper organization.

Several attempts were made to establish rivals to the P.A.F.L. One was a conference in Mexico in 1926 which brought together leaders of important organizations in several countries. However, no permanent group resulted.

More successful was the communist-sponsored conference which met in Montevideo, Uruguay in 1929, and established the *Confederacidn Sindical Latinoamericana* (C.S.L.A.). The Latin American Communists, in conformity with the Comintern's "third period" line of establishing dual unions under Communist control, had set up such groups in most of the Latin American nations and all of these joined the C.S.L.A. It continued until 1935 when the Latin American Communists faithfully followed the new popular front line of the Comintern calling for merging Communist union groups into non-Communist central labour organizations in each country.

In 1938 the new *Confederacidn de Trabajadores de México* sponsored the formation of the *Confederacidn de Trabajadores de la América Latina* (C.T.A.L.). Although the C.T.A.L. began as a genuine united front of virtually all Latin American national labour groups, of all political colours, it came completely under Communist control during World War I. After 1944, 7 of the 11 members of the C.T.A.L. executive were avowed members of their national Communist parties.

A general revolt against Communist domination of Latin American labour and a return of interest by the A.F. of L. in hemispheric labour matters resulted in the formation in Jan. 1948 of a new group, including both Latin American and North American unions. the *Confederación Interamericana de Trabajadores* (C.I.T.). In 1951. after the formation of the International Confederation of Free Trade Unions (I.C.F.T.U.), the C.I.T. was reorganized as the *Organización Regional Interamericana de Trabajadores* of the I.C.F.T.U., and became known by its Spanish initials as the O.R.I.T. It dominated the field during most of the 1950s.

During the 1950s, the chief rivals of the O.R.I.T. were those unions under control of the Peronistas. On invitation of the Argentine *Confederacidn General del Trabajo,* these formed the A.T.L.A.S., with affiliates in Mexico, Nicaragua, Panamá, Costa Rica, Colombia and Venezuela. It collapsed with Perón's overthrow in 1955.

By the end of the 1950s the O.R.I.T. was in decline. The reorganized labour movement of Venezuela refused to join it, and the Cuban Workers confederation withdrew from the O.R.I.T. These two groups took the lead in trying to establish a new Latin American labour confederation, without participation by the North American unions, a move in which Communist-controlled union groups in Chile, Uruguay and other countries were co-operating.

By 1960 the great majority of the industrial, transportation and public utilities workers of Latin America were unionized. Increasingly, national industrial unions were superseding local federations of labour as the key organizations of national labour movements. More and more unions were acquiring the checkoff of union dues, and thus gaining greater financial independence. The labour movement had acquired an important role in the economic, social and political life of the majority of the Latin American countries.

X. COMMUNISM

The Communists have been active in Latin America since shortly after the Bolshevik revolution. From the beginning they have constituted an integral part of the international Communist movement. Although no Latin American Communist party has succeeded in gaining control of its nation's government, the Communists constituted by the late 1950s an element of considerable importance in the political life of several nations, and there were Communist parties in all Latin American republics.

The Latin American Communists have faithfully followed the tnists and turns of the Communist or Third International (Comintern) line from their early days During the period preceding the death of Lenin in 1924 the International was principally concerned nrth establishing its character as a highly disciplined, tightly knit international party, dedicated to violent overthrow of capitalist regimes and the establishment of the "dictatorship of the proletariat." The Latin American Communists. like their confreres elsewhere. were busy shedding the vestiges of the democratic Socialist and anarchist past of their parties' founders.

The late 1920s were overshadowed by the struggle between Stalin and his various opponents. The Latin American parties. too. were wracked with factional squabbles. which melded into the over-all struggle within the International. The Latin American parties. like those elsewhere. emerged from this period as monolithic organizations in which no dissent was permitted.

Between 1928 and 1935 the Communists passed through their "third period." marked by extreme sectarianism and dual unionism. The Latin American Communists faithfully followed along. They violently attacked everyone else on the left in Latin American politics as "social fascists" and established their own sectarian labour movements in every country in which they were organized. Subsequently. in the succeeding popular front period, the Latin American Communists followed the International's lead. and made overtures to the democratic leftist groups which they had denounced shortly before. Still in conformity with the International's policy in the late 1930s. the popular fronts the Latin American Communists sought to establish included not only the democratic left. but men and parties reaching far to the right and including such dictators as ex-Pres. Carlos Ibáñez of Chile, Pres. Oscar R. Benavides of Peru and Col. Fulgencio Batista of Cuba.

During World War II the Latin American Communists. like the International generally. first supported the Soviet Union's collaboration with the Nazis and attacked the war as imperialist. After the U.S.S.R. itself was invaded they became the most extreme partisans of the Allied cause.

Finally, after World War II, the attitudes and policies of the Latin American Communists were indistinguishable from those of Communists in other parts of the world. Like Communist parties elsewhere, their principal efforts were devoted to trying to arouse antagonism toward the United States and to discrediting any local political leaders inclined to be friendly toward the United States.

Over the whole period of existence of Communist parties in Latin America. they have shared the two basic objectives characteristic of Communist parties throughout the world: to support the policies of the Soviet Union and to establish a dictatorship of their own party within their nation.

That the Latin American Communist parties have been aided by and subject to the control of the international Communist apparatus has been demonstrated frequently. Communist parties throughout the area have long been noted for the very large amounts of money and the staffs of paid bureaucrats at their disposal. Usually these have indicated resources far beyond anything available to them from within the individual Latin Xmerican country.

Several instances of international interference in the internal affairs of the Latin American Communist parties could be cited. In the late 1920s the South American bureau of the Comintern deposed the leadership of the Chilean party without consulting the rank and file of that party's leadership. In 1940 Comintern representatives deposed the leadership of the Mexican party without consulting its membership. In the early 1950s, two rival Communist groups in Guatemala were merged as the result of instructions received by their leaders during visits behind the "iron curtain."

The appeal made by various Latin American Communist parties has varied from time to time. They have always sought support from the urban workers on a class basis, picturing themselves as the chosen spokesman of that class. They have appealed to the social conscience of intellectuals, and more recently have made an intensive appeal to this same group on the grounds of nationalism, and particularly anti-United States sentiment. In the last few years they have begun extensive efforts among the exceedingly depressed peasantry of several Latin American countries. In dictator-ridden countries, they have appeared as opponents of the tyrants; and have spoken much about democracy — though in the late 1940s and early 1950s, the Communist parties of Peru, Venezuela. Argentina and Cuba split into two groups, one backing the dictator, the other opposing him.

Historical Background. — The Bolshevik revolution in Russia had a considerable attraction for the radical movements then existing in Latin America. The Socialist parties of Chile and Uruguay joined the Communist International and changed their name to *Partido Comunista.* A group of dissident Socialists. who had formed the *Partido Socialisfa Internacionalista* some years before, became the *Partido Comunista de Argentina.* A group of younger anarchosyndicalist labour leaders in Brazil broke with their confreres. who quickly became disillusioned in the Soviet experiment, and formed the *Partido Comunista* do *Brasil* in 1922.

In Mexico, early chosen by the Comintern as its Latin American headquarters, an assorted group of expatriate United States citizens and Mexicans formed the *Partido Comunista de México*, after a comedy of errors type of rivalry among various contenders for the official endorsement of the Comintern. Leading figures in the Comintern including the Russian Michael Borodin the Japanese Sen Katayama and the Indian M. N. Roy, served as official midwives at its birth.

Most other Communist parties were founded considerably later than those in Argentina, Brazil. Chile and Mexico. That of Honduras, for example was set up in the middle 1950s.

During the third period, the Communist parties of Latin America remained relatively small sects in most cases. Those like the Chilean party, which had started out with considerable support, declined during this period. It was not until the advent of the popular front period that the Latin American Communist parties began to gain ground. They won considerable influence in the labour movements of Mexico. Colombia Venezuela, Peru, Chile. Argentina. Uruguay, Brazil and Cuba. They formed part of the popular front which won the 1938 election in Chile, and of the Democratic Socialist coalition which successfully supported Colonel Batista in Cuba's 1940 election.

During the first part of World War II the virtually pro-Nazi position of the Latin American Communists alienated them in most countries from the democratic allies whom they had courted during the 1930s However this period did not last long enough to do them irreparable damage, and they were able to pick up once again their popular frontism once the Soviet Union had been invaded During the latter part of the war, they won the tolerance, if not support. not only of left democratic groups, but of the governments, dictatorial as well as democratic. of several Latin American nations, because of their opposition to strikes and other movements nhich interfered with production for the Allies.

The high point of Communist influence in Latin America was reached during and immediately after World War II. The Communist parties of Ecuador and Cuba had ministers in the governments of presidents Velasco Ibarra in 1934 and Batista from 1912 and 1944. The Chilean Communists supported Gabriel González Videla in the 1946 election, and mere rewarded with three posts in the first cabinet. However. President González requested the resignation of his Communist ministers in April 1947 and later in the year he sponsored the so-called law for the preservation of democracy. which outlawed the Communist party in Chile

During World War II the Communists gained the general leadership of the Latin American labour movement. With the help of Vicente Lombardo Toledano president of the Confederación de Trabajadores de la América Latina, the Communists gat complete control of this organization, which at the time represented on a hemispheric basis most of the Latin Xmerican trade union movement. In many individual countries as well, the Communists nere able during World War II to make large gains in the labour movement.

Generally. the Communists lost ground during the decade after the war. There was widespread revulsion against them as a result

of their close identification with the Soviet Union. Then the cold war began, and most Latin Americans chose the anti-Soviet side, the Communists lost much of the popularity acquired during World War II. In a number of countries they were persecuted by the government which served to hamper their ability to appeal to the general population.

The'principal gains made by the Communists during the post-war decade mere in Brazil and Guatemala. As Pres. Getulio Vargas eased his dictatorship in Brazil, he permitted the Communists extensive freedom both in the general political field and in the trade unions. In return, the Communists supported his ambition to remain in the presidency until he was forcibly overthrown by the army in Oct. 1945. As a result of this arrangement with Vargas, the Brazilian Communists experienced spectacular growth during 1945. which continued for about a year after the overthrow of Vargas. The party increased from a handful of members early in 1945 to an estimated 150,000 early in 1947. When the party was declared illegal, and was forced to function partially underground, it lost much of what it had gained during the 1945–47 period. However, the 60,000 members remaining in the late 1950s were a hard-core. well-trained and severely disciplined group.

In Guatemala, the Communists were able to capitalize on the revolution that began in 1944. Because of the failure of a democratic revolutionary party to develop as spokesman for the forces unleashed in 1944 and to distinguish clearly between itself and the Communists, the latter were able to drape the mantle of the revolution about themselves and claim to be its most loyal supporters. They were a step from absolute control of the government when Pres Jacobo Arbenz was overthrown in 1954. 'Arbenz' fall cut short the Communists' activities for a while, though they had begun a comeback by the end of the 1950s.

Summary and Conclusion. — As the 1950s came to a close, the Communists were gaining ground in Latin America. The friendly attitude of the United States toward various Latin American dictators during the late 1940s and the 1950s had aroused much bitterness, which the Communists were exploiting with more or less success in the nations freed from dictatorial control after 1955. The Communists were supporting a move to establish a new autonomous Latin American labour confederation, without participation of North American unions, a move sponsored by the labour movements of Venezuela and Cuba, which had been members of the O.R.I.T.. the hemispheric labour group to which the A.F.L.-C.I.O. was affiliated.

The Cuban revolution of Jan. 1959 gave the Communists a particularly good opportunity. The anti-C.S. feeling of the Cuban revolutionaries was seconded by the Communists, who sought to encourage the strongest possible opposition by Cuba to the United States.

Although the Communists at the start of the 1960s were not a major party in any Latin American country, they were a potential force of considerable importance in all of them. They played principally on the social and economic grievances of the lower classes of those countries. and the nationalist anti-U.S. sentiment widespread in Latin America. Hence, the future of the Latin American Communists tended to depend largely on the ability of democratic groups to raise standards of living and overcome social injustices, and upon the ability of the United States to evolve policies to blunt the sharpness of Latin American anti-U.S. feelings. (R. J. A.)

XI. LATIN AMERICA IN INTERNATIONAL ORGANIZATIONS

Latin America's role in modern international organizations has been a prominent one. Traditionally, jurists, scholars and statesmen from this region have had a view of world society which has strongly disposed them to collaborate in the establishment and development of such organizations, as attested by their joining the Cnited States in the creation of a regional system well before World War I, beginning in 1889. (See PAN AMERICAN CONFERENCES.)

Fifteen Latin American states were charter members of the League of Nations (*q.v.*), and the others joined later. In the 1920s the Latin Americans tended primarily to regard the League as a counterbalance to their powerful northern neighbour, especially after the United States failed to join the organization. They made repeated efforts, unsuccessfully, to have the League formulate an official interpretation of the Monroe Doctrine that would restrict the discretion of the United States in its intrahemispheric relationships. The League was consistently reluctant to become involved in these relationships, however, in the face of the disapproval of the Cnited States.

On only tno occasions did the League directly concern itself with inter-American problems. From 1932 to 1935 the Chaco mar between Bolivia and Paraguay was on its agenda. The League's efforts to resolve this conflict were on the whole unsuccessful, in large measure as a result of a lack of co-ordination aith the inter-American system. In the case of a boundary dispute between Peru and Colombia from 1932 to 1934, the League was considerably more effective. A cease fire was established, and a final settlement proposed by the League was then accepted by both sides.

Latin American statesmen were prominent in the affairs of the League. Two of them served as presidents of the assembly and three as presidents of the council Three Latin American states were customarily members of the council. Seven Latin American jurists served as judges of the Permanent Court of International Justice.

In the 1930s Latin American interest in the League declined markedly, due largely to tno factors. One was the increasing preoccupation of the League with strictly European affairs as well as its inability to check the drift to war. The other was the marked change in relations between the United States and Latin America. In the early and middle 1920s, the United States continued to follow a policy of intervention, but in 1928 Pres-elect Herbert Hoover undertook a good will visit to Latin America. Shortly thereafter he advanced a reinterpretation of the Monroe Doctrine which suggested a repudiation of intervention. He also withdrew the marines from Nicaragua and Haiti. Pres Franklin Roosevelt continued this same policy, which he described as that of the good neighbour. Following an explicit renunciation by the United States at Montevideo in 1933 of the right of unilateral intervention, together with a significant increase in cultural interchange and technical assistance, the structure of the inter-American system was steadily strengthened during the 1930s. At the same time, Latin American membership and interest in the League steadily declined.

With the onset of World War II, Latin American objectives definitely shifted to a regional perspective, as these states made a concerted effort to remain clear of the conflict. Regional machinery was devised for this purpose at meetings of the American foreign ministers at Panamá in 1939 and Havana in 1940. (*See* PAN AMERICAN CONFERENCES.) Following this, however, the involvement of the United States in the war in Dec. 1941, brought about another major change. By the end of March 1945, every Latin American state had declared war on the Axis and thus established a right to participate in organizing the new international system that was to come after the war.

Prior to the United Nations Conference on International Organization at San Francisco in 1945, at which the charter was drafted, the Latin American states met with the United States at Chapultepec, Mexico, to clarify their position on the relationship of their regional system to the new organization. Their concern non was to protect the integrity of the former against encroachment by the latter. Out of this concern came the famous art. 51 of the charter, guaranteeing the right of individual and collective self-defense until the United Nations can take effective action against armed aggression. It was designed to permit action by the regional system should the United Nations be unable to act because of the veto or for other reasons. The treaty of reciprocal assistance, signed at Rio de Janeiro in 1947, was the first treaty to be brought into existence under art. 51.

Othernise, the Latin Americans were not very influential in shaping the charter. Their efforts to increase the role of the smaller states within the organization were generally unavailing. They did contribute to strengthening and clarifying the position of the

general assembly and toward gaining of at least formal recognition of the importance of international law. As a sequel to both the Chapultepec and San Francisco conferences, the ninth international conference of American states, held at Bogotá, Colombia, in 1948, greatly strengthened the structure of the regional system through the adoption of the charter of the Organization of American States. (See AMERICAN STATES, ORGANIZATION OF)

Latin American influence in decision-making during the early years of the United Nations was considerably greater than it had been in the shaping of the charter. Until 1955, the 20 Latin American votes constituted one-third or more of the general assembly's voting strength and were thus a potential collective veto on any substantive decision of which they disapproved. Actually, they rarely voted as a bloc. Mindful. nevertheless, of the advantages to be gained from their united strength, they customarily caucused before voting in an effort to achieve the broadest possible consensus. With the expansion in United Nations membership after 1955. an expansion which the Latin Americans strongly supported, their relative influence steadily diminished but still remained significant.

The Latin American nations were principally interested in three areas of action within the United Kations: the maintenance of international peace and security, the extension of self-government or independence, and economic development. In the first of these areas, their record was consistent in supporting western-sponsored proposals. including the historic Security council resolutions dealing with Korea in 1950. (Colombia thereafter provided an infantry battalion and a frigate to the Cnited Nations command) They were the only bloc to vote against both the Soviet intervention in Hungary and the Anglo-French-Israeli invasion of Suez. Brazilian and Colombian units were included in the United Nations emergency force established in the middle east as a sequel to the Suez crisis.

In the second area, influenced by recollections of their own history, they usually backed the anti-colonialist position and favoured concessions to the pressures generated by nationalism among the nonself-governing peoples. This policy was occasionally modified, however, by considerations relating to the cold war.

The question of economic development was the issue that most significantly concerned the Latin Americans in United Nations debates. They identified themselves with the underdeveloped countries and, perhaps more than any other group of states, provided strong and persistent leadership in working for United Nations programs dealing with this problem.

In the case of both colonialism and economic development, the Latin Americans frequently voted in opposition to the industrialized states of the west. including the United States, whom they generally supported on more purely political issues.

Another of the principal objectives of the Latin Americans within the United Nations has been the strengthening of the influence of international law. They played a very prominent part in the formulation of the Universal Declaration of Human Rights.

The Latin Americans have held many offices of responsibility in the United Nations. They customarily occupy two seats on the Security council, four on the Economic and Social council, two on the Trusteeship council. and four on the International Court of Justice. Every fourth year a Latin American customarily serves as president of general assembly.

In addition to membership in the United Nations and their own regional Organization of American States, nearly all the Latin American states belong to the principal specialized agencies and functional organizations within the United Nations system.

See Warren H. Kelchner, *Latin American Relations with the League of Nations* (1930); John A. Houston, *Latin America in the Cnited Nations* (1956). (J. A. Ho.)

LATIN-AMERICAN LITERATURE: see IBERO-AMERICAN; LITERATURE.

LATINI, BRUNETTO (c. 1220–1294), Florentine scholar regarded by his contemporaries as a man of great learning, who cared not for the soul. who sinned in unnatural vice and who scoffed at the things of God and the church, was a member of the Guelph party and a leading figure in the political life of Florence. After the defeat of the Guelphs at Montaperti (1260), he went into exile in France but returned to Tuscany in 1266 and held public office for about 20 years from 1267, becoming famous as a master of rhetoric. Between 1262 and 1266 he wrote a prose encyclopaedia in French, Li *Livres* dou *Trésor* (Lat. *Thesaurus;* 13th-century translation by Bono Giamboni under the title Tesoro), and an abridged version in Italian verse called the Tesorctto. He was a friend of the young Dante (*Inferno* xv, 30–124); but although he helped to mold Dante's thought, the idea that he was a tutor or schoolmaster is a poetical exaggeration.

BIBLIOGRAPHY.—For biography *see* the critical edition of *Li Livres dou Trésor* by F J. Carmody (1948). *See* further the edition of the *Tesoro by L.* Gaiter (1878). On the *Tesoretto,* see B. Wiese, article in *Zeitschrift für romanische Philologie,* vol. vii, pp. 236–389 (1883). For Latini's association with Dante, *see* the translation *by* Dorothy L. Sayers, *The Divine Comedy,* i, *Hell* (1949). (S. J. C.)

LATIN LANGUAGE. To write the history of a language is to trace the changes which it underwent in form, with special reference to time and place. from its earliest records, and indeed before, to its latest. A spoken language is constantly in a state of change, never fixed: it is dynamic, not static. Strictly speaking, languages do not "live" or "die" or have "family" relationships; such terms are purely metaphorical. Thus the Romance languages (*q.v.*), said to be descended from Latin, really represent Latin in its changed form in various localities at various dates down to the present. In the same way. Latin itself is a changed form. a developed dialect, of an earlier tongue, a so-called parent language, which is commonly known as Indo-European (*q.v.*), since most of its members in the old world are located mainly either in India or Europe. If Latin is said to be related to these other members. all that is meant by the phrase is that it possesses in common with them. not by borrowing but by inheritance, *i.e.,* by direct derivation from the Indo-European, a fund of words (its vocabulary), certain types of word formation and inflection (morphology) and certain modes of expression (syntax). The Indo-European tongue itself must by no means be thought of as primitive or original. Even in its predialectal state, before the distribution of Indo-European dialects from a common centre, it was a highly developed speech, with an agelong evolution behind it.

Naturally and inevitably Latin had diverged considerably from this predialectal tongue by the time (c. 600 B.C.) from which the oldest extant records of it, inscriptions. date. Destined to survive over 1,000 years more as a distinct though constantly changing language, but itself split, as the Indo-European had been, into separate dialects long before the close of its career, it had acquired, by the end of the 1st century B.C., a norm which, by standards not really arbitrary, is judged classical and which, in prose style, especially, but also in verse, at once reflects and is reflected by that grave, restrained, stately and impressive character of the Roman people who first spoke it and whose empire made it a world language.

Prehistory. — Latin was at first the language of only the Latins or people of Latium, that is the Romans themselves and their immediate neighbours. Precisely whence, at what date and by what route this tongue was brought to the banks of the Tiber is not known, although it may be conjectured that it came from somewhere in Europe, across the Alps and Apennines, and certainly , before the Etruscan invasion of Italy by sea in the 8th century B.C. More exact definition cannot be given. Spoken contemporaneously with it. in Italy, about the 5th century B.C., were other more or less closely related Indo-European languages and dialects. from the very Latinlike Sicel, known now only from Sicily, to Ligurian, linguistically as well as geographically intermediate between Italic and Celtic. in the northwest; an Illyrian group of dialects (Messapic. Picene, Raetic and perhaps the so-called old Sabellic) on the Adriatic coast; and. finally, the Italic dialects proper—Oscan (*q.v.*), Umbrian and the minor dialects. There were also the less nearly related, but still Indo-European Celtic, brought in by the invading Gauls, and Greek of Magna Graecia. Lastly there was Etruscan (*q.v.*) spoken north of the Tiber and, for a time, in Campania. Etruscan was not Indo-European; but it was the only non-Indo-European tongue in

ancient Italy, before the coming of Hannibal's Carthaginian troops, of which there is any record. Outside Italy, the Italic group of dialects (including Latin itself and its closest congeners like Faliscan) is most nearly linked to Celtic and next to Greek and Germanic. but the historical implications of their similarities are clear only in the case of Celtic and Italic (see CELTIC LANGUAGES; ITALIC DIALECTS). In this case, striking phenomena, among them the subdivision of Celtic into two main branches, Goedelic and Brpthonic, strictly parallel to the subdivision of Italic into Latin-Faliscan and Osco-Umbrian, make it certain that the linguistic ancestors of the Celtic- and Italic-speaking peoples must have lived for a long period in close community. Inside Italy itself, Latin was early subjected to considerable influence from the non-Indo-European Etruscan and from its nearest Italic neighbour. Sabine. Greek influence became important only later, and Celtic influence nas never great. being limited to a few elements borroned by the Latin vocabulary, e g., *petorritum*, "four-wheeler"; *gaesum*, "spear." Not only individual names like Casca, *Sulla*, but characteristic features of the Roman name system and formative suffixes used in name formation, have been compared with the Etruscan; there are also a number of borrowed words (*e.g., histrio*, "actor"; persona, "mask"; and even the stem of the verb am-aye, "love"); the substitution of breathed for voiced sounds, e.g, in *sporta* (Gr. σπυρίδα, accusative singular, "basket"), catamitus (Gr. Γανυμήδης, "Ganymede") and other words; the aspiration in names like Gracchus, Cethegus (and perhaps in the *chommoda* for commoda of Arrius in Catullus); loss or -weakening of syllables as in Lat. *Pollux* (from Gr. Πολυδεύκης), consequent upon a shift of accent to the initial syllable of the word; that mode of accentuation itself; and the names of the three old tribes said to have constituted the early Roman people—Ramnes, Tities, Luceres—even the very name of Rome, Roma, where the existence of an Etruscan quarter, *vicus* Tuscus, is well known. Finally, reason has been shown for rejecting the older view, which derived the Latin alphabet directly from the Greek, in favour of an origin at least partly Etruscan.

From the Sabines were taken a number of forms showing f medially, as *rufus*, "red haired" (contrast ruber, "red," with pure Lat. b); or f initially. e g., Jordicidia, "sacrifice of unborn calves" (pure Lat h, as in hordicalia), *filum*, "thread," beside Lat. ni-hil, "nothing"—literally "not a thread"; and 1 for pure Lat. d, as in *lacrima*, "tear." It has also been plausibly held that the peculiar hodgepodge of six or eight different means of forming nonpresent or noncontinuous tenses, which in Latin were fused together into a single perfect tense, and also the shaping of forms in *-r* in the passive voice were the work of a large Sabine element in the population of Rome, which some have identified with the patrician class. Finally, if not from Sabine itself, from some one of the Italic dialects outside the Latinian group, were imported words with p or b for pure Lat. *qu* (c) or *u* (g), as Pompilius, lupus, "nolf"; popina, "cookshop"; bos, "ox." Thus does the evidence of language confirm the historical tradition of Sabine and Etruscan kings in Rome.

Latin in the Historical Period.—Certain differences in sounds (*e.g.*, losna, Lat. luna, "moon"; nefrones, Lat. *nebrundines*, "testes"), in usage (*e.g.*, tammodo, properly "just as," in the sense of "on the spot, straightway"), in word forms (*e.g.*, magistreis for nominative plural *magistri;* or the dual form Cestio, "the two Cestiuses") and in vocabulary (*e.g*, tongitio, "idea," Lat. notio) are clearly marked in early rustic Latin as spoken at Praeneste, about 20 mi. from Rome. Besides such local peculiarities of dialectal Latin. account must be taken of distinctions of date. Subsequent to the development of an elaborate literature, for the most part after Greek models, further account should be taken of: (1) differences which may be called social, though they are not merely as between educated and uneducated usage, but also betaeen the stylized language of literary forms and the popular spoken language of everyday life; and (2) differences, at least in expression and style, between prose and poetry, or between the language of oratory and that of philosophy, science, law or correspondence. Slangy Latin, for example, is occasionally to be recognized in the letters of some of Cicero's friends. Naturally the popular language (vulgar Latin) appears, not only in the artless inscriptions of plain folk, but from time to time in the literature too, as in the plays of Plautus, and later in the Satyricon of Petronius. In the end it was spoken Latin which won and which was the true basis of the Romance languages. In Romance. it is again important to discriminate with regard to date and locality. The language of Spain, for example, was superimposed upon a different linguistic substratum from, say, that of Rumania; it was planted there by speakers of quite different stock. and that 300 years earlier. Such considerations help to explain the divergent development of the Romance languages from a common spoken Latin. The oldest documents of what can no longer be called Latin do not, it is true, go back beyond the 9th century; but it is certain that, as regularly happens, the development of the written had lagged far behind that of the spoken tongue. The artificiality of the Latin of writers later than the 5th century is self-evident. Indeed the very conditions—central government, stability and security of life, ease of intercommunication and the rest—which had ensured the spread and maintenance of a common language were already seriously impaired and destined soon to fail. As an official language for correspondence and ritual, Latin had been retained by the Roman Catholic Church; and it remained the language of instruction throughout western Europe for many centuries. But in both cases it was divorced from the living tongues developing around it. Suggestions to revive Latin as an international auxiliary language for learned use seem hardly likely to result in actual practice, although it has been so used among classical scholars.

The sources of knowledge of the history of Latin are: mainly the language itself as recorded in inscriptions and in the literature; the testimony of ancient grammarians and glossographers; and the light shed by comparison with related languages and dialects and by the history of the Romance languages themselves. Chronologically six periods may be distinguished, beginning with:

1. Preliterary Latin (to c. 250 B.C.). The oldest document is a presentation inscription on a brooch found, not at Rome itself, but at Praeneste, so that perhaps it would be better counted dialectal. It runs *Manios* med fhefhaked *Numasioi*, "Manius made me for Numerius," and is not later than *c.* 600 B.C. The differences between this and the classical Latin (Manius me fecif *Numerio*) are striking. Next in date are two 5th-century inscriptions, from the Roman Forum and Tivoli (*Tibur*), respectively, the latter discovered in 1926; neither is perfectly understood, the former being so much mutilated as to defy all attempt at restoration and interpretation. But it shows among others the following interesting forms which are certain: *recei* (regi), "for the king"; sakros (sacer), "holy"; iouxmenta (iumenta), "beasts of burden"; diouestod (iusto), "lawfully"; and the Tibur inscription contains *mitat* third person singular, present subjunctive (mittat), a spelling which had long been known from the Quirinal vase inscription (4th century), a curse beginning with the words iouesat deiuos qoi med *mitat*, "whoso sends me adjures the gods . . ." The epitaphs of the Scipios, the laws of the Twelve Tables, the Saliar and Arval hymns, and the commemorative inscription of Gaius Duilius—these were nearly all more or less restored in a later age—are the more important surviving documents of this period.

2. The period of archaic Latin (from c. 250 to *c.* 90 B.C.) is represented not only by numerous inscriptions of all kinds but also by considerable literary remains (of Livius Andronicus, Naevius, Plautus, Ennius, the elder Cato, Terence, Pacuvius, Accius and Lucilius). The written still generally reflected the spoken language with fidelity, which is the reason why certain idioms of old Latin, judged by the standards of the classical language to be incorrect, reappeared in late Latin and Romance; *e.g.*, the use of the present instead of the future tense in an if-clause, such as *si* venis, te videbo, "if you come, I shall see you" (in classical Latin, si venies, "if you [shall] come"), like Fr. si tu viens, je te verrai, although Italian has the literary idiom. se tu verrai (future), io te *vedrò*. Similarly. the versification of Plautus is intelligible only if it is recognized that the diction of his plays was in accord with popular usage (*e.g.*, note the loss of final *-s* and

-m, as in Romance, or the scansion of ille as a monosyllable; cf. Fr. and It. il). Orthography was not yet standardized (thus consonants really pronounced double, or prolonged, were commonly written single, as in habuise for *-isse*—at least in inscriptions—the manuscripts of Plautus have had their spelling continually modernized, like texts of Shakespeare). Old verbal and nominal forms still, though precariously, held their own (*e.g*, the future perfect in *-[s]so* and perfect subjunctive in *-[s]sim*, the passive infinitive in *-ier*, the ablative singular in -d, the dissyllabic genitive singular of a-stems in *-āī*, and, in a few words, the genitive plural of o-stems in *-um* instead of *-orum*). Finally. Greek words imported during the period were, as a rule, completely Latinized in form and sound; no attempt was made to preserve rigorously their native shape. There was already in process of development a national prose style, not very well represented, honever. by Cato's treatise on agriculture. Its most characteristic features show that Latin prose had its springs in oratory.

3. In the classical period, roughly contemporary with the Golden Age of Latin literature, c. 90 B C. to A.D 14, some notable poets were Lucretius, who was old fashioned in language as well as in style. Catullus representing the new school. and Virgil and Horace nith their finished style and highly elaborated language; and in prose there were the archaizing Sallust, the simple and direct Caesar and the polished Cicero. Inscriptions of this period are reckoned in thousands from Rome alone. The cleft betneen the popular and the literary language can be shown to have become wide by the end of the republic. Steadily increasing Greek influence is marked, though in syntax its extent has certainly been exaggerated by commentators and grammarians. But viewed as a whole. in respect of vocabulary, accent, sounds, forms and syntax, the Latin language had, by the last century B C., developed all the characteristics which may be regarded as typical of it: of these the salient features are indicated below.

4. Silver Latin: from *Tiberius* to *Trajan* (A.D. 14 to 117). Although in earlier ages they often were not Roman. Latin authors were now seldom even Italian by birth. Of Livy it was said by a contemporary that marks of his Paduan origin were discernible in his language. and modern criticism has succeeded in identifying some of them. But into the language of later writers provincialisms and vulgarisms crept in increasing numbers and frequency. Ovid's diction is at times distinctly artificial. Characteristic, too. is the straining after effect which reveals itself in writers like Tacitus, trained as rhetoricians, and mhich was responsible for many a queerly turned sentence; archaisms and Grecisms are both needlessly frequent; and prose was invaded by expressions and style hitherto considered proper to verse. Seneca, Lucan. Martial, Quintilian—all Spaniards—the elder and the younger Pliny and Juvenal are the other outstanding writers of this period.

5. Archaism mas so pronounced in the succeeding age (AD. 117 to *c*. 180, Gellius, Fronto, Apuleius) that it may even be called an *archaizing period*. But it was accompanied by daring innovation. especially in the creation of new forms and in the admission of popular ones.

6. To the period of decadence which followed belong the Christian writers, among them the famous Africans. Tertullian, Cyprian, Arnobius and Augustine. The classical standard nas gradually and unconsciously being lost. The written Latin of learned ecclesiastics of still later date—Gregory of Tours (6th century) may be taken as a fair sample—was an artificial survival, full of corruptions and remote from the living dialects into nhich the spoken Latin of the empire was developing wherever it had really taken root, that is, except in Dacia and Illyricum, mainly in the west.

The Developed Language.—The more striking features which distinguish Latin may now be briefly noted Latin is one of the Indo-European group known as the *centum* languages, nhich may be broadly designated western and are characterized by the preservation of k sounds (Lat. *centum*, "hundred." but Sans. *šatam*) and the more or less complete labialization of q sounds (Lat. *quis*, "who"; Oscan pis, but Sans. ka-s) Latin has considerably modified the inherited system of accentuation and the original vowel sounds by extruding or weakening them in final and (if unaccented) medial syllables and by generally substituting simple sounds for diphthongs (see below, Accent, for examples). The Indo-European consonants which in Sanskrit become mainly voiced aspirates (*bh, dh*, gh) and which are represented in Latin in most cases by spirant (f, h) or stopped sounds (b, d, g), *e.g.*, corresponding to Lat. *fero*, "carry," *fumus*, "smoke," *formus*, "warm," are in Sanskrit *bharati, dhuma-s, gharma-s;* and similarly Lat. hauvio, "drain," is in Sanskrit ghasati, "consumes"; Lat. tibi, "to thee," Sans. *tubhy-am;* Lat. iubco, "bid," Sans. yodhayati, "stirs to battle"; Lat. medius, "middle," Sans. *madhya-s;* Lat. in-dulgere, "be complaisant" (literally "go a long way"), Sans. dirgha-s, "long"; Lat. *muger*, "false at play," Sans. mogha-s, "vain." Latin also changed *-s-* standing between vowels into *-r-*, a change which can be dated to c. 450–350 B C., e.g, *Furius* from an older Fusios, cited by the grammarians. Exceptions, when not phonetically explicable (as in *causa*, older caussa, "a case at law") are due to borroning, e g., *carbasus*, "linen," which was probably taken from Sabine. In the sphere of declension Latin preserved almost intact six of the original eight cases. the functions of the other two being absorbed by the six that were kept. It tended to fuse stems in -i- and stems ending in a consonant (*e.g.*, -es came to be the termination of the nominative and accusative plural in both classes). In conjugation, among other innovations. it developed a new set of forms in -b- (*e.g., amabam*, "I loved," *amabo*, "I shall love") for the imperfect and future tenses, and in *-r* for the passive voice. It amalgamated the old perfect and aorist tenses and the old subjunctive and optative moods. Finally. in syntax. the development of the elaborate and somewhat rigid principles which govern the sequence of tenses and the forms of indirect quotation is perhaps the most noteworthy feature.

Pronunciation of Latin in Italy in the classical period has been determined with approximate accuracy by the application of strict philological and linguistic methods; e g., in the last century B.C. the Romans never pronounced C like an English *s*, but always like k and G not as *j* but as g (in get), I and V, as consonants, were sounded like English y and *w*, respectively (not j and v), S was always as *-ss* in *hiss*, and the vowels had roughly much the same sounds as in modern Italian.

Accent.—In predialectal Indo-European the position of the chief accent of a word (or nord group) was not limited either by the quantities or the number of the syllables. But in an early stage of the development of Latin the Indo-European accent, which in character had been predominantly musical, at least in the final period of the Indo-European, gave way to a system of accentuation by which the initial syllable of a word was uttered with more force. Later the Latin accent remained a weak stress accent, though before the classical period it had come to be restricted to the last three syllables of a word. The precise position was determined by quantity, the penultimate being accented if long (*e.g., amāre*), the antepenultimate if the penultimate was short (*e.g., amábimus*). The chief difference between this and a somewhat earlier system of accentuation. which prevailed as late as the days of Plautus, is that in words in which the three syllables before the last were all short, the *fourth* syllable from the end was accented (*e.g., fácĭlĭus*). A fen typical examples of the changes dependent upon these conditions of accent may serve to indicate their importance (the position of the accent. where indicated, is that not of classical but of pre-Plautine Latin).

Syncope of short medial and final unaccented vowels, *e.g.*, in *árdēre*, "to be parched," but *aridus*, "dry, parched" (unsyncopated), mens, "mind," from an older **méntis* ("denotes a form which is not recorded. but nhich can be proved to have existed); syncope nith vocalization of a neighbouring consonant; e g., *amicio*, "thron around," from **am-iacio* (the y sound of the initial i in iacio, "throw," has become the vowel *i* at the same time that the *-a-* was lost). sdkros, "holy," became sacer (-ros first passed into *-rs*, in which r is vocalic, like a French final -re, and this successively into *-ers*, -err and *-er*).

Weakening of short medial vowels in unaccented syllables; *e.g., óbsideo*, 'beset," but *sĕdeo*, "sit"; *éfficio*, "complete." but *făcio*, "do, make"—contrast (before two consonants) *éffectus*, "completed," or (before r) *péperi*, "have borne," but *părio*, "bring

forth"; ilico, "on the spot," beside *lŏcus,* "place"—contrast (after i) *pietas,* "sense of duty," but old Lat. **pīŏs* (classical *pius*), "dutiful," or (before two consonants) *vénustus,* "charming," but old Lat. Venos "(the goddess) love"; *capitis,* genitive singular, "head," but *caput,* neuter singular; weakening of diphthongs in unaccented syllables, *e.g.,* cecidi, "have slain," but caedo (older caid-), "slay," *éxclūdo,* "shut out," but claudo, "shut." Dependent upon stress accent, too, is the regular shortening of a long syllable when preceded by a short syllable and also immediately either preceded or followed by the accent; thus bene, "well" (older *-ēd*), but, *e.g., honestē,* in which the second syllable is long.

Changes of *sound,* in addition to those already mentioned, include the following:

1. Vowels and diphthongs. When e was followed by I it became o (except before e, i, or a second *l*), hence volo, "wish," *volebam,* volam, but velim, vellem, velle; *-e* before nc, ng and gn (pronounced ngn) became i, *e.g.,* septingenti, "seven hundred," but septem, "seven"; and -ei became i, *e.g., dīco,* "say" (older, *deico*). Similarly ai became ae, *e.g.,* aedes, "temple" (older, ai-), but in rustic Latin a long open e, as in *ēdus* for haedus, "goat." Successively oi became oe and *ū, e.g., ūnus* (older, oi-); eu became first ou and then *ū, e.g., iūmentum,* "beast of burden," old Lat. plural iouxmenta (see above), but in Greek *ζεύγ-νυ-μι* "yoke." With this ou original ou also became ti, *e.g., lūcus,* "grove," lit. "a clearing," in old Latin *loucom* (accusative singular), except in rustic Latin, in which both ou and au (ordinarily preserved in polite Latin) gave *ō, e.g., lōsna,* "moon" at Praeneste (*see* above), cognate with lux, "light," lucus, "grove," and *ōrum,* "gold" (hence It. *oro,* Fr. or) but polite *aurum.*

2. Consonants. After about A.D. 50, *b* between vowels became a sound like English v (cf. It. *avere,* Fr. avoir from Lat. *habere,* "have"). About the same time Lat. *v* (pronounced like Eng. w) passed into the same sound (*cf.* It. *voce,* Fr. *voix* from Lat. *vōcem,* "word, voice") The corresponding change of consonantal i (= Eng. *y*) into a *j* sound (*cf.* It. *giusto,* Fr. *juste* from Lat. *iustum,* "legal, fair") took place about 400 years later. Consonantal *i* and consonantal *u* inherited from the Indo-European were lost at a very early date, the former between any two vowels, the latter between two like vowels of which the first was accented: thus in *torreo,* "scorch," the ending was originally *-ēio;* the genitive singular *divitis* (nominative dives) became, with the loss of *u* and contraction, *dītis.* Where for any reason *i* occurs in the developed language between vowels it really stands for *-iy-* in pronunciation; *e.g.,* in *eius,* pronounced *ei-y-us.* From the group *du* (*u* being consonantal) at the beginning of a word arose b-: thus we have *bis,* "twice," from **dwis,* beside *duo,* "two." In popular Latin a single breathed consonant (*p, t, k*) seems regularly to have been doubled in the middle of a word when preceded by a long vowel, and the vowel shortened at the same time—but not in the literary language. Hence arose a number of doublets; *e.g.,* in the popular language *cuppa,* "cask" (Fr. *coupe*), beside *cūpa* (Fr. cuve) in the literary language. On the other hand, *-ss-* became *-s-* in the first centurv B.C. after a long vowel or dinhthong; *e.g., cāsum,* supine of cado, "fall," from *cādsum,* older **cad-tum* (I.E. *t* + *t*, *d* + *t*, *dh* + *t* regularly becoming *-ss-* except before *r*), and *-ll-* became *l* after a long vowel when *i* stood in the following syllable: thus the plural of mille, "thousand," is *mīlia.* Assimilation of neighbouring unlike consonants, characteristic of all languages, is prevalent in Latin: *āctus,* "driven," from **ag-tos* (*cf.* ag-o); ferre, "carry," from **fer-se* (cf. es-se). Before d, *m, n, l* and v, *-s-* was always lost and the preceding vowel lengthened; *e.g., prīmus,* "first," for **pris-mos* (cf. *pris-cus,* "ancient").

Vocabulary is in the main inherited directly from the Indo-European, but there are numerous borrowed words from other tongues; moreover, the popular speech retained the power freely to form compounds much longer than the written language. Some of these are half comic, as the *vaniloquidorus,* "generous in talk." of Plautus (there the element *-doro-* is also Greek). Prepositional compounds, however, in which the true force of the preposition was not felt, so that the compound, *e.g.,* in con-, de-, *in-,* gained merely in emphasis, were common in the spoken tongue throughout its history. Many suffixes remained or became productive, and new words were constantly being built up on old patterns from existing stems.

Numerals reflect an Indo-European system of reckoning that was mainly decimal. Only the first three of cardinal numerals up to 100 were declined; the decades, however, were originally neuter plurals, and the hundreds and thousands (except *centum* and mille) were regularly declined. Even where originally nouns the numerals have almost all become adjectival.

Noun and Verb Forms have certain peculiarities noted above; others include the almost complete loss of the dual number, the employment of a termination *-i* in the genitive singular of the first (-ae from -hi) and second declensions (peculiar to Italic and Celtic in the o-stems), the adoption (as in Greek) of pronominal terminations in the nominative plural of the same two declensions, the extension of -ti- abstract nouns by an *-ōn-* suffix (*e.g.,* ratio, "thought"), the wider development of the dies-type of declension, and the loss of the u declension of adjectives. In verbs may be noted the disuse of the augment in the past tenses (Gr. *ἔ-θη-κ-α*, "I put," but Lat. *fē-c-i,* "I did"), and the growth of new forms for the future perfect and pluperfect tenses and for the imperfect subjunctive. Even the syntactical categories of the future perfect and imperfect subjunctive were new.

Syntax.—Further features of special interest are the running together of the true ablative, the instrumental, and (for the most part) the locative of the Indo-European into a single ablative case, and sharp definition in the use of all the cases; the development of constructions by which the subjunctive was regularly used in dependent questions and in clauses of definition, purpose and result; and the peculiarly Latin idiom of the gerundive.

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LATIN LITERATURE. Preliterary Period, to 240 B.C.—The germs of an indigenous literature had existed at an early period in Italy in forms such as we might expect in a people just emerging from barbarism. The art of writing was first employed in the service of the State and of religion for books of ritual, treaties with other States, laws of the Twelve Tables, etc. An approach to literature was made in the chronicles, public and private, funeral orations and tomb-inscriptions. A nearer approach was probably made in oratory, as we learn from Cicero that the famous speech delivered by Appius Claudius Caecus against concluding peace with Pyrrhus (280 B.C.) was extant in his time. Appius also published a collection of moral maxims and reflections in verse.

But it was rather in the chants and litanies of the ancient

religion, such as those of the Salii and the Fratres Arvales, and the dirges for the dead (neniae), and in certain extemporaneous effusions, that some germs of a native poetry might have been detected; these seem to have been in Saturnian (*q.v.*) or other rude and probably accentual metre. We may also mention the vates (bards or soothsayers), of whom the most famous was one Marcius, and the "Fescennine verses" (*q.v.*). There were also commemorative poems, accompanied with music, which were sung at funeral banquets, in celebration of the exploits and virtues of distinguished men. The latest and probably the most important of these rude and inchoate forms was that of quasi-dramatic *saturae* (medleys), put together without any regular plot and said to have consisted of jocular dialogue in verse,[1] accompanied with music (Livy vii. 2). These have a real bearing on the subsequent development of Latin literature. They may have contributed to the formation of the style of comedy which appears at the very outset much more mature than that of serious poetry, tragic or epic. They gave the name and some of the characteristics to that special literary product of the Roman soil, the *satura*, addressed to readers, not to spectators, which ultimately was developed by Lucilius, Horace, Persius and Juvenal.

First Literary Period: 240 to 80 B.C.—*Livius Andronicus.*—The historical event which brought about the greatest change in the intellectual condition of the Romans, and thereby exercised a decisive influence on the whole course of human culture, was the capture of Tarentum in 272. After the capture many Greek slaves were brought to Rome, and among them the young Livius Andronicus (*c.* 284–204), who was employed in teaching Greek in the family of his master, a member of the Livian gens. From that time to learn Greek became a regular part of the education of a Roman noble. In the year after the first Punic war (240), when the armies had returned and the people were at leisure to enjoy the fruits of victory, Livius Andronicus substituted at one of the public festivals a regular drama, translated or adapted from the Greek for the musical medleys (saturae) hitherto in use. From this time dramatic performances became a regular accompaniment of the public games, and came more and more to drive out or transform the native compositions. The dramatic work of Livius was mainly of educative value. The same may be said of his translation of the Odyssey, which was still used as a school-book in the days of Horace, and the religious hymn which he was called upon to compose in 207 had no high literary pretensions. He was, however, the first to familiarize the Romans with the forms of the Greek drama and the Greek epic, and thus to determine the main lines which Latin literature followed for more than a century afterwards.

Naevius.—His immediate successor, Cn. Naevius (d. c. 200 B.C.), was not, like Livius, a Greek, but either a Roman citizen or, more probably, a Campanian who enjoyed the limited citizenship of a Latin and who had served in the Roman army in the first Punic war. His first appearance as a dramatic author mas in 235. He adapted both tragedies and comedies from the Greek, but seems to have been more successful in the latter. An attempt to introduce political satire (against the Metelli) led to his imprisonment, and henceforth personalities are absent or carefully veiled in Roman drama, save for a few very mild jests against persons of little importance. Even complimentary allusions are seldom very outspoken. Besides celebrating the success of M. Claudius Marcellus in 222 over the Gauls in a play called *Clastidium*, he gave the first specimen of the *fabula* praetexta or tragedy on a Roman subject in his *Alimonium Romuli* et *Remi*. In his long Saturnian poem on the first Punic war, he not only told the story of contemporary events but helped to shape the legend of the settlement of Aeneas in Latium.

Plautus.—His younger contemporary, T. Maccius Plautus (c. 254–184), was the greatest comic dramatist of Rome, a thorough Roman despite his Umbrian origin, and possessing a range arid vigour of wit almost Shakespearean, which breathes into the faded prettiness of New Comedy something of the heartiness of Aristophanes. His work survives fairly complete. Apart from his merits as a dramatist, Plautus is of great interest to philologists, as the largest specimen we have of early Latin. Moreover, he was a very skilful metrician, showing an extraordinary power of adapting the foreign (Greek) metres in which he wrote to the rhythm, largely accentual, of spoken Latin. In consequence of this, careful examination of his text has led to the recovery, in considerable measure, of the very cadences of ancient Latin speech.[1]

Ennius.—Thus far Latin literature had some claim to be considered popular. But a new spirit, which henceforth became predominant, appeared in the time of Plautus. Latin literature became the expression of the ideas, sentiment and culture of the aristocratic governing class. It was by Q. Ennius (239–169) of Rudiae in Messapia, that a new direction was given to Latin literature. Deriving from his birthplace the culture, literary and philosophical, of Magna Graecia, and having gained the friendship of the Scipionic circle, he was of all the early writers most fitted to be the medium of conciliation between the serious genius of ancient Greece and the serious genius of Rome.

First among his special services to Latin literature was the fresh impulse which he gave to tragedy. He turned the eyes of his contemporaries from the commonplace social humours of later Greek life to the contemplation of the heroic age. To judge from rather scanty fragments, he introduced into his Greek plots a genuinely Roman tone. Although Rome wanted creative force to add a great series of tragic dramas to the literature of the world, yet the spirit of elevation and moral authority breathed into tragedy by Ennius passed into the ethical and didactic writings and the oratory of a later time.

Another work was the *Saturae*, written in various metres, but chiefly in the trochaic tetrameter. He thus became the inventor of a new form of literature; and, if in his hands the satura was rude and indeterminate in its scope, it became a vehicle by which to address a reading public on matters of the day, or on the materials of his wide reading, in a style not far removed from the language of common life. His greatest work, which made the Romans regard him as the father of their literature, was his epic poem, in 18 books, the *Annales*, a chronicle in verse of the whole history of Rome. The idea which inspired Ennius was ultimately realized in both the national epic of Virgil and the national history of Livy. Its metre, the hexameter (*q.v.*) was, although still rude, the first step in the development which culminated in Virgil. As grammarian and poet, he fixed Greek rules of scansion upon the literary Latin. Although of his writings only fragments remain, these fragments are enough, along with what we know of him from ancient testimony, to justify us in regarding him as the most important among the makers of Latin literature before the age of Cicero.

Cato.—M. Porcius Cato the Censor (234–149), was a younger contemporary of Ennius, whom he brought to Rome. More than Naevius and Plautus he represented the pure native, especially the plebeian element. His lack of imagination and his narrow patriotism made him the natural leader of the reaction against the new Hellenic culture. He strove to make literature ancillary to politics and to objects of practical utility, and thus started prose literature on the chief lines that it afterwards followed. Through his industry and vigorous understanding he gave a great impulse to the creation of Roman oratory, history and systematic didactic writing. He was one of the first to publish his speeches and thus to bring them into the domain of literature. Cicero, who speaks of 150 of these speeches as extant in his day, praises them for their acuteness, their wit, their conciseness. He speaks with emphasis of the impressiveness of Cato's eulogy and the satiric bitterness of his invective.

Cato was the first historical writer of Rome to use his native tongue. His Origines, the work of his old age, was written with that thoroughly Roman conception of history which regarded actions and events solely as they affected the continuous and pro-

[1] The reliability of Livy's account is uncertain; see Schanz-Hosius, p. 20, for the controversy.

[1] The best and fullest treatment of this matter is to be found in W. M. Lindsay, Early Latin *Verse;* for discussion of a rather important point in connection with the accentual element in Plautine verse, *see* Sonnenschein in Class. *Rev.* XX. (1906), *p.* 156, Eton, ibid., p. 31, Wallstedt, *Studia Plautina* (Lund, 1909).

gressive life of a State. It was an attempt, apparently somewhat in the style of the Greek logographi (*q.v.*), to record the early history of the Italian communities which Rome had conquered. Its loss is much to be deplored.

Terence, Lucilius, etc.—In Naevius, Plautus, Ennius and Cato are represented the contending forces which strove for ascendancy in determining what was to be the character of the new literature. The work, begun by them, was carried on by younger contemporaries and successors; by Statius Caecilius (c. 220–168), an Insubrian Gaul, in comedy; in tragedy by M. Pacuvius (c. 220–132), the nephew of Ennius, called by Cicero the greatest of Roman tragedians; and, in the following generation, by L. Accius (*c.* 170–86), who was more usually placed in this position. The impulse given to oratory by Cato, Ser. Sulpicius Galba and others, and along with it the development of prose composition, went on with increased momentum till the age of Cicero. But the interval between the death of Ennius (169) and the beginning of Cicero's career, while one of progressive advance in the appreciation of literary form and style, was much less distinguished by original force than the time immediately before and after the end of the second Punic War. The one complete survival of the generation after the death of Ennius, the comedy of P. Terentius Afer or Terence (*c.* 185–159), exemplifies the gain in literary accomplishment and the loss in literary freedom. Terence has nothing Roman or Italian except his pure and idiomatic Latinity. His Athenian elegance affords the strongest contrast to the Italian rudeness of Cato's *De Re Rustica.* What. makes Terence an important witness of the culture of his time is that he wrote from the centre of the Scipionic circle, in which what was most humane and liberal in Roman statesmanship was combined with the appreciation of what was most vital in the Greek thought and literature of the time. The comedies of Terence may therefore be held to give some indication of the tastes of Scipio, Laelius and their friends in their youth. The influence of Panaetius and Polybius was more adapted to their maturity. But in the last years during which this circle kept together a new spirit of discontent, powerfully voiced by the Gracchi in politics and in oratory, arose and with it a new literary *genre,* satire. Roman satire, though in form a legitimate development of the indigenous dramatic *satura* through the written *satura* of Ennius and Pacuvius, is really a birth of this time, and its author was the youngest of those admitted into the intimacy of the Scipionic circle, C. Lucilius of Suessa Aurunca (*c.* 180–103). The loss of his works, which seem to have been full of originality and pungent criticism, is most regrettable. The years that intervened between his death and the beginning of the Ciceronian age are singularly barren in works of original value. But in one direction there was some novelty. The tragic writers had occasionally taken their subjects from Roman life *(fabulae praetextae),* and in comedy we find the corresponding *togatae* of Lucius Afranius and others.

Summary of the Period.—*The* general results of the last 50 years of the first period (130 to 80) may be thus summed up. In poetry we have the satires of Lucilius, the tragedies of Accius and of a few successors among the Roman aristocracy; various annalistic poems intended to serve as continuations of the great poem of Ennius; minor poems of an epigrammatic and erotic character, unimportant anticipations of the Alexandrian tendency operative in the following period; and works of criticism in trochaic tetrameters by Porcius Licinus and others, forming part of the critical and grammatical movement which almost from the first accompanied the creative movement in Latin literature.

The only extant prose work which may be assigned to the end of this period is the treatise on rhetoric known by the title *Ad Herennium (c.* 84) a work indicative of the attention bestowed on prose style and rhetorical studies during the last century of the republic, and which may be regarded as a precursor of the oratorical treatises of Cicero and Quintilian. But the great literary product of this period was oratory, developed indeed with the aid of these rhetorical studies, but itself the immediate outcome of practical needs. The speakers and writers of a later age looked back on Scipio and Laelius, the Gracchi and their contemporaries, L. Crassus and M. Antonius, as masters of their art.

Cicero denies to Rome the existence, before his own time. of any adequate historical literature. Nevertheless it was during this period that the annalists (*q.v.*) flourished, and formed the traditional history and chronology of Rome. There were also special works on antiquities, and contemporary memoirs and autobiographies such as those of M. Aemilius, Scaurus, the elder, Q. Lutatius Catulus (consul 102 B.C.), and P. Rutilius Rufus, which formed the sources of future historians. *(See,* further, ROME: *Ancient History.)*

So far, then, we find drama, which was not destined to play any leading part in the future literature. a fairly well developed, dignified prose style; imaginative poetry, and its vehicle, the hexameter, albeit rude and unmelodious as yet; satire, using the hexameter as one of its media (it afterwards discarded all others); but, so far, no personal lyric and no elegy or none of importance. The influences of Greek literature to which Latin literature owed its birth had not as yet spread beyond Rome and Latium. The Sabellian races of central and eastern Italy and the Italo-Celtic and Venetian races of the north, in whom the poetic susceptibility of Italy was most manifest two generations later, were not, until after the Social war, sufficiently in sympathy with Rome, and were probably not as yet sufficiently educated to contribute their share to the national literature. Hence the end of the Social war, and of the Civil war, which arose out of it, is most clearly a determining factor in Roman literature, and may most appropriately be taken as marking the end of one period and the beginning of another.

Second Period: 80 to **42 B.C.**—The last age of the republic coincides with the first half of the Golden age of Roman literature. It is generally known as the Ciceronian age from the name of its greatest literary representative, whose activity as a speaker and writer was unremitting during nearly the whole period. The five chief representatives of this age who still hold their rank among the great classical writers are Cicero, Caesar and Sallust in prose, Lucretius and Catullus in verse. The works of other prose writers, Varro and Cornelius Nepos, have been partially preserved; but these writers have no claim to rank with those already mentioned as creators and masters of literary style. There was by this time a not inconsiderable educated reading public, and regular publishing had begun. Joined to the national love of oratory, this produced not only the published speech, which already existed, but the pamphlet in speech form, *e.g.,* Cicero's second *Philippic,* which was never delivered.

Cicero.—Thus the speeches of M. Tullius Cicero (106–43) belong to the domain of literature quite as much as to that of forensic or political oratory. It is urged with justice that the greater part of Cicero's *Defence* of *Archias* was irrelevant to the issue and would not have been listened to by a modern jury. But it was fortunate for the interests of literature that a court of educated Romans could be influenced by the considerations there submitted to them. In this way a dispute about the status of an unimportant person has produced one of the most impressive vindications of literature ever spoken or written. In many other orations, the largeness of the issues involved adds interest and elevation. The Roman oratory of the law courts had to deal, not only with petty questions of disputed property, of fraud, or violence, but with great imperial questions, with matters affecting the well-being of large provinces and the honour and safety of the republic; and no man ever lived who, in these respects, was better fitted than Cicero to be the representative of the type of oratory demanded by the condition of the later republic. A patriot, a sensitive artist, a master of technique, he was also, if not exactly a dramatist, an excellent portrayer of the broad outlines of character. The Verres, Catiline, Antony of Cicero are living and permanent types. The story told in the *Pro Cluentio* may be true or false, but the picture of provincial crime which it represents is alive. Had we only known Cicero in his speeches we should, even so, recognize him as the master and perfecter of Latin style. But to his services to Roman oratory we have to add his services not indeed to philosophy but to the literature of philosophy. Perhaps no one, save Plato and Aristotle, has so influenced the views of later ages as this brilliant pleader, who gave

part of his leisure to embodying, in an attractive form, ethical doctrines of which he had but a superficial and inaccurate knowledge, but in whose practical applications he, like a true Roman, took a most lively interest. His works on rhetoric place him high among critics of prose style.

The Letters of Cicero are of at least three kinds: the manifesto or apologia in letter form; the official or semi-official *communiqué;* and the genuine intimate letters like those to Atticus, in which we learn, not only the innermost thoughts of a complex mind, but the rich, varied and easy speech of a Roman of high education.

Caesar.—Among the many rival orators of the age the most eminent were Quintus Hortensius Hortalus and C. Julius Caesar. The former was the leading representative of the Asianic style of oratory, and, like other members of the aristocracy, such as C. Memmius and L. Manlius Torquatus, and like Q. Catulus in the preceding generation, was a kind of dilettante poet and a precursor of the poetry of pleasure, which attained such prominence in the elegiac poets of the Augustan age. Of Julius Caesar (102–44) as an orator we can judge only by his reputation and by the testimony of Cicero; but we are able to appreciate the special praise of perfect taste in the use of language attributed to him.[1] In his Contmentaries, by laying aside the ornaments of oratory, he created the most admirable style of prose narrative, the style which presents interesting events rapidly and vividly, with scarcely any colouring of personal or moral feeling, any oratorical passion, any pictorial illustration. While he shows the persuasive art of an orator by presenting the subjugation of Gaul and his own action in the Civil War in the light most favourable to his claims, he is entirely free from self-laudation or disparagement of an adversary. The character of the man reveals itself especially in a perfect simplicity of style, the result of the clearest intelligence and the strongest sense of personal dignity. Rhetorical colouring is never used, or at least never displayed; yet the narrative is never cold nor dry.

Sallust.—In the simplicity of his style, the directness of his narrative, the entire absence of any didactic tendency, Caesar presents a marked contrast to another prose writer of that age—the historian C. Sallustius Crispus or Sallust (86–34). Like Varro, he survived Cicero by some years, but the tone and spirit in which his works are written assign him to the republican era. He was the first of the purely artistic historians, as distinct from the annalists and the writers of personal memoirs. He imitated the Greek historians in taking particular actions—the Jugurthan War and the *Catilinarian* Conspiracy—as the subjects of artistic treatment. He wrote also a continuous work, Historiae, treating of the events of the 12 years following the death of Sulla, of which only fragments are preserved. His two extant works are more valuable as first-rate party pamphlets than as trustworthy narratives of facts. His style aims at effectiveness by pregnant expression, sententiousness, archaism. He produces the impression of caring more for the manner of saying a thing than for its truth, and his vehement bias in favour of Caesar colours everything he writes. Of the other historians, or rather annalists, who belong to this period, such as Q. Claudius Quadrigarius, Q. Valerius Antias, and C. Licinius Macer, the father of Calvus, we have only fragments remaining.

Varro.—The period also produced learned writers on philology and antiquities, whereof one is entitled to a separate mention. This was M. Terentius Varro, the most learned not only of the Romans but of the Greeks, as he has been called. The list of Varro's writings includes over 70 treatises and more than 600 books dealing with topics of every conceivable kind. His *Menippeae* Saturae, miscellanies in prose and verse, of which unfortunately only fragments are left, was a work of singular literary interest.

Lucretius.—Since the Annals of Ennius no great and original poem had appeared. The powerful poetical force which for half a century continued to be the strongest force in literature, and which created masterpieces of art and genius, first revealed itself in the latter part of the Ciceronian age. The conditions which enabled it to come to maturity in the person of T. Lucretius Carus (96–51) were entire seclusion from public life and absorption in the ideal pleasures of contemplation and artistic production. His De *Rerum Natura* stands forth as the greatest philosophical poem in any language. Form and metre are Greek, and the subject is the philosophy of Epicurus; but all that is of deep human and poetical meaning in the poem is his own. Lucretius's death left the poem unfinished, and he did not possess the perfect poetical technique of Virgil. Yet, apart altogether from its independent value, by his speculative power and enthusiasm, by his revelation of the life and spectacle of nature, by the fresh creativeness of his diction and the elevated movement of his rhythm, Lucretius exercised a more powerful influence than any other on the art of his successors, and particularly on Virgil himself.

Catullus.—While the imaginative and emotional side of Roman poetry was so powerfully represented by Lucretius, attention was directed to its artistic side by a younger generation, who moulded themselves in a great degree on Alexandrian models. Such were Valerius Cato, also a distinguished literary critic, and C. Licinius Calvus, an eminent orator. Of this small group of poets one only has survived, fortunately the man of most genius among them, and probably the least Alexandrian, the bosom-friend of Calvus, C. Valerius Catullus (84–54). He, too, was a new force in Roman literature. He was a provincial by birth, although early brought into intimate relations with members of the great Roman families. The subjects of his best art are taken immediately from his own life—his loves, his friendships, his travels, his animosities, personal and political. No poet has surpassed him in the power of vitally reproducing the pleasure and pain of the passing hour, not recalled by idealizing reflection as in Horace, nor overlaid with mythological ornaments as in Propertius, but in all the keenness of immediate impression. He also is perhaps the most polished and mordant lampooner in any language. His greatest contribution to poetic art consisted in the perfection which he attained in several lyric metres, and in the ease and grace with which he used the language of familiar intercourse to give at once a lifelike and an artistic expression to his feelings. In his life and in his art he was the precursor of those poets who used their genius as the interpreter and minister of pleasure; but he rises above them in the spirit of personal independence, in his affection for his friends, in his keen enjoyment of natural and simple pleasures, and in his power of giving vital expression to these feelings.

Third Period: Augustan Age, 42 B.C. to A.D. 17.—The poetic impulse and culture communicated to Roman literature in the last years of the republic passed on without any break of continuity into the literature of the succeeding age. One or two of the circle of Catullus survived into that age; but an entirely new spirit came over the literature of the new period, and it is by new men, educated indeed under the same literary influences, but living in an altered world and belonging originally to a different order in the State, that the new spirit was expressed. The literature of the later republic reflects the sympathies and prejudices of an aristocratic class, sharing in the conduct of national affairs and living on terms of equality with one another; that of the Augustan age, first in its early serious enthusiasm, and then in the licence and levity of its later development, represents the hopes and aspirations with which the new monarchy was ushered into the world, and the pursuit of pleasure and amusement, which becomes the chief interest of a class cut off from the higher energies of practical life, and moving in the refining and enervating atmosphere of an imperial court. The great inspiring influence of the new literature was the enthusiasm produced first by the hope and afterwards by the fulfilment of the restoration of peace, order and national glory, under the rule of Augustus. That distracted age longed for a deliverer and peacemaker, and in Augustus it found him. It was not, however, by his equals in station that the first feeling was likely to be entertained. The earliest to give expression to it was Virgil; but the spell was soon acknowledged by the colder and more worldly-wise Horace. Before, but still more after, his defeat of Antony and Orientalism,

[1] *Latine loqui elegantissime.*

Virgil hailed him as more than mortal, a kind of Messiah, and Horace echoed Virgil.

The empire of Xugustus gave literature an environment both good and bad. On the one hand, its suppression of the turbulence of republican times meant a certain amount of restriction in public life and, in particular, left political oratory almost without any excuse for existence. On the other, it furnished to those who had eyes to see it the noblest of political ideals, that of a world-wide empire of peace and justice. Almost of necessity, therefore, literature became idealistic, or reflective, or purely personal, wherefore, apart from the prose epic of Livy, to be considered later, the work of this age is largely in verse, which includes epic and didactic poetry (Virgil), lyrics, in large measure personal (Horace), satire, avoiding personalities (Horace again), and elegiac poetry, fanciful or dealing with the affections (Gallus, Tibullus, Propertius, Ovid).

Gallus.—The work of Gallus is unfortunately lost, unless, as Skutsch has plausibly suggested (Aus *Vergils Frühzeit*, 1901; *Gallus und Vergil*, 1906), the pseudo-Virgilian poem Ciris, an *epullion* in the Alexandrian manner, is his, and the Sixth and Tenth Eclogues of Virgil contain a poetical summary of his elegies. He certainly was Virgil's friend, and an elegiac poet of considerable merit, to judge by the references to him in the later elegiasts. As governor of Egypt, in 26 B C. he allowed his vanity to lead him into appropriating honours to himself, or at least allowing them to be paid him, which properly belonged to Augustus. Disgrace and suicide followed, and Virgil found himself obliged to mutilate the fourth Georgic, which should have ended with a panegyric on his friend, and substitute the episode of Orpheus. perhaps originally an independent composition, beautiful in itself but dragged in very unnaturally where it stands Gallus's amatory pieces were addressed to a lady whom he called Lycoris, no doubt a feigned name.

Virgil.—The greatest surviving Augustan poet, and also the earliest, is P. Vergilius (often miswritten Virgilius, whence the English spelling Virgil) Maro (70–19 B C.). 4 native of Andes (Calvisano? certainly not Pietole) in the Mantuan territory, he began his poetical career with a few fugitive pieces in various styles, represented for us by the so-called *Appendix Vergiliana*, a miscellaneous collection, ranging from compositions in all probability his to others which can by no sound criticism be attributed to him, even in his salad days The little pieces called catalepta ("trifles") are an example of the former, the Culex ("Gnat") of the latter.[1]

Next came the *Eclogues* or *Bucolics*, a series of ten pieces somewhat in the manner of Theocritus's pastorals, the scene of the odd-numbered ones at least being laid in the Mantuan territory or the neighbouring Italian Alps, and containing many allusions to the poet and his friends. They are slight, but full of exquisitely accurate observation of nature, a mastery of metre and style, and what Horace calls tender humour (molle *atque facetum*, Sat, 1, 10, 44) in the handling of the subject-matter.

In the Georgics we are struck by the great advance in the originality and self-dependence of the artist, in the mature perfection of his workmanship, in the deepening and strengthening of all his sympathies and convictions. Although he draws upon Greek authors for material and form, yet by sheer force of original genius he, like Lucretius, has put the didactic poem among the highest forms of serious poetry, so transmuting his material that, without violation of truth, he has made the whole poem alive with poetic feeling. The homeliest details of the farmer's work are transfigured through the poet's love of nature; through his religious feeling and his pious sympathy with the sanctities of human affection; through his patriotic sympathy with the national greatness; and through the rich allusiveness of his art to everything in poetry and legend which can illustrate and glorify his theme.

In the *Eclogues* and Georgics Virgil is the idealizing poet of the Italian countryside. In the *Aeneid* he is the idealizing poet of the empire and of Augustus. The epic of national life, vividly conceived but rudely executed by Ennius, was perfected in the years that followed the decisive victory at Actium. To do justice to his idea Virgil enters into rivalry with no less a poet than Homer. That he does not thereby make himself ridiculous is no small tribute to his greatness; that out of the poor, late and artificial legend of Aeneas he has reared up a lasting monument of the grandeur of Rome marks him a consummate artist and a master of epic.

Horace.—The second great poet of the time—Q. Horatius Flaccus or Horace (6 j–8 B.C.) is both the realist and the idealist of his age. If we want to know the actual lives, manners and ways of thinking of the Romans of the generation succeeding the overthrow of the republic it is in the Satires and partially in the Epistles of Horace that we shall find them. If we ask what that time provided to stir the fancy and move the mood of imaginative reflection, it is in the lyrical poems of Horace that we shall find the most varied and trustworthy answer. His literary activity extends over about 30 years and naturally divides itself into three periods, each marked by a distinct character. The first—extending from about 40 to 29—is that of the Epodes and Satires. In the former he imitates the lampooning style of the Greek iambic writers, but the objects of his attack are all, or mostly, imaginary. In the Satires we find realistic pictures of social life, and the conduct and opinions of the world submitted to the standard of good feeling and common sense. The style is natural and familiar. The hexameter no longer, as in Lucilius, moves awkwardly, but easily and as if carelessly, as befits the colloquial tone. The next period is the meridian of his genius, the time of his greatest lyrical inspiration, which he himself associates with the peace and leisure secured to him by his Sabine farm. The life of pleasure which he had lived in his youth comes back to him in the idealizing light of meditative retrospect. He had not only become reconciled to the new order of things, but was moved by his intimate friendship with Maecenas to aid in raising the world to sympathy with the imperial rule through the medium of his lyrical inspiration, as Virgil had through the glory of his epic art. With the completion of the three books of Odes he cast aside for a time the office of the vates, and resumed that of the critical spectator of human life, but in the spirit of a moralist rather than a satirist. In his Epistles he combines the ease of the best epistolary style with the grace and concentration of poetry—the style, as it has been called, of "idealized common sense," that of the *urbanus* and cultivated man of the world who is also in his hours of inspiration a genuine poet. In the last ten years of his life Horace published his fourth, and poorest, volume of Odes under pressure of the imperial command. But his chief activity is devoted to criticism, vindicating the claims of his own age to literary pre-eminence, and seeking to stimulate the younger writers of the day to what he regarded as the manlier forms of poetry and especially to tragedy (Epistles ii. and Ars *Poetica*).

But the poetry of the latter half of the Xugustan age destined to survive did not follow the lines either of lyrical or of dramatic art marked out by Horace. There now came to perfection another vehicle for poetic expression, the elegy. Here the influence of Alexandria was great; but the pupils seem to have surpassed their teachers. The greatest masters of this kind of poetry are Tibullus, Propertius and Ovid.

Tibullus.—Of the ill-fated C. Cornelius Gallus, their predecessor, we have already spoken. Of the three Tibullus (c. j4–19) is the most refined and tender. As the poet of love he gives utterance to the pensive melancholy rather than to the pleasures associated with it. In his sympathy with the life and beiiefs of the country people he shows an affinity both to the idyllic spirit and to the piety of Virgil.

Propertius.—A poet of more strength and more powerful imagination, but of less exquisite taste in his art, is Sextus Propertius (*c.* 50–*c.* 15). His youth was spent in Rome. His passion for

[1] The objection to attributing the ***Culex*** to Virgil, despite good ancient testimony that he wrote a poem so called, is not that it is trash, for the early efforts of great poets have often been rubbish, but that it is a kind of trash, both in content and in style, which could by no psychological possibility have been the fore-runner of Virgil's acknowledged works. R. Radford (Trans. Amer. *Phil.* Ass., **li.,** p. 159, and elsewhere), and one or two others, would attribute much of the Appendix to Ovid.

Cynthia (Hostia, probably a libertina) was the inspiration of his best work; and of her he has left a finished portrait. Sometimes heavy from too much Alexandrian learning, at times macabre, he shows more power of dealing gravely with a great or tragic situation than either Tibullus or Ovid, and his diction and rhythm at times approach sublimity.

Ovid.—The most facile and brilliant of the elegiac poets and the least poetical is P. Ovidius Naso or Ovid (43 B.C.–A.D. 18). As an amatory poet he is the poet of pleasure and intrigue rather than of tender sentiment or absorbing passion. Though he treated his subject in relation to himself with more levity and irony than real feeling, yet by his sparkling wit and fancy he created a literature of sentiment and adventure adapted to amuse the idle and luxurious society of which the elder Julia was the centre. His power of continuous narrative is best seen in the Metamorphoses, written in hexameters to which he has imparted a rapidity and precision of movement more suited to romantic and picturesque narrative than the weighty verse of Virgil. In his *Fasti* he successfully adapts to Roman themes the manner of Callimachus's Aitia. In his latest works—the Tristia and *Ex* Ponto—he imparts the interest of personal confessions to the record of a unique experience. Latin poetry is more rich in the expression of personal feeling than of dramatic realism. In Ovid we have both. We know him in the intense liveliness of his feeling and the human weakness of his nature more intimately than any other writer of antiquity, except perhaps Cicero. For the next 1 j centuries or so, amatory poets and romantic versifiers learned their trade from him. His elegiacs are to Latin poetry what the Popian couplet is to English.

Livy—The past of Rome had always a peculiar fascination for Roman writers. But it was in the great historical work of T. Livius or Livy (59 B.C.–A.D 17) that the record of the national life received its most systematic exposition. Its execution was the work of a life prolonged through the languor and dissolution following so soon upon the promise of the new era, during which time the past became glorified by contrast with the disheartening aspect of the present. The value of the work consists not in any power of critical investigation or weighing of historical evidence, but in the intense sympathy of the writer with the national ideal, and the vivid imagination with which under the influence of this sympathy he gives life to the events and personages, the wars and political struggles, of times remote from his own. He makes us feel more than any one the majesty of the Roman State, of its great magistracies, and of the august council by which its policy was guided. The vast scale on which the work was conceived and the thoroughness of artistic execution with which the details are finished are characteristically Roman. The prose style of Rome, as a vehicle for the continuous narration of events coloured by a rich and picturesque imagination and instinct with dignified emotion, attained its perfection in Livy.

Fourth Period: The Silver Age, A.D. 17 to 130.—For more than a century after the death of Augustus, Rome, though drawing from the provinces, remains the centre of the literary movement. The Silver Age, as it is called, is alternately overpraised and undervalued, as taste swings from one extreme to another. In many respects it resembled the Alexandrian period in Greek literature, more especially in its verse. Here, alongside of great virtuosity and improvements in technical skill, we find a lack of real inspiration, a merely imitative continuation of old forms side by side with a restless search for new ones. In prose the story would be much the same were it not for the appearance of one very great writer, Tacitus. An interesting point is that enough of the work of this period survives to enable us clearly to trace schools and tendencies. We may say, as regards the former, that there was a Ciceronian and an anti-Ciceronian school in prose, a Virgilian school and one which, if not exactly anti-Virgilian, was at least decidedly Ovidian, in verse. As in Greek oratory Atticism and Asianism strove with one another, so in Latin literature we may distinguish very clearly an anti-classical and a classicizing or archaizing school.

The Senecas, *Lucan.*—Under Tiberius and Caligula, literature did not flourish greatly. Apart from Manilius (see p. 752) those principates have left us nothing save the fables of Phaedrus, slight, graceful, and not especially poetical versifyings of the traditional Aesopic apologues by a Macedonian freedman with a mastery of Latin very remarkable in a foreigner, the historical compendium of Velleius Paterculus. a work which expands, when it reaches Tiberius, into a rhetorical panegyric of his military and political career, and one or two trifles like the collection of anecdotes by Valerius Maximus. We have no reason to suppose that the lost literature of the period included any works of first-rate importance. Cremutius Cordus, for instance, wrote a history rabidly republican in tone, which was made a ground for a charge of treason against him in A.D. 25. The public burning of his work, and his own suicide, increased the popularity of his writings enormously, as might have been expected (Tacitus, *Annal.* iv., 34–35), but there is no evidence that they were in themselves remarkable for style or content. The emperor Claudius was himself an author, if a dull and pedantic one, and had a genuine love of learning; under him the Senecas became prominent, particularly the younger, Seneca Philosophus, as he is called to distinguish him from his father, Seneca Rhetor, who has left us a most interesting collection of literary gossip and specimens of compositions then admired, the so-called Controversiae and *Suasoriae.* This was published sometime between A.D. 34 and 41, and shows us, even in the curtailed form in which we have it, how the taste of the day was formed and training in style given. Rhetorical instruction had long been in vogue, and to make speeches on imaginary topics, the more absurd and paradoxical the better, was the standard method of learning. As political oratory ceased to be necessary, and the great majority of forensic speeches (trials before the Senate were an exception at times) were perforce short and businesslike, these schoolboy themes were cultivated for their own sake, and there were men who grew grey in declaiming, as it was called, but never made a real speech in their lives. This declamation, being wholly artificial, was highly spiced. Cleverly-turned phrases (*sententiae*), ingenious setting of the facts in a particular light (colores), and all manner of tricks of language (figurae, σχήματα) were its outstanding characteristics. This not only governed the prose style of that age, it pervaded its verse also. Here Ovid was a pioneer, for his works are full of clever declamations in verse, of which the letter of Phaedra in the *Heroides* and the debate of Ajax and Ulysses in the *Metamorphoses* may serve as specimens.

The elder Seneca was a great admirer of Cicero; his son, whether consciously or not, headed the anti-Ciceronian school. It is highly likely that political ideals had something to do with this; so outstanding a champion of the dying Republic was not likely to be persona grata with the Caesars, and at least one prominent Augustan writer, the historian Pollio had vehemently attacked him. But the altered literary tastes induced by too exclusive a fondness for declamation had still more weight. The younger Seneca (L. Annaeus Seneca, about 4 B.C.–A.D. 6 j) was banished for a while under Claudius by Messalina's influence but recalled by her successor Agrippina, who made him the tutor of her young son Nero. From that day till his death in the conspiracy of Piso against his former pupil, he was almost literary dictator of Rome. He deserted the stately Ciceronian period for short, elaborately rhythmical, balanced clauses in the Asianic manner. His productions for the most part were essays and open letters on philosophic themes, and he is perhaps the most insincere writer on ethics who ever lived. It is difficult to read without impatience the praises of poverty and simplicity from the richest subject of the Empire, and quite impossible not to be nauseated by the abject flattery of Claudius which, the moment that emperor was dead. gave place to the clever, but mean pasquinade against his memory known as the *Apocolocyntosis.* However, he is highly moral in tone, and later ages valued him for his morality as his own admired him for his style.

A much better writer was his nephew Lucan (M. Annaeus Lucanus, A.D. 39–65), author of an unfinished poem on the civil wars between Caesar and Pompey, generally known as the *Pharsalia,* besides several other works now lost. It is versified rhetoric and not poetry; its faults of taste are glaring; and Lucan's sen-

timental republicanism leads him into depreciating Caesar and making a hero out of the impossible pedant, Cato the Younger; yet it is full of passages of the most glowing eloquence and fervid imagination, which all the schoolboy learning and other immaturities cannot efface.[1] For the work of a man under 30, at first favoured and then snubbed by Nero—who wished well by poetry, but was too madly jealous of all whose talents surpassed his own to be a reassuring patron—it is an astonishing achievement.

Manilius, Persius, Statius, etc.—It is interesting to contrast with these three clever Spaniards the work of two men, one of unknown nationality, the other an Etruscan, who wrote verse in the times of Tiberius and Nero respectively. Marcus Manilius, author of the *Astronomica,* in five books, which has come down to us, seems to have been moved to write a counterblast to the Epicureanism of Lucretius, of whose style he has now and then an echo, although his technique in general bears witness that he comes after Ovid. He appears fully to have believed in astrology, which he expounds at length in his poem, and to have been, like many Stoics, a man of a genuine moral earnestness; and these qualities give rise to a certain number of passages not without poetical worth. But in general he was no great poet, and his crabbed subject often results in a most contorted and obscure style.[2] A. Persius Flaccus (Persius), like Lucan, died young; like him, he was a Stoic, and lived in the time of Nero. There the resemblance ends. His surviving work consists of six satires, in a style which. although reminiscent of Horace, is singularly difficult, allusive, and cloudy, yet not without a fascination of its own. The first of these is literary and contains a vigorous onslaught on those who despise the older Roman writers and spend their time over Ovidian prettinesses.[3] The rest are on ethical topics, and marked quite as much by their earnest and obviously sincere tone as by their quaintness of diction. Persius was admired and imitated in antiquity, Manilius neglected.

The old forms of literature, of course, continued one and all to be practised, and several examples have come down to us. Bucolic poetry, neat and pretty but wholly artificial, was written in the time of Nero by T. Calpurnius Siculus, who of course imitated Virgil; much later he himself found an imitator, not wholly contemptible, in the person of M. Aurelius Olympius Nemesianus, who lived in the time of Carus and his sons. Fragments of a third bucolic poet, unknown, are preserved in an Einsiedeln ms.

Epic proper—for the poem of Lucan is rather chronicle-epic—is represented chiefly by P. Papinius Statius, who was exceedingly popular in the time of Domitian and exercised great influence in the middle ages, partly because of his merits as a rhetorician, partly from a legend that he was secretly a Christian.[4] In modern times he has found much less favour. If learning and industry could make a poet, he would be one of the greatest; as it is, his *Thebais* is somewhat heavy reading, although here and there passages genuinely poetical occur. His unfinished Achilleis, so far as it goes, is rather better; the five books of occasional poems called *Silvae* ("Leaves from a Notebook") contain much that is of interest. A poet rather neglected since his own day, but admired and regretted by his contemporary Quintilian, is Valerius Fraccus (C. Valerius Flaccus Balbus Sentinus), author of an unfinished Argonautica, in which the well-worn theme is handled not without originality, grace and romantic feeling.[5]

Martial, *the Plinies.*—But the best verse, on the whole, was satiric and epigrammatic. Martial (C. Valerius Martialis, another Spaniard), did most of his work under Domitian. A poor hanger-on of Roman society and distinguished neither for self-respect, elevation of character, or fastidiousness in his choice of topics, he had a mordant and cynical wit, coupled with a genuine fondness for children and a sufficiency of good taste to prevent his Epigrams, whereof there are altogether 15 books, degenerating into mere lampoons; while his great skill gave them vividness, polish, variety, and point that have hardly been excelled. A much more bitter commentator on society was his contemporary Juvenal (D. Iunius Iuvenalis), who has left us 16 satires, the last unfinished. His merits, which have won him readers ever since his own day, are remarkable powers of eloquent invective, inspired by a righteous indignation certainly not always simulated, and a mastery of solemn and impressive commonplace, as in the famous tenth Satire, the original of Johnson's *Vanity of Human* Wishes. His defects are a too great fondness for lingering over the details of the vices he attacks, and an utter lack of any sense of proportion, which leads him to inveigh as violently against mere bad form as against the most hideous crimes.

All this time, what may be called scientific prose had continued to flourish. Of the great antiquary, Verrius Flaccus, who wrote under Augustus, we possess only a meagre epitome, made in the 4th century by one Festus, and even that is largely lost and must be supplied as well as may be from the Carolingian epitome of it by Paulus Diaconus, and from sundry glosses which drew upon it.[1] But apart from such writers as Pomponius Mela (? time of Claudius), who wrote a respectable little handbook of geography, L. Iunius Moderatus Columella, contemporary of the younger Seneca and author of a treatise on agriculture, A. Cornelius Celsus. the writer on medicine (part of an encyclopaedia, the rest of which is lost), the jurists, whereof the Digest preserves us fragments, and other writers, of whom many are now lost, this age produced the very remarkable Naturalis *Historia* of the elder C. Plinius Secundus (Pliny), dedicated to Vespasian. When Pliny tries to be eloquent and impressive, the result is not happy; he is credulous, uncritical, and very inaccurate; but his prodigious learning makes the book perhaps the most valuable epitome of the science and pseudo-science of a whole age that ever was written. His nephew, the younger Pliny (C. Plinius Caecilius Secundus), who proved a good civil servant and an able barrister, under Trajan, was a faithful imitator of Cicero, whom indeed he resembled alike in his disarmingly childish vanity and in his real honesty and kindness of heart. His letters, including a series of dispatches to Trajan, with the emperor's answers, have obviously been revised for publication. but are none the less full of interest and paint a far less depressing picture of the times than that given by Juvenal or Tacitus; his one surviving speech, a panegyric on Trajan, is of some historical importance, but exceedingly dull. It was, however, much admired at the time.

Tacitus, Other Writers.—But by far the greatest writer of the Silver Age, one of the greatest of all time, is Tacitus (Cornelius Tacitus, friend of the younger Pliny, exact dates unknown). To explain the extreme bitterness with which he handles everything belonging to the Empire, it is necessary to remember that a great part of his manhood was spent under Domitian, and that he lived through the reign of terror, directed especially against the senatorial class, with which that unhappy and morbid prince closed his career. Add to this the sentimental republicanism of the older senatorial families, and the bias against which Tacitus honestly but vainly struggles is easily explained. It is also easily allowed for, and so does not greatly affect the historical worth of his writings. Much more serious than any of his faults as a historian is the lamentable chance which has lost us the greater part of the Histories and much of the Annals. Of his minor works, the *Germania* is the most important of our scanty documents for the early history of Germany; the Agricola holds a corresponding place for Roman Britain; and the *Dialogus* is of especial interest as showing clear traces of the Ciceronian movement in literature of which Quintilian was the foremost champion. A later and much lesser historian was the polymath Suetonius (C. Suetonius Tranquillus) from whom we have Lives of the Caesars from Julius to Domitian, brilliant things of their kind, if superficial, also fragments of a biographical work on literary men (De Grammaticis et *Rhetoribus,* a section of a

[1]After much useful work on the mss. by Carl Hosius, the *Pharsalia* has at last been satisfactorily edited by A. E. Housman (first ed., 1926).

[2]A. E. Housman thinks better of him, and in his edition emends away many faults of argument and diction. The mss. are poor.

[3]*See* Rose in Class. **Rev.** xxxviii. (1924), p. 64.

[4]*See* Dante, Purgatorio, xxii., 64 ff.

[5]Modern editions of his text (which is none of the best) by J. B. Bury (in Postgate's Corpus *Poetarum Latinorum*), 1900; **C.** Giarratano, Milan, Panormus and Naples, 1904; and O. Kramer, Leipzig, 1913.

[1]A large edition by W. M. Lindsay **was** in course of preparation in 1928.

longer treatise ***De Viris illustribus***).[1] A minor writer, Q Curtius Rufus, wrote a history of Alexander, of more literary than historical merit; one might almost class him among the writers of the Alexander-romance. His date is uncertain.

The drama flourished, but only in its lower forms. It is a pity that we have quite lost the mimes, or farces which delighted this and the preceding age, and appear to have been very curious and not over-decent performances; but the loss to literature as such is probably not great. Lost also are the libretti of the pieces played by *pantomimi* or dancers, whose writers included Statius. They were the ancient equivalent of our film-dramas. Closet-drama is represented for us by the tragedies of the younger Seneca and his imitators. Despite Seneca's ingenuity of style and good command of metre, they are wretched compositions; but their great influence on later European play-writing makes them important in the history of literature. Of the imitators, one, the author of the Octavia, has some merit.

The novel was also of some importance, to judge by the considerable fragments of a picaresque romance, the Satyricon, by Petronius, the arbiter *elegantiarum* or semi-official Master of the Revels in Nero's court, and one of those who perished in the conspiracy of Piso. Apart from literary interest, it throws a great light on the colloquial speech of the time.

In literary criticism the great name is that of M. Fabius Quintilianus (Quintilian, *c.* 35–*c.* 100), also the greatest Latin writer, save Cicero, on rhetoric and literary education generally. His chief work, the *Institutio Oratoria* ("Training of an Orator") was written probably about the last decade of the 1st century.[2] He was a classicizer, and a passionate admirer of Cicero's style, yet by no means in favour of mere imitation of classical models; for him, the decay of Latin literature had not begun. Like so many writers of this age, he was a Spaniard.

Later Writers. — For two centuries after Juvenal we can name no verse-writers but Q Serenus Sammonicus, with his pharmacopoeia in verse (*c.* 225), and M. Aurelius Olympius Nemesianus, who, besides imitating Calpurnius, as mentioned above, wrote (283) a dull piece on the training of dogs for the chase.[3] Towards the middle of the 4th century we have Decimus Magnus Ausonius, a professor of Bordeaux and afterwards consul (379), whose style is as little like that of classical poetry as is his prosody. His *Mosella*, a detailed description of the river Moselle, is the least unattractive of his works. A little better is his contemporary, Rufius Festus Avienus, who made some free translations of astronomical and geographical poems in Greek. A generation later, in what might be called the expiring effort of Latin poetry, appeared two writers of much greater merit. The first is Claudius Claudianus (*c.* 400), the court poet of the emperor Honorius and his minister Stilicho. Claudian may be properly styled the last of the poets of Rome. He breathes the old national spirit, and his mastery of classical idiom and versification is for his age extraordinary. Something of the same may be seen in Rutilius Namatianus, a Gaul by birth, who wrote in 416 a description of his voyage from the capital to his native land, which contains the most glowing eulogy of Rome ever penned by an ancient hand. Of the Christian poets only Aurelius Prudentius Clemens (*c.* 348–410) need be mentioned. He was well read in the ancient literature; but the task of embodying the Christian spirit in the classical form was one far beyond his powers.

Prose. — In prose, the rise of M. Cornelius Fronto (*c.* 100–175), a native of Cirta, marks the beginning of an African influence. Fronto, a distinguished orator and intimate friend of the emperor M. Aurelius, broke away from the traditional Latin of the Silver and Golden ages, and took as his models the pre-classical authors. The reaction was shortlived; but the same affectation of antiquity is seen in the writings of Apuleius, also an African, who lived a little later than Fronto and was a man of much greater natural parts. In his *Metamorphoses*, which were based upon a Greek original, he takes the wonderful story of the adventures of Lucius of Madaura, and interweaves the famous legend of Cupid and Psyche. His bizarre and mystical style has a strange fascination for the reader; but there is nothing Roman or Italian about it. Two epitomists of previous histories may be mentioned; Justinus (of uncertain date) who abridged the history of Pompeius Trogus, an Augustan writer; and P. Annius Florus, who wrote in the reign of Hadrian a rhetorical sketch based upon Livy. The Augustan History (*q.v.*) is marked by puerility and poverty of style. Ammianus Marcellinus (*c.* 330–400) had a higher conception of the historian's function. His narrative of the years 353–378 (all that now remains) is honest and straightforward, but his diction is awkward and obscure. The last pagan prose writer who need be mentioned is Q. Aurelius Symmachus (*c.* 350–410), the author of some speeches and a collection of letters. All the art of his ornate and courtly periods cannot disguise the fact that there was nothing now for paganism to say.

It is in Christian writers alone that we find the vigour of life. The earliest work of Christian apologetics is the *Octavius* of Minucius Felix, a contemporary of Fronto. It is thoroughly classical in style. Quite different is the work of Q. Septimius Florens Tertullianus (Tertullian, *c.* 150–230), a native of Carthage, the most vigorous of the Latin champions of the new faith. His style shows the African revolt of which we have already spoken, and in its medley of archaisms, Graecisms and Hebraisms reveals the strength of the disintegrating forces at work upon the Latin language. A more commanding figure is that of Aurelius Augustinus or St. Augustine (354–430), bishop of Hippo, who for comprehensiveness and dialectical power stands out in the same way as Hieronymus or St. Jerome (*c.* 331 or 340–420), a native of Stridon in Dalmatia, does for many-sided learning and scholarship.

Grammarians and Jurists. — The decline of literature proper was attended by an increased output of grammatical and critical studies. The grammarian M. Valerius Probus (*c.* A.D. 60) was the first critical editor of Latin texts. In the next century we have Velius Longus's treatise *De Orthographia*, and then a very interesting miscellany, the Noctes Atticae of Aulus Gellius, and (*c.* 200) a treatise in verse by Terentianus, an African, upon Latin pronunciation, prosody and metre. The tradition was continued in the 4th century by Nonius Marcellus and C. Marius Victorinus, both Africans, Flavius Sosipater Charisius and Diomedes. Commentaries on Terence, Horace, and Virgil have come down to us under the names of Acro, Porphyrio, Donatus, and Servius; of these "Donatus" on Terence and "Servius" on Virgil preserve a great deal of ancient learning. Ambrosius Macrobius Theodosius (*c.* 400) wrote a treatise on Cicero's *Somnium Scipionis* and seven books of miscellanies (*Saturnalia*); and Martianus Capella (*c.* 430), a native of Africa, published a compendium of the seven liberal arts, written in a mixture of prose and verse, with some literary pretensions. The last grammarian who need be named is the most widely known of all, the celebrated Priscianus, who published his text-book at Constantinople probably in the middle of the 5th century.

In jurisprudence, which may be regarded as one of the outlying regions of literature, Roman genius had had some of its greatest triumphs, and, if we take account of the "codes," was active to the end. The most distinguished of the early jurists (whose works are lost) were Q. Mucius Scaevola, who died in 82 B.C., and following him Ser. Sulpicius Rufus, who died in 43 B.C. In the Augustan age M. Antistius Labeo and C. Ateius Capito headed two opposing schools in jurisprudence, Labeo being an advocate of method and reform, and Capito being a conservative and empiricist. The strife, which reflects the controversy between the "analogists" and the "anomalists" in philology, continued long after their death. Salvius Iulianus was entrusted by Hadrian with the task of reducing into shape the immense mass of law which had grown up in the edicts of successive praetors — thus taking the first step towards a code. Sex. Pomponius, a contemporary, wrote an important legal manual of which fragments

[1] Editions of the ***Life*** of Julius (H. E. Butler and M. Cary) and that of Vespasian (A. W. Braithwaite) have been published by the Clarendon Press, 1927.

[2] Good editions are available in English of Book i. (F. H. Colson, 1924) and Book x. (W. Peterson, 1891).

[3] The *Pervigilium Veneris*, or Vigil of Venus, is of unknown date, but probably early in this period. Its 90-odd lines would do credit to any age, but it stands **alone.**

are preserved. The most celebrated handbook, however, is the *Institutiones* of Gaius, who lived under Antoninus Pius. The most eminent of all the Roman jurists was Aemilius Papinianus, the intimate friend of Septimius Severus; of his works only fragments remain. Other considerable writers were Domitius Ulpianus (*c.* 215) and Iulius Paulus, his contemporary. The last juristical writer of note was Herennius Modestinus (*c.* 240). But the effects of their work remained and are clearly visible long after in the "codes"—the code of Theodosius (438) and that of Justinian (529 and 533), with which is associated the name of Tribonianus.

This vast mass of literature has been studied with more or less intelligence ever since it was written, and especially since the Revival of Letters. But in the present century there has been a healthy tendency to treat the literature along with the other means open to us of understanding the life and thought of antiquity, and break down the barriers which the 19th century was prone to set up between "pure scholarship," or philology, and history, archaeology, and so forth (*realien*, to use the convenient German title). Thus, the observations on Virgil and on Gallus in this article rest largely on the application to literature of Mommsen's interpretation of an inscription found in Egypt, on first-hand investigations of Virgil's country, and on the works of men such as the late W. Warde Fowler, who have investigated Roman religious ideas.[1]

At the same time, the actual text of the great authors is being set upon a sounder basis than before by the study, not simply of their language, but of their mss. tradition (*überlieferungsgeschichte*). Thanks to modern methods of palaeographical study and the history of mss., it is often possible to some extent to reverse the process of copying, with its necessary accumulation of small corruptions, and reconstruct, more or less exactly, the text as it was in the 4th century, for instance. The danger of this method is that in the hands of an inferior editor it may be taken as a substitute for, instead of a help to, the sympathetic understanding of the thought and language of the author.[2]

Another aspect of this tendency is the readiness to study authors, not as isolated literary phenomena, but against the background of their own time and in relation to the movements of literature and thought of which they formed a part; to consider Quintilian, for example, not in the abstract as a monument of literary criticism or educational theory, but as part of the long history of the development of certain ideas.

Yet another side of modern research is an abandonment of the last century's excessive classicism, which turned attention away from such interesting fields as the ecclesiastical writers, the grammarians and glossarists, and the monuments of vulgar Latin.[3]

BIBLIOGRAPHY.—The best general history is by Martin Schanz (*Geschichte der romiscken Literatur bis zum Gesetzgebungswerk des Kaisers Justinian*), in I. v. Müller's *Handbuch der Altertumswissenschaft;* new (fourth) edition, revised by Carl Hosius, began to appear in 1927. Mention should also be made of W. S. Teuffel, *Geschichte der romischen Literatitr* (several editions, the last complete one being the 6th, revised by W. Kroll and F. Skutsch, Leipzig, 1910–16: vol. 2 has appeared in a 7th ed., Leipzig, 1920. English translation, now out of print, by C. C. Warr, of an older revision by L. Schwabe). In English, short histories by J. W. Mackail (1899), C. T. Cruttwell (1910), M. S. Dimsdale (1915), H. N. Fowler (1923) and J. Wight Duff (1925). Note also a French compendium by L. Laurand, in his *Manuel des études grecques et latines* (1925). (Bibl. in most of the above, especially the first, which *see* for the very numerous treatises on parts of the subject.)

For recent progress in the study, *see* the classical periodicals (*Classical Review, Classical Quarterly, Journal of Roman Stitdies,* England; *American Journal of Philology, Classical Philology, Classical Journal,* U.S.A.); these mostly contain accounts also of Continental periodicals. Good reviews of literature in *Philologische Wochenschrift* (Leipzig, weekly), *Revue* de *Philologie* (quarterly), ***Bursians Jahresberichte*** and ***Year's*** *Work* in *Classical Studies* (annual).

(H. J. R.; J. P. P.; W. Y. S.)

[1] *See* for example R. S. Conn-ay, *New Studies of a Great Inheritance* (1921); *W.* Warde Fowler, *Virgil's Gathering of the Clans* (1916); *Aeneas at the Site of Rome* (1918); *Death of Turnus* (1919).

[2] For vigorous protests against such an error, *see* especially A. *E.* Housman (Prefaces to his editions of Juvenal, Manilius, and Lucan).

[3] Examples in Great Britain of the new attitude are the works of A. Souter (patristics) and W. M. Lindsay (grammarians and glossators). It has been longer in vogue on the Continent, witness the activities of Traube, Götz, Friedlander and others, and the great Viennese *Corpus scriptorum ecclesiasticorum Latinorum.*

MEDIAEVAL

Latin literature which is classed as "mediaeval" is usually accounted as beginning after the death (A.D. 524) of Boethius, "the last of the Romans," with Cassiodorus (*c.* 490–*c.* 585), of a noble family in the Abruzzi. While still "in the world" he compiled a universal history and a more particular account of the Goths, and, after retiring to the Benedictine monastery of Vibarium in Squillace (c. 540), a series of theological treatises important because he considered the retention of the secular learning then still existing, essential to his fellow monks. His immediate successor in Italy was Pope Gregory the Great (d. 604), the first great Latin writer who knew no Greek; the mission of St. Augustine of Canterbury to England originated the Latin culture there which was to have a great reflex action in western Europe through Aldhelm at the Carolingian revival.

After Gregory the Great, the lamp of learning in Italy was dim for a time; we must look to Africa, where the tradition of St. Augustine of Hippo lingered, and to Spain, the home of the Roman gentleman and poet Prudentius. In the former. Verecundus (d. 552) was an expositor of the Old Testament canticles; Corippus (*c.* 550) wrote historical epics on the wars against the Moors; in the latter, St. Martin of Braga (d. 580) writing on Christian morals and doctrine leads up to the encyclopaedist, St. Isidore of Seville (c. 570–636) whose *Chronicle of the World* and *Etymologies* are of magistral authority throughout the middle ages. In Gaul we find the troubador Venantius Fortunatus, whose courtier's trifles in honour of Queen Radegund are redeemed by his magnificent hymns (*Vexilla regis* and *Pange lingua*) for the fragment of the True Cross received at Poitiers in 569, and Gregory of Tours (d. 594) the historian of the Franks.

Latin Culture in the British Isles.—The centre of Latin learning now moves yet further away from Rome. There is some still unexplained connection between the Irish writers and the amusing pedant Virgilius Maro Grammaticus (in the south-west of France, 7th century); but apart from this, scholars fled to the peaceful island to escape the wars and invasions that were devastating Europe; they carried some Greek with them, which was strangely kept alive for centuries. Much of the work of their successors is in Irish: in Latin we may mention at the beginning of the period the fine, rugged cosmogonical and eschatological poem *Altus prosator* of St. Columba (d. 597) and at its end Adamnan (642–704), the prose author of a pilgrimage to the Holy Land, a life of Columba. and commentaries on the *Groraics* and *Eclogues* of Virgil. For 150 years there is a Latin literary culture in Ireland while Europe is sunk in war and ignorance, though the record of England is only less glorious than that of the sister isle; scholars and writers are fewer, but of almost equal merit Fastidius (5th century, the writer of a tract on the Christian life for widows) is unimportant: in the 6th century Gildas "the Wise" is our authority for the history of the last days of Roman Britain Later, there is a succession of figures of high literary merit, Aldhelm (640–709), the Venerable Bede (673–735) and Alcuin (730–793): Bede's *Ecclesiastical History* is a work of first-rate importance, and Alcuin was summoned by Charlemagne to his court to revive that learning in Europe which had almost flickered out

The Birth of Rhyme.—Before considering the writers of the Carolingian revival brief mention must be made of the poets omitted in this historical sketch St Xmbrose (*c* 340–397) is before the period ordinarily accounted mediaeval, but his adoption of a Latin iambic measure and modification of it. perhaps under the influence of Hebrew psalmody and music, set a model for hymnology for 1,000 years He is followed by Sedulius in the 5th century and about this time rhyme begins to appear first assonance, then time rhyme, monosyllabic only: to the Irish we owe the richer double rhymes found in the rest of the period At the same time the ancient classical measures were kept in being by such writers as Prudentius in early days and Bedc and the

Anglo-Saxon poets later on.

Paul the Deacon. the historian of the Lombards, who died towards the end of the 8th century, was at Charlemagne's court, after the emperor had summoned Alcuin to revive learning by the institution of schools in France and Germany: among Alcuin's more famous pupils were Einhart (d. 840), the biographer of Charlemagne, the Spaniard Theodulf (d. 821), bishop of Orleans and the best poet of his day and Angilbert (d. 814), of less literary merit than the two others; also Hrabanus Maurus (784–856), archbishop of Mayence, possibly the author of the *Veni creator spiritus,* and his pupil Walafrid Strabo (808–849), abbot of Reichenau, a writer in the Virgilian tradition. To this period belong the unfortunate but gifted Godescalc of Orbais *(c.* 805–869) the monk persecuted by Hincmar of Rheims for his erroneous doctrine of predestination, a tender poet in his short pieces and possibly, under the assumed name of Theodulus, the author of an *Eclogue* full of classical learning, which was read until the close of the middle ages: and the intriguing figure of Johannes Scotus Erigena, brought in to write against Godescalc's doctrine; an Irishman who knew Greek well, almost alone of his age, and a free thinker and untamed spirit beyond his time.

Irish Influence. — The Irish exercised further influence on the Continent through their pupils, such as Heiric of Auxerre (841–876), who had a knowledge of classical writers lost elsewhere and in the monastery of St. Gall, when Notker Balbulus (840–912) wrote the *Gesta Karoli,* anecdotes of the life of Charlemagne, and brought into existence a new form of sacred poetry, the sequence: first a kind of *vers libre,* then taking metrical form. important both for itself and for the influence it afterwards had on secular poetry. At St. Gall also was Ekkehard I. (d. 973), whose *Waltharius,* a poem of heroism and love, is one of the best romances of the middle apes. Luitprand, bishop of Cremona *(c.* 920–972), Lombard. and historian of the Lombards, is the best historian of the time, and gives lively pictures of the Eastern empire, having twice gone on embassy to Constantinople. The nun Hrosvitha (c. 960), wrote a series of plays, modelled on Terence with subjects drann from hapiographical sources, in which the dialogue is lively and sometimes even humorous To the latter part of the 10th century also belong a few anonymous but beautiful lyrics. such as *Jam dulcis amica venito* and *Levis exurgit zephyrus,* preserved to us by happy chance in a collection called the *Carmina Cantabrigiensia,* which foreshadows the *Carmina Burana* of more than 100 years later. The inspiration of those early love lyrics is the Song of Songs; later, the love poems of Ovid exercise more and more influence.

The next century is. from a purely literary aspect, a period of decline At the beginning of it the great figure is Gerhert (d as Pope Sylvester II., 1003), so learned in the ancients and in natural science that he was suspected of being a magician; then Fulbert of Chartres (d 1029), a great theological teacher, whose influence lasted throughout France for more than one generation, and came through Lanfranc (d. 1089) and Anselm (d 1109) to England. Much of the intellectual life of this century is connected with the controversies aroused by Fulbert's pupil. Berengarius of Tours (d. 1088), who refused to be bound by the traditional authority of Priscian, Donatus, and Boethius; but the interest of this and of his attack on transubstantiation is philosophical rather than literary. as are the early contests between realists (such as Anselm) and nominalists (such as Roscellinus. d. 1106). In poetry mention may be made of the Burgundian Wipo, who flourished in the middle of the century, best known to us by the Eastern sequence *Victimae paschali,* and Peter Damian (d. 1072), author of two or three hymns of deep religious feeling.

A Century of Revival. — The next century witnesses a revival as important as that of Charlemagne, and Peter Abelard (d. 1142) in the first great figure of it His controversy with nominalist and realist alike. his struggles with Bernard of Clairvaux, interest us less than his studies of Plato and Aristotle, and his *History of his own misfortunes* in which he relates his tragic love of Heloise. He was a master of metre. and left a set of six *Dirges* of high merit and a hymn-book for the nuns of Heloïse's convent, the Paraclete of which one *(O quanta qualiu)* is still famous in western Christendom. The literary revival of the first half of the century was rich in poetry of all kinds: religious, such as that of Bernardus Morlanensis' *De contemptu Mundi,* whence comes *Jerusalem the golden* and other popular hymns: learned, such as the epics of the excellent poet Hildebert (d 1134), archbishop of Tours; dramatic, such as the mystery plays of the Englishman Hilarius *(c.* 1130), though he lived mostly in France; and purely secular, such as the famous *Phyllis and Flora,* a lively discussion between two girls on the topic whether a soldier or a clerk made the better lover. The second half is no less rich: there is the *Rosy Sequence,* ordinarily attributed to St. Bernard but more probably English, and the works of Adam of St. Victor (1130–So), one of the great hymn-writers of the world. To this period also we may ascribe many of the tender lyrics (most of French, a few of German origin) of the *Carmina Burana,* and the "Goliardic" poems, sung in praise of love and wine, and in satire of the great in Church and State by the "Wandering Scholars." A few stanzas from one of these, beginning *Meum est propositum in taberna mori* has lasted as a drinking song to this day, and is the best-known mediaeval secular poem. Its author, a mysterious figure known as the "Archipoeta," was a man of genius.

It will be difficult even to enumerate the more serious writers of this age, but mention must be made of John of Salisbury (1110–80) friend of St. Thomas of Canterbury and perhaps the ripest scholar of his time, nhose *Polycraticus* expounds an important theory of government, supported by use of the Latin classics; of Giraldus Cambrensis, the lively Welsh bishop. historian and reformer *(c.* 1147–1220); and of Walter Map *(c.* 1200), Archdeacon of Oxford and chronicler of the folklore of the Welsh Marches. On the borderline between this century and the next one must place the two authors of *Artes Poeticae,* Matthew of Vendôme and Geoffrey de Vinsauf (an Englishman) whose works were carefully studied and followed for the rest of the mediaeval period.

The **Schoolmen.**—The 13th century is the age of the recovery of the forgotten works of Aristotle and the perfecting of the work of the schoolmen rather than of pure literature: but mention may be made of the learned figures of Robert Grosseteste *(c.* 1175–1253), bishop of Lincoln, and the encyclopaedist Vincent of Beauvais (d. 1264). a tutor of French princes, who digested into his *Specula* all the learning of his time, and of the Dominican Albertus Magnus (1193–1280), who first systematized the use of the whole of Aristotle in the scholastic philosophy. His great pupil, St Thomas Aquinas of noble south Italian birth (d. 1274, less than 50 years old) is remembered as much by his noble Eucharistic hymns, *Pange lingua, Verbum Supernum,* and the sequence *Lauda Sion* as by his vast prose philosophical works The grandest Latin poem of the middle ages, the *Dies irae* is probably the work of Thomas of Celano (d shortly after 1250), the friend and biographer of St Francis of Assisi. Two archbishops of Canterbury, Stephen Langton (d. 1228) and John Pecham (d. 1292) wrote hymns of some beauty: a greater hymn-writer than either was Philip de Grève (d. 1236), chancellor of the University of Paris. Late in this century we find the scientific and sceptical spirit of Roger Bacon (1214–94), and the beginning of Dante (1265–1321), whose Latin writings must not be forgotten because of his greater Italian works.

We are now on the eve of the Renaissance. and the middle ages near their close with the most typical of schoolmen. Johannes Duns Scotus (possibly from Northumberland, d. 1308) and John Wycliffe (1324–84), and the humanist and bibliophile Richard of Bury, bishop of Durham (d. 1345). If Wycliffe was "the morning star of the Reformation," Petrarch (1304–74) was "the morning star of the Renaissance," and with him may be said to be the beginning of a new era.

Modern **Latin Literature.**—Latin is no longer an instrument to be developed or modified at mill (often to be debased), but a revival, and the neo-latin writers confine themselves to the usage of the classical models, attaining a more correct but less flexible medium for thought: with Petrarch, Boccaccio (1313–75) is naturally classed, the greatest recoverer of the classical authors, himself an elegant writer in Latin, and Poggio (1380–1459), who lived

into the time when the whole intellectual world was changed by the Greek immigrants from fallen Constantinople and the discovery of printing. Among these humanists were some true poets, writing in Latin, such as Angelo Poliziano (1454–94), Giovanni Gioviano Pontano (1426–1503), Sannazaro (1458–1530), Giovanni Battista Spagnuoli (John Baptist Mantuanus, 1448–1516), and their prose, after Pope Pius II (Aeneas Sylvius Piccolomini, d. 1464), culminates in Erasmus (1466–1536), the greatest of the later humanists. For its comical humour and wide effects mention must here be made of the *Epistolae obscurorum virorum,* a terrific and effective, if sometimes unfair, satire on mediaeval piety, learning and style, the work of Johann Reuchlin (1455–1522) and his friends.

After the Reformation and the growth of nationalism, Latin was still more the medium of a learned few than the common language of all cultured persons. In Scotland, George Buchanan (1506–82) was a Latin poet of rare merit; in Wales, the epigrammatist, John Owen (d. 1622); in England. Ascham and Cheke descend in direct succession to Milton. In France, the Estiennes ("Stephens") and the Scaligers; in Spain, Antonio de Lebrixa ("Nebrissensis," 1444–1522) were great writers of Latin as well as classical scholars.

Later, though it keeps a certain position in the world as the official language of the Roman Catholic Church, Latin writing is more an elegant accomplishment than a natural form of expression.

Leaving aside the international lawyers, who wrote in Latin on account of the universality of their subject, mention may be made in France of the brothers Santeui'l (second half of the 17th century) and Charles Coffin (1676–1749) who wrote Latin hymns with much of mediaeval spirit and feeling. Elsewhere the tradition of Latin poetry survived in a somewhat narrow stream in Italy and in England; as examples may be mentioned the Westminster and Eton schoolmasters. Vincent Bourne (1695–1747) and William Johnson (later Cory, 1823–92), the works of both of whom were not unworthy to be compared with the minor poets of ancient Rome.

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LATIN MONETARY UNION: *see* MONETARY AGREEMENT.

LATINUS, in Roman legend. king of the aborigines in Latium and eponymous hero of the Latin race. In Hesiod's *Theogony* he is the son of Odysseus and Circe and ruler of the Tyrsenians; in Virgil, the son of Faunus and the nymph Marica, a national genealogy being substituted for the Hesiodic, a piece of Roman reshaping of the story.

Latinus was a shadowy personality, invented to explain the origin of Rome and its relations with Latium.

According to Virgil's *Aeneid,* Aeneas, on landing at the mouth of the Tiber, was welcomed by Latinus, the peaceful ruler whose seat of government was Laurentum, and ultimately married his daughter Lavinia.

LATITUDE, a word meaning breadth or width, hence, figuratively. freedom from restriction, but more generally used in the geographical and astronomical sense here treated. The latitude of a point on the earth's surface is its angular distance from the equator, measured on the curved surface ,of the earth. The direct measure of this distance being impracticable, it has to be determined by astronomical observations.

As thus determined it is the angle between the direction of the plumb line at the place and the plane of the equator. This is identical with the angle between the horizontal planes at the place and at the equator, and also with the elevation of the celestial pole above the horizon *(see* ASTRONOMY: *The Founding of Modern Astronomy).* Latitude thus determined by the plumb line is termed astronomical.

The geocentric latitude of a place is the angle which the line from the earth's centre to the place makes with the plane of the equator. Geographical latitude, which is used in mapping. is based on the supposition that the earth is an elliptic spheroid of known compression, and is the angle which the normal to this spheroid makes with the equator. It differs from the astronomical latitude only in being corrected for local deviation of the plumb line.

The latitude of a celestial object is the angle which the line drawn from some fixed'point of reference to the object makes with the plane of the ecliptic.

See also GEODESY.

LATIUM, the ancient name of the portion of central Italy, bounded on the northwest by Etruria, on the southwest by the Tyrrhenian sea! on the southeast by Campania, on the east by Samnium and on the northeast by the mountainous district inhabited by the Sabini, Aequi and Marsi. Latium, originally the land of the Latini, a tract of limited extent, was, after the overthrow of the Latin confederacy, when the neighbouring tribes of the Rutuli, Hernici. Volsci and Aurunci were also reduced to the condition of subjects and citizens of Rome, extended to comprise them all. It thus denoted the whole country from the Tiber to the mouth of the Savo, and just included the Mons Massicus. This change was not formally established until Augustus formed of this larger Latium, taken together with Campania, the first region of Italy: but it is already recognized by Strabo, as well as by Pliny. who terms the additional territory thus incorporated *Latium Adjectum,* designating the original Latium from the Tiber to Circeii as *Latium Antiquum.*

Latium **Antiquum.**—This consisted principally of an extensive plain now known as the Campagna di Roma, in the centre of which rise the volcanic Alban hills. bounded toward the interior by the Apennines, which rise very abruptly from it to a height of 4,000–5,000 ft. Several of the Latin cities, including Tibur and Praeneste, were situated on the terracelike underfalls of these mountains, while Cora, Norba and Setia were placed in like manner on the slopes of the Volscian mountains (Monti Lepini), a rugged and lofty limestone range, which runs parallel to the main mass of the Apennines, being separated from them. however. by the valley of the Trerus (Sacco), and forms a continuous barrier from there to Terracina. No volcanic eruptions are known to have taken place in the Alban hills within the historic period, though Livy sometimes speaks of it "raining stones in the Alban hills" (i, 31; xxxv, 9—on the latter occasion it even did so on the Aventine). It has been recently ascertained. too, that the earliest tombs of the necropolis of Alba Longa (*q.v.*) do not, as has been asserted, lie beneath a stratum of peperino. Earthquakes (not of a violent character within recent centuries, though the ruin of the Colosseum, and many other buildings of ancient Rome is certainly to be ascribed to this cause, and most probably to an earthquake in A.D. 854) are not unknown even at the present day in Rome and in the Alban hills, and there is a seismographic observatory at Rocca di Papa. The surface is by no means a uniform plain, but is a broad undulating tract, furrowed throughout by numerous depressions, with precipitous banks, serving as watercourses, though rarely traversed by any considerable stream. As the general level of the plain rises, these channels by degrees assume the character of ravines.

Geology.— The hills on the right bank of the Tiber culminating in Monte Mario (456 ft.) belong to the Pliocene; they consist of a lower bluish-gray clay and an upper group of yellow sands and gravels. This clay since Roman times has supplied the material for brickmaking, and the valleys which now separate the summits (Janiculum, Vatican, Monte Mario) are partly artificial. On the left bank this clay has been reached at a lower level, at the foot of the Pincian hill, while in the Campagna it extends below the later volcanic formations. The earlier eruptions occurred at the bottom of the Pliocene sea, and the tufa. which extends over the whole Campagna to a thickness of 300 ft. or more. was formed. At the same time, hot springs, containing abundant carbonate of lime in solution, produced deposits of travertine. Later, after the Campagna, by a great general uplift, had become a land surface, volcanic energy found an outlet in comparatively few large craters, which emitted streams of hard lava as well as fragmentary materials, the latter forming sperone *(lapis Gabinus)* and peperino

(*lapis Albanus*), while upon one of the former, which runs from the Alban hills to within 2 mi. of Rome, the Via Appia was carried. The two main areas near Rome are formed by the group of craters on the north (Bracciano, Bolsena, etc.) and the Alban hills on the south, the latter consisting of one great crater with a base about 12 mi. in diameter, in the centre of which a smaller crater was later on built up (the basin is now known as the Campo di Annibale) with several lateral vents (the Lake of Albano, the Lake of Nemi, etc.). The Alban Mount (Monte Cavo) is almost the highest point on the rim of the inner crater, while Mount Algidus and Tusculum are on the outer ring wall of the larger (earlier) crater.

Subsequently, rain and rivers have made gullies in the plain. The communities which inhabited the detached hills and projecting ridges which later on formed the city of Rome were in a specially favourable position. These hills (especially the Palatine. the site of the original settlement) with their naturally steep sides, partly surrounded at the base by marshes and situated not far from the confluence of the Anio with the Tiber, possessed natural advantages not shared by the other primitive settlements of the district; and their proximity to one another rendered it easy to bring them into a larger whole. The volcanic materials available in Rome and its neighbourhood were especially useful in building. The tufa, sperone and peperino were easy to quarry and could be employed by those who possessed comparatively elementary tools, while travertine, which came into use later, was an excellent building stone, and the lava (selce) served for paving stones and as material for concrete. The strength of the renowned Roman concrete is largely due to the use of pozzolana (see PUTEOLI), which also is found in plenty in the Campagna.

Between the volcanic tract of the Campagna and the sea there is a broad strip of sandy plain, evidently formed merely by the accumulation of sand from the sea, and constituting a barren tract, still covered almost entirely with wood as it was in ancient times, except for the almost uninterrupted line of villas along the ancient coastline, which is now marked by a line of sandhills, about ½ mi. or more inland. (See LAVINIUM; TIBER.) This long belt of sandy shore extends without a break for a distance of more than 30 mi. from the mouth of the Tiber to the promontory of Antium (Porto d'Anzio), a low rocky headland, projecting out into the sea, and forming the only considerable angle in this line of coast. From there a low sandy shore of similar character, but with extensive shore lagoons which served in Roman times and serve still for fish breeding, extends for about 24 mi. to the foot of the Monte Circeo (*q.v.*; Circeius Mons). The region of the Pomptine marshes (*q.v.*) occupies almost the whole tract between the sandy belt on the seashore and the Volscian mountains. extending from the southern foot of the Alban hills below Velletri to the sea near Terracina.

Drainage. — The district sloping down from Velletri to the dead level of the Pontine (Pomptine) marshes has not, like the western and northern slopes of the Alban hills, drainage toward the Tiber. The subsoil too is differently formed: the surface consists of very absorbent materials, then comes a stratum of less permeable tufa or peperino (sometimes clay is present), and below that again more permeable materials. In ancient, and probably pre-Roman, times this district was drained by an elaborate system of *cuniculi*, small drainage tunnels, about 5 ft. high and 2 ft. wide, which ran, not at the bottom of the valleys, where there were sometimes streams already, and where, in any case, erosion would have broken through their roofs, but along the slopes, through the less permeable tufa, their object being to drain the hills on each side of the valleys. They had probably much to do with the relative healthfulness of this district in early times. Some of them have been observed to be earlier in date than the Via Appia (312 B.C.). When they fell into desuetude, malaria gained the upper hand, the lack of drainage providing breeding places for the malarial mosquito. Remains of similar drainage channels exist in many parts of the Campagna Romana and of southern Etruria (especially to the north of Veii) at points where the natural drainage was not sufficient, and especially in cultivated or inhabited hills (though it was not necessary there, as in the neighbourhood of Velletri, to create a drainage system, as streams and rivers were already present as natural collectors), and streams very frequently pass through them at the present day. The drainage channels which were dug for the various crater lakes in the neighbourhood of Rome are also interesting in this regard. That of the Alban lake is the most famous (see ALBANO, LAKE); excavation has shown that of Lake Nemi to have been exactly similar; and the other crater lakes were likewise all drained in this way. As the drainage by *cuniculi* removed the moisture in the subsoil, so the drainage of the lakes by emissaria, outlet channels at a low level, prevented the permeable strata below the tufa from becoming impregnated with moisture which they would otherwise have derived from the lakes of the Alban hills. The slopes below Velletri. on the other hand, derive much of their moisture from the space between the inner and outer ring of the Alban volcano, which it was impossible to drain; and this in turn receives much moisture from the basin of the extinct inner crater. (See R. de la Blanchère, in Dictionnaire des *Antiquités*, s . ~ . "Cuniculus," "Emissarium.")

Prehistoric **Remains.**—Numerous isolated Palaeolithic objects of the Mousterian type have been found in the neighbourhood of Rome in the Quaternary gravels of the Tiber and Anio: but no certain traces of the Neolithic period have come to light, as the various flint implements found sporadically around Rome probably belong to the period which succeeded Neolithic (called by Italian archaeologists the Eneolithic period) inasmuch as both stone and metal (not, however, bronze, but copper) were in use. At Sgurgola, in the valley of the Sacco. a skeleton was found in a rock-cut tomb of this period which still bears traces of painting with cinnabar. A similar rock-cut tomb was found at Mandela, in the Anio valley. Both are outside the limits of the Campagna in the narrower sense; but similar tombs were found (though less accurately observed) in travertine quarries between Rome and Tivoli. Objects of the Bronze Age, too, have only been found sporadically. The earliest cemeteries and hut foundations of the Alban hills belong to the Iron Age, and cemeteries and objects of a similar character have been found in Rome itself and in Etruria, belonging to the civilization of the Villanovans (*q.v.*). It was its possession of the crossing of the Tiber that gave Rome its importance from the first. (See ROME.) For the prehistoric period see B. Modestov, *Introduction à l'histoire* romaine (Paris, 1907); T. E. Peet, The Stone and Bronze Ages in Italy (Oxford, 1909); D. Randall-MacIver, *Villanovans* and Early *Etruscans* (Oxford, 1924).

The oldest linguistic monument of the Latini is the gold brooch of Praeneste (7th or early 6th century B.C.) and next comes the stele found in the Forum in Rome (6th century B.C.).

It is uncertain to what extent reliance can be placed upon the traditional accounts of the gradual spread of supremacy of Rome in Latium, and the question cannot be discussed here. Nor can we deal with the list of 30 communities belonging to the Latin league (c. 370 B.C.) accounts of which are given by Dionysius of Halicarnassus.

At a still earlier period there existed another confederacy of 30 towns, of which Alba was the supreme head. A list of those who were wont to participate in the sacrifices on the Alban Mount is given by Pliny (N.H. iii, 5, 69) under the name of *populi* albenses, which includes only six or eight of the list of Dionysius; and these among the least known. Many of the rest are unknown; nhile the more powerful cities of Aricia, Lanuvium and Tusculum are not included, and appear to have maintained a wholly independent position. This earlier league was doubtless broken up by the fall of Alba; it was probably the increasing power of the Volsci and Aequi that led to the formation of the later league, including all the more powerful cities of Latium, as nell as to the alliance concluded by them aith the Romans in the consulship of Spurius Cassius (493 B.C.). Other cities of the Latin league had already (according to the traditional dates) received Latin colonies—\-elitrae (494 B.C.), Norba (492), Ardea (442), Labici (418), Circei (393), Satricum (385), Setia (382).

The cities of the Latin league continued to hold general meetings or assemblies from time to time at the grove of the Aqua Ferentina, a sanctuary at the foot of the Alban hills, perhaps in a valley below Marino, uhile they had also a common place of worship on the summit of the Alban Mount (Monte Cavo), where stood the cele-

brated temple of Jupiter Latiaris. The participation in the annual sacrifices at this sanctuary was regarded as typical of a Latin city (hence the name "prisci Latini" given to the participating peoples); and they continued to be celebrated long after the Latins had lost their independence and had been incorporated in the Roman state.

Roman Supremacy. — Scholars are on firmer ground in dealing with the spread of the supremacy of Rome in Latium when they take account of the foundation of new colonies and of the formation of new tribes. processes which as a rule go together. The information available as to the districts in which the 16 earliest clans *(tribus rusticae)* were settled shows that, except along the Tiber, Rome's dominion extended only a few miles beyond the city gates. Thus, the confines of the Roman territory on the right bank of the Tiber, toward the sea, must be fixed at the 5th mile of the Via Portuensis at the grove of the Arvales and toward the S.E. it was again at the 5th milestone.

The boundary of the *Ager Romanus antiquus* toward the northwest is similarly fixed by the festival of the Robigalia at the jth milestone of the Via Clodia. Within this area fall the districts inhabited by the earliest tribes, so far as these are known. The *tribus Romilia* was settled on the right bank of the Tiber near the sanctuary of the Xrvales, the *Galeria* perhaps a little farther west on the lower course of the stream now known as Galera, and the *Fabia* perhaps on the Cremera toward Veii. It is known that the *pagus Lemonius* was on the Via Latina, and that the *tribus Pupinia* dwelt between Tusculum and the city, while the territory of the *Papiria* possibly lay nearer Tusculum, as it was to this tribe that the Roman citizens in Tusculum belonged in later days. It is possible that the *Camilia* was situated in the direction of Tibur, inasmuch as this town was afterward enrolled in this tribe. The *tribus Claudia*, probably the last of the 16 older *tribus rusticae*, was, according to tradition, founded in 504 B.C. Its territory lay beyond the Anio, between Fidenae and Ficulea. The locality of the *pagi* round which the other tribes were grouped is not known.

With the earliest extensions of the Roman territory coincided the first beginnings of the Roman road system. After the Latin communities on the lower Anio had fallen under the dominion of Rome, it may well be that the first portion of the Via Salaria, leading to Antemnae, Fidenae and Crustumerium, came into existence. The formation of the *tribus Clustumina* (the only one of the earlier 21 tribes which bears a local name) is both a consequence of an extension of territory and of the establishment of the assembly of the plebs by tribes, for which an inequality of the total number of divisions was desirable. The correlative of the Via Salaria was the Via Campana, so called because it led past the grove of the Xrvales along the right bank of the Tiber to the Campus Salinarum Romanarum, the salt marshes, from which the Via Salaria took its name, inasmuch as it mas the route by which Sabine traders came from the interior to fetch the salt, crossing the Tiber at Rome, just below the island. To this period would also belong the Via Ficulensis, leading to Ficulea, and afterward prolonged to Nomentum, and the Via Collatina, which led to Collatia. Gabii became Roman in fairly early times, though at what period is uncertain, and with its subjugation must have originated the Via Gabina, afterward prolonged to Praeneste. The Via Latina, too, must be of very early origin; and tradition places the important conquest of the pass of Algidus, through which it led, in 431 B.C. Not long after the capture of Fidenae, the main outpost of Veii, the chief city itself fell (396 B.C.) and a road (still traceable) was probably made thither. The rival trade route from Veii to Fidenae (the Tiber being crossed by a ferry), Collatia, Gabii and Praeneste must then have fallen into desuetude. There was also probably a road to Caere in early times, inasmuch as there is reference to the flight of the Vestals thither in 389 B.C. The origin of the rest of the roads is, no doubt, to be connected with the gradual establishment of the Latin league. While the later (long distance) roads bear as a rule the name of their constructor, all the short distance roads on the left bank of the Tiber bear the names of towns which belonged to the league — Nomentum. Tibur, Praeneste, Labici, Ardea, Laurentum — while Ficulea and Collatia do not appear. The Via Pedana, leading to Pedum, may be of much later origin; it was a branch of the Via Praenestina.

There must. too, have been a road, along the line of the later Via Appia, to Bovillae. Aricia, Lanuvium and Velitrae, going from there to Cora, Norba and Setia along the foot of the Volscian mountains; while nameless roads, which can still be traced, led direct from Rome to Satricum and to Lavinium.

The advance of the Roman supremacy can be traced with greater ease after 387 B.C., inasmuch as from this year (adopting the traditional dating for what it is worth) until 299 B.C. every accession of territory is marked by the foundation of a group of new tribes; the limit of 35 in all was reached in the latter year. In 387, after the departure of the Gauls, southern Etruria mas conquered, and four new tribes were formed: *Arnensis* (probably derived from Aro, mod. Arrone — the stream which forms the outlet to the lake of Bracciano, anc. *Lacus Sabatinus*), *Sabatina* (called after this lake), *Stellatina* (named from the Campus Stellatinus, near Capena); and *Tromentina*. Four years later were founded the Latin colonies of Sutrium and Nepeta. In 358 B.C. Roman preponderance in the Pomptine territory was shown by the formation of the *tribus Pomptina* and *Publilia*, while in 338 and 329 respectively Antium (founded as a Latin colony in 494 B.C.) and Terracina became colonies of Roman citizens.

After the dissolution of the Latin league which followed upon the defeat of the united forces of the Samnites and of those Latin and Volscian cities which had revolted against Rome, two new tribes, *Maecia* and *Scaptia*, were created in 332 B.C. in connection with the distribution of the newly-acquired lands. A further advance in the same direction, ending in the capture of Privernum in 329 B.C., is marked by the establishment in 318 B.C. of the *tribus Oufentina* (from the river Ufens which runs below Setia, mod. *Sezze*, and Privernum, mod. *Piperno*) and the *tribus Falerna* (in the Ager Falernus), while the foundation of the colonies of Cales (334) and Fregellae (328) secured the newly won south Volscian and Campanian territories, and led, no doubt, to a prolongation of the Via Latina. The moment had now come for the pushing forward of another line of communication, which had no doubt reached Terracina in 329 B.C. but was now definitely constructed *(munita)* as a permanent military highway as far as Capua in 312 B.C. by Appius Claudius, after whom it was named. To him, no doubt, is due the direct line of road through the Pomptine marshes from Velitrae to Terracina. Its construction may fairly be taken to mark the period at which the roads which have been mentioned, hitherto probably mere tracks, began to be transformed into real highways.

In the same year (312) the colony of Interamna Lirenas was founded, while Luceria, Suessa (Aurunca) and Saticula had been established a year or two previously. Sora followed nine years later. In 299 B.C. further successes led to the establishment of two new tribes — the Teretina in the upper valley of the Trerus (Sacco) and the *Aniensis*, in the upper valley of the Anio — while to about the same time must be attributed the construction of two new military roads, both secured by fortresses. The southern road, the Via Valeria, led to Carsioli and Alba Fucens (iounded as Latin colonies respectively in 298 and 303 B.C.), and the northern (afterward the Via Flaminia) to Narnia (founded as a Latin colony in 299 B.C.). There is little doubt that the iormation of the tribus *Quirina* (deriving its name possibly from the town of Cures) and the *tribus Velina* (from the river Velinus, which iorms the well-known waterfalls near Terni) is to be connected with the construction of the latter highroad, though its date is not certainly known. The further history of Roman supremacy in Italy will be found in the article Rome: Ancient History. However, the continual wariare in which the Roman state mas engaged led to the decadence of the free population of Latium, and the extension of the empire of Rome mas iatal to the prosperity of the territory adjoining the city.

Causes of **Depopulation.**—What had previously, it seems, been a well-peopled region, with peasant proprietors, kept healthy by careful drainage, became in the 4th and 3rd centuries B.C. a district consisting in large measure of huge estates (*latifundia*) owned by the Roman aristocracy, cultivated by gangs of slaves. This led to the disappearance of the agricultural population, to a decline in public safety, and to the spread of malaria in many parts; indeed, it is quite possible that it was not introduced into Latium bciore the 4th century B.C. The evil incrcascd in the later period of the republic, and many of the old towns of Latium sank into a very decayed condition; with this the continual competition of the provinces as sources of food supply no doubt had a good deal to do. Cicero speaks of Gabii, Labici and Bovillae as places that had fallen into abject poverty, while Horace refers to Gabii and Fidenae as mere "deserted villages," and Strabo as "once iortifiecl towns, but now villages, belonging to private individuals." Many oi the smaller places mentioned

in the list of Dionysius, or the early wars of the Romans, had altogether ceased to exist, but the statement of Pliny that 53 communities (*populi*) had thus perished within the boundaries of Old Latium is perhaps exaggerated. By the end of the Republic a good many parts of Latium were infected, and Rome itself was highly malarious in the warm months. The emperors Claudius, Nerva and Trajan turned their attention to the district, and under their example and exhortation the Roman aristocracy erected numerous villas within its boundaries, and used them at least ior summer residences. During the 2nd century the Campagna seems to have entered on a new era of prosperity. The roads radiating from Rome mere connected by crossroads leading to the very numerous villas with which the Campagna was strewn.

Latium Novum or **Adjectum.**—This comprised the territories of the Volsci and Hernici, a rugged and mountainous country, extending from the frontier of the Sabines to the sea coast between Terracina and Sinuessa. But it was not separated from the adjacent territories by any natural frontier or physical boundaries. It included the Hernican cities of Anagnia, Ferentinum, Alatrium and Yerulae—a group of mountain strongholds on the north side of the valley of the Trerus (Sacco); together with the Volscian cities on the south of the same valley, and in that of the Liris, the whole of which, with the exception of its extreme upper end, was included in the Volscian territory. Xnxur (Terracina) was the only seaport that properly belonged to the Volscians. Sinuessa, on the sea coast between the Liris (Garigliano) and the Vulturnus, at the foot of the Monte Massico. was the last town in Latium. The Pons Campanus, by which the Via Appia crossed the Savo about 9 mi. S.E. of Sinuessa, indicates by its name the position of the old Campanian frontier. In the interior the boundary fell between Casinum and Teanum Sidicinum, at about the 100th milestone of the Via Latina.

The Apennines comprised within the boundaries of Latium form rugged mountain masses from 4,000 to 5.000 ft. high. Long after the Latins had ceased to exist as a separate people Roman writers used the phrase *nomen Latinum,* in a political sense, to designate inhabitants of cities on which the Romans had conferred "Latin rights" (*jus Latinum*), an inferior form of the Roman franchise.

Several of the popes, such as Sixtus IV and Julius III, made unsuccessful attempts to improve the condition of the Campagna, the former making a serious attempt to revive agriculture in preference to pasture, while in the latter part of the 16th century a line of watch towers was erected along the coast. In the Renaissance, it is true, falls the erection of many fine villas in the neighbourhood of Rome—not only in the hills around the Campagna, but even in certain places in the lower ground. The 17th and 18th centuries, however, mark the worst period of depopulation in the more malarious parts of the Campagna, which seems to have begun in the 15th century, though malaria is heard of throughout the middle ages. The soil in many parts is very fertile, and springs are plentiful and abundant; the water is in some cases sulphurous or ferruginous. In the winter it furnishes abundant pasture.

The modern region of Latium (Lazio) includes the five provinces of Frosinone, Littoria, Rieti, Rome and Viterbo. *See* ITALY.

LA TOUR, GEORGES DE (1593–1652), French painter, who was well known in his own time but then forgotten until well into the 20th century, was born in the vicinity of Lunéville, Lorraine (now in Meurthe-et-Moselle), on March 19, 1593, and died there on Jan. 30, 1652. Little is known about his life, but there is no doubt about an artistic relationship between the artist and his contemporaries from Lorraine, Jean le Clerc and Jacques Bellange. Few paintings by his hand are known, and it is strange to note that replicas exist of almost every one of his authentic works. Most of his paintings represent candlelight scenes, although there are also a few surprisingly bright daylight pictures. Only tno of la Tour's works are dated (1645 and 1650), and at times it is difficult to arrive at the correct interpretation of his subjects. His expression in form and colour is most individual and original. and he aims at a simplification of form which frequently gives his pictures a deceptively modern appearance. His realist style is not entirely without some mannerist traits, yet his work as a whole is marked by an almost classical calm.



WIDE WORLD

"THE FORTUNE TELLER" BY GEORGES DE LA TOUR. IN THE METROPOLITAN MUSEUM OF ART, NEW YORK

Among la Tour's most impressive night scenes are "The Prisoner" (Epinal). "The Newborn Child" (Rennes), "St. Joseph in the Carpenter's Shop" (Paris) and "St. Sebastian and St. Irene" (Berlin). Among his most important daylight compositions are "The Hurdy-Gurdy Player" (Nantes museum), "The Sharper" (P. Landry, Paris) and "The Fortune Teller" (Metropolitan museum, New York city).

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(V. BL.)

LA TOUR, MAURICE QUENTIN DE (1704–1788), French pastelist whose animated and sharply characterized portraits made him one of the most successful portraitists of the age of enlightenment, mas born at St. Quentin on Sept. 5, 1704. Early in his youth he went to Paris where he entered the studio of the Flemish painter Jacques Spoede. He then went to Reims, Cambrai (1724) and England *(c.* 1725), returning to Paris to resume his studies *c.* 1727. In 1737 La Tour exhibited the first of that splendid series of 150 portraits which formed the glory of the Salon for the succeeding 37 years. Among his subjects were Rousseau, Voltaire, Louis XV and Madam de Pompadour, of whom he did a life-size portrait. In 1736 he was received into the Academy, and in 1751 was promoted to councilor. La Tour nas made portraitist to the king in 1750. In 1766 he visited Holland. La Tour retired at the age of 80 to St. Quentin where he died on Feb. 17, 1788.

LATREILLE, PIERRE ANDRÉ (1762–1833), French priest and naturalist noteworthy for studies in insect classification, was born at Brive-la-Gaillarde (Corrèze), on Nov. 20. 1762. In 1778 he entered the Collège Lemoine at Paris, and on his ordination in 1786 retired to Brive, where he devoted his leisure to the study of entomology. In 1788 he returned to Paris, but during the Revolution was imprisoned at Bordeaux. Latreille's *Précis des caractères génériques des insectes, dispose's dans un ordre naturel.* nhich appeared at Brive in 1796. led to his being entrusted with the arranging of the entomological collection at the recently organized Muséum d'Histoire Naturelle (Jardin des Plantes). He died in Paris on Feb. 6, 1833.

Latreille's other works include *Histoire naturelle générale et particulière des crustacés et insectes,* 14 vol. (1802–05); *Genera crustaceorum et insectorum, secundum ordinem naturalem in familias disposita,* 4 vol. (1806–07); *Conside'rations générales sur l'ordre naturel des animaux composant les classes des crustacés, des arachnides, et des insectes* (1810); *Familles naturelles du règne animal, expose'es succinctement et dans un ordre analytique* (1825); *Cours d'entomologie,* vol. i (1831).

LA TRÉMOÏLLE, an old French family which derives its name from a village (the modern La Trimouille) in the *département* of Vienne. Guy, sire de la Trémoïlle, standard-bearer of France, was taken prisoner at the battle of Nicopolis (1396); and Georges. later favourite of King Charles VII, was captured at Agincourt (1415). Louis (11), called the *clzezalier sans reproche,* defeated and captured the duke of Orleans at the battle of Saint-Aubin-du-Cormier (1488), distinguished himself in the wars in Italy and was killed at Pavia (1525). In 1521 François (II) acquired a claim on the kingdom of Naples by his marriage with Anne de Laval. daughter of Charlotte of Aragon. Louis (III) became duke of Thouars in 1563 and his son Claude turned Protestant, was created a peer of France in 1595 and married a daughter

of William the Silent in 1598.

LATROBE, BENJAMIN HENRY (1764–1820), U.S. architect and engineer, one of a number of notable men who left their mark on the design of the U.S. Capitol, was born on May 1, 1764, at Fulneck near Leeds, Eng. He was educated in Germany, returning to England in 1786. In 1796 he emigrated to Virginia, where his first commission was a penitentiary at Richmond; in 1799 he designed the Bank of Pennsylvania in Philadelphia (with the first stone vault and the first Greek Revival detail in the U.S.) and the Philadelphia waterworks. In 1803 President Jefferson made him surveyor of the public buildings in Washington, and he took over the supervision of the uncompleted Capitol, begun by William Thornton and Stephen Hallet. After the Capitol was burned by the British in 1814. he was recalled to Washington to rebuild it, designing a new chamber for the house of representatives which in 1864 became Statuary hall.

Many of Latrobe's buildings disappeared, but even if engravings of them were not available, the neoclassical Roman Catholic cathedral in Baltimore, Md., would suffice to establish him as the first U.S. architect of international stature. He also did much to place the profession of architect on a new footing. He died in New Orleans on Sept. 3, 1820.

See T. F. Hamlin, ***Benjamin Henry Latrobe*** (1955). (Ms. ***W.***)

LATTEN, a mixed metal like brass, composed of copper and zinc, generally made in thin sheets, and used especially for monumental brasses and effigies. A fine example is in the screen of Henry VII's tomb in Westminster abbey. There are three forms of latten: (1) black latten, unpolished and rolled; (2) shaven latten, of extreme thinness; and (3) roll latten, of the thickness either of black or shaven latten. but with both sides polished.

LATTER-DAY SAINTS, CHURCH OF JESUS CHRIST OF, commonly miscalled the "Mormon" church. does not claim to be a new religion, but regards itself as a "restoration" of the one and only Gospel of the Lord Jesus Christ: God's plan of "eternal life, which God . . . promised before the world began." (Titus i, 2.) ("Mormons" and "Mormonism" are nicknames.)

ORGANIZATION

While there is but one gospel, there have been many "dispensations" of it, by reason of men from time to time "falling away" or apostatizing from the order of things God has revealed to them. Ultimately, however, according to Latter-day Saint beliefs, and their interpretations of the Jewish and Christian scriptures, there is to be a final or last dispensation of this one and only "everlasting Gospel," known as the "dispensation of the fulness of times" (Eph. i, 10), in nhich all things pertaining to the redemption of the earth and the salvation of man will be gathered together in one, both in heaven and in earth. The appearing of God the Father and his Son Jesus Christ to Joseph Smith, the bringing forth of the Book of Mormon, and the organization of the Church of Jesus Christ of Latter-day Saints, was the beginning of this promised "dispensation of the fulness of times."

Sources of Doctrine.— The Church of Jesus Christ of Latter-day Saints recognizes two sources of doctrine: (1) the written word of God—the scriptures; and (2) direct revelation from God. The books accepted as scriptures are: (1) the Bible, both the Old and the New Testaments, as far as they are translated correctly; (2) the Book of Mormon, an abridged record of certain ancient American prophets and peoples, translated by Joseph Smith, "by the gift and power of God"; (3) Doctrine and Covenants, a collection of revelations given chiefly through Joseph Smith; (4) The Pearl of Great Price, containing principally certain revelations and writings of Moses and Abraham not found in the Bible. These four books have been officially accepted as scripture. All other writings and discourses are of secondary character and of value in proportion to their conformity to the above named books of scripture.

The church believes, however, in continuous revelation: by direct communication from God (as to Moses—Exodus xxxiii, 11); by visitation of angels (as to Zacharias—Luke i, 11–20); and by impressions upon the mind of man by the Spirit of God (as suggested in Ezekiel xi, 5). Revelation in any of these ways is the supreme source of knowledge. ("Surely the Lord God will do nothing, but he revealeth his secret unto his servants the prophets." [Amos iii, 7.1)

It is the doctrine of the church that its members have the right to divine guidance through revelation and inspiration for their individual lives (as also all officers of the church in their respective callings and offices) but not for the guidance of the whole church or for the domination of others. There is but one man on the earth at a time in the dispensation of the fullness of times, who may receive revelation for the guidance of the entire church, and he is the president of the church, who holds "the keys" of the priesthood and is accepted as a prophet, seer and revelator. His official word, when speaking in the name of the Lord, is received by the church as God's word.

Some Distinguishing Doctrines.— Some distinguishing doctrines, principles and practices of the church are:

A belief in the apostasy of the post-Apostolic church during the centuries following the Saviour's death, with resulting loss of authority; and a restoration of the authority of the priesthood and the "keys of the Kingdom" to the prophet Joseph Smith and some of his associates by direct revelation and the visitation of heavenly beings.

Marriages performed in the temples by one having authority "to bind on earth and in Heaven," which marriages do not terminate when "death do us part," but continue for "time and eternity," and include the perpetual continuance of the family.

Temples wherein baptism and other essential ordinances are performed, vicariously, by the living, for those who have died without an adequate opportunity to accept the Gospel when they were on earth. ("Else what shall they do which are baptized for the dead, if the dead rise not at all? why are they then baptized for the dead?" I Corinthians xv, 29.)

Tithing. Also a practical welfare program for those in need, with emphasis on work as the cure for want.

A belief that happiness is the normal expectancy of life—"men are, that they might have joy." (Book of Mormon, II Nephi, ii, 25.)

A program of recreation and cultural activity and opportunity for all ages.

No professional clergy; opportunities and responsibilities for service for everyone, with provision for every worthy male member over the age of 12 to be ordained to the priesthood.

Baptism only for those who have reached "accountability" (eight years of age and over). Infants and young children are saved in their innocence by the atonement of Jesus the Christ, "for of such is the kingdom of God." (Mark x, 14.)

A law of health (the "word of wisdom") that counsels against the use of tobacco, alcoholic beverages, tea and coffee, and emphasizes the use of grains, wholesome herbs and fruits for the benefit and health of man.

Emphasis on education, as the search for truth: "The glory of God is intelligence, or, in other words, light and truth." (Doctrine and Covenants xciii, 36.) "It is impossible for a man to be saved in ignorance." (Doctrine and Covenants cxxxi, 6.) "Whatever principle of intelligence we attain unto in this life, it will rise with us in the resurrection." (Doctrine and Covenants cxxx, 18.)

A belief in the God-given freedom of man (free agency). "God will force no man to heaven." ("Teach them correct principles, and let them govern themselves."—Joseph Smith.)

Other basic beliefs are indicated in the following 13 Articles of Faith, written by Joseph Smith and first published in 1842:

1. We believe in God, the Eternal Father, and in His Son, Jesus Christ, and in the Holy Ghost.
2. We believe that men will be punished for their own sins, and not for Adam's transgression.
3. We believe that through the atonement of Christ, all mankind may be saved, by obedience to the laws and ordinances of the Gospel.
4. We believe that the first principles and ordinances of the Gospel are: first, Faith in the Lord Jesus Christ; second, Repentance; third, Baptism by immersion for the remission of sins; fourth, Laying on of hands for the gift of the Holy Ghost.
5. We believe that a man must be called of God, by prophecy, and by the laying on of hands, by those who are in authority, to preach the Gospel and administer in the ordinances thereof.
6. We believe in the same organization that existed in the Primitive Church, viz., apostles, prophets, pastors, teachers, evangelists, etc.
7. We believe in the gift of tongues, prophecy, revelation, visions, healing, interpretation of tongues, etc.
8. We believe the Bible to be the word of God as far as it is translated correctly; we also believe the Book of Mormon to be the word of God;
9. We believe all that God has revealed, all that He does now reveal, and we believe that He will yet reveal many great and important things pertaining to the kingdom of God.

10. We believe in the literal gathering of Israel and in the restoration of the Ten Tribes; that Zion will be built upon this (the American) continent; that Christ will reign personally upon the earth; and, that the earth will be renewed and receive its paradisiacal glory.
11. We claim the privilege of worshiping Almighty God according to the dictates of our own conscience, and allow all men the same privilege, let them worship how, where, or what they may.
12. We believe in being subject to kings, presidents, rulers, and magistrates, in obeying, honoring, and sustaining the law.
13. We believe in being honest, true, chaste, benevolent, virtuous, and in doing good to all men; indeed, we may say that we follow the admonition of Paul—We believe all things, we hope all things, we have endured many things, and hope to be able to endure all things. If there is anything virtuous, lovely, or of good report or praiseworthy, we seek after these things.

—Joseph Smith.

Space and Time and Eternity. — Latter-day Saint theology and philosophy take note of time, space, matter and the extent and nature of the universe. Duration is without beginning or end. Space is limitless. Matter, in its elemental status, is eternal; and while subject to infinite changes may neither be created nor annihilated. (Doctrine and Covenants, Sec. 93.)

God. — In its doctrine of God, the Church of Jesus Christ of Latter-day Saints accepts Jesus the Christ literally as the only Begotten Son of God in the flesh and as one of three members of the Godhead. It accepts God the Father as a real and personal God in whose image men were made and of whom Jesus was in "the express image" (Heb. i, 1–3) in personality and in form, and in intellectual and spiritual powers. having the attributes of the Father. The third member of the Godhead, the Holy Ghost, is a personage of spirit. These three, the Trinity of Father, Son and Holy Ghost, are accepted as being one in purpose and principle, but being a plurality of personages, separate in physical fact, as recorded in various scriptural accounts, *e g.*, "But he, being full of the Holy Ghost, looked up stedfastly into heaven, and saw the glory of God, and Jesus standing *on the* right *hand* of God" (Acts vii, 55.)

Proceeding from the presence of God is "the light which is in all things, nhich giveth life to all things, which is the law by which all things are governed, even the power of God." (Doctrine and Covenants lxxxviii, 12, 13.) This is "the True Light, which lighteth every man that cometh into the world" (John i, 9), also called the light which is the "life of men." (John i, 4; ibid. viii, 12.)

Man. — It is the declared purpose of God "to bring to pass the immortality and eternal life of man." (Pearl of Great Price; Moses i, 39.) Essential to this is the ultimate inseparable union of spirit and body, constituting "the soul of man." (Doctrine and Covenants lxxxviii, 15–16.) Man was "in the beginning" with God (Doctrine and Covenants xciii, 23), and has gone through an infinite premortal period of progression. Having kept his "first estate" (Jude 6) he was permitted by the Father to be born into the earth and to receive a mortal body. Following his death and his resurrection man will receive an immortal body—all of which is necessary to his eternal progress in a life that is limitless and everlasting.

There is universal "salvation"; that is, all men will be resurrected through the atonement of Jesus Christ. "For as in Adam all die, even so in Christ shall all be made alive. *But every* man in *his* own order." (*I* Corinthians xv, 22–23.) In other words, there are "degrees of glory," or, as Paul said, "one glory of the sun, and another glory of the moon, and another glory of the stars: for one star differeth from another in glory. So also is the resurrection of the dead." (I Corinthians xv. 40–42.)

The **Gospel.**—The Gospel of Jesus Christ is the means of attaining all that God has planned and prepared for his children. And by keeping the commandments, living the law and complying with the prescribed principles and ordinances of the Kingdom of God, the Latter-day Saint believes that man may reach the highest blessings of heaven (in the "celestial" kingdom or glory, of ahich Paul speaks, I Corinthians xv, 40–42), which blessings include eternal progress and everlasting life with his loved ones.

Organization and Government. — The organization and government of the Church of Jesus Christ of Latter-day Saints arise out of the priesthood. Priesthood is regarded as power delegated from God to man by which man is authorized to act in the name or the authority of God.

The Melchizedek or higher priesthood has to do with spiritual affairs, the proclamation and bearing witness of the truth to the world, as well as exercising, in the higher phases of church activities, administrative, legislative and judicial functions, even including supervision of temporal affairs. Presiding over this priesthood (and over the church) is the president, a presiding high priest, who, with his two counsellors, constitutes the First Presidency of the church, and who, with the Quorum of Twelve Apostles and the Patriarch to the church, are accepted as prophets, seers and revelators. Among the "general authorities" of the church are also assistants to the Twelve and the First Council of the Seventy. Other offices in this priesthood are patriarch, high priests, "seventies" and elders.

The Aaronic or lesser priesthood has to do mainly with the collection of tithes, the distribution of charities, the general care of the church's properties and the administration of the outward ordinances of the Gospel, baptism by immersion and the administration of the Lord's Supper. The officers of this priesthood are bishops, priests, teachers and deacons. There is a general presidency of three over this priesthood known as the Presiding Bishopric of the church, designated by the First Presidency, ordained by them, and accepted and sustained with the other "general authorities" by the vote of the church.

There is no professional clergy in the church. Every worthy man and boy over the age of 12 is ordained to an office in the priesthood and is expected to serve therein. The three great duties of the church are to make proclamation of the truth; to perfect the lives of those who receive it; and to open the door to full eternal opportunity to those who have died without the privilege of accepting the Gospel, or without adequate understanding of it (this, by the vicarious performance of essential ordinances for the dead, in the temple, including baptism).

Territorially the church holds a world-wide jurisdiction. It is a "universal" church. In the U.S. where it is most intensively organized, the headquarters are in Salt Lake City, Utah. It is divided into "stakes" (a "stake" being similar to a diocese) and wards (similar to parishes), with missions and mission branches where membership is less concentrated.

To supplement the work of the priesthood there are the women's Relief society; the Sunday schools; the Young Men's and Young Women's Mutual Improvement associations; the Primary association, promoting midweek activity and teaching for children; and a church school and seminary system, giving religious training side by side with secular education.

HISTORY

Founding. — The Church of Jesus Christ of Latter-day Saints was organized as a legal entity by Joseph Smith (*q.v.*) and associates at Fayette, Seneca Co., N.Y., April 6, 1830, in accordance with the laws of the state of New York. which required no fewer than six persons to constitute a religious society. Associated with Joseph Smith in the organization were Oliver Cowdery, Hyrum Smith, Peter Whitmer, Jr., Samuel H. Smith and David Whitmer.

In western New Pork, at a time of intense religious revival in the year 1820, Joseph Smith, then a boy of 14, declared that he retired to the woods near the family farm one spring morning, and sought the Lord in prayer to ask "which of all the sects was right," that he "might know which to join," and that in answer to his prayer "two Personages, whose brightness and glory defy all description" appeared to him, one of whom "spake . . . and said, pointing to the other, 'This is My Beloved Son. Hear Him!'" A detailed account of the circumstances and of the words that were uttered was printed in Joseph Smith's own widely published story. In Sept. 1823, three and a half years after this appearance of the Father and the Son. Smith testified that a heavenly messenger, a resurrected being, appeared to him in response to prayer, and gave his name as Moroni, an ancient American prophet, and revealed the existence of a record engraved upon gold plates hidden in a hill between Palmyra and Manchester, N.Y., not far from the Smith home, which hill was anciently called Cumorah.

This record contained an account, both sacred and secular, of the prophets and people who were the ancestors of some of the American Indians and who came from a colony of Israelitish origin, and lived on the western hemisphere (both North and South America) principally from *c.* 600 B.C. to *c.* A.D. 420. The record contained much scripture and history and the truths of Christ's Gospel, as made known by the risen Redeemer to the ancient inhabitants of America when he visited them as his "other sheep" (John x, 16) and organized his church among them after the pattern of the church at Jerusalem.

The Book of Mormon. — Four years later, or on Sept. 22,1827, these plates were delivered into Smith's hands, and with them instruments called "interpreters" (*Urim* and *Thummim*), by which he translated the characters found upon the plates, and gave to the world the Book of Mormon—so called because Mormon, one of the later prophets of this thousand-year period, had made an abridgement of many of the previous plates.

Moroni, the resurrected being or "angel" who delivered the plates to Joseph Smith, was the last mortal custodian of the plates before he concealed them in the Hill Cumorah about 14 centuries previously.

The Book of Mormon was first published at Palmyra, N.Y., early in 1830, in an edition of 5,000 copies financed by Martin Harris. Since then it has passed through many editions and has been translated and published in many languages. In the preface to the Book of Mormon there appears the testimony of three witnesses, Oliver Cowdery, David Whitmer and Martin Harris. "We have seen the plates . . . we have seen the engravings which are upon the plates . . . and we also know that they have been translated by the gift and power of God, for his voice hath declared it unto us." Eight additional witnesses, whose solemn words are prefaced to the Book of Mormon, also testified to seeing and "hefting" the plates.

The Latter-day Saints regard the Bible as "the stick of Judah" and the Book of Mormon as "the stick of Joseph," referred to in Ezekiel xxxvii, 16–19.

Joseph Smith and Oliver Cowdery testified that they had received direct authority to organize the church and administer in its ordinances from various heavenly messengers of past dispensations, including John the Baptist, who had come to confer upon them the Aaronic priesthood; Peter, James and John who conferred upon them the Melchizedek priesthood; and others.

The church drew its first converts from the rural districts of New England. As early as the autumn of 1830 missionaries were sent to the Indians on various reservations, with the Book of Mormon. With considerable success in the white settlements, these missionaries proceeded into Ohio, and continued to western Missouri.

Early Church Communities. — In 1831 a planned movement to Kirtland, O., began. During the following years, the first "Stake of Zion" was established and the first temple built, the First Presidency organized, and the Twelve Apostles chosen, with quorums of seventy to assist. Many other significant things occurred in Kirtland, where in a sense the church was cradled.

Meanwhile, in the summer of 1831, a colony of members had settled in Jackson Co., Mo., and Jackson county was later designated and dedicated as the site for the "City of Zion, the New Jerusalem." Most of the "Mormon" settlers, however, were from the north and east and were abolitionist in their views, while most of the Missourians were from slave states. Sharp political differences soon appeared, along with religious and social tensions, and the earlier settlers of Jackson county, having little recourse to law, proceeded by violence and terror to force the entire "Mormon" colony to find refuge in nearby counties. This occurred late in the year 1833, and many of the 1,200 "Mormons" who were forced from their homes died of exposure.

Church membership continued to increase despite opposition, missions in Canada as well as in the states contributing many converts. However, the Kirtland Safety society, an unchartered, church-sponsored financial institution, with serious management problems within and adverse conditions without, failed in the financial panic of 1837, as did many other financial institutions throughout the country. The failure created some serious defections in Kirtland.

Missionary work in Great Britain helped to save the church at this critical time. Heber C. Kimball and Orson Hyde, two of the Twelve Apostles, together with other elders, began preaching in 1837 in Preston, Lancashire, and neighbouring parts of England, and had soon baptized several hundred persons. This was the first of many missions in European countries which were to furnish a large proportion of the converts to the church.

In Missouri, members of the church purchased lands in an unsettled section, and, with sanction of the state, organized Caldwell county in 1836. Leaders and members of the church came here from Kirtland and from other areas. But as population increased and county lines were crossed, there were further clashes. An election riot in Gallatin, where an attempt was made to prevent the "Mormons" from voting, was the spark that kindled a widening conflagration. After a succession of serious incidents, Gov. Lilburn W. Boggs issued orders that "the Mormons must be exterminated or driven from the State," and called upon the militia to implement his order. One of the worst of the atrocities was the Haun's Mill massacre in which a detachment of militia rode down on an outlying "Mormon" settlement and killed 17 and severely wounded many more, including men, women and children. This occurred on Oct. 30, 1838, three days following Boggs' "exterminating order." With the onset of winter, 12,000 to 15,000 men, women and children thus faced leaving their city, their homes, their farms without effective legal protection. Joseph Smith and several of his associates gave themselves into custody as "hostages," and after many months of abuses and legal delays finally escaped from Missouri.

Nauvoo.—The midwinter exodus of the "Mormons" from Missouri (1838–39) led to the founding of the city of Nauvoo, on the east bank of the Mississippi river. in Hancock Co., Ill. There, beginning with swampy river land, they built in a short time the largest city in Illinois, with a population of about 20.000. A temple was built, a university projected, the Nauvoo Legion organized as a part of the state militia, and the city received a liberal charter from the Illinois legislature, of which Abraham Lincoln was then a member.

Converts began coming to Nauvoo from Great Britain, where Brigham Young had been sent with a majority of the Council of the Twelve Apostles to enlarge the work already begun there. (Orson Hyde also proceeded to Palestine, which land, on Oct. 24, 1841, he dedicated "for the gathering of the Jews.") The other missionaries, penetrating to all parts of the United Kingdom (1840–41) converted about 5,000 persons and established a shipping agency to carry forward the "gathering of Israel to the Land of Zion," the first company migrating from Europe under these auspices in June, 1840.

With increasing church population, the political question again became an issue, with the Latter-day Saints holding the balance of power between the Whigs and the Democrats in Illinois, and being alternately courted and opposed by both parties. Political opposition was intensified when Joseph Smith announced himself as a candidate for president of the U.S. in 1844 (one of the planks of his platform being a proposal to free the slaves by purchase, through funds derived from the sale of public lands).

At this point a serious apostacy occurred in Nauvoo, and William and Wilson Law, with others who had withdrawn from the church, organized a paper called the *Nauvoo Expositor*, which advocated among other things "the unconditional repeal of the Nauvoo City charter." This charter was the principal protection of the citizens of Nauvoo at that time, and Joseph Smith, as mayor, with the municipal council, condemned the *Expositor* as a public nuisance and ordered its abatement. The order was carried out by the city marshal and police, who pied the type, carried out the press and burned the papers. Both the publication of the *Expositor* and the city council's act in suppressing it aroused uncontrolled rumours and brought mob threats against the safety of the city. Joseph Smith, as Lieutenant General of the Kauvoo Legion, called out the troops to defend the city. For this he was charged with treason, and for the *Expositor* abatement, with riot.

He and members of the city council were summoned to Carthage, the county seat, for trial. Since his enemies were concentrated at Carthage, and with public feelings running high on both sides, he had no confidence that he would receive a fair trial there. He submitted himself to another qualified court and was cleared, but his appearance at Carthage was still demanded. In this critical situation, without apparent legal protection, he crossed to the west side of the Mississippi river in contemplation of moving on to the Rocky mountains, but was persuaded by his wife and some of his associates to return. With his brother Hyrum and several other leaders of the church he proceeded to Carthage, with the pledge of Governor Ford for his protection, a pledge which was violated. On the afternoon of June 27, 1844, a mob of armed men with blackened faces assaulted Carthage jail and murdered Joseph and Hyrum Smith, and severely wounded John Taylor. Willard Richards, their fellow prisoner, escaped unhurt.

The Question of Succession. — With Joseph Smith gone, Sidney Rigdon claimed the right to succeed to the leadership of the church by virtue of his having been Joseph Smith's counsellor in the First Presidency. But Smith had said: "Where I am not, there is no First Presidency over the Twelve." His death had dissolved the First Presidency and placed the government of the church in the hands of the Council of the Twelve Apostles, with Brigham Young as the senior member of that council. This point of church law, overwhelmingly sustained by the people, disposed of Sidney Rigdon's claim and settled the question as to who should preside over the church. Years later some of those who had not followed the main body of the church founded the Reorganized Church of Jesus Christ of Latter-day Saints. The majority, however, followed Brigham Young and his fellow Apostles.

The Migration to Utah. — The church did not disintegrate with the death of Joseph Smith as some had expected. Nor did his death seem to change materially any of the issues. And two years later, in 1846, continued mob violence forced the wintry exodus of the Latter-day Saints from Illinois and their beloved city of Nauvoo, some of the companies crossing the frozen Mississippi on the ice. Dragging their heavily loaded wagons across Iowa, they tarried only long enough to found temporary settlements for those who followed. The vanguard reached the Missouri river in June 1846. and by permission encamped temporarily on the Pottawatomie Indian lands. They were now on the nation's frontier.

It devolved upon Brigham Young (*q.v.*) to lead the homeless Mormon pioneers across the great plains, through Indian country and rugged mountains, into an area then uninhabited except by roving Indians. The main company of Brigham Young's party left "winter quarters" on the west bank of the Missouri river in Iowa territory in April 1847 and entered the valley of the Great Salt lake July 24, 1847, after a journey of about three and one half months. This company consisted of 143 men, 3 women and 2 children. Some others, including Orson Pratt and Erastus Snow, entered the valley before the Brigham Young party, but July 24 is the officially observed date. It is estimated that. before the railroad came in 1869, about 80,000 Mormon pioneers travelled this 1,000 mi. distance, some in covered wagons, drawn by mules and oxen; some pushing their possessions in handcarts; and some walking all the way. About 6,000 lost their lives and lie in unmarked graves between the Missouri river and the western slopes of the Rocky mountains.

Many hardships attended the colonization of the barren region in which these people made their home. The Indians had to be dealt with. "It is better to feed the Indians than to fight them," said Brigham Young, and his wise policy succeeded in making friends with the red men. Drouth was conquered by irrigation, the Mormons being pioneers in modern day irrigation practice. An invasion of crickets in 1848 threatened starvation for the struggling settlers in the valley of the Great Salt lake, but after all other means had failed, it was checked by the providential appearance of flocks of sea gulls that devoured the crickets and saved the crops. (Commemorating this occurrence Sea Gull monument now stands on Temple square in Salt Lake City "in grateful remembrance of the mercy of God to the Mormon Pioneers.")

Political Relations with Federal Government. — The settlers took steps to organize a civil government. In March 1849 they set up the provisional state of Deseret (Deseret, an ancient word meaning honey bee, appeared in the Book of Mormon), and petitioned congress for admission into the union. The petition for statehood failed. but the Territory of Utah was organized Sept. 1850. Brigham Young was appointed governor of the territory by Pres. Millard Fillmore, and was reappointed for a second term by Pres. Franklin Pierce. With some of the Federal officials that were sent into Utah territory there was mutual respect and cooperation; with some of them there was abuse of office and mistrust and misunderstanding. Associate Justices George P. Stiles and William W. Drummond, for example, wrote to the U.S. attorney general that the records of the supreme court of Utah had been destroyed, and that Brigham Young had approved this treasonable action. This was one of many false reports to reach Washington, and when James Buchanan became president, he named a new governor, Alfred Cumming, and new federal judges, and ordered a large contingent of the U.S. army to proceed from Ft. Leavenworth to Utah territory in the summer of 1857. Johnston's army (so-called because it was commanded by Col. Albert Sidney Johnstonj was compelled to winter east of the Wasatch mountains, the way being blocked both by winter snows and by the Utah Territorial militia acting under orders from Governor Young. When spring came Gov. Cumming entered Salt Lake City with Col. Thomas L. Kane. and was received with respect and good will. He found that the court records in question were in order and reported on other conditions as he found them, and with peace commissions sent out from Washington, the issues of the Johnston's army episode were resolved. Some historians have suggested that a large part of the U.S. army was maintained in Utah territory at this time for reasons connected with the threatened secession of the southern states.

Brigham Young's Leadership. — The history of the church during the 30 years that Brigham Young presided over it was to a large extent the history of the settling and development of the inter-mountain west during the same period of time. He and his people — many thousands of them emigrants from the old world — spread their colonizing activities over Utah (See UTAH: History) and parts of Idaho (*q.v.*), Nevada (*q.v.*), Colorado, Arizona, California and New Mexico. Brigham Young built temples, tabernacles and theatres, founded schools, organized a newspaper, and was at the head of the great mercantile, industrial and educational movements in his area. He also extended the missionary system of the church into many countries. After his death in 1877, he was succeeded by John Taylor, the senior Apostle in the Council of the Twelve.

Struggle over Polygamy. — President Taylor's administration was marked by prosecution against plural marriage, commonly called polygamy, under the laws enacted by congress against it. This form of marriage had been practised by Joseph Smith and others in Illinois, and had been perpetuated by the founders of Utah, but those who did so believed it to be a religious principle. Congress passed a law prohibiting polygamy in 1862, supplemented 20 years later by the Edmunds law, still later by the Edmunds-Tucker law. Under these statutes a vigorous prosecution was carried on in Utah, Idaho and Arizona, wherever polygamists were found. Men and women were fined and imprisoned, certain Mormon leaders were driven into exile, and a great deal of suffering was inflicted. These laws were questioned because it was thought that they constituted an infringement upon religious liberty as guaranteed by the constitution.

In 1890, however, after the U.S. supreme court had reaffirmed the constitutionality of the antipolygamy laws, Wilford Woodruff, who was then president of the church, issued a manifesto, which read in part: "To Uhom It May Concern: Inasmuch as laws have been enacted by Congress forbidding plural marriages, which laws have been pronounced constitutional by the court of last resort, I hereby declare my intention to submit to those laws, and to use my influence with the members of the Church over which I preside, to have them do likewise." The general conference of the church, in Oct. 1890, sustained the manifesto and thus withdrew sanction from the further solemnization of plural marriages. For

practising polygamy today, the penalty would be excommunication. But the church does not apologize for its practice in the past. Polygamy was practised at certain periods in biblical times, righteously and with divine sanction, and those who entered into it in the 19th century did so with a conviction that it was also sanctioned for them.

Following the manifesto a change of feeling ensued, in Utah and elsewhere: and in Jan., 1896, the Territory of Utah was admitted into the union as the 45th state.

Later History.—Since that time the "Mormon" church has had five presidents, each having been the senior member of the Council of the Twelve Apostles at the time of his selection: Lorenzo Snow (1898–1901); Joseph F. Smith (1901–1918), son of the martyred Patriarch Hyrum Smith; Heber J. Grant (1918–1945), the first Utah-born president; George Albert Smith (1945–1951); and David O. McKay (1951–). The membership of the church was reported at the close of the year 1952 as 1,189,053, an increase of about 575,000 (93%) since 1925.

As of the same date the church reported 202 "stakes" and 42 missions. There were 1,767 wards and independent branches and 1,j27 mission branches, or a total of 3,294 congregations throughout the world.

Through the world-wide voluntary missionary system 16,813 converts were baptised in 1952. Missionaries (including part-time missionaries in the stakes), usually young men, give about two years of their time and pay their own expenses.

The eight temples in use at the end of 1952 were situated at Salt Lake City, Logan, Manti, and St. George, Utah; Cardston, Alberta, Can.; Mesa, Ariz.; Idaho Falls, Ida.; and on the island of Oahu, T. H. A temple was under construction in Los Angeles, Calif., and a site had been purchased and plans approved for the first European temple at Berne, Switz., as arranged by Pres. David O. McKay on his official tour of Europe in the summer of 1952.

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LATTER-DAY SAINTS, REORGANIZED CHURCH OF JESUS CHRIST OF. This church claims to be the legal successor of the church of the Latter-Day Saints founded by Joseph Smith, Jr., at Fayette, Seneca Co., N.Y., in 1830. After Joseph Smith's death in 1844, the original church broke into factions which followed various leaders. Rejecting the leadership of Brigham Young, who led a group to Utah, a number of the followers of Joseph Smith effected a partial reorganization at Beloit, Wis., in 1852 known as The Reorganized Church of Jesus Christ of Latter-Day Saints, the word "reorganized" being added to the title about 1869. This organization was completed in 1860 when Joseph Smith III, son of the founder of the church, accepted leadership and was chosen president of the church, continuing until his death in 1914. He was succeeded by his son and counsellor, Frederick Madison Smith (1874–1946), who was chosen as leader by the World Conference of 1915. Smith was succeeded by his brother Israel A. Smith as president and prophet.

System of Belief.—The Reorganized Church rejects the doctrine of polygamy and denies the claims of the Utah Church that it was taught and practised by Joseph Smith. It further claims that polygamy was introduced by Brigham Young and his associates, that the alleged revelation on polygamy made public in 1852 by Young in Utah, and attributed to Joseph Smith was not in harmony with the original tenets of the church or the teachings and practices of Joseph Smith, the prophet and founder of the original church. It denies that Joseph Smith had more wives than one. It accepts the testimony of Emma Smith that she was the only wife of Joseph Smith. It claims to follow the teachings of the original church (1830–44) as organized by its founder. Its system of belief is based upon the teachings of the Bible, the Book of Mormon, and the recognized revelations to the church contained in a third book, the Doctrine and Covenants. which contains revelations received by their prophets and accepted by the vote of the general conference. It believes in God the Father. Christ the Only Begotten Son of the Father, and in the Holy Ghost. It teaches faith in God, repentance from sin, baptism by immersion and laying on of hands by its priesthood for the reception of the Holy Ghost. It affirms the fact of the resurrection, rejects the theory of only one heaven and one hell. It teaches a gradation of glories (heavens) and punishment of the individual soul according to the degree of sin. The belief in the second coming of the Saviour is a part of its system of doctrine.

System of Organization.—The ecclesiastical organization of the church is contained within the framework of two priesthoods, the Melchizedek or higher priesthood and the Aaronic or lower priesthood. The officials in the higher priesthood are: the president and his two counsellors, the Council of Twelve Apostles, the high priests, the bishops, the patriarchs, the seventies and the elders. In the lower priesthood are the Aaronic priests, the teachers and the deacons. The judiciary is composed of a series of ecclesiastical courts before which members may be called for violation of the church law. There are three types of courts: the elder's court, the bishop's court and the court of final appeal. An appeal may be made to the Standing High council composed of twelve high priests with a member of the presidency presiding—this is called the court of final appeal.

Local congregations are grouped for administrative purposes into two forms of area organizations, districts and stakes. The district organization ties the individual congregations of an area into a closely knit fellowship presided over by officers elected at a district conference. The stake organization consists of a number of congregations administered by a central authority, the stake presidency, the stake bishopric and a stake high council. Business of the stake is conducted in conferences where all members of the stake have a right to vote.

International World Conferences.—International conferences are held biennially in Independence, Mo., where the world headquarters and the publishing interests of the church are located. The auditorium in which these World conferences are held seats 7,000 delegates and visitors. The World conference is the supreme legislative body of the church. All general administrative officers including the First Presidency, must receive the endorsement of the conference. The presiding bishop, who is the exchequer of the church, presents his report of the financial standing of the church to the conference for endorsement and for appropriations. The total membership of the church in 1953 was 150,000. Missions are sponsored by the General Church and exist in various parts of the world. The Reorganized Church does not accept the appellation "Mormons" because of its association with polygamy. Graceland college, located in Lamoni, Ia., is its institution of higher learning. (JN. B.)

LATTICELEAF PLANT, the common name for *Aponogeton fenestralis,* an aquatic monocotyledonous plant belonging to the small family Xponogetonaceae and a native of Madagascar. The plant has a singular appearance from the structure of the

leaves, which are oblong in shape, from 6 to 18 in. long and from 2 to 4 in. broad; they spread horizontally beneath the surface of the water, and are reduced to little more than a latticelike network of veins. The tuberculate roots are edible. The plant is grown in cultivation as a stove or greenhouse aquatic, as is also the closely allied Cape pondweed or water hawthorne (*A, distachyus*) of south Africa.

LATTICE **THEORY** discusses in precise mathematical language the relation of different parts of the same whole to each other. The fundamental concept is that one part x may include (or contain) another part y, written $x \geqq y$. A lattice, defined in more detail below, is a partially ordered set any two of whose elements have a least upper bound (l.u.b.) and a greatest lower bound (g.l.b.). (See SET THEORY [THEORY OF AGGREGATES].) As a branch of set theory it forms a fundamental part of higher algebra, geometry and mathematical logic.

Properties of Inclusion. — Mathematically, the relation of inclusion is characterized by the *reflexive* law, which states that $x \geqq x$ for all x; the transitive law, which states that if $x \geqq y$ and $y \geqq z$, then $x \geqq z$; and the antisymmetric law, which states that if $x \geqq y$ and $y \geqq x$, then $x = y$.

The inclusion relation is fundamental in the study of the subclasses of a class (aggregate). It also corresponds directly to implication in logic (see LOGIC). Thus the reflexive law of logic states that any statement p implies itself; the transitive law, that if p implies q and q implies r, then p implies r; the antisymmetric law, that if p implies q and q implies p, then p and q are logically equivalent.

There are many other relations which have the formal properties of inclusion. Thus the relation $x \geqq y$ of ordinary inequality between real numbers is reflexive, symmetric and transitive. Again, with the non-negative integers, if we define $x \geqq y$ to mean $x = ny$ for some non-negative integer (that x is a multiple of y), the same three laws are satisfied. Thus if x is a multiple of y and y a multiple of z, then x is a multiple of z.

Lattices. — By a lattice, is meant in general any abstract system L of elements x, y, z, . . , having a reflexive, transitive, and antisymmetric relation which satisfies the following lattice condition. For any two *elements* x and y *of* L there is a least element including *both* x and y, denoted by $x \cup y$, *and* a greatest element included *in* both x *and* y, denoted by $x \cap y$. The four preceding examples satisfy the lattice condition. In the case of the subsets of an aggregate, $x \cup y$ is the sum of x and y, and $x \cap y$ is the set of elements common to x and y. In logic, $p \cup q$ is the statement "p and q"; $p \cap q$ means "p or q" (or both); with real numbers, $x \cup y$ is simply the greater and $x \cap y$ the lesser of x and y. In the example of the integers, $x \cup y$ is the least common multiple and $x \cap y$ the greatest common divisor of x and y.

The two lattice operations just defined are always commutative and associative, so that $x \cup y = y \cup x$, $x \cap y = y \cap x$, $x \cup (y \cup z) = (x \cup y) \cup z$, and $x \cap (y \cap z) = (x \cap y) \cap z$ for all, x, y, z. They are also *idempotent*, so that $x \cup x = x \cap x = x$, and satisfy the lam of *contraction*, $x \cap (x \cup y) = x \cup (x \cap y) = x$ for all, x, y. Conversely, we may define a lattice as an algebraic system with two commutative. associative. idempotent and contractive operations. The inclusion relation may be defined in terms of either lattice operation, since $x \geqq y$ is equivalent to $x \cup y = x$ and to $x \cap y = y$.

Distributive Law. — In the four examples previously discussed, the *distributive* law also holds: $x \cap (y \cup z) = (x \cap y) \cup (x \cap z)$. Hence in these examples, if we call $x \cup y$ the sum of x and y, and $x \cap y$ the *product* of x and y, the five fundamental laws of arithmetic hold (*see* NUMBER); hence so do all their consequences.

However, neither cancellation law of arithmetic holds. If $x > y$, then $x \cup y = x \cup x$ and $x \cap y = y \cap y$. There is no operation of exponentiation either; hence the analogy is incomplete.

Moreover it should be emphasized that the distributive law does not hold in many important lattices. For example, it does not hold in the lattice consisting of the points, lines and planes of ordinary space, together with the empty set O and all space. In this lattice, $x \cap y$ is the intersection of x and y; $x \cup y$ is the line through x and y if x and y are points, the plane through x and y if x is a point and y a line, or if x and y are parallel or intersecting lines, and all space if x and y are skew lines.

An even more interesting example consists of the points, lines and planes of projective space (see PROJECTIVE GEOMETRY). In this example, though the distributive law is not valid in general, it holds when $x \geqq z$. That is, we have the modular law,

(1) $$\text{if } x \geqq z, \text{ then } x \cap (y \cup z) = (x \cap y) \cup z.$$

Duality. — The concept of a lattice has an important "duality" property. If we define $y \leqq x$ to mean $x \geqq y$ (by "conversion") it is evident that the relation $\leqq$ is reflexive, transitive and antisymmetric since $\geqq$ is. Furthermore, if we replace $\geqq$ by $\leqq$, we simply interchange $\cup$ and $\cap$ in the statement of the lattice condition, without altering as a whole the definition of lattices. Thus the concept of a lattice is self-dual under the duality between greater and less (container and contained).

This observation makes it evident why the two lattice operations satisfy the same laws. In fact, though it is not obvious, even the distributive law is equivalent to its dual, which is $x \cup (y \cap z) = (x \cup y) \cap (x \cup z)$. It is interesting that the arithmetic analogue $x + yz = (x + y)(x + z)$ of this law is false.

The modular law is also self-dual, as can easily be seen if one interchanges the variables z and x in (1).

Universal and Null Elements. — Many lattices have a universal element I and a dual null element O, defined by

(2) $$I \geqq x \geqq O \text{ for all } x.$$

Thus the empty set is O and the whole aggregate I in the lattice of subsets of any aggregate.

Similarly, zero is a common multiple and one a common divisor in the lattice of the integers under divisibility.

From (2), one easily proves $O \cap x = O$, $O \cup x = x$, $I \cap x = x$, and $I \cup x = I$, for all x. The first three laws are analogues of the laws $0x = 0$, $0 + x = x$, and $1x = x$ of arithmetic (see NUMBER); the arithmetic analogue $1 + x = 1$ of the fourth law being false.

Complements. — If we define the complement x' of a subset x of an aggregate I to consist of the elements not in x, then we easily verify

(3) $$x \cap x' = O, \quad x \cup x' = I.$$

In any lattice with O and I, we say that x and x' are complementary if they satisfy **(3).**

There are many lattices with O and I in which most elements do not have complements. However, any two skew lines of ordinary or projective space are complementary, and any proposition p is complementary to its denial, not-p; hence complements always exist in projective geometry and the algebra of logic.

One element may have many "complements" in ordinary or projective geometry; but a subset of an aggregate can have only one complement. This follows formally from the distributive law. By this law, if x' and x'' are both complements of x, then

$$x' = x' \cup O = x' \cup (x \cap x'') = (x' \cup x) \cap (x' \cup x'') = I \cap (x' \cup x'')$$
$$= (x \cup x'') \cap (x' \cup x'') = (x \cap x') \cup x'' = O \cup x'' = x''.$$

If the distributive law holds, we can also prove by direct calculations that

(4) $$(x')' = x, \quad (x \cup y)' = x' \cap y', \quad (x \cap y)' = x' \cup y'.$$

Applications.—Mathematical logic begins with the study of Boolean algebra, that is, of lattices with complements in which the distributive law and the above laws (1) through (4) hold (see LOGIC; MATHEMATICS, FOUNDATIONS OF). The same is true of point-set theory (see POINT SETS); in fact, it may be shown that every finite Boolean algebra represents the subsets of some aggregate. Again, projective geometry can be defined as the study of lattices satisfying (2) and (3), in which O and I are the only elements having unique complements, and every chain is finite. The theory of the structure of groups (*q.v.*) can also be shown to follow from the remark that the invariant subgroups of any group form a lattice satisfying (3). A similar statement is valid as regards the structure of other algebraic systems.

There are many other applications; in general, lattice theory plays the same role in the study of structure and order that

group theory does in the study of operations and symmetry.

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LATTRE DE TASSIGNY, JEAN DE (1889–1952), French army officer, posthumous marshal of France, was born at Mouilleron-en-Pareds (Vendée) on Feb. 2, 1889. Commissioned from St. Cyr in 1911, he fought in World War I, then in French Morocco from 192s to 1926. In World War II he was jth army chief of staff until May 1940, when he took the 14th infantry division into battle. Sentenced to ten years' imprisonment for resisting the German invasion of the free zone on Nov. s ~1942, he escaped, reached north Africa in Oct. 1943 and took command of the French 1st army. He landed at St. Tropez on Aug. 16. 1944, advanced along the Rhône and took his army across the Rhine into Germany and Austria. On May 8, 1945, in Berlin, De Lattre signed for France the German act of capitulation. Subsequently he became army inspector general, then commander of the Western European Union ground forces. Sent to Indochina in Dec. 1950, he brought the Vietminh offensive to a halt and undertook to organize a Vietnamese national army. Illness forced his return to Paris, where he died on Jan. 11, 1952. De Lattre published *Histoire* de *la Première Armée* (1949; Eng. trans., *The History* of the *French* First Army, 1952). (M. V.)

LATVIA (Lettish LATVIJA, Estonian LATIMAA. German LETTLAND, Polish ŁOTWA), a former independent republic of northeastern Europe incorporated into the U.S.S.R. in 1940 as a Soviet Socialist Republic bounded on the north by the Gulf of Riga and Estonia, on the east by Russian Soviet Federated Socialist Republic, on the south by Belorussian Soviet Socialist Republic and Lithuania and on the west by the Baltic sea.

Physical Geography.— The country is low-lying, one-fifth of it being less than 130 ft. above sea level and three-quarters no more than 400 ft. above. In the eastern region the surface is higher but, except for Gaizins hill (1,017 ft.), is nowhere higher than 950 ft. Geologically, the country is a platform of sedimentation, generally of Devonian formation, interrupted by a few vertical dislocations. The glacial period left deposits of gypsum, clay, limestone and chalk, as well as many peat bogs. There are 2,980 lakes, the most extensive being Lake Rezna (21.6 sq.mi.) in Latgale. Latvia's largest waterway. the Dvina (Daugava) river, rises in Russia, flows for 228 mi. through Latvia and empties into the Gulf of Riga, where its mouth is a mile wide. It is navigable throughout its entire course in Latvia. Forests cover 26.5% of the country. While the trees are mainly white pine and fir, birch, aspen, black alder, maple, ash, elm, linden and oak also occur. The climate is damp with annual precipitation averaging 27.9 in. The January medium temperatures vary from 30° F. at Liepaja (Libau) to 45° at Daugavpils (Dvinsk); the July averages are respectively 56° and 65°. Although the Gulf of Riga is ice-locked generally from mid-December until mid-March, the ports of Liepaja and Ventspils (Windau) are ice-free in winter.

History.— The ancestors of the present-day Latvians who call themselves *Latvieši* were the Latgals who, in the 9th century, inhabited the eastern half of the country; in the west. south of the Daugava, there were the Zemgals and farther west, along the Baltic coast, dwelled the Kurs. Together with the Lithuanians and ancient Prussians. the Latvians constituted a Baltic group of peoples akin to the Slavs. In the course of history. especially after the German conquest of all Livonia (*i.e.*, Latvia and Estonia together). the Latvian tribes not only fused together into one racial and linguistic group but also absorbed what remained of the ancient Livs. a Finno-Ugrian tribe. who inhabited the coast of the Gulf of Riga. The history of the German colonization of Latvia and Estonia is told in the article ESTONIA.

Until 1561 Latvia was an integral part of Livonia. the domain of the Teutonic Order. In 1561 Latvia was partitioned into two parts: Kurlandia. or Courland (*q.v.*), south of the Daugava, became an autonomous duchy under the suzerainty of the Polish crown; Latgale with Daugavpils and Rezekne and Vidzeme with Cesis (Wenden) became an integral part of Poland. Riga was incorporated into Poland in 1581, but was conquered by the Swedes in 1621. Eight years later Vidzeme became part of the Swedish dominion of Livonia, Latgale (Inflanty) remaining under Polish rule. Vidzeme, or northern Latvia, was in Russian hands from 1721; Latgale was annexed by Russia in 1772 at the first partition of Poland; and Kurlandia in 1795, at the third partition.

Under Russian Domination.— Although the country was under Russian rule, the influence of the German noblemen remained supreme for almost a century. Of the 12 Kuronian governors from 1795 to 1882, 10 were Germans; of the 15 governors of Livonia (*i.e.*, northern Latvia and southern Estonia) during the period 1790–1885, 14 were Germans. In Kurzeme and Zemgale in 1817 and in Vidzeme in 1819 local diets passed bills restoring to the peasants their personal freedom, but deprived them of their farmlands, declaring that these were manorial property. Only when the Russian agrarian law of 1861 was applied in Latgale, did the German squires of other Latvian provinces begin to sell small lots to the manorial farmsteaders. A class of Latvian smallholders then began to emerge.

When the farmers gained permission in the 1830s to settle in towns and take 'up trade, a Latvian middle class was born. The 1860s saw the emergence of a first generation of Latvian intelligentsia. By the end of the 19th century, as an inevitable outcome of growing industrialization and utilization by Russia of the Latvian ports, a new social class, the industrial proletariat, became vocal. At the time of the Russian Revolution of 1905, Latvian Socialists and peasants rose against the Tsarist regime and the German landlords. The repression was ruthless: about 2.000 Latvians were killed and about 8,000 were deported to Siberia.

In the first *duma* (1906) Latvians had five representatives, including Janis Čakste, but after the reduction of non-Russian members only two Latvians, including Janis Goldmanis, sat in the third and the fourth *duma*. Although in 1908 the tsarist government started a policy of Russification of the country, when World War I broke out Goldmanis declared in the *duma* that the Latvians would fight the Germans in the ranks of the Russian army. In 1915, when the Germans invaded Kurlandia, 355,000 Latvian peasants were evacuated to Russia. Goldmanis obtained from the Russian government the decree of Aug. 1. 1915. establishing eight battalions of Latvian Rifles. Later the whole force was increased to about 50.000.

War of Independence.— After the Revolution of March 1917 the Latvian National Political conference. convened at Riga, asked in July for complete political autonomy. Meanwhile on Sept. 3 the German army took Riga. After the Communist coup of Nov. 1917, a Latvian assembly was convened at Valka (Wolmar) and proclaimed itself the Latvian National council. However, by the treaty of Brest-Litovsk (March 3, 1918), the Soviet government ceded the Baltic countries to Germany and in April a German-controlled Landesrat was set up in Riga whose intention was to form a Baltic grand duchy comprising Latvia and Estonia whose hereditary ruler would be the king of Prussia.

On Nov. 18, 1918. the Latvian National council proclaimed the independence of Latvia. Janis Čakste, Gustav Zemgals and Karlis Ulmanis (*q.v.*) were respectively elected president, vice-president and premier of the republic. But the Soviet government, having declared the treaty of Brest-Litovsk null and void. established at Valmiera a Communist "government" headed by Peteris Stučka. An important section of the Latvian Rifles passed to the Red side and on Jan. 3, 1919, they took Riga. The Glmanis government moved to Liepaja. where it was protected by one British cruiser and six destroyers. On Feb. 3 Gen. Count Riidiger von der Goltz (*q.v.*) arrived at Liepaja with orders from the German high command to repulse the Reds and rebuild a sort of German-controlled *Baltikum*. He commanded a mixed force including 3,500 Latvians under Col. Janis Balodis. On April 16 the Germans tried to arrest the Latvian government but its members sought refuge on board a British ship. 'The Germans produced a,"government" headed by a Germanophile Latvian pastor. Andrievs Niedra. On May 22, Goltz's forces took Riga. Pushing northward. they were stopped near Cesis by the Estonian army under Gen. J. Laidoner which included 2,000 Latvians under Col. J. Zemitans. In the battle of June 19–22 the Germans were defeated and had to

abandon Riga, and the Ulmanis government returned there in July.

In June 1919 the Allied Supreme council in Paris appointed Gen. Sir Hubert Gough head of the Allied Military mission to the Baltic countries. He ordered Goltz to retreat with his force to East Prussia. But the Germans staged a transformation trick and declared themselves "White" Russians eager to fight the Communists. A Caucasian adventurer, Col. Prince Bermondt-Avalov, emerged as the new commander in chief. On Oct. 8 he attacked the Latvians and occupied the suburbs of Riga south of the river. By Nov. 10 the Latvians, helped by the artillery of four British and four French destroyers. had defeated the Germans who eventually retreated to East Prussia. Only Latgale remained in Red hands. This province was cleared by 33,000 Latvians under General Balodis, 20.000 Poles under Gen. Edward Smigly-Rydz and 6,000 volunteers of the *Landeswehr* which from July 1919 was under the command of Col. H. R. Alexander (later Earl Alexander of Tunis). On Jan, 5, 1920, the Poles took the fortress of Daugavpils; within two weeks the whole of Latvia was free.

Independence Restored. — On Aug. 11, 1920, a Latvian-Soviet peace treaty was signed in Riga by which the Soviet government renounced all rights over the Latvian people and territory. The Latvian constituent assembly which had been elected in April 1920 convened in Riga on May 1 and appointed Čakste head of state and Ulmanis premier. On Feb. 15, 1922, it adopted a constitution providing for a republic with a president and a unicameral parliament, or Saeima. of 100 members elected for three years.

The first Saeima comprised 22 political parties; in the fourth Saeima, elected in 1931, there were 24 parties. Governments changed frequently and had to be coalition cabinets. Between 1918 and 1934, 18 premiers held office. A reaction against such a system set in. Ulmanis, the premier, proposed a constitutional reform which was angrily opposed by the national minorities. the Social Democrats and the Communists. The German minority became nazified and Ulmanis had to suppress in 1934 the Latvian branch of the *Baltischer Bruderschaft* whose program was the incorporation of the Baltic states into the third reich. A Fascist organization called *Perkonkrust* (Thundercross) seemed ready to seize power. On May 15, 1934, Ulmanis and Balodis issued a decree declaring a state of siege. The Saeima and all the political parties were dissolved. On April 11, 1936. on the expiry of the second term of office of Pres. Albert Kviesis, Clmanis succeeded him. A corporative form of government came into effect. The country's economic position considerably improved. Latvia had concluded a nonaggression treaty with the U.S.S.R. on Feb. 5, 1932.

Independence **Lost.**—When World War II started in Sept. 1939, the fate of Latvia had been already decided in the secret protocol of the so-called German-Soviet nonaggression treaty of Aug. 23. In October Latvia had to sign a dictated treaty of mutual assistance by which the U.S.S.R. obtained military. naval and air bases on Latvian territory. On June 16, 1940, Latvia mas invaded by the Red army, while A. Y. Vyshinski arrived in Riga to sovietize the country. On June 20 the formation of a new government headed by August Kirchensteins was announced; on July 14–1j a mockery of an election was staged; on July 21 Ulmanis and Balodis were arrested; on the same day the new Saeima voted for the incorporation of Latvia into the U.S.S.R. and on Aug. 5 the U.S.S.R. accepted this incorporation. During the first year of Soviet occupation about 35,000 members of Latvian intelligentsia were deported to northern Russia and Siberia.

Following the German attack on the U.S.S.R., from July 1941 to Oct. 1944, Latvia was a province of a larger "Ostland" consisting of three Baltic republics and of Byelorussia. After the reconquest of Latvia by the Soviet army the Soviet regime was restored with Kirchensteins as chairman of the presidium of the supreme soviet and Vilis Lacis as chairman of the council of ministers. The former was succeeded in April 1952 by Karlis Ozolins. In Nov. 1959 Janis Kalnberzins, from 1940 first secretary of the Latvian Communist party, succeeded Ozolins while Janis Peive was appointed chairman of the council of ministers. Arvid Pelse succeeded Kalnberzins at the key party post.

Population and Territory. — On the eve of World War I the country's population was 2,552,000. The census of 1920 revealed only 1,596,931 inhabitants. At the 1935 census the population had risen to 1,950,502, the increase being partly explained by the return of 236,000 Latvian refugees from Russia. In 1935 the population included 1,472,612 Latvians (75.5%). 206,499 Russians (10.6%), 93,479 Jews (4.8%), 62,114 Germans (3.2%) and 48,949 Poles (2.5%). According to religion the composition of the population in 1935 was: Lutheran 56.1%, Roman Catholic 24.5%, Orthodox 8.9%, Jewish 4.8% ; Old Believers (Russians) 5.5%.

During 1939–49 the population was reduced by the evacuation to Germany of 60,000 Germans, by the Germans' murder of about 80,000 Jews, and by deportations to Russia of about 105,000 Latvians; in addition 115,000 Latvians escaped to Germany. Nevertheless, according to the Soviet census of Jan. 15, 1959, the country had 2,195,458 inhabitants.

Riga. the capital, in 1914 had 517,000 inhabitants, but in 1920 only 212,000. In 1935 its population had risen to 385,100, including 242.700 Latvians and 38,500 Germans; and to 580.423 in 1959. The population of other towns was: Liepaja (1959) 71,000; Daugavpils (1959) 65,000; Jelgava (1959) 36,300. The area of the independent republic was 25,395 sq.mi. In 1958 the area was 24.594 sq.mi.

Education. — Before World War I Latvia had one of the lowest illiteracy rates in the Russian empire. Illiteracy then was 22%; in 1937 it was 10%. The number of schools and pupils in independent and in Soviet Latvia was as follows (first figure 1939; in parentheses 1950): schools, elementary 1,895 (1,598), pupils 229,825 (232,000); secondary 114 (96), pupils 25,225 (30,000). In 1919 the Latvian university was opened in Riga and by 1939 it had 7,281 students and a teaching staff of 446. In 1958 Latvia had 9 institutions of higher education with a total of 18,200 students.

Economy. — On Sept 16, 1920, the Agrarian Reform act was adopted by the constituent assembly. It limited the size of estates to 123 5 ac. and that of new farms to 54 3 ac. From the 1,338 confiscated large estates, mainly German, which had covered 48% of the country, it created a land fund of 8,492,000 ac. The reform was completed in 1937 and in that year there were 237,500 farms, including 103,648 new farms. More than 63% of the population were engaged in agriculture, while 13% drew their living from industry. Agriculture contributed 4070 of the national income which by 1938 was estimated at $400,000,000.

The average cereal harvest was 30% higher in 1931–33 than it was in 1909–13, while the potato crop doubled. The yearly average crops in 1937–39 were as follows (in metric tons): rye 409,700; wheat 186,900; barley 215,900; oats 433,800; potatoes 1,729,700; flax 22,300. Between 1920 and 1938 the number of head of cattle increased by 60% and amounted to 1,224,350. Other livestock also increased and in 1938 the country had 813,500 pigs, 1,360,460 sheep and 414,000 horses In 1957 the country had 811,000 head of cattle, 676,000 pigs and 535,000 sheep and goats

Under the Communist regime collectivization of agriculture started in 1947: by 1949 there were 4,115 kolkhozy or collective farms; by 1957 the number was reduced to 1,259. There were also 123 sovkhozy or state farms.

Between 1940 and 1957 industrial production increased considerably: the generation of electric power rose from 251,100,000 to 1,211,600,000 kw hr ; the production of steel from 27,900 to 86,800 tons; of cement from 125,000 to 415,000 tons; of cotton fabrics from 20,600,000 to 47,100,000 metres; and of radio sets from 21,500 to 485,000.

In 1934–35 the budget revenue amounted to 139,100,000 lats and expenditure to 139,600,000 lats; in 1938–39 the respective figures were 204,800,000 lats and 186,500,000 lats. In 1938 the lat's exchange rate was 19.3 U.S. cents In Sept. 1940 Soviet currency was introduced with an exchange rate of 1 rouble per lat. In 1950 the budget of the Latvian S S.R. was balanced at 1,470,100,000 roubles; that of 1959 was balanced at 4,086,764,000 roubles

The length of railways increased between 1921 and 1938 from 2,603 km. to 3,350 km, and that of roads, between 1928 and 1938, from 26,280 km to 34,513 km. In 1939 Latvia had 82 sea-going ships totaling 200,585 gross tons.

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LATVIAN LANGUAGE: *see* LETTISH (LATVIAN) LANGUAGE.

LAUBE, HEINRICH (1806–1884). German dramatist, novelist and theatre director, was born at Sprottau. Silesia. on Sept. 18, 1806. He studied theology at Halle and Breslau (1826–29) and settled in Leipzig in 1832. Some early writings and his share in the literary movement known as *Das junge Deutschland* brought him under police surveillance, and his works were confiscated. On his return in 1834 from a journey to Italy, undertaken in the company of Karl Gutzkow, Laube was expelled from

Saxony and imprisoned for nine months in Berlin. In 1837 he was again imprisoned for his revolutionary sympathies. In 1839 he returned to Leipzig and began to write plays. Chief among his earlier productions are the tragedies *Monaldeschi* (1845) and *Struensee* (1847); the comedies *Rokoko, oder die alten Hevven* (1846); *Gottsched und Gellert* (1847); and *Die Karlsschüler* (1847). of which the youthful Schiller is the hero. In 1848 Laube was elected to the national assembly at Frankfurt-on-Main for the district of Elbogen but resigned in the spring of 1849 when he was appointed artistic director of the Hofburg theatre in Vienna. This office he held until 1867, and in this period fall his finest dramatic productions, notably the tragedies *Graf Essex* (18 j6, still occasionally acted) and *Montrose* (1859) and his historical romance *Der deutsche Krieg* (1865–66, 9 vol.), which graphically pictures a period in the Thirty Years' War. In 1869 he became director of the Leipzig Stadttheater, but returned to Vienna in 1870, where in 1872 he was director of the new Stadttheater. With the exception of a short interval he managed this theatre with brilliant success until his retirement from public life in 1880. Laube's work as theatre manager left its mark on the German stage. and he has given an invaluable record of his work in Vienna and Leipzig in *Das Burgtheater* (1868), *Das norddeutsche Theater* (1872) and *Das Wiener Stadttheater* (1875). He died at Vienna on Aug. 1, 1884. To his later years belong the novels *Die Böhminger*.(1880), *Louison* (1881), *Der Schatten-Wilhelm* (1883) and his *Erinnerungen, 1841–1881* (1882).

His *Gesammelte Schriften* (excluding his dramas) were published in 16 vol. (1875–82); his *Dramatische Werke* in 13 vol. (1845–75); *see* also M. Moorman, *Die Bühnentechnik Heinrich Lnubes.*

LAUD, WILLIAM (1573–1645), English archbishop, only son of William Laud. a cldthier, was born at Reading on Oct. 7, 1 j73. He was educated at Reading free school, matriculated at St. John's college, Oxford, in 1589, gained a scholarship in 1590, a fellowship in 1593, and graduated B.A. in 1594, proceeding to D.D. in 1608. In 1601 he took orders, in 1603 becoming chaplain to Charles Blount, earl of Devonshire, whom he married to Penelope, the divorced wife of Lord Rich. which he afterward bitterly repented. Laud early took up a position of antagonism to the Calvinistic party in the church, and in 1604 was reproved by the authorities for maintaining in his thesis for the degree of B.D. "that there could be no true church without diocesan bishops." and again in 1606 for advocating "popish" opinions in a sermon at St. Mary's. Laud in 1607 mas made vicar of Stanford in Northamptonshire, and in 1608 became chaplain to Bishop Neile, who in 1610 presented him to the living of Cuxton, when he resigned his fellowship. In 1611, in spite of the influence of Archbishop Abbot and Lord Chancellor Ellesmere, Laud was made president of St. John's, and in 1614 obtained in addition the prebend of Buckden, in 1615 the archdeaconry of Huntingdon and in 1616 the deanery of Gloucester. In 1617 he went with the king to Scotland, and aroused hostility by wearing the surplice. In 1621 he became bishop of St. David's, when he resigned the presidentship of St. John's.

In May 1622 Laud! by the king's orders. took part in a controversy with Percy, a Jesuit. known as Fisher, to prevent the conversion of the countess of Buckingham to Romanism. He acknowledged the Roman Church as a true church and a branch of the Catholic body. but attacked the claim to the pope's infallibility; and with regard to the English Church he denied that all its 39 articles were fundamental. The foundation of belief was the Bible, and when dispute on matters of faith arose, "a lawful and free council, determining according to Scripture. is the best judge on earth." 4 close intimacy between Laud and Buckingham, the countess's son, now began, and proved the chief instrument of Laud's advancement. On the accession of Charles. Laud's activities were allowed free scope. A list of the clergy was prepared by him for the king. in which each name was labelled with an O or a P, distinguishing the Orthodox to be promoted from the Puritans to be suppressed. Laud defended Richard Montague, whose pamphlet against Calvinism had angered parliament. He supported the king's prerogative throughout the conflict with the parliament, preached in favour of it before Charles's second parliament in 1626 and assisted in Buckingham's defense. In 1626 he was nominated bishop of Bath and Wells, and in July 1628 bishop of London. On April 12, 1630. he was elected chancellor of Oxford university after a bitter contest.

At Oxford Laud carried out many useful reforms, including the codification of the statutes, the statute by which public examinations were rendered obligatory for university degrees. and the ordinance for the election of proctors, the revival of the college system and of moral and religious discipline and order, and of academic dress. He founded a readership in Arabic, procured in 1636 the royal charter to print all kinds of books, and obtained for the Bodleian library more than 1,300 mss.. adding a new wing to the building to contain his gifts. His rule at Oxford was marked by a great increase in the number of students. In his own college he erected the new buildings, and was its second founder. Of his chancellorship he himself wrote a history, and the Laudian tradition long remained the great standard of order and good government in the university. Elsewhere he showed his liberality and his zeal for reform. He was an active visitor of Eton and Winchester, and endowed the grammar school at Reading, where he was himself educated. In London he procured funds for the restoration of the dilapidated cathedral of St. Paul's.

As a judge he showed a tyrannical spirit both in the star chamber and high commission court, threatening Felton, the assassin of Buckingham, with the rack, and showing special activity in procuring a cruel sentence in the former court against Alexander Leighton in June 1630 for a diatribe against episcopacy. His power was greatly increased after his return from Scotland, whither he had accompanied the king, by his promotion to the archbishopric of Canterbury in Xug. 1633. "As for the state indeed,'! he wrote to Wentworth (the earl of Strafford) on this occasion, "I am for *Thorough*." In 1636 the privy council decided in his favour his claim of jurisdiction as visitor over both universities. Soon afterward he was placed on the commission of the treasury and on the committee of the privy council for foreign affairs. He was all-powerful in both church and state. He proceeded to impose by authority the religious ceremonies and usages to which he attached so much importance. He wished to enforce a decent and uniform order in services because he felt that "outward worship" was a witness to the true "inward worship of the heart." He tried to get repaired the fabric of churches, much neglected since the Reformation. The pulpit was no longer to be the chief feature in the church, but the communion table. The Puritan lecturers were suppressed. He showed great hostility to the Puritan Sabbath, and supported the reissue of the *Book of Spouts*, especially odious to that party. Wherever he could he insisted on the use of the Prayer Book among Englishmen abroad and aliens in England. In 1637 he took part in the sentence of the star chamber on Prynne, Bastwick and Burton, and in the same year in the prosecution of Bishop Williams. He urged Strafford in Ireland to carry out the same reforms and severities.

He was now to extend his ecclesiastical system to Scotland. The new prayer book and canons mere drawn up by the Scottish bishops with his assistance. Presbyterian Scots hated them as an attack not only on the national religion, but on the national independence, signed the national league and covenant in 1638, raised an army, and defied Charles I and Laud. Laud continued to support Strafford's and the king's arbitrary measures to the last. Though at first opposed to the sitting of convocation, after the dissolution of parliament in 1640, as an independent body: on account of the opposition it would arouse, he yet caused to be passed in it the new canons which both enforced his ecclesiastical system and asserted the king's divine right, resistance to his power entailing "damnation." Laud's infatuated policy could go no further, and the et cetera oath. according to which whole classes of men were to be forced to swear perpetual allegiance to the "government of this church by archbishops, bishops, deans and archdeacons, etc.," was long remembered and derided. He was attacked and reviled as the chief author of the troubles on all sides. In October he was ordered by Charles to suspend the et cetera oath. The same month. when the high commission court was sacked by the mob, he was unable to persuade the star chamber to punish the offenders.. On Dec. 18, 1640, he was impeached by the Long parlia-

ment. and on March 1, imprisoned in the Tower. On May 12, at Strafford's request, the archbishop appeared at the window of his cell to give him his blessing on his way to execution, and fainted as he passed by. On May 31. 1643, Prynne received orders from the parliament to search his papers, and published a mutilated edition of his diary. The articles of impeachment were sent up to the lords in October: the trial beginning on March 12, 1644, but the attempt to bring his conduct under a charge of high treason proving hopeless, an attainder was substituted and sent up to the lords on Nov. 22. In these proceedings there was no semblance of respect for law or justice, the lords yielding (Jan. 4. 1645) to the menaces of the commons. Laud now tendered the king's pardon, which had been granted to him in April 1643. This was rejected, and it was with some difficulty that his petition to be executed with the axe, instead of undergoing the ordinary brutal punishment for high treason, was granted. He suffered death on Jan. 10 on Tower hill. asserting his innocence of any offense known to the law, repudiating the charge of "popery," and declaring that he had always lived in the protestant Church of England. He was buried in the chancel of All Hallows, Barking, whence his body was removed on July 24, 1663, to the chapel of St. John's, Oxford.

Laud never married. He is described by Fuller as "low of stature, little in bulk, cheerful in countenance (wherein gravity and quickness were all compounded), of a sharp and piercing eye, clear judgment and (abating the influence of age) firm memory." His personality, on account of the sharp religious antagonisms with which his name is inevitably associated, has rarely been judged with impartiality. His severities were the result of a narrow mind and not of a vindictive spirit, and their number has certainly been exaggerated. His career was distinguished by uprightness, by piety, by a devotion to duty, by courage and consistency. In particular it is clear that the charge of partiality for Rome is unfounded, but he was unfortunate in that unscrupulous enemies could misrepresent his measures as popish. Laud's complete iailure to appreciate the strength of puritanism is a principal prooi of his total lack of true statesmanship. The hostility to "innovations in religion" may have been a stronger cause of the great rebellion than even the violation of constitutional liberties; and to Laud, thereiore, more than to Strafford, to Buckingham or even perhaps to Charles himself, may be especially due the responsibility for the catastrophe. He held fast to the great idea of the catholicity of the English church, to that conception of it which regards it as a branch of the whole Christian church. and emphasizes its historical continuity and identity from the time of the apostles, but here again his policy was at fault; for his despotic administration not only excited and exaggerated the tendencies to separatism and independency which finally prevailed, but alienated churchmen from communion with their church and from their country. The emigration to Massachusetts from 1629 onward was composed not only of Separatists but also of Episcopalians. Thus what Laud grasped with one hand he destroyed with the other.

Spiritual influence, in Laud's opinion, was not enough for the church. The church as the guide of the nation in duty and godliness, even extending its activity into state affairs as a mediator and a moderator, was not sufficient. Its power must be material and visible, embodied in great places of secular administration and enthroned in high offices of state Thus the church, descending into the political arena, became identified with the doctrines of one political party in the state—doctrines odious to the majority of the nation—and at the same time became associated with acts of violence and injustice. Equally disastrous to the state was the identification of the king's administration with one party in the church, and that with the party in a minority not only in the nation but even among the clergy themselves

BIBLIOGRAPHY.—All Laud's works are to be found in the *Library* of *Anglo-Catholic Theology* (Oxford, 7 vol), including his sermons (of no great merit), letters, history of the chancellorship, history of his troubles and trial. and his remarkable diary, the manuscripts of the last two works being the property of St. John's college. Peter Heylyn's *Cyprianus Anglicus* (London, 1668) is still valuable. Various modern opinions of Laud's career can be studied in *Congregational Union Jubilee Lectures,* vol. i (London, 1882); W. H. Hutton, *Wm. Laud* (London, 1895); *Archbishop Laud Commemoration,* ed. by W. F. Collins (lectures, bibliography, catalogue of exhibits, London, 1895); W. F. Hook, *Lives of the Archbishops of Canterbury,* 12 vol. (London, 1860–76); H. Bell, *Archbishop Laud and Priestly Government* (London. 1905); A. S. Duncan-Jones, *Archbishop Laud* (London, New York, 1927); H. R. Trevor-Roper, *Archbishop Laud* (London, New York, 1940). (G. Ds.)

LAUD, a term meaning praise. now rarely found in this sense except in poetry or hymns. Lauds is the name for the second of the offices of the canonical hours in the Roman breviary, so called from the three *laudes* or psalms of praise. cxlviii–cl, which form part of the service *(see* BREVIARY and HOURS, CANONICAL).

LAUDANUM, originally the name given by Paracelsus to a famous medical preparation of his own. composed of gold, pearls, etc., but containing opium as its chief ingredient. The term is now only used for the alcoholic tincture of opium (*q.v.*).

LAUDER, SIR HARRY (MACLENNAN) (1870–1950), British music-hall comedian, who excited enthusiasm throughout the English-speaking world as singer and composer of simplehearted Scottish songs, was born at Portobello, Edinburgh, on Aug. 4, 1870. While a child labourer in a flax mill he won singing competitions but worked in a coal mine for ten years before joining a concert party that took him to Belfast, Birkenhead and other places which claim to have seen his professional debut. The first songs that he wrote and sang were Irish or English, but when he came to London, to Gatti's music hall, in May 1900, he was wearing the kilt. Later he wore trousers for his character studies only, such as "Saftest of the Family" and "It's Nice to Get Up in the Morning." During his week's engagement at Gatti's a gap occurred, through illness, in the program at the Tivoli, and he stepped into it with "Lass o' Tobermory," an immediate success. Until then his songs had all been comic. With "I Love a Lassie" he struck the homely poetic note that gave charm to "When I Get Back Again to Bonnie Scotland" and "Roamin' in the Gloamin'." His range extended from the bibulous "Just a Wee Deoch and Doris" to the hortatory "End of the Road." With a large repertoire of his own songs (some verses partly by other persons) he toured America, South Africa and Australia. and during World War I he sang to troops in France. He gave many concerts for war charities and was knighted in 1919. On tour in 1935 he still acted the amorous exuberance of youth. He published four books of reminiscences and acted in several films. He died at Strathaven, Lanarkshire, on Feb. 26, 1950. (M. W. D.)

LAUDER, a royal and small burgh of Berwickshire, Scot., on the Leader, 27 mi. S.E. of Edinburgh by road. Pop. (1951) 623. The burgh is said to date from the time of William the Lion (1165–1214); its charter was granted in 1502. In 1482 James III with his court and army rested there on the way to raise the siege of Berwick. Robert Cochrane, earl of Mar, was hanged with other royal favourites by "Bell-the-Cat" Douglas, earl of Angus (*q.v.*), and other nobles at Lauder bridge, in sight of the king.

LAUDERDALE, JAMES MAITLAND, 8TH EARL OF (1759–1839), was born at Ratho, Midlothian, on Jan. 26, 1759. He was M.P. from 1780 to Aug. 1789, when he succeeded his father in the earldom. He was a Scottish representative peer, 1790–96. In 1806 he was made a peer of the United Kingdom as Baron Lauderdale of Thirlestane, and was keeper of the great seal of Scotland in the "talents" ministry, 1806–07. In early life he was a follower of Charles James Fox, but became a Tory in 1820 and voted against the Reform bill in 1832. He died at Thirlestane castle, Berwickshire, on Sept. 13, 1839. He wrote *An Inquiry Into the Nature and Origin* of *Public Wealth* (1804) and *The Depreciation of the Paper-currency of Great Britain Proved* (1812). (A. AL.)

LAUDERDALE, JOHN MAITLAND, DUKE OF (1616–1682), eldest surviving son of John Maitland, 2nd Lord Maitland of Thirlestane (d. 1645), who was created earl of Lauderdale in 1624. was born on May 24, 1616, at Lethington. He began public life as a zealous adherent of the Presbyterian cause, took the covenant. sat as an elder in the assembly at St. Andrews in July 1643 and went to England as a commissioner for the covenant in August and to attend the Westminster assembly in November. In Feb. 1644, at Uxbridge, he tried to persuade Charles to agree to the establishment of presbyterianism. In 1645 he advised Charles to reject the proposals of the Independents, and in 1647 approved the king's surrender to the Scots.

At this period Lauderdale veered round completely to the king's cause, offering the aid of the Scots, on the condition of Charles's consent to the establishment of presbyterianism, and on Dec. 26, he obtained from Charles at Carisbrooke "the engagement" with the Scots on these lines. Returning to Scotland, in the spring of 1648, Lauderdale joined the party of Hamilton in alliance with the English royalists. Their defeat at Preston postponed the

arrival of the prince of Wales; but Lauderdale had an interview with the prince in the Downs in August, and he persuaded him later to accept the invitation to Scotland from the Argyll faction, accompanied him thither in 16jo and in the expedition into England. He was taken prisoner at Worcester in 1651, remaining in confinement till March 1660. He joined Charles in May 1660 at Breda. On his accession Charles made him secretary of state. He was lodged at Whitehall and was "never from the king's-ear nor council." He abandoned Argyll to his fate, permitted. if he did not assist in, the restoration of episcopacy in Scotland, and after triumphing over all his opponents in Scotland drew into his own hands the whole administration of that kingdom; he imposed on Scotland the absolute supremacy of the crown in church and state. and took severe measures against the Covenanters.

Lauderdale was a member of the cabal ministry, but took little part in English affairs. In 1672 he u-as created duke of Lauderdale and earl of March, and knight of the garter. In 1673, on the resignation of James in consequence of the Test act, he was appointed a commissioner for the admiralty. In October he visited Scotland to suppress the dissenters and obtain money for the Dutch war. In 1674 he was created earl of Guilford and Baron Petersham in the peerage of England. His ferocious measures having failed to suppress the conventicles in Scotland. he summoned to his aid in 1677 a band of Highlanders, who were sent into the western country. He held his place in spite of all efforts to dislodge him.

On June 22, 1679, the last attempt of the unfortunate Covenanters was suppressed at Bothwell Brig. In 1680, however, failing health obliged Lauderdale to resign; in 1682 he was stripped of all his offices, and he died in August. Lauderdale left no male issue, consequently his dukedom and his English titles became extinct, but he was succeeded in the earldom by his brother Charles (d. 1691).

See *The Lauderdale Papers,* ed. *by* Osmond Airy for the Camden Society (1884–85); *Hamilton Papers* published *by* the same society; "Lauderdale Correspondence With Archbishop Sharp,:' *Scottish Hist. Soc. Publications,* vol. 15 (1893); Burnet's *Lives of the Hanziltons* and *History of His* **Own** *Time; R.* Baillie's *Letters.*

LAUE, MAX THEODOR FELIX VON (1879–1960), German physicist, recipient of the 1914 Nobel prize in physics for his work on the diffraction of X rays in crystals, was born Oct. 9. 1879, at Pfaffendorf, near Coblenz. He attended the universities of Strasbourg, Gottingen and Munich and became an assistant in the University of Berlin and later in Munich, being subsequently called to the University of Ziirich as professor (1912). From there he went to the University of Frankfurt (1914), finally proceeding to the University of Berlin (1919) as a director of the Institute for Theoretical Physics. where he became emeritus professor in 1943. In 1951, Laue became director of the Max Planck institute for research in physical chemistry in Berlin. He died in Berlin on April 24, 1960.

Laue specialized in theoretical physics and was a champion of Albert Einstein's theory of relativity. He also devoted his attention to the quantum theory. to the Compton effect (alteration of the frequency of Röntgen rays), to the "Einstein-Bohr equation" and the disintegration of atoms. Besides his work for various scientific publications, he also had many articles published in the daily press. He was the first to suggest the use of a crystal to act as a grating for the diffraction of X rays. showing that if a beam of X rays passed through a crystal, diffraction would take place and a pattern would be formed on a photographic plate placed at right angles to the direction of the rays. This was verified experimentally in 1912 by W. Friedrich and P. Knipping. working under the direction of Laue. and was the starting point of much subsequent work on X rays and crystal structure.

Laue's published works include: *Über e. Versuch z. Optik d. bewegten Körper* (1911); *Die Relativitätstheorie* (1911; 3rd ed., 1952–53); *Röntgenstrahleninterferenzen* (1941); *Geschichte der Physik* (1946; 3rd ed., 1950; Eng. trans., 1950); and *Theorie der Supraleitung* (1947; 2nd ed., 1949; Eng. trans.. 1952).

See also his autobiography in H. Hartmann, *Schöpfer des neuen Weltbildes* (1952).

LAUENBURG, a former duchy of Germany, at one time also belonging with Holstein to Denmark, but from 1865 to Prussia, and now included in the *Land* of Schleswig-Holstein. It lies on the right bank of the Elbe and has an area of 453 sq.mi. The surface is an undulating plain with fertile alluvial soils. *(See* PRUSSIA.)

The earliest inhabitants of the district were a Slav tribe, the Polabes, who were gradually replaced by colonists from Saxony. About the middle of the 12th century the country was subdued by the duke of Saxony, Henry the Lion, who founded a bishopric at Ratzeburg, and after Henry's fall in 1180 it formed part of the smaller duchy of Saxony, which was governed by Duke Bernhard. In 1203 it was conquered by Waldemar II, king of Denmark, but in 1227 it reverted to Albert, a son of its former duke. When Albert died in 1260 Saxony was divided. Lauenburg (Saxe-Lauenburg) became a separate duchy ruled by his son John, and had its own lines of dukes for over 400 years, one of them, Magnus I (d. 1543), being associated with the Renaissance movement. The reigning family, however, became extinct when Duke Julius Francis died in Sept. 1689, and there were at least eight claimants for his duchy, chief among them being John George III, elector of Saxony, and George William, duke of Brunswick-Lüneburg-Celle, the ancestors of both these princes having made treaties of mutual succession with former dukes of Saxe-Lauenburg. George William was ultimately recognized as duke. Lauenburg next passed to his nephew, George Louis, elector of Hanover, afterward king of Great Britain as George I, whose rights were recognized by the emperor Charles VI in 1728. In 1803 the duchy was occupied by the French, and in 1810 it was incorporated with France. It reverted to Hanover after the battle of Leipzig in 1813, and in 1816 was ceded to Prussia, the greater part of it being at once transferred by it to Denmark in exchange for Swedish Pomerania. In 1848, when Prussia made war on Denmark. Lauenburg was occupied at its own request by Hanoverian troops, and was administered for a time by the German confederation, being restored to Denmark in 1851. Definitely incorporated with this country in 1853, it experienced another change of fortune after the war of 1864 between Denmark on the one side and Prussia and Austria on the other, as by the peace of Vienna (Oct. 30, 1864) it was ceded with Schleswig and Holstein to the two German powers. By the convention of Gastein (1865) Austria surrendered its claim to Prussia in return for payment and in 1865 King William I took formal possession of the duchy. Lauenburg entered the North German confederation in 1866 and the German empire in 18 jo. It retained its constitution and its special privileges until 1876, when it was incorporated with the kingdom of Prussia. It ceased to be a duchy in 1918.

LAUGHTER is commonly regarded as the expression of various feelings, such as sheer joy, lightness of heart, amusement, and feelings more grave than any of these. It is mainly *a human phenomenon.* Among louer animals laughter is a very rare occurrence if, indeed, it is met with at all. Man is the laughing animal *par excellence.* And man is also the principal butt of laughter, though not the only one. He is the most *laughed* at as well as the chief or sole *laughing animal.* From the point of view of the student of psychology laughter presents the following main problems. (1) What is it that provokes laughter? Intimately connected with this problem is the question whether or not there are different varieties of laughter. (2) The second main problem is: What is the function of laughter?

(1.) The Causes of Laughter. — One obvious cause of laughter barely deserves passing mention, namely, tickling. This sort of laughter is a purely physiological or reflex reaction, and not the spontaneous expression of a feeling. And here we are only concerned with laughter as an expression of feeling induced by the observation, memory, imagination. or contemplation of something or other. The problem before us is, what kind of things or situations make us laugh, or are felt to be ludicrous, when we observe or contemplate them? Some writers have attempted to reduce them all to one class, or to find in them all one common characteristic which makes them ludicrous or provokes us to laughter. But these writers do not agree among themselves; each identifies the common cause or essential character-

istic with some other feature of the ludicrous situation. Thus Hobbes, for instance, held that any awkwardness or other deformity or imperfection in others makes one laugh because it heightens his self-esteem and so pleases him. The same sort of "sudden glory" (as Hobbes calls it) may be produced more directly by the apprehension of some excellence in oneself. Such exultation may account for some cases of laughter, but certainly not for all cases. Schopenhauer, on the other hand, found the cause of laughter in the incongruity of what is apprehended. The sudden perception of incongruity certainly is a frequent source of laughter, and a common device for provoking it. Recently Bergson has attempted another general explanation. According to him, it is always the perception of the substitution of mere mechanism for adaptive pliancy that provokes laughter. Many cases of laughter caused by observed awkwardness, carelessness, thoughtless routine, etc., would certainly come under Bergson's description. But as an all-inclusive theory Bergson's view cannot be regarded as satisfactory. *Prima facie,* it seems unlikely that any uniform explanation will fit all the facts. Everyday language seems to bear witness to the existence of different kinds of laughter, provoked by different kinds of causes or situations. We commonly distinguish somehow between the ridiculous. the comic, the humorous, etc., on the one hand, and between laughter that is gay or grave, derisive or scornful, etc., on the other hand. In Heine's poem called "Woman," the four stanzas of which it is made up depict each a totally different situation, passing from gaiety to tragedy, but each ends "and she laughed." Needless to say, the laughter is very different in each case, as every good recitation of the poem makes the hearer realize.

(2.) The Function of Laughter. — For the merely physiological function of laughter a passing reference must suffice — laughter benefits the lungs and is an outlet for some forms of superfluous energy. But we are concerned with the mental function or functions of laughter. In a general sort of way it is commonly realized that laughter has a useful function in human life. Laughter enables man to beguile the present, just as forgetfulness shields him from the past, and hope helps him to face the future. But, leaving aside such vague popular philosophy, various theories have been put forward by psychologists and philosophers. The most interesting of them is the view of Bergson. Bergson begins by pointing out that laughter is mainly a *social* phenomenon. "Our laughter" (he says) "is always the laughter of a group. It may, perchance, have happened to you, when sitting in a railway carriage or at a *table d'hôte,* that you heard travellers relating to one another stories which must have appeared comic to them, for they laughed heartily. If you had been one of their company, you would have laughed with them; but, as you were not, you felt no desire whatever to do so. A man who was once asked why he did not weep at a certain sermon, when everybody else was shedding tears, replied: 'I don't belong to this parish.' What that man felt about tears is even more true of laughter. However spontaneous it seems, laughter always implies a kind of freemasonry, or even complicity, with other laughers, real or imaginary. It has often been remarked that the fuller the house, the more uncontrolled is the laughter of the audience. On the other hand, as has also often been remarked, many comic effects cannot be translated from one language into another, because they refer to the habits and thoughts of a particular social group." It seems, therefore, natural that Bergson should attribute to laughter a special *social* function. And so he does. Laughter, according to Bergson, is a kind of social "ragging," a method of "breaking in" people to the forms and conventions of society, a way of curing eccentricity and unsociability in their early stages. "What life and society require of each of us is a constantly alert attention, that discerns the outlines of the present situation, together with a certain elasticity of mind and body to enable us to adapt ourselves accordingly. *Tension* and *elasticity* are two mutually complementary forces which life brings into play. If these two forces are lacking in the body to any considerable extent, we have sickness and infirmity and accidents of every kind. If they are lacking in the mind, we find every degree of mental deficiency, every variety of insanity. Finally, if they are lacking in the character, we have cases of the gravest inadaptability to social life. . . . Society is therefore suspicious of all *inelasticity* of character, of mind, and even of body, because it is the possible sign of a slumbering activity as well as of an activity with separatist tendencies that inclines to swerve from the common centre round which society gravitates. . . . And yet society cannot intervene at this stage by material repression, since it is not affected in a material fashion. It is confronted with something that makes it uneasy, but only as a symptom — scarcely a threat; at the very most a gesture. A gesture, therefore, will be its reply. Laughter must be something of this kind, a sort of *social gesture."*

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LAUMONT, FRANÇOIS PIERRE NICHOLAS GILLET DE (1747–1834), French mineralogist, was born in Paris on May 28, 1747. He was educated at a military school and served in the army from 1772–84, when he was appointed inspector of mines. His leisure was given to mineralogy, and he assisted in organizing the new École des Mines in Paris. The mineral laumontite was named after him by Haüy. He died in Paris on June 1, 1834.

He was author of numerous mineralogical papers in the *Journal* and *Annales des Mines.*

LAUNCESTON, chief city of northern Tasmania, Austr., is situated where the confluence of two rivers (North Esk and South Esk) forms the Tamar, a navigable tidal estuary which winds through 40 mi. of "drowned valley" to Bass strait. Pop. (1954) 37,627.

The setting is hilly and picturesque and the Cataract gorge of the South Esk cuts through the town less than half a mile from the shopping centre. There are numerous well-planned parks and open spaces, and the equable climate (average annual temperatures: 64.5° F. to 44° F.; annual rainfall 27 in.) adds attraction as a tourist centre. It forms the hub of the rail and road systems of the north and is the possessor of the airport nearest to the mainland.

There is a large export and import trade by air and sea, the shipping being handled partly by the wharves at Launceston, and partly by other wharves on both shores of the estuary, all under the control of the Launceston Marine board. The chief exports are agricultural produce, timber, apples, wool and textiles, and aluminum from the vast new commonwealth aluminum plant at Bell bay.

Large woollen mills, railway engineering works, a brewery, flour mills and potteries have long been a source of industrial prosperity, and cheap hydroelectric power has drawn many other industries to establish model factories in the city, the largest of these being Tasmanian Board mills, covering about 50 ac. The city was founded in 1804–05.

LAUNCH. (1) A verb meaning originally to hurl a missile or other object, or to shoot out suddenly. (Lat. *lanceare,* to hurl, from *lancea,* a spear.) It is particularly used of the setting afloat a vessel from the stocks on which she has been built.

(2) The name of a type of boat, usually the largest size of ships' boats, or a large boat moved by electricity, steam or other power. The word is an adaptation of the Span. *lancho,* pinnace.

LAUNDRY INDUSTRY. Laundering is as old as mankind and became an organized business in the United States when the "Forty-niners" joined the gold rush to California. Not a woman was to be found within 500 miles and one disillusioned miner turned laundryman. By 1851, the Contra Costa laundry was operating in Oakland, Calif. A clean shirt became symbolic of the American way of life.

Up to 1917, laundry remained a shirt and collar business. With World War I came large-scale expansion, the beginning of wet wash. and services priced by the pound. Under the pressure of global war, the U.S. government in 1942 declared "laundry service essential to the health and welfare of the people and a vital contribution to the war effort," and became the biggest laundry owner in the world, operating more than 600 mammoth plants in the U.S. and overseas. Outside the U.S., the industry developed

chiefly in England, Canada, Australia, New Zealand and South Africa.

Laundries thrive in democratic countries where the status of women, position of labour and standard of living are relatively high.

By mid-20th century, measured by the number of employees, the laundry industry was one of the nation's larger industries and the leader among service industries. The volume of sales increased consistently every year after 1933.

The laundry industry is permanent. its service being always needed; repetitive, work done today being consumed tomorrow; on a cash, not credit. basis; stable. involving no rapid style changes, no fluctuating inventory, no speculative risk. Profit depends on management, not on size. The investment in fixed equipment is substantial, the unit of sales small. the trading area local, labour is the chief expense item, and net profits are small but continuous. The business is not entangled with patented processes. As technological advances are made, information is generally shared and publicized to all.

There are three general types of laundry: (1) family laundry, serving individual customers at retail; (2) wholesale, commercial and linen supply laundries, including diaper service and household linen rental; (3) institution laundries—in hotels, hospitals and government institutions.

The Process.—The customer usually telephones, and the bundle is picked up and delivered by route men. Work is first identified for ownership, then classified by fabric and soil in preparation for washing.

The washing process has been developed to a high state of efficiency. Monel metal washing machines combine automatic control of formula and feeding of supplies with mechanical unloading. Some machines have a capacity up to 1,000 lb. in a single load. By the use of automatic washroom controls, soft water, specialized detergents, pH and titration tests and multiple suds formulas, modern washing produces sterilized sparkling white work. It has been shown that after 20 laundry washings. white cotton fabrics lose only 5% of their tensile strength and retain 97% of their original whiteness. After washing, excess water is removed by extractors in which manual handling has been eliminated.

After it is washed, flat work is fed damp into a flat work ironer, in which the pieces pass between heavily padded rolls and steam chests, to emerge at the other end dry and ironed. The modern 12-roll flat work ironer cap finish and automatically fold 15 sheets per minute.

Wearing apparel is pressed on specially designed units which are steam heated and driven by compressed air, and are shaped to fit the need of various type garments. Little, if any, hand ironing is required. The most notable mechanization of laundry work has come in shirt pressing units. Men's shirts are pressed and finished on a series of specialized machines. No hand iron is used at all. All machines are adjusted to avoid excess wear or strain on the garments. When finished, the work is assembled, mended, inspected, sorted for ownership, and wrapped ready for delivery.

Services.—Services are offered under avariety of names, but only three are basic—damp, dry and finished. (1) Under the damp or wet wash service! everything is washed and returned damp, on a 24-hour delivery basis. (2) Under the rough dry service, flat work (bed and table linens, towels) is ironed ready for use, and wearing apparel is dried but not ironed. (3) Under the finished type of service, all pieces are ironed or pressed. Finished service is also offered on a piece-price basis. In all services, a minimum size bundle is required. Price is based on the amount of work done, and excludes retailers' mark-up. Costs are not accurately known, but they tend to diminish as volume increases.

The power laundry may be termed a secondary utility, but its strongest competitor is its own customer, who can always go back to doing her own washing. The industry lags behind the business cycle. both in times of depression and prosperity. A wider mass market could be reached if prices could be lowered.

Traditionally, the wage scales were low; but beginning in 1936, wage rates advanced rapidly. By 1955 U.S. laundries paid their employees an average of $1.01 per hour. In large cities, workers were organized in labour unions. After 1941, many wage incentive plans were introduced, under which each worker could increase his earnings in ratio to his ability and the quantity of uork he produced, while the unit cost of production decreased.

Supplies and Equipment.—The supplies used in a laundry include water, soap, alkali, bleach, blue, sour, starch, wetting-out agents. water repellent?. salts, nets, cover cloth. knitted padding, apron duck, canton flannel paper, boxes and shirt boards. Research has produced controlled supplies which are chemically pure, uniform and noninjurious to fabrics. Notable progress has been made in the use of synthetic detergents. fluoride sours and complex phosphates.

The power plant is the basic element in a laundry; hence the terms "steam laundries" or "power laundries." Every laundry needs ample hot water at 160° F.. steam at 100 lb. pressure, electricity at 110 and 220 voltage, and compressed air at 70 lb. pressure. Approximately 15% of the total investment in a laundry consists of power plant equipment, whose operating costs average 6% of sales. To wash and sterilize one pound of clothes, laundries use six gallons water, of which four gallons are heated to 160° F. Water is softened to zero (rain soft).

Research.—The American Institute of Laundering (A.I.L.) maintains at Joliet. Ill., testing and research laboratories, renders consultative assistance to its members, operates a model professional laundry plant serving the city of Joliet, and pretests launderable products for textile manufacturers. From 1930, the A.I.L. School of Laundry Management has offered full-time courses for specialized training in laundry production, merchandising and management. There is another laundry school at Ohio Mechanics institute, Cincinnati, Ohio.

Complaints and Claims.—The laundry is legally a bailee of goods entrusted to it and is responsible for loss or damage caused by its negligence. The loss of an entire bundle by fire or theft is generally insured. (V. RR.; X.)

LA UNION, Philippine province on the northwest coast of Luzon. Area 530 sq.mi.; pop. (1959 est.) 290,750, an increase of 77,619 over 1939. The province consists of a narrow coastal plain backed by rugged mountains. The annual roo-in. rainfall is concentrated between June and October. Rice, both lowland and upland varieties, is the major food crop and tobacco is the leading cash crop. San Fernando, the provincial capital, has tobacco warehouses and rice mills. It is the province's leading town and the northern terminus of the Manila railroad. (R. E. HE.)

LA UNIÓN, a port of the Republic of El Salvador, Central America. capital of the department of La Union and the southern terminus of the International Railways of Central America, which traverse Salvador and Guatemala. The International bridge between Ayutla, Guatemala, and Suchiate, Mexico, makes it possible to travel by rail from any point in the U S. to La Unión via the National Railways of Mexico. La Unión also has rail connections with Puerto Barrios, a Guatemalan port on the Caribbean sea. Pop. (1950) 7.890. La Unión is 137 mi. E.S.E. of San Salvador, the national capital, with which it is connected by railway and highway.

It is the best port of the republic, lying on the shores of the great Bay of Fonseca, and has a concrete and steel pier belonging to the railway that enables steamers to load and unload without lighters, the only port of El Salvador where this is possible. The region produces coffee. maize, rice and beans. Above the town rises one of the volcanoes which cross El Salvador in an almost direct line from east to vest, this cone being known variously as Conchagua, Pinos and Meanguera.

LAURACEAE, a family of dicotyledonous trees and shrubs. best-known members of which are the laurels (*q.v.*). There are 40 genera and 1,000 species. nearly all tropical and subtropical and especially numerous in southeastern Asia and in Brazil The leaves are leathery and evergreen; the tissues contain oil-cavities; the flowers are without petals, the parts usually arranged in threes; the stamens are characteristic, opening by 2 to 4 uplifted valves; the fruit is a drupe. Besides the laurel (*Laurus*), the family includes the cinnamon, cassia and camphor

(*Cinnamomum*), the avocado (*Persea*) and numerous valuable medicinal plants.

In North America the family is represented by several trees and shrubs, found chiefly in the southern United States, such as the sassafras, spicebush and Oregon myrtle (qq *v.*).

LAURANA, FRANCESCO DA (1425?–1502), sculptor and medalist, especially distinguished for a series of female portraits, was one of the most widely traveled artists of the 15th century. He was born in Vrana (Laurana) in central Dalmatia, and was active in Naples by 1458 and in France from 1461 to 1466. He was again in Italy and Sicily for nine years before returning to France, where he worked until his death in 1502. Laurana's early training, the formative influences on his art, the extent of his contribution to collaborative projects and the course of his development are all problems which remain unsolved.

Laurana's documented works include a series of medals executed for King René of Anjou, statues of the Madonna and bas-reliefs in Italy and Sicily and tombs and architectural sculpture in the south of France. His portraits (Louvre; National gallery, Washington, Frick collection, New York) have been variously identified as being members of the Aragon and Sforza families. They are characterized by a quality of serene, detached dignity and reserve. Laurana created an ideal image of aristocratic elegance by reducing individual details to a minimum and concentrating on the essential geometry of forms harmoniously balanced, clearly and precisely carved.

In its seriousness and gravity of impression, as well as in its general simplification of forms, Laurana's work may be compared to that of Piero della Francesca, whom he knew in Urbino, or to the structural logic of his brother (or relative), the architect Luciano Laurana.

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LAUREL, a city of southeastern Mississippi, U.S., and the seat of Jones county, is 27 mi NNE. of Hattiesburg. Founded in 1882 when two lumbermen established a sawmill in the largest virgin yellow-pine forest in the United States, Laurel was incorporated in 1890 and grew rapidly. By 1920 it had become the world's largest shipper of yellow-pine timber, but soon the forests were depleted and Laurel faced economic collapse. It was then that William Mason, an associate of Thomas Edison discovered uses for the waste products of the lumber industry. From these wastes Mason developed a hardboard, "Masonite," which is produced in Laurel. Other industries include the refining of petroleum from nearby oil fields and the production of machinery and naval stores. Laurel is served by excellent highway, air and rail facilities. The Lauren Rogers library and museum has the largest woven basket collection in the world. For comparative population figures *see* table in MISSISSIPPI: *Population*. (E. H. Hs.)

LAUREL, the popular name of at least four shrubs or small trees; viz, the common or cherry laurel (*Prunus laurocerasus*), the Portugal laurel (*P. lusitanica*), the bay or sweet laurel (*Laurus nobilis*) and the spurge laurel (*Daphne laureola*). The first two belong to the rose family (Rosaceae), section *Laurocerasus*, and are the only evergreens in the genus *Prunus*.

The common laurel is a native of the woody and subalpine regions of the Caucasus, of the mountains of northern Iran, of northwestern Asia Minor and of the Crimea. It was received into Europe in 1576, and flowered for the first time in 1583. John Ray in 1688 relates that it was first brought from Trebizond to Constantinople, then to Italy. France, Germany and England Parkinson in his *Paradisus* records it as growing in a garden at Highgate in 1629; and in the 1633 edition of John Gerard's *Herball* it is recorded that the plant "is now got into many of our choice English gardens, where it is well respected for the beauty of the leaues and their lasting or continual1 greenness."

The leaves of this plant are rather large, broadly lance shaped and of a leathery consistence the margin being somewhat serrated. They are remarkable for their poisonous properties, giving off the odour of bitter almonds when bruised and yielding oil of bitter almonds and hydrocyanic (prussic) acid in distillation.

The following varieties of the common laurel are in cultivation: the Caucasian (*Prunus laurocerasus*, var., *caucasica*), which is hardier and bears very rich dark-green glossy foliage; the Colchican (var., *colchica*), which is a dwarf-spreading bush with narrow, sharply serrated pale-green leaves; and var, *schipkaensis*, the hardiest of the cherry laurels. Several other varieties also occur.

The Portugal laurel, a native of Portugal and Madeira, was introduced into England about the year 1648, where it was cultivated in the Oxford Botanic gardens.

The bay or sweet laurel (*Laurus nobilis*) belongs to the family Lauraceae, which contains sassafras, benzoin, camphor and other trees remarkable for their aromatic properties. It is a large evergreen shrub. sometimes reaching the height of 60 ft., but rarely assuming a truly treelike character. The leaves, smaller than those of the preceding laurels, possess an aromatic and slightly bitter flavour, and are quite devoid of the poisonous properties of the cherry laurel. The small yellowish-green flowers are produced in axillary clusters, are male or female, and consist of a simple four-leaved perianth which encloses nine stamens in the male, the anthers of which dehisce by valves which lift upward as in the common barberry. The fruit consists of a succulent berry surrounded by the persistent base of the perianth. The bay or sweet laurel is a native of Italy, Greece and north Africa, and is abundantly grown in the British Isles as an evergreen shrub, as it endures most winters. The date of its introduction is unknown, but must have been previous to 1562, as it is mentioned in Turner's *Herbal* published in that year. It was carried to North America by the early colonists, and is much cultivated in the narmer parts of the United States, often as a sheared tub plant for formal effects.

This laurel is generally held to be the *Daphne* of the ancients. Among the Greeks the laurel was sacred to Apollo, especially in connection with Tempe, in whose laurel groves the god himself obtained purification from the blood of the Python. This legend was dramatically represented at the Pythian festival once in eight years—a boy fleeing from Delphi to Tempe, and after a time being led back with song. crowned and adorned with laurel. The victors in the Pythian games were crowned nith the laurels of Apollo, and the laurel became the symbol of triumph in Greece and later in Rome also. As Apollo was known as the god of poets, the *Laurea Apollinaris* naturally belonged to poetic merit. The various prerogatives of the laurel among the ancients are collected by Pliny in his *Natural History*. It was a sign of truce, like the olive branch; letters announcing victory and the arms of the victorious soldiery were adorned nith it; it was thought that lightning could not strike it, and the emperor Tiberius always wore a laurel wreath during thunderstorms. From its association nith the divine power of purification and protection, it nas often set before the doors of Greek houses, and among the Romans it was the guardian of the gates of the Caesars.

The last of the plants mentioned above under the name of laurel is the so-called spurge laurel (*Daphne laureola*). This and one other species (*D. mezereum*), the mezereon, are the sole representatives of the family Thymelaeaceae in Great Britain. The spurge laurel is a small evergreen shrub, with alternate somewhat lanceolate leaves with entire margins. The greenish-yellow flowers are produced in early spring and form drooping clusters at the base of the leaves, followed by a berry, green at first, but finally black.

The name laurel is applied to several North American shrubs or trees, usually nith a qualifying term. The best knonn are the mountain laurel (*q.v.; Kalmia latifolia*), the sheep laurel (K. *angustifolia*), the great laurel (*Rhododendron maximum; see* RHODODENDRON), siramp laurel (*Magnolia virginiana; see* MAGNOLIA) and the California laurel (*Umbellularia californica*), which is often called Oregon myrtle (*q.v.*), and yields a valuable wood used in cabinetmaking. Of these, the rhododendrons and kalmias have a poisonous juice. In the mountain forest of northern Argentina, *Phoebe porphiria* (also of the Lauraceae) is called laurel. (X.; N TR.)

LAURENS, HENRY (1724–1792), U.S. statesman, nas born in Charleston, S.C., on Feb. 24, 1724, of Huguenot ancestry.

When 16 he became a clerk in a countinghouse in London, and later engaged in trade and planting at Charleston until 1771, when he retired. He spent the next three years traveling in Europe and in superintending the education of his sons in England. In spite of his attachment to England, he united with 37 other Americans in a petition to parliament against the passing of the Boston Port bill. Convinced that a peaceful settlement was impracticable. he returned to Charleston at the close of 1774, and joined the conservative element of the Whig party.

He was made president of the South Carolina council of safety, and in 1776 vice-president of the state. He was sent as a delegate to the Continental Congress at Philadelphia, Pa., of which he was president from Nov. 1777 until Dec. 1778. In Aug. 1780 he started on a mission to negotiate on behalf of congress a loan of $10,000,000 in Holland; but he was captured off Newfoundland and imprisoned in the Tower. His papers were found to contain a sketch of a treaty between the Cnited States and Holland This discovery led to nar between Great Britain and the United Provinces. On Dec. 31, 1781, he was released on parole, and finally exchanged for Cornwallis.

In June 1782 Laurens was appointed one of the American commissioners for negotiating peace with Great Britain, but he did not reach Paris until Nov. 28, 1782, only two days before the preliminaries of peace were signed by himself, John Adams, Franklin and Jay. Because of failing health he did not remain for the signing of the definitive treaty. He died at Mepkin plantation near Charleston Dec 8. 1792.

His son, JOHN LAURENS (1754–1782), American revolutionary officer, was born at Charleston. S.C . on Oct. 28, 1754. He was educated in England. and on his return to America in 1777 joined Washington's staff, and was entrusted with the delicate duties of a confidential secretary, which he performed with much tact and skill. He was present in all Washington's battles, from Brandywine to Yorktown, and his gallantry on every occasion gained him the title of "the Bayard of the Revolution." He wounded Gen Charles Lee in a duel, fought because of that officer's disrespectful conduct toward Washington. Laurens distinguished himself further at Savannah, and at the siege of Charleston in 1780.

After the capture of Charleston by the English, he was selected by Washington as a special envoy to appeal to the king of France for supplies for the relief of the American armies. The more active co-operation of the French fleets with the land forces in Virginia, which nas one result of his mission, brought about the disaster of Lord Cornwallis at Yorktown. Laurens rejoined the army. and at Yorktonn was at the head of an American storming party which captured an advanced redoubt. He was designated with the vicomte de Noailles to arrange the terms of the surrender. which virtually ended the war. In a skirmish on Aug. 27, 1782, on the Combahee river, before peace was formally concluded, Laurens was killed. Washington lamented deeply his death, saying of him, "He had not a fault that I could discover, unless it were intrepidity bordering upon rashness." (D. D. W.)

LAURENT, AUGUSTE (1807–1853), French chemist whose greatest contribution to chemistry was his clarification of the obscure ideas concerning equivalent. atomic and molecular weights, mas born at La Folie, Haute-Marne, on Nov. 14. 1807. He spent most of his life in poverty. He was first an *ingénieur des* mines, and then *préparateur* at the Central School of Arts and Manufactures in Paris. He occupied various industrial positions and was appointed professor of chemistry at Bordeaux in 1838. a post which he held until 1846. He was appointed warder of the mint at Paris in 1848. He stayed there until his death from tuberculosis, April 23, 1853. Laurent assisted in bringing to light Avogadro's hypothesis *(see* CHEMISTRY: *Organic Chemistry: The Theory of Chemical Type and the Overthrow of the Electro-Dualistic Theory),* which played a great part in the accurate fixing of atomic weights *(see* ATOM). In conjunction with C. F. Gerhardt *(q.v.)* he helped develop the systematic classification of organic compounds *(see* CHEMISTRY: *Organic Chemistry*). His famous *Mktkode de chimie* appeared a year after his death.

For biographical details *see* E Grinaux, *Revue scientifique* (1926); E Riegel, *Journal of Chemical Education* (1926); essay by M Bloch in *G.* Bugge (ed), *Buch der grossen Chemiker* (1929–30).

His son, PAUL MATHIEU HERMANN LAURENT, French mathematician, was born Sept. 2, 1841, and died Feb. 19. 1908; he was *répétiteur* at the Polytechnic school of Paris and published a number of papers on various aspects of mathematics.

LAURENTINA, VIA, ancient southward road from Rome. The nomenclature of roads between the Via Ardeatina and the Via Ostiensis is difficult. Probably the Via Laurentina proper is that which led out of the postern generally called the Porta Ardeatina of the Aurelian wall and went direct to Lavinium, while the road branching from the Via Ostiensis at the third mile, and leading past Decimo to Lavinium, is that called Via Laurentina by Pliny *(see* LAVINIUM). On this latter road. beyond Decimo, two milestones, one of Tiberius, the other of Maxentius, each bearing the number 11, have been found.

LAURENTIUS JUSTINIANUS: *see* GIUSTINIANI.

LAURESTINUS, the popular name of a common evergreen garden shrub known botanically as *Viburnum tinus,* with rather dark-green ovate leaves in pairs and flat-topped clusters (corymbs) of white flowers, which are rose-coloured before expansion and appear very early in the year. In milder parts of the United States it is grown in gardens as an ornamental plant and for low hedges, especially in California; in the north it is often cultivated as a pot plant. It is a native of the Mediterranean region and was in cultivation in Britain at the end of the 16th century. The genus *Viburnum* belongs to the family Caprifoliaceae and includes the wayfaring tree *(V. lantana),* the guelder-rose *(V. opulus sterilis)* and other attractive shrubs. *See* VIBURNUM.

LAURIA (LURIA or LORIA), **ROGER DE** (d. 1305), admiral of Aragon and Sicily, was the most prominent figure in the naval war which arose directly from the Sicilian Vespers. Brought up at the court of Aragon after the submission of Sicily to Peter III, in 1283 he was made admiral and in the same year defeated a French naval force, in the service of Charles of Anjou, off Malta In 1284 Roger defeated the Angevine fleet in the Bay of Naples, taking prisoner the heir to the kingdom, Charles of Salerno.

In 1285 he fought on the coast of Catalonia one of the most brilliant campaigns in all naval history. The French king Philippe le Hardi had invaded Catalonia with a large army, which relied almost wholly for its stores on the co-operation of its allies stationed in squadrons along the coast. Roger de Lauria, recalled from Palermo by Peter III, fell on the central squadron of the French fleet near the Hormigas; the Catalan and Sicilian squadrons gained a complete victory.

This campaign, which was followed by destructive attacks on the French coast, saved Catalonia from the invaders and completely ruined the French naval power for the time being.

After the death of Peter III (1286), Roger de Lauria adhered for a time to Fadrique, younger brother of the new king, James, who had accepted the Sicilian crown in defiance of both the Angevines and his senior. Fadrique's arrogant temper and his own large estates in Valencia (which were a strong reason for not offending the king of Aragon) led to Lauria's secession. His Sicilian estates were confiscated by Fadrique and one of his nephews was put to death as a traitor. Roger de Lauria died at Valencia on Jan. 2. 1305.

LAURIER, SIR WILFRID (1841–1919), Canadian statesman, was born on Nov. 20, 1841, at St. Lin. Que., of French Roman Catholic parents. He attended the elementary school of his native parish and for eight or nine months the Protestant elementary school at New Glasgow to learn English; his association with the Presbyterian family with whom he lived during this period had a permanent influence on his mind. At 12 years of age he entered L'Assomption college, which he left in 1860 to study law at McGill university. At graduation he delivered the valedictory address, which, like so many of his later utterances. closed with an appeal for sympathy and union between the French and English people as the secret of the future of Canada. He practised law in Montreal. but owing to ill health soon moved to Athabaska, where he opened a law office and edited *Le Défricheur.*

While at Montreal Laurier joined the Institut Canadien, a literary and scientific society which, owing to its liberal dis-

cussions and the fact that certain books upon its shelves mere on the *Index Librorum Prohibitorum*, was finally condemned by Roman Catholic authorities. *Le Défricheur* was an organ of extreme French sentiment. opposed to confederation, and also under ecclesiastical censure. One of its few surviving copies contains an article by Laurier opposing confederation as a scheme designed in the interest of the English colonies in North America and certain to prove the tomb of the French and of lower Canada.

Laurier was elected to the Quebec legislature in 1871 and his first speech aroused attention both by its literary qualities and the attractive manner and logical method of the speaker. He was equally successful in the Dominion House of Commons, to which he was elected by a small majority in 1874. During his first two years in the federal parliament his chief speeches were in defense of Riel and the French halfbreeds nho were concerned in the Red river rebellion, and on fiscal questions. Sir John Macdonald, then in opposition. had committed his party to a protectionist policy, and Laurier, notwithstanding that the Liberals stood for a low tariff, avowed himself to be "a moderate protectionist," because he felt that a young country needed protection for the development of its manufactures. In the by-election which followed Laurier's admission to the cabinet he nas defeated—the only personal defeat he ever sustained; but a few weeks later he was returned for Quebec East, a constituency which he held thenceforth by enormous majorities. In 1878 his party went out of office and Sir John Macdonald entered upon a long term of power, with protection as the chief feature of his policy, to which was added afterwards the construction of the Canadian Pacific railway.

After the defeat of the Mackenzie government. Laurier sat in Parliament as the leader of the Quebec Liberals and first lieutenant to the Hon. Edward Blake, who succeeded Mackenzie in the leadership of the party. He was associated with Blake in his sustained opposition to high tariff, and to the Conservative plan for the construction of the Canadian Pacific railway, and was a conspicuous figure in the long struggle between Sir John Macdonald and the Liberal leaders to settle the territorial limits of Ontario and the legislative rights of the provinces under the constitution. He was also in conflict with the ultramontane element in Quebec. which was closely allied with Conservative politicians.

In 1887, upon the resignation of Blake. Laurier became Liberal leader. He was the first French Canadian to lead a federal party in Canada since confederation. Apart from the fear that he would arouse prejudice in the English-speaking provinces, the second Riel rebellion was then still fresh in the public mind, and the fierce nationalist agitation which Riel's execution had excited in Quebec had hardly subsided. Laurier could hardly have come to the leadership at a more inopportune moment, but from the first he won great popularity even in the English-speaking provinces. and showed unusual capacity for leadership. His party was beaten in the first general election held after he became leader (1891), but even with its policy of unrestricted reciprocity with the United States, and with Sir John Macdonald still at the head of the Conservative party, it was beaten by only a small majority. Five years later, with unrestricted reciprocity relegated to the background. Laurier carried the country with a platform which demanded tariff revision so adjusted as not to endanger established interests, and which opposed the federal measure to restore in Manitoba the separate or Roman Catholic schools which the provincial government had abolished. In July 1896 he was called by Lord Aberdeen, then governor general, to form a government.

First French-Canadian Premier

He was the first French-Canadian to become premier; and his personal supremacy was shonn by his long continuance in poner. From 1896–1910 he held a position within the British Empire which was in its way unique, and in this period he saw Canadian prosperity advance progressively by leaps and bounds. The chief features of his administration were the fiscal preference of 33⅓% in favour of goods from Great Britain. the dispatch of Canadian contingents to South Africa during the Boer War the contract with the Grand Trunk railway for the construction of a second transcontinental road, the assumption by Canada of the imperial fortresses at Halifax and Esquimault, the appointment of a federal railway commission nith power to regulate freight charges, express rates and telephone rates, and the relations between competing companies, the reduction of the postal rate to Great Britain from 5 to 2 cents and of the domestic rate from 3 to 2 cents, a substantial contribution to the Pacific cable, a practical policy of settlement and development in the Western territories, the division of the North-nest territories into Alberta and Saskatchewan and the enactment of the legislation necessary to give them provincial status, and finally (1910) a tariff arrangement with the United States, which, if not all that Canada might claim in the way of reciprocity. showed how entirely the course of events had changed the balance of commercial interests in North America.

During his first visit to Great Britain on Queen Victoria's diamond jubilee (189;). he received the grand cross of the Bath, and secured the denunciation of the Belgian and German treaties, thus obtaining for the colonies the right to make preferential trade arrangements with the mother country. His personality made a powerful impression in Great Britain and also in France, which he visited before his return to Canada.

At the general election of 1911 the Liberals were defeated over the reciprocity agreement with the United States and the naval question but Laurier remained leader until his death. At the outbreak of World War I in 1914 he eloquently defended Great Britain's cause and supported the urgent measures adopted for the maintenance of Canadian troops. However, he strongly opposed conscription on the ground that it was a departure from the enactments of the Military Service act, and a still wider departure from the principles of constitutional government. When Sir Robert Borden was invited to attend continuous meetings of the war cabinet in London. Sir It'ilfrid expressed his desire to facilitate public business in Canada in order to make the absence of the premier possible. He declined, however. to enter the cabinet in the Coalition government. In 1918 Sir Wilfrid took part in the debate on hereditary titles and honours in Canada and opposed them. He died in Ottaaa on Feb. 17, 1919.

A skillful party leader, Laurier kept from the first the respect of his opponents; while enforcing the orderly conduct of public business, he was careful as first minister to maintain the dignity of parliament. His jealousy for the political autonomy of Canada was noticeable at the Colonial conference held at the time of King Ednard's coronation, and marked his diplomatic dealings with the mother country. But he strove for sympathetic relations and general legislative and fiscal co-operation between the two countries. He strove also for good relations between Canada and the United States. An individualist, he opposed the intrusion of the state into private enterprise, and showed no sympathy with state operation of railways telegraphs and telephones. or nith kindred proposals for the extension of the obligations of the central government.

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LAURISTON, JACQUES ALEXANDRE BERNARD LAW, Marquis de (1768–1828), French soldier and diplomatist, was born at Pondicherry on Feb. 1. 1768. He obtained his first commission about 1786, served in the earlier Revolutionary campaigns and became brigadier of artillery in 1795. Resigning in 1796, he was brought back into the service in 1800 as aide-de-camp to Napoleon. Lauriston became director of the Le Fère artillery school and afterwards special envoy to Denmark. and he was selected to convey to England the ratification of the peace of Xmiens (1802). In 1805, having risen to the rank of general of division, he took part in the mar against Austria. He was made governor general of Venice (1807), took part in the Erfurt negotiations (1808), was made a count, served with the emperor in Spain (1808–1809) and held commands in the Italian campaign and the advance to Vienna in the same year. At the battle of Wagram he commanded the guard artillery in the famous "artil-

lery preparation" which decided the battle. In 1811 he was made ambassador to Russia; in 1812 he held a command in the *Grande Arme'e*. He was captured in the retreat from Leipzig, held a prisoner of war until the fall of the empire and then joined Louis XVIII, to whom he remained faithful in the Hundred Days. His reward was a seat in the house of peers and a command in the royal guard. In 1817 he was created marquis and in 1823 marshal of France. During the Spanish War he commanded the corps which besieged and took Pamplona. He died at Paris on June 12, 1828.

LAURIUM or LAVRÍON, a town in Attica, Greece, famous for the silver mines which were one of the chief sources of revenue of the Athenian state. After the battle of Marathon, Themistocles persuaded the Athenians to devote this revenue to shipbuilding, and thus made possible the victory of Salamis. The mines were state-owned, and leased for a fixed sum with a percentage on the working; slave labour was employed. The ancient shafts and galleries for extracting the metal may still be seen. The mines were worked in modern times mainly for lead. manganese and cadmium. Pop. (1951) 6,725.

LAURVIK, LARVIK or LAURVIG, a seaport of Norway, in Vestfold *fylke* (county), at the head of a short fjord near the mouth of the Laagen river, 98 mi. S.S.W. of Oslo by the Skien railway. Pop. (1959 est.) 10,559. It has various industries, including saw- and planing mills, shipbuilding, glassworks and factories for wood pulp. barrels and potato flour; and an active trade in exporting timber. ice, wood pulp and granite. chiefly to Great Britain, and in importing from the same country coal and salt. The port was occupied by Germany during World War II.

LAUSANNE, the capital of the Swiss canton of Vaud. It is the junction of the railway lines from Geneva, from Brig and the Simplon, from Fribourg and Berne, and from Vallorbe (for Paris). A funicular railway connects the upper town with the central railway station and with Ouchy, the port of Lausanne on the lake of Geneva. Lausanne takes its name from the Flon stream flowing through it, which was formerly called Laus (water). The older or upper portion of the town is built on the crest and slopes of five hillocks which form part of the Jorat range.

The original town (mentioned in the Antonine Itinerary) was on the shore of the lake, southwest of the present city. It was burned in the 4th century by the Alamanni. Some of the inhabitants took refuge in the hills above and there founded a new town, which acquired more importance when Bishop Marius about 590 chose it as his see city. Across the Flon was a Burgundian settlement, later known as the Bourg, while to the west was a third colony around the church of St. Laurent. These three elements joined together to form the present city. The bishops gradually obtained great temporal powers, becoming in 1125 princes of the empire. But in 1368 the bishop was forced to recognize various liberties and customs that had been gradually won by the citizens, the *Plaid Général* of that year showing that there was already some kind of municipal government, save for the *citk*, which was not united with the *ville inférieure* or the other four *quartiers* (Bourg, St. Laurent, La Palud and Le Pont) in 1481. In 1536 the territory of the bishop (as well as the Savoyard barony of Vaud) was forcibly conquered by the Bernese, who at once introduced Protestantism. The Bernese occupation lasted till 1798, when Lausanne became a simple prefecture of the canton Léman of the Helvetic republic. But in 1803, on the creation of the canton of Vaud, it became its capital. The bishop of Lausanne resided after 1663 at Fribourg, while from 1821 onward he added "and of Geneva" to his title.

The railways were built between 1856 and 1862, while the opening of the Simplon tunnel (1906) greatly increased the commercial importance of Lausanne, locating it on the great international highway from Paris to Milan. The town rapidly extended, especially toward the south and west. Since the days of Gibbon, Lausanne has become a favourite place of residence for foreigners, and in 1930 they numbered 10,548 out of a total of 75,915. In 1709 it is said that the inhabitants numbered only 7.432. and 9,965 in 1803, while the numbers were 20,515 in 1860. 33,340 in 1888, 106,807 in 1950 and 126,328 in 1960.

The principal building is the cathedral church (now Protestant) of Notre Dame, which stands 500 ft. above the lake. Earlier buildings were more or less completely destroyed by fire, but the present edifice was consecrated in 1275 by Pope Gregory X in the presence of the emperor Rudolf of Habsburg. It was sacked after the Bernese conquest (1536), but many ancient tapestries and other precious objects are still preserved in the Historical museum at Berne. The church was well restored from 1873 onward. Close by is the castle, built in the early 15th century by the bishops. later the residence of the Bernese bailiffs and now the seat of the various branches of the administration of the canton of Vaud. Near both is the Palais de Rumine. opened in 1906 and now housing the university as well as the cantonal library, the cantonal picture gallery and collections of archaeology, natural history, etc. The university was raised to that rank in 1890, but, as an academy, dates from 1537. Among its former teachers may be mentioned Theodore Beza, Conrad Gesner, J. P. de Crousaz, Charles Monnard, Alexandre Vinet, Eugène Rambert, Juste Olivier and several members of the Secretan family.

To the southwest of the cathedral is the seat of the cantonal courts, a building which was from 1886 to 1927 the Federal Palace of Justice. The federal courts were moved to the new Palace of Justice in the *Parc Mon Repos*. The house, La Grotte, which Gibbon inhabited 1783–1793, and on the terrace of which he completed (1787) his famous history, was demolished in 1896 to make room for the new post office that stands on the Place St. François. The first book printed in Lausanne was the missal of the cathedral church (1493), while the *Gazette de Lausanne* (founded 1798) took that name in 1804. Lausanne has been the birthplace of many distinguished men, such as Benjamin Constant, the Secretans, Vinet and Rambert.

LAUSANNE, CONFERENCES OF. Under this heading two international conferences are discussed: that of 1922–23 which led to the peace treaty with Turkey after World War I, and that of 1932 which put an end to the problem of German reparations resulting from World War I.

Peace with Turkey. — In April 1920, at the conference of San Remo (*q.v.*), a peace treaty between the Allies and Turkey was drawn up, and the representatives of the Ottoman government of Constantinople (Istanbul) were compelled. at Sèvres, near Paris, to sign it on hug. 10, 1920. But it was a stillborn affair because at that time the real government of Turkey sat at Ankara, and it repudiated the treaty of Sbvres. In Sept. 1922 the Greco-Turkish war in Anatolia ended in disaster for the Greeks. On Sept. 23, 1922, the principal Allied powers invited the Ankara government to a peace conference. The invitation was accepted, but the Ankara government proposed a preliminary armistice conference, which met at Mudania, on the Sea of Marmara, on Oct. 3 and resulted in the signature of an armistice convention on the 11th.

The peace conference met at Lausanne, Switz., on Nov. 20. 1922. The Turkish delegation, led by Gen. Ismet Inond, arrived as victors and on an equal footing with the principal Allied powers (Great Britain, France, Italy and Japan). Greece, Bulgaria and Yugoslavia were also represented, while the United States sent an observer. The Turks secured at Lausanne practically everything they demanded in their "national pact" adopted at Erzurum in July and reaffirmed at Sivas in Sept. 1919 (*see* TURKEY). The former Arab provinces were not claimed, but otherwise Turkey recovered everything which was Turkish in 1914.

The peace treaty was signed on July 24, 1923, together with 16 other diplomatic instruments. The treaty conhrmed the rectification of the Turco-Syrian frontier in Turkey's favour, which had been made by the Franco-Turkish agreement of Oct 20, 1921. The destiny of Mosul (*q.v.*) was referred, by agreement, to the League of Nations. The position of the Bosporus and the Dardanelles was defined by a special convention. (*See* STRAITS QUESTION.) Turkey recognized the annexations of Cyprus by Great Britain and of the Dodecanese by Italy. Greece obtained the islands of Samothrace, Lemnos, Lesbos, Chios, Samos and Ikaria. The Turco-Greek boundary in Thrace was withdrawn to the Maritsa (Evros) river leaving the port of Alexandroupolis (formerly Dedeagach) to Greece. The Turco-Bulgarian frontier was

readjusted as compared with the treaty of Neuilly (*q.v.*). The special spheres of influence in Anatolia, which had been assigned to France and Italy by an agreement of Aug. 10, 1920, between those two powers and Great Britain, were tacitly dropped. There was no further question of giving autonomy to Turkish Kurdistan or of ceding Turkish territory to Armenia (*q.v.*). No restrictions were imposed on the Turkish armed forces, and no control was asserted by the Allies over Turkish finances. A convention respecting conditions of residence and business and jurisdiction in Turkey, as well as a declaration relating to the administration of justice, replaced the capitulations (*q.v.*). On Jan. 30, 1923, the Greek and Turkish delegations signed a separate convention providing for the compulsory exchange of national minorities, with a special exemption in favour of Greeks domiciled in the city of Istanbul and of Turks domiciled in western Thrace.

See *Lausanne Conference on Near Eastern Affairs, 1922–23; Proceedings and Draft Terms of Peace* (Cmd. 1814, H.M.S.O., London, 1923); H. W. V. Temperley, *History of the Peace Conference of Paris,* vol. 6 (London, 1924).

German Reparations.— The Lausanne conference of June–July 1932 was held to liquidate the payment of reparations by Germany to the former Allied and Associated powers. Attended by representatives of the creditor powers (Great Britain, France, Belgium and Italy) and of Germany, the conference resulted in agreement on July 9, 1932, that the conditions of world economic crisis made continued reparation payments impossible. Germany, however, was to deliver to the Bank for International Settlements, set up in 1929, 5% redeemable bonds to the value of 3,000,000,000 Reichmarks. The creditor governments canceled war debts as between themselves, but made a "gentleman's agreement" that the Lausanne protocol would not be ratified until they had reached a satisfactory agreement about their own war debts to the United States. Although never ratified, the Lausanne protocol in effect ended attempts to exact reparations from Germany. In Germany it was claimed as a great diplomatic victory by Chancellor Franz von Papen. (See also REPARATIONS.)

See *Final Act of the Lausanne Conference, July 9, 1932* (Cmd. 4126, H.M.S.O., London, 1932); *Further Documents Relating to the Settlement Reached at the Lausanne Conference, June 16–July 9, 1932* (Cmd. 4129, H.M.S.O., London, 1932). (D. TN.)

LAUTREC, HENRI DE TOULOUSE: see TOULOUSE-LAUTREC, HENRI DE.

LAUTREC, ODET DE FOIX, VICOMTE DE (1485–1528), French soldier. Odet de Foix and his two brothers, the seigneur de Lescun and the seigneur de l'Esparre or Asparros, served Francis I as captains; and the influence of their sister, Françoise de Châteaubriant, who became the king's mistress, gained them high offices. In 1515 Lautrec took part in the campaign of Marignano. In 1516 he received the government of the Milanese, and by his severity made the French domination insupportable. In 1521 he defended the duchy against the Spanish army, but in 1522 he was defeated at the Bicocca and was forced to evacuate the Milanese. Created marshal of France, he received again, in 1527, the command of the army of Italy, occupied the Milanese, and was then sent to undertake the conquest of the kingdom of Naples. The defection of Andrea Doria and the plague which broke out in the French camp brought on a fresh disaster. Lautrec caught the infection and died on Aug. 15, 1528.

LAUZUN, ANTONIN NOMPAR DE CAUMONT, MARQUIS DE PUYGUILHEM, DUC DE (1632–1723), French courtier and soldier, was the son of Gabriel, comte de Lauzun, and his wife Charlotte, daughter of the duc de La Force. He was brought up with the children of his kinsman, the maréchal de Gramont, of whom the comte de Guiche became the lover of Henrietta of England, duchess of Orleans, while Catherine Charlotte, afterwards princess of Monaco, was the object of the one passion of Lauzun's life. He served under Turenne, also his kinsman, and in 165j succeeded his father as commander of the cent *gentilshommes* de la *maison du* roi. Puyguilhem (or Péguilin, as contemporaries simplified his name) rapidly rose in Louis XIV's favour, became colonel of the royal regiment of dragoons and was gazetted *maréchal* de camp. He and Mme. de Monaco belonged to the coterie of the young duchess of Orleans. He prevented a meeting between Louis XIV and Mme. de Monaco, and it was jealousy in this matter, rather than hostility to Louise de la Valliiire, which led him to promote Mme. de Montespan's intrigues with the king. He was disgraced for a time, but, after a short sojourn in the Bastille, he returned to his functions of court buffoon. Meanwhile, the duchess of Montpensier (La Grande Mademoiselle) had fallen in love with the little man. The wedding was fixed for Dec. 20, 1670, when on the 18th Louis sent for his cousin and forbade the marriage. Lauzun was arrested and was imprisoned at Pignerol, where excessive precautions were taken to ensure his safety. A fellow prisoner, from communication with whom he was supposed to be rigorously excluded, was Eustache Dauger. (See IRON MASK.)

Mademoiselle agreed to the immediate settlement of the principality of Dombes. the county of Eu and the duchy of Aumale—three properties assigned by her to Lauzun—on the little duc de Maine. eldest son of Louis XIV and Mme. de Montespan, in the hope of securing Lauzun's release. But Lauzun, even after ten years of imprisonment, refused to sign the documents when he was brought to Bourbon for the purpose. A short term of imprisonment at Chalon-sur-Saône made him change his mind, but when he was set free Louis XIV was still set against the marriage, which was supposed to have taken place secretly. In 1685 Lauzun went to the court of James II. In 1688 he was again in England and arranged the flight of Mary of Modena and the infant prince, whom he accompanied to Calais. In 1689 he commanded the expedition fitted out at Brest for service in Ireland, and he sailed in 1690. Lauzun was honest, but inexperienced in war. After the battle of the Boyne he fled with Tyrconnel to Limerick and thence to the west, leaving Patrick Sarsfield to show a brave front. Mademoiselle died in 1693, and two years later Lauzun married Geneviiive de Durfort, a child of fourteen, daughter of the maréchal de Lorges. Lauzun died on Nov. 19. 1723.

See the letters of Mme. de Sévigné, the memoirs of Saint-Simon, who was Lauzun's wife's brother-in-law; also J. Lair, *Nicolas Fouquet,* vol. ii. (1890); Martin Hailes, *Mary of Modena* (1905), and *M.* F. Sandars, *Lawun, Courtier and Adventurer* (1908).

LAVA, an Italian word applied to the liquid products of volcanic activity. Streams of rainwater, formed by condensation of exhaled steam often mingled with volcanic ashes so as to produce mud, are known as lava d'acqua, while the streams of molten matter are called lava di fuoco. The term lava is applied to all matter of volcanic origin which is or has been in a molten state. (See VOLCANO: VULCANISM: PETROLOGY.)

LAVAL, ANDRÉ DE, SEIGNEUR DE LOHÉAC (*c.* 1410–1486), French soldier, was serving in the French army against England in 1423 and was taken prisoner by John Talbot, 1st earl of Shrewsbury, after the capitulation of Laval (1428), which he was defending. After paying his ransom he was present with Joan of Arc at the siege of Orléans, at the battle of Patay and at the coronation of Charles VII. He was made admiral of France in 1437 and marshal in 1439. He served Charles VII faithfully in all his wars, even against the dauphin (1456). When the latter became king as Louis XI. Laval was dismissed from the marshal's office. He took refuge in Brittany. then joined the League of the Public Weal; after the peace of Saint-Maur (1465), he was restored to favour and recovered the marshal's baton. The king also granted him the offices of lieutenant general to the government of Paris and governor of Picardy. In 1472 he was successful in relieving Beauvais, besieged by Charles the Bold, duke of Burgundy.

LAVAL. CARL GUSTAF PATRIK DE (1845–1913), Swedish scientist, engineer and inventor, who was a pioneer in high-speed machinery, was born on May 9, 1845, in Blasenborg, Sweden. He received his B.S. and Ph.D. degrees from the University of Cpsala in 1872. De Laval is remembered for his invention of a cream separator in 1878 and of an impulse turbine in 1888. In addition, his invention and development of a divergent-nozzle, flexible-shaft, double-helical gear laid the foundation for most steam-turbine development that followed. He also constructed and operated a reversible turbine for marine use in 1893 and designed and operated complete power plant with initial steam pressure of 3,400 lb. in 1896. A De Laval reaction turbine, pat-

ented in 1883, reached a speed of 42,000 r.p.m., corresponding to about 200 metres per second tip speed. He died in Stockholm on Feb. 2, 1913. (G. W. SM.)

LAVAL, FRANÇOIS DE MONTMORENCY (1623–1708). first Roman Catholic bishop of Canada. was born into one of the greatest families of France, at Montigny-sur-Avre (Eure) on April 30, 1623. He studied under the Jesuits at the then famous colleges of La Flèche and Clermont in Paris, was ordained priest in 1647 and took his degree in canon law at the Sorbonne. He was then named head archdeacon of the diocese of Evreux. During nearly five years. he visited every parish to the great edification of all, acquiring at the same time experience that would be very helpful to him in later days. When in 1653 the great missionary Alexander de Rhodes came to Europe in search of bishops for the missions of the far east, Laval was one of the three selected. This project however did not materialize. Having resigned his office of head archdeacon. he lived (1654–58) at the *Ermitage* of Caen, a school of perfection under the direction of Jean de Bernières. In 1658 he was named bishop of Petrea *in partibus infidelium* and vicar apostolic of New France. He had already learned to know Canada through the Jesuit *Relations*, which had a great circulation among the students of La Flèche and Clermont. He knew many of the Jesuit missionaries and especially St. Gabriel Lalemant. cne of his teachers at La Flèche. He landed at Quebec on June 16. 1659, and set to work immediately. Laval was a man of great vision and of strong character, and he had in a very high degree. as befitted a founder of the church in a new world. the spirit of prayer and self-denial. He organized his seminary, founded parishes and promoted the true spirit of the church among the French settlers of Canada as well as among the Indians. He had to fight against the Gallicanism of the governors and against the avidity of the traders. which was a menace to the good morals and to the survival of the Indian tribes. He was made bishop of Quebec in 1674. After his resignation in 1688 because of ill health. he continued to take the place of his successor. Bishop de Saint-Vallier, during the latter's long stays in Europe. He was then known as "Monseigneur l'Ancien," and cherished by all for his charity and sanctity. Bishop Laval died on May 6. 1708. The Seminary of Quebec which he had founded in 1663 became in 1852 the first Catholic university of Canada and was named after him. His cause of beatification was introduced in 1880; the decree on the heroicity of the virtues of Laval was promulgated by Pope John XSIII. February 28. 1960. (L. PT.)

LAVAL, PIERRE (1883–1945), French statesman, prominent in the international affairs of the 1930s but chiefly important for his role in the Vichy government during World War II, was born June 28. 1883, at Chhteldon in Puy-de-Dbme, where his father owned a small café. He entered the chamber of deputies in 1914 as a man of the extreme left. representing the Parisian working-class constituency of Aubervilliers. which continued to support him for the next 30 years. When he became a senator in 1926 he began to move to the political right, though remaining always a lone figure. After experience in various ministerial posts he became premier for the first time in Jan. 1931. Resigning in Jan. 1932, he was asked to form a new ministry and was again premier and also minister of foreign affairs for a short period before the formation of André Tardieu's cabinet, in which he served as minister of labour (Feb.–June 1932). Under Gaston Doumergue he was minister for colonies (Feb.–Oct. 1934) and then again minister of foreign affairs (Oct.–Nov.); he retained the latter post under Pierre Étienne Flandin (Nov. 1934–May 1935); and he was again both premier and minister of foreign affairs from June 1935 to Jan. 1936. He left his mark mainly on French foreign policy, in which he was a staunch advocate of reaching agreement with Italy. In the international crisis caused by Italy's attack on Abyssinia he was coauthor of the Hoare-Laval agreement which proposed to appease Italy at Abyssinia's expense, and he consistently urged the need for Franco-Italian friendship.

Out of office after Jan. 1936 Laval could later claim to have had no share of responsibility for France's entry into World War II against Germany in 1939. The day after the Franco-German armistice of June 22. 1940, he joined the government of Marshal Pétain; and he helped to secure ratification of the armistice by the national assembly at Vichy in July 1940. He served as vice-premier under Pétain until Dec. 1940, when he was ousted from power. Convinced of an ultimate German victory, he urged that France must abide by the terms of the armistice and stake out a place for itself in Hitler's "new order" in Europe. But when he returned to power as "chief of government" at Vichy in April 1942, the whole prospect had changed. He then believed that France must bargain hard with Germany; and his ambiguous policy brought upon him fierce attacks from the extreme French collaborators and resisters alike and severe criticism from both Germans and British. The Germans hoped to use him to obtain better supplies of French workers for Germany and greater security for their western front while their main energies were directed against the Soviet Union. He took full advantage of German and Italian difficulties to secure his own interests and to husband French resources, while opposing the violent anti-German activities of the resistance movements and the Free French.

By the beginning of 1944 civil war was fast developing in the French countryside. The Vichy government was in its death throes, and Germany forced upon Laval the extreme collaborators whom he had hitherto kept out of power: Joseph Darnand was given a post at the end of Dec. 1943, Marcel Déat in the following March. In August Laval tried to convoke a national assembly in Paris; but events moved too fast, and on Aug. 17 he was carried off by the retreating Germans. Escaping in 1945 to Switzerland and thence to Spain, he returned to France at the end of July to stand trial for treason. The trial mas conducted so badly and Laval showed so much energy and skill in his defense that proceedings were cut short. He was sentenced to death and mas shot, after attempting suicide in the prison of Fresnes (Seine), on Oct. 15, 1945.

Laval's personal fortune, though large, was greatly exaggerated, and most of it derived not (as was alleged) from corruption but from the astute management of his many business interests. Although his name was so closely associated with the Vichy governments, he had little but' contempt for the cult of Pétainism and the reactionary measures of its "National Revolution." Distrusted by nearly all and taken as a symbol of shady parliamentary politics in France, he held a materialistic and unheroic view of national interests which he served with immense ingenuity and craftiness and considerable courage.

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LAVAL, a town of north-western France, capital of the department of Mayenne, on the Mayenne river, 188 mi. W.S.W. of Paris by rail. Pop. (1954) 30,119. The old feudal city, with its ancient castle, is situated on the right bank while the new town is on the opposite bank. There is communication by steamer as far as Angers. The old castle with a donjon of the 12th century is now transformed into a museum. The "new castle," dating partly from the Renaissance, serves as courthouse. The transept and nave of the Trinity church, which serves as a cathedral, are of the 12th century while the choir is of the 16th; St. Vénérand (15th century) has good stained glass; Notre-Dame des Cordeliers, which dates from the end of the 14th century or the beginning of the 1jth, has some marble altars. Half-a-mile below the Point Vieux is the 12th century church of Aveniirres with an ornamental spire of 1534. The finest remaining relic of the ancient fortifications is the Beucheresse gate near the cathedral. The narrow streets around the castle are bordered by many houses of the 15th and 16th centuries, chief among which is that named the "Maison du Grand Veneur." There are an art museum, a museum of natural history and archaeology and a library.

Seigneurs and Counts of Laval.—The castle of Laval was founded at the beginning of the 11th century by a lord of the name of Guy and remained in the possession of his male descendants until the 13th century. In 1218 the lordship passed to the house of Montmorency by the marriage of Emma, daughter of

Guy VI of Laval, to Mathieu de Montmorency, the hero of the battle of Bouvines. Of this union was born Guy VII, seigneur of Laval, the ancestor of the second house of Laval. Anne of Laval (d. 1466), the heiress of the second family, married John de Montfort, who took the name of Guy (XIII) of Laval At Charles VII's coronation (1429) Guy XIV, who was afterwards son-in-law of John V, duke of Brittany, and father-in-law of King René of Anjou, was created count of Laval, and the countship remained in the possession of Guy's male descendants until 1547. After the Montforts, the countship of Laval passed by inheritance to the families of Rieux and Sainte Maure, to the Colignys and finally to the La Trémoilles, who held it until the Revolution.

LAVALLEJA, a department in southeast Uruguay, was named for Juan Antonio Lavalleja (1784–1853), a hero of the War of Independence. Population 128,918 (1954 estimate); area 3,936 sq.mi. Agriculture, which supplies milk. vegetables and industrial crops to Montevideo, pushed ranching, Lavalleja's principal activity, to the north of the department. The department has some of the few hilly areas of Uruguay Quarrying for slate, limestone and marble, and mining of galena, emery and dolomite, once important. still took place on a limited scale in the second half of the 20th century. (M. I. V.)

LA VALLIERE, LOUISE FRANÇOISE DE (1644–1710), mistress of Louis XIV., born at Tours on Aug. 6, 1644, the daughter of an officer, was brought up at the court of Gaston d'Orléans at Blois, with the younger princesses, the step-sisters of La Grande Mademoiselle. After Gaston's death his widow moved with her daughters to the palace of the Luxembourg in Paris, and with them went Louise, who was now a girl of sixteen. She was named maid of honour to Henrietta of England, who was about her own age and had just married Philip of Orleans, the king's brother. Henrietta joined the court at Fontainebleau, and was soon on the friendliest terms with her brother-in-law; to avoid scandal it was determined that Louis should pay marked attentions elsewhere. The person selected was Madame's maid of honour, Louise, who became the king's mistress. The affair, begun on Louis's part as a blind, developed into real passion on both sides. It was Louis's first serious attachment, and Louise was an innocent, religious-minded girl, who brought neither coquetry nor self-interest to their relation, which was sedulously concealed. In February 1662 there was a storm when Louise refused to tell her lover the relations between Madame (Henrietta) and the comte de Guiche. She fled to an obscure convent at Chaillot, where Louis followed her. Her enemies secured her removal from the service of Madame, and she was established in a small building in the Palais Royal, where in December 1663 she gave birth to a son, Charles, who was entrusted to two faithful servants of Colbert.

Within a week of Anne of Austria's death in January 1666, La Vallière appeared at mass side by side with Maria Theresa. She had given birth to a second child in January 1665, but both children were dead before the autumn of 1666. A daughter born at Vincennes in October 1666, who received the name of Marie Anne and was known as Mlle. de Blois, was recognized by Louis as his daughter in letters-patent making the mother a duchess in May 1667 and conferring on her the estate of Vaujours. In October of that year she bore a son, but by this time her place in Louis's affections was definitely usurped by Athénaïs de Montespan (*q.v.*). She was compelled to remain at court as the king's official mistress, and even to share Mme. de Montespan's apartments at the Tuileries. She made an attempt at escape in 1671, when she fled to the convent of Ste. Marie de Chaillot, only to be compelled to return. In 1674 she was finally permitted to enter the Carmelite convent in the Rue d'Enfer.

La Vallière's *Réflexions sur la miséricorde de Dieu,* written after her retreat, were printed by Lequeux in 1767, and in 1860 *Réflexions, lettres et sermons,* by M. P. Clement (2 vols.). Some apocryphal *Mémoires* appeared in 1829, and the *Lettres de Mme la duchesse de la Vallière* (1767) are a corrupt version of her correspondence with the maréchal de Belleionds. Of modem works on the subject *see* Arsène Houssaye, *Mlle de la Vallière et Mme de Montespan* (1860); Jules Lair, *Louise de la Vallikre* (3rd ed., 1902, Eng. trans. 1908); and C. Bonnet, *Documents inédits sur Mme de la Vallière* (1904).

LAVATER, JOHANN KASPAR (1741–1801), poet, theologian, mystic, physiognomist, was born at Zurich on Kov. 1j, 1741, and died there on Jan. 2, 1801. He was educated at the Ziirich Gymnasium; J. J. Bodmer and J. J. Breitinger were among his teachers. Lavater took orders in 1769 and for the rest of his life he was deacon or pastor in one or other of the Protestant churches of Ziirich. In 1j67 he aroused great patriotic enthusiasm by his ardent *Schweizerlieder,* which quickly became popular. His oratorical fervour and genuine depth of conviction gave him an extraordinary personal influence; and he was consulted as a spiritual adviser by many thousands of Swiss and Germans, either in person or by correspondence. His mystical writings were also widely popular. Lavater's name, however, is now chiefly remembered by a by-product of his genius—his work or, physiognomy, *Physiognomische Fragmente zur Beförderung der Menschenkenntnis und Menschenliebe* (1775–78). This book found many enthusiastic admirers in France and England, as well as in Germany. Goethe, who was long a warm friend of Lavater, contributed a chapter to it. It left, however, the science ot physiognomy as desultory and unscientific as it found it. More characteristic of Lavater's genius and religious temperament are his somewhat mystical *Aussichten in die Ewigkeit* (1768–78), which went through several editions; *Geheimes Tagebuch von einem Beobaclzter seiner selbst* (1772–73); and *Pontius Pilatus, oder der Mensch in allen Gestalten* (1782–85).

On the capture of Ziirich by Masséna in 1799, Lavater was shot by a French grenadier. He lingered for more than a year and died on Jan. 2, 1801.

More or less complete collections of his works were published both in his lifetime and after, the last in 1841–44. Lives of him have been written by G. Gessner (1802–03), F. W. Bodemann (2nd edt., 1877), F. Muncker (1883), P. I. Heisch (1842, in English), and A. Vömel (1923). *See* also the studies by V. Hegner (1836), F. D. Pestalozzi (1915), F. Behrend (1916), and C. Janentzsky (1916); also *Goethe und Lavater* (1901), published by the Goethegesellschaft. The *Physiognomie* and the *Geheimes Tagebuch* have been translated into English (the former by H. Hunter and Thos. Holcroft).

LAVENDER, botanically *Lavandula,* a genus of the mint family (Labiatae), comprising about 20 species. The plant to which the name of lavender is commonly applied, *Lavandula spica* (*officinalis* or *vera),* is a native of the countries bordering on the Mediterranean, preferring stony slopes in open sunny situations. The name is also applied to *L. stoechas,* often distinguished as French lavender. Lavender is an evergreen undershrub about two feet high, with grayish-green hoary linear leaves, rolled under at the edges when young. The flowers are borne on an interrupted terminal spike at the summit of a long naked stalk. The corolla is of a pale violet colour, but darker on its inner surface, tubular, two-lipped! the upper lip with two and the lower with three lobes. Both corolla and calyx are covered with stellate hairs, among which are imbedded shining oil glands to which the fragrance of the plant is due. The dried flowers have long been used for perfuming linen.



FROM KOEHLER, "MEDIZINAL PFLANZEN"
LAVENDER (LAVANDULA SPICA)

In England and in the United States, especially near Philadelphia and in California, lavender is cultivated for its essential oil, which is freed by distillation. In the south of Europe the flowers form an object of trade. The plants in cultivation do not produce seed, and propagation is always made by slips or by dividing the roots. In the climate of New York lavender is not hardy, but southward it is perfectly

so. The flowers are collected at the beginning of August and taken directly to the still. The yield of oil depends in great measure upon the weather. From 12 to 30 lb. of oil per acre is the average amount obtained.

Oil of lavender is a mobile liquid having a specific gravity from 0.875 to 0.888 at 25° C. Lavender water consists of a solution of the volatile oil in spirit of wine, with the addition of other scents.

Another form of lavender (L. latifolia) is also used for the distillation of an essential oil which is known as oil of spike. It is used in painting on porcelain and in soap manufacture. 4 closely allied species. L. lanata, a native of Spain, with broader leaves, is also very fragrant. Other species of lavender are known, some extending as far east as India. Sea lavender is *Limonium,* a genus of the leadwort family (Plumbaginaceae). Lavender cotton is Sarttolina *chamaecyparissus,* a low shrub from southern Europe.

(N. TR.)

LAVERAN, (CHARLES LOUIS) ALPHONSE (1845–1922), French physician: pathologist and parasitologist, discoverer of the parasite of human malaria (*q.v.*), was born in Paris on June 18, 1845, and educated at the Strasbourg faculty of medicine. He served as an army surgeon in the Franco-German War (1870) and thereafter practised and taught military medicine until 1897. when he joined the Pasteur institute, Paris. There he remained until his death, on May 18. 1922.

Laveran was a powerful influence in developing tropical medicine research. and himself carried on fruitful work in trypanosomiasis, leishmaniasis and other protozoal diseases, in addition to his epochal work in malaria. He established the Laboratory of Tropical Diseases at the Pasteur institute (1907) and founded the Société de Pathologie Exotique (1908). He was elected to the Academy of Medicine (1893), Academy of Sciences (1901), received the Nobel prize in medicine (1907) and became commander of the Legion of Honour (1912).

Laveran published over 600 scientific papers and textbooks. His works included: Traite' des maladies et *épidémies* des *armées* (1875); Traite' des *fièvres* palustres (1884); *Traité d'hygiene militaire* (1896); Traitk *du* paludisme (1898); and *Trypanosomes* et *trypanosomiases* (1904) with F. Mesnil.

See Marie Phisalix, *Alphonse Laveran sa* vie, *son oeuvre* (1923).

(P. F R.)

LAVERNA, an old Italian divinity. perhaps one of the spirits of the nether world. A cup found in an Etruscan tomb bears the inscription Laucrnai *pocolom,* and in a fragment of Septimius Serenus Laverna is expressly mentioned in connection with the di inferi. By an easy transition, she came to be regarded as the protectress of thieves, whose operations were associated with darkness. Laverna had an altar on the Aventine hill. near the gate called after her Lavernalis, and a grove on the Via Salaria.

LAVERY, SIR JOHN (1856–1941), British painter of portraits. interiors and landscapes, was born in Belfast, Ire.. and received his art training at the Haldone Academy of Art in Glasgow, Heatherby School of Art, London (from 1879), and the Académie Julian in Paris, where he studied under T. Robert-Fleury and A. W. Bouguereau. He first exhibited at the London Royal Academy in 1886 and was elected to its membership in 1921. Lavery often spent his winters painting in Tangier. Morocco. In 1918 he was created a knight. He was president (1932–41) of the Royal Society of Portrait Painters. Lavery died at Kilmoganny, Ire., on Jan. 10, 1941.

LAVIGERIE, CHARLES MARTIAL ALLEMAND (1825–1892), French Roman Catholic ecclesiastic, cardinal archbishop of Algiers and Carthage, was importantly involved in two prime issues of the third French republic: policy in colonial North Africa and the attitude of Catholics to the Republican regime. Lavigerie was born near Bayonne on Oct. 13, 1825, and was ordained priest in 1849 after studies at St. Sulpice. Paris. Having obtained doctorates in letters and theology, he was professor at the Sorbonne, resigning to become director of the Society for the Promotion of Education in the Near East. In this capacity he raised large sums for the Christian victims of the Lebanese massacres (1859–60). Touring Lebanon. he made his first contact with the Moslem world and developed his belief in France's civilizing mission to backward lands. His success made him an official of the Roman Rota and in 1863 bishop of Nancy. Four years later he was named archbishop of Algiers and immediately found himself involved with the French authorities. Algeria had a military administration without civil liberties and with Moslems and Europeans separated. Lavigerie, who favoured assimilation, successfully defied the ban on missionary work by establishing villages for the orphaned Algerian victims of famine. For him, North Africa had a glorious Christian past and would be the springboard for the conversion of the continent. He extended his activities into Tunisia and was named cardinal in 1881 and archbishop of the restored see of Carthage (1884). His most enduring creation was the White Fathers (1868), pioneer missionaries in the Sahara, the Sudan and much of central Africa, who still flourish under the sensible rules of their founder.

In politics Lavigerie was a realist and a moderate. A royalist in 1870, he became convinced that the republic would last and that the majority of anticlerical Republicans could be won to moderation. He co-operated closely with Leo XIII's policy of conciliation. Always a bitter opponent of slavery, he spent his last years organizing antislavery societies to protect the natives of central Africa. Cardinal Lavigerie died at Algiers on Nov. 25. 1892.

(J. N. M.)

LAVINIUM, ancient town of Latium (see LAURENTINA, VIA), 19 mi. S. of Rome, the modern Pratica, situated 300 ft. above sea level and 2½ mi. N.E. from the seacoast. It was the city of King Latinus; and Aeneas ritually refounded it, naming it after his wife, Lavinia, Latinus' daughter. Consuls and praetors, or dictators, sacrificed on the Alban mount and at Lavinium to the Penates and to Vesta, before they entered upon office or departed for their provinces, and the cults of Lavinium were kept up largely by the imperial appointment of honorary nonresident citizens to hold the priesthoods. The citizens of Lavinium were known as Laurentes and under the empire as Laurentes Eavinates, and the place itself at a late period as Laurolavinium. It was deserted or forgotten not long after the time of Theodosius.

A separate city of Laurentum never existed, though it has often been sought at Tor Paterno, close to the sea coast, 5 miles north by west. Even in ancient times its territory was famous for salubrious groves of bay-trees (laurus) to which both Vitellius and Commodus resorted. Under the empire a portion must have been imperial domain and forest in which elephants were kept, and the imperial villa may be identified with the extensive ruins at Tor Paterno. Remains of other villas lie along the ancient coastline (half a mile inland of the modern, now marked by a row of sand-hills, and followed by the Via Severiana), both northwest and southeast of it, and indeed from the mouth of the Tiber to Antium, and then again to Astura. In one of these villas, excavated by the king of Italy in 1906, was found a fine replica of the famous discobolus of Myron. Some way to the northwest was the village of Vicus Augustanus Laurentium, taking its name probably from Augustus himself, and probably identical with the village mentioned by Pliny the younger as separated by only one villa from his own. This village was brought to light by excavation in 1874, and its forum and curia are still visible. The remains of the villa of Pliny, too, were excavated in 1713 and in 1802–10. It is impossible without further excavation to reconcile the remains—mainly of substructions—with the elaborate description of his villa given by Pliny, Ep. ii, 1 (cf. H. Winnefeld in Jahrbuch des *Instituts,* 1891, 200 ***seq.).***

The site of the ancient Lavinium, 300 ft. above sea level and 23 mi. inland, is healthy. It possesses considerable natural strength, and consists of a small hill, the original acropolis, occupied by the modern castle and the village surrounding it, and a larger one, now given over to cultivation, where the city stood. On the former there are now no traces of antiquity, but on the latter are scanty remains of the city malls. The necropolis, too, has been discovered, but not systematically excavated; but objects of the first Iron age, including a sword of Aegean type have been found.

LAVISSE, ERNEST (1842–1922), French historian, was born at Nouvion-en-Thiérache, Aisne, on Dec. 17, 1842, and died in I'aris on Xug. 18, 1922. He was educated at the École Normale Supérieure, and after working as private secretary to Victor Duruy

for a time, he returned there in 1876 as *maître de conférence,* succeeding Fustel de Coulanges. In 1883 he was appointed assistant professor of modern history at the Sorbonne, and in 1888 full professor. In this post, and as director of the École Normale (1904–19), after its incorporation in the University of Paris, he played an important part in the revival of higher studies in France after 1871 and showed himself to be not only a brilliant historian but also an extraordinarily able organizer and teacher. On his retirement in 1919 he mas made honorary director of the École Normale.

His thesis for his doctor's degree in 1875, a study on the origin of the Prussian monarchy, was crowned by the Academy in 1879, in which year he published his *Etudes sur l'histoire de la Prusse.* Other works on German history were *Trois empereurs d'Allemagne* (1888). *La Jeunesse du grand Frédéric* (1891, Eng. trans. 1891) and *Frédéric II avant son avènement* (1893); but Lavisse is best known for the *Histoire générale du IVe siècle jusqu' à nos jours* (1893–1901, 12 vol.), which he edited with his friend Alfred Rambaud, and for the *Histoire de France depuis les origines jusqu'à la Révolution* (1908–11, 9 vol.). His greatest work was completed in the *Histoire de France contemporaine depuis la Révolution jusqu' à la paix de 1919* (1920–22, 10 vol.), of which he was also the editor.

Lavisse was admitted to the Académie Française in 1892, and after the death of James Darmesteter, became editor of the *Revue de Paris* (1894).

LAVOISIER, **ANTOINE LAURENT** (1743–1794), French chemist and father of modern chemistry, was a brilliant experimenter and many-sided genius. He was born in Paris on Aug. 26, 1743. His father, an *avocat au parlement,* gave him an excellent education at the Collège Mazarin, and he studied mathematics and astronomy with Nicolas de Lacaille, chemistry with the elder Rouelle and botany with Bernard de Jussieu. In 1766 he received a gold medal from the Academy of Sciences for an essay on the best means of lighting a large town. Among his early work were papers on the analysis of gypsum, on thunder, on the aurora and on congelation and a refutation of the prevalent belief that water by repeated distillation is converted into earth. He also accompanied J. E Guettard (1715–86) on a long geological trip and assisted him in preparing his mineralogical atlas of France. In 1768 he was nominated *adjoint chimiste* to the Academy. He passed through all the grades in the Academy, was director in 1785 and was made treasurer in 1791. His father bought him a title of nobility in 1772. In 1768 he became *adjoint* to Baudon, one of the farmers-general of the revenue, subsequently becoming a full titular member of the *ferme générale* Appointed *régisseur des poudres* in 1775, he abolished the vexatious search for saltpetre in the cellars of private houses, increased the production of the salt and improved the manufacture of gunpowder.

In 1778 he started a model farm at Fréchines, where he demonstrated the advantages of scientific agriculture. In 1785 he was nominated to the committee on agriculture, and as its secretary drew up reports and instructions on the cultivation of crops, and promulgated various agricultural schemes. Chosen a member of the provincial assembly of Orléans in 1787, he planned the improvement of the social and economic conditions of the community by means of savings banks, insurance societies, canals, workhouses, etc. He advanced money without interest to the towns of Blois and Romorantin for the purchase of barley during the famine of 1788. Attached in this same year to the *caisse d'escompte,* he presented the report of its operations to the National Assembly in 1789, and as commissary of the treasury in 1791 he established a system of accounts of unexampled punctuality. He was also asked to draw up a new scheme of taxation in connection with which he produced a report, *De la richesse territoriale de la France.* He was associated with committees on hygiene, coinage, the casting of cannon, public education, etc. Lavoisier was a member of the nobility of the Blois district. In 1789 he drew up the code of instructions *(cahier)* for the guidance of the deputies to the states-general, to which he was elected alternate deputy. He was secretary and treasurer of the commission appointed in 1790 to secure uniformity of weights and measures throughout France. This led to the establishment of the metric system.

Lavoisier's membership of the *ferme générale* was alone sufficient to make him an object of suspicion to the authorities during the French Revolution. Marat accused him of putting Paris in prison and of stopping the circulation of air in the city by the wall erected at his suggestion in 1787. In Aug. 1792 he had to leave his house and laboratory at the arsenal. In November the Convention ordered the arrest of the former farmers-general, and in May 1794 they were sent to be tried by the revolutionary tribunal. The trial lasted only part of a day and Lavoisier and 27 others were condemned to death. That same afternoon, May 8, he and his companions, including his father-in-law, were guillotined at the Place de la Revolution (now Concorde). His body was thrown into a common grave. The following day, Joseph Lagrange said, "It required only a moment to sever that head, and perhaps a century will not be sufficient to produce another like it." Lavoisier's wealthy widow married Benjamin Thompson (Count Rumford) in 1805, but because of incompatibility they separated after a few years.

Lavoisier's name is indissolubly associated with the overthrow of the phlogistic doctrine that had dominated the development of chemistry for more than a century *(see* CHEMISTRY: *History of).* and with the establishment of the foundations upon which modern science reposes. Lavoisier's apparatus is preserved in the Conservatoire des Arts et Métiers in Paris. The famous painting of Lavoisier and his wife by Jacques David is now in the Rockefeller institute in New York city. The statue behind the Madeleine in Paris, erected in 1900 by international subscription, was destroyed by the Germans during the occupation in World War II.

SCIENTIFIC ACHIEVEMENTS

On Nov. 1, 1772, Lavoisier deposited with the Academy of Sciences a note which stated that sulfur and phosphorus when burned increased in weight because they absorbed "air," while the metallic lead formed from litharge by reduction with charcoal weighed less than the original litharge because it had lost "air." The exact nature of the airs concerned in the processes he did not explain until after the preparation of "dephlogisticated air" (oxygen; *q.v.*) by Joseph Priestley in 1774. Then, perceiving that in combustion and the calcination of metals only a portion of a given volume of common air was used up, he concluded that Priestley's new "air" was what was absorbed by burning phosphorus, etc., "nonvital air," azote, or nitrogen remaining behind.

In a memoir presented to the Academy in 1777, read in 1779 but not published until 1781, he assigned to dephlogisticated air the name oxygen, or "acid producer," on the erroneous supposition that all acids were formed by its union with a simple, usually nonmetallic, body. Combustion was explained by Lavoisier not as the result of the liberation of hypothetical "phlogiston," but as the result of the combination of the burning substance with oxygen. On June 25, 1783 he announced to the Academy that water was the product formed by the combination of hydrogen and oxygen; however, he had been anticipated by Henry Cavendish (*q.v.*). From his knowledge of the composition of water Lavoisier was led to the beginnings of quantitative organic analysis. He burned alcohol, and other combustible organic compounds, in oxygen and from the weight of water and carbon dioxide produced calculated their composition.

Up to about this time Lavoisier's work, mainly quantitative in character, had appealed most strongly to physicists, but it now began to win conviction from chemists also. Claude L. Berthollet (*q.v.*), Louis B. Guyton de Morveau and Antoine F. Fourcroy, his collaborators in the reformed system of chemical terminology set forth in 1787 in the *Méthode de nomenclature chimique,* were among the earliest French converts to the new theory of combustion; they were followed by Martin H. Klaproth and the German Academy, and by most English chemists except Cavendish, who rather suspended his judgment, and Priestley, who clung to the old ideas. The spread of Lavoisier's doctrines was greatly facilitated by the defined and logical form in which he presented them in his *Traité élémentaire de chimie (présenté dans un ordre nou-*

veau et d'après les découvertes modernes) (1789), and eventually they were adopted universally. The list of simple substances (elements), which could not be further decomposed by any known process of analysis, contained in the first volume of this work, includes "light" and "caloric" with oxygen, azote and hydrogen. Under the-head of "oxidable or acidifiable" substances, the combination of which with oxygen yielded acids, were placed sulfur, phosphorus, carbon and the muriatic, fluoric and boracic radicals. The metals, which by combination with oxygen became oxides, were antimony, silver, arsenic, bismuth, cobalt, copper, tin, iron, manganese, mercury, molybdenum, nickel? gold, platinum, lead, tungsten and zinc; and the "simple earthy salifiable substances" were lime, baryta, magnesia, alumina and silica. The simple nature of the alkalies he considered so doubtful that he did not class them as elements. It is to Lavoisier that we owe to a great extent the modern concept of an element as against the old Greek idea.

In addition to his purely chemical work, Lavoisier, mostly in conjunction with Pierre Laplace, devoted considerable attention to physical problems, especially those connected with heat. The two carried out some of the earliest thermochemical investigations, devised an apparatus for measuring linear and cubical expansions, and employed a modification of Joseph Black's ice calorimeter in a series of determinations of specific heats *(see* CALORIMETRY). Regarding heat (*matière de feu)* as a peculiar kind of imponderable matter. Lavoisier held that the three states of aggregation—solid, liquid and gas—were modes of matter, each depending on the amount of *matière de feu* with which the substances concerned were associated. He also worked at fermentation, respiration and animal heat, looking upon the processes concerned as essentially chemical in nature. A paper discovered many years after his death showed that he had anticipated later thinkers in explaining the cyclical process of animal and vegetable life.

BIBLIOGRAPHY.—A collected edition of the writings of Lavoisier, *Oeuvres de Lavoisier,* 6 vol. (1864–93), contains all his main works and memoirs irom the Academy volumes as well as numerous letters, notes and reports. *See* also D. *I.* Duveen and H. S. Klickstein, *A Bibliography of the Works oj Antoine Laurent Lavoisier* (1954); *E.* Grimaux, *Lavoisier 1743–1794* (1888); D. McKie, *Antoine Lavoisier* (1952); *S.* French, *Torch and Crucible* (1941). (D. I. D.)

LA VOISIN. CATHERINE MONVOISIN, known as "La Voisin" (d. 1680), French sorceress, whose maiden name was Catherine Deshayes, was one of the chief personages in the famous *affaire des poisons,* which disgraced the reign of Louis XIV. Her husband, Monvoisin was a jeweller, and she practised chiromancy and face-reading. She gradually added the practice of witchcraft, in which she had the help of a renegade priest, Étienne Guibourg, whose part was the celebration of the "black mass." She practised medicine, especially midwifery, procured abortions, and provided love powders and poisons. Her chief accomplice was one of her lovers, the magician Lesage, whose real name was Adam Coeuret. The great ladies of Paris flocked to La Voisin, who accumulated enormous wealth. Among her clients were Olympe Mancini, comtesse de Soissons, who sought the death of the king's mistress, Louise de la Vallière; Mme. de Montespan, Mme. de Gramont *(la belle* Hamilton) and others.

In April 1679 a commission appointed to inquire into the subject and to prosecute the offenders met for the first time. Its proceedings, including some suppressed in the official records, are preserved in the notes of one of the official *rapporteurs,* Gabriel Nicolas de la Reynie. The revelation of the treacherous intention of Mme. de Montespan to poison Louis XIV and of other crimes, planned by personages who could not be attacked without scandal which touched the throne, caused Louis XIV to close the *chambre ardente,* as the court was called, on Oct. 1, 1680. It was reopened on May 19, 1681 and sat until July 21, 1682. Many of the culprits, Marie Anne Mancini, duchess of Bourbon, and Madame de Montespan among others, escaped through private influence. Some hundred prisoners, among them the infamous Guibourg and Lesage, escaped the scaffold through the suppression of evidence insisted on by Louis XIV and Louvois. Some innocent persons were imprisoned for life because they had knowledge of the facts. La Voisin herself was executed at an early stage of the proceedings, on Feb. 20, 1680.

See F. Ravaisson, *Archives de la Bastille,* vols. iv.–vii. (1870–74); the notes of La Reynie, preserved in the Bibliothèque Nationale; F. Funck-Brentano, *Le Drame des poisons* (1899); A. Masson, *La Sorcellerie et la science des poisons au XVIIe siècle* (1904). Sardou made the affair a background for his *Affaire des poisons* (1907). There is a portrait of La Voisin by Antoine Coypel, which has been often reproduced.

LAW, ANDREW BONAR (1858–1923), British statesman, was born in New Brunswick, Canada, on Sept. 16, 1858. He came to Scotland when still a boy and finished his education at Glasgow High school. After acquiring a sufficient competence in business, he went into parliament in 1900 as Conservative member for the Blackfriars division of Glasgow.

His commercial experience had led him to the conclusion that free trade, in the Cobdenite sense, was no longer beneficial for Great Britain. A speech made on April 22, 1902, in favour of Hicks-Beach's corn duty, led to his appointment as parliamentary secretary to the board of trade in the Conservative government. When Chamberlain started his tariff reform movement in 1903, he found a supporter in Bonar Law.

Bonar Law shared in the general conservative rout in Jan. 1906, and had another electoral mishap in Dec. 1910; but in each case came back to the house shortly at a by-election, and took his full share in the opposition attack on Lloyd George's 1909 budget and on the Parliament bill. He kept aloof from the "Die-hard" movement, and warmly defended his leader, Balfour, from the reproaches cast upon him. This loyal attitude, no doubt, was one of the reasons, and his strong tariff reform programme was another, which recommended him to his party as Balfour's successor in the leadership when the claims of Austen Chamberlain and Walter Long appeared to divide the Conservatives pretty evenly. Both the rivals stood aside, and on Nov. 13, 1911, Bonar Law was unanimously elected leader in the commons, Lord Lansdowne continuing to lead the party in the lords.

As opposition leader, Bonar Law was very trenchant in his criticism of the government, and put up a strong fight against the Home Rule bill on Ulster's behalf, when civil war was ahead or threatened. Meanwhile, he had to deal with differences inside his own party as to the extent to which the tariff reform policy should be carried. A considerable section, especially strong in Lancashire, was definitely against any duties on food; and the assurances which Bonar Law gave in a speech at Ashton-under-Lyne on Dec. 16, 1912, did not convince them that there was no possibility of food taxes being imposed without reference to the people. As the party dreaded a split, Bonar Law and Lord Lansdowne, in response to a general appeal, gave on Jan. 14, 1913, a formal promise that food duties should not be imposed without the approval of the electors at a subsequent general election. The imminent danger of the Ulster problem, on which Bonar Law had insisted for two years, brought ministers in 1914 to express a readiness for compromise; but no settlement, satisfactory to the opposition, had been formed when World War I supervened.

Directly the crisis became acute Bonar Law wrote, on Aug. 2, on behalf of Lord Lansdowne and their colleagues, tendering to Asquith the unhesitating support of the opposition in any measures necessary to support France and Russia. Even when criticism of the management of the war began legitimately to spring up in the early months of 1915 he used his influence to repress or moderate its expression in parliament. He promptly accepted Asquith's proposal in 1915 to assist in forming a Coalition government and brought seven of his colleagues into the cabinet, himself accepting the colonial secretaryship. He took charge in the house of commons of the first military service bill in Jan. 1916 and got it through all its stages with little difficulty. He promoted the economic conference in Paris in June 1916 and, as principal representative of his country, was largely influential in carrying through the co-operative and protective resolutions then adopted. He was a member of the war committee of the cabinet, but, like Lloyd George, he was far from satisfied with its organization and powers. It was natural therefore that he should be one of the four persons, besides Lloyd George, to whom that statesman, forcing the issue on Dec. 1, 1916, asked Asquith to confide the absolute conduct of the war. In the confused crisis which followed, the premiership was offered to Bonar Law; but he recognized that Lloyd George

was the prime minister whom the nation demanded, and to a ministry formed under him, the Conservative leader brought the full co-operation of his party.

In this second coalition, Bonar Law, whose followers supplied the main body of the ministerial supporters, was partner rather than second-in-command of his chief. He was chancellor of the exchequer and member of the war cabinet, and also undertook the leadership of the house of commons, so as to enable the prime minister to devote the whole of his energies to the prosecution of the war. It was his duty, as chancellor of the exchequer, to find the money to meet the gigantic cost of the war, and this was done principally by means of two great loans and by numerous increases of taxation. consequently, it must have been with peculiar gratification that Bonar Law announced in April 1917 that the imperial war cabinet had accepted the principle of imperial preference. Throughout the war he opposed a firm front both to pacifists and to pessimists, and never doubted that there could be no peace "until the Germans are beaten and know that they are beaten."

As the general election of 1918 approached he responded heartily to Lloyd George's proposal that the Coalition should be continued to forward postwar reconstruction. The Coalition obtained an immense majority, and among the Coalitionists Bonar Law's special followers, the Unionists, predominated. When the ministry was reconstituted in Jan. 1919 the arrangement by which Bonar Law led the house was continued, as the prime minister would be much away at the Peace conference; but he was relieved of the exchequer, and took the sinecure office of privy seal. He was one of the British peace plenipotentiaries, though his duties at Westminster seldom permitted him to go to Paris; and he appended his signature to the Treaty of Versailles. During 1919 and 1920 he handled postwar disorders and projects, and the passing of the Home Rule act of 1920, constituting two subordinate governments and parliaments in Ireland.

Bonar Law's incessant labours during and after the war undermined his health, which suddenly broke down in March 1921; on the advice of his medical advisers, he resigned office at once, and went away to rest in the south of France. He returned in the autumn greatly restored, and took part in recommending the Irish treaty to the house of commons. During the first half, and more, of 1922 he only spoke occasionally, but he watched carefully the increasing reluctance of the Conservative party to support Lloyd George and the Coalition; a reluctance which had indeed resulted in the formation of a large group of independent "Die-hards" under Lord Salisbury's leadership. When the question was brought to an issue at the Carlton club meeting on Oct. 19, the decisive factor was Bonar Law's declaration that the only method of preserving the unity of the party was to come out of the Coalition and to appeal to the country as an independent body. Lloyd George at once resigned, and Bonar Law, after being unanimously elected to his old post of party leader, formed a purely Conservative government, which did not include the most prominent Conservative Coalitionists. His action was endorsed by the country at the general election in November, when the Conservatives returned 344 strong, a majority of 74 over all other parties put together. He at once reduced the cabinet secretariat, and restored the foreign office to its former position in the official hierarchy; and he carried through parliament the bill to establish the Irish Free State constitution.

Though he proclaimed the policy of his government to be one of tranquillity and stability, he found himself, in the winter, deeply involved in political troubles. Unemployment was rampant, with labour unrest and housing problems threatening; a European conference at Lausanne proved impotent in face of the obstinacy of nationalist Turkey; and M. Poincaré, the French premier, insisted, in spite of Bonar Law's personal intervention at Paris, on despatching a French military expedition to the Ruhr to exact reparations from Germany. Baldwin, his chancellor of the Exchequer, did indeed succeed in concluding in Jan. 1923 at Washington an arrangement to fund the British war debt to the United States; but the terms were so severe that the prime minister was at first reluctant to accept them. After such an anxious winter it is not surprising that in the spring of 1923 his health once more gave way, and he resigned office on Whitsunday, May 20, after a ministry which only lasted 209 days. He died five months later, on Oct. 30, 1923, and was buried in Westminster Abbey. He married in 1891 Annie Pitcairn, daughter of Harrington Robley, of Glasgow, by whom he had a family; but he was left a widower in 1909. Two sons perished in World War I. (G. E. B.)

LAW, **JOHN** (1671–1729), Scottish economist, the originator of the "Mississippi scheme," was born at Edinburgh in April 1671. He studied mathematics, commerce and political economy in London, and banking operations at Amsterdam, whither he fled (1694) after killing Edward Wilson in a duel. On his return to Scotland in 1705, he submitted a scheme for a national bank to the Scottish parliament, but owing to Paterson's influence it was rejected, and similar proposals made to other European governments met with a like fate. On May 20, 1716, however, Law obtained letters patent to establish a *Banque générale* in France. The capital of six million livres was divided into 1,200 shares of 5,000 livres each, payable in four instalments, one-fourth in cash, three-fourths in *billets d'état*. The bank was empowered to issue notes payable at sight in the weight and value of the money mentioned at the day of issue, and on April 10, 1717, it was decreed that Law's notes should be received in payment of taxes. So successful was the undertaking that not only did the rate of interest fall to $4\frac{1}{2}\%$, but the note issue rose to 60 million livres. Law, having gained the full confidence of the Regent, now proceeded with his Mississippi scheme.

In Aug. 1717, he founded the *Compagnie de* la *Louisiane ou d'Occident*, which absorbed both the company founded by Antoine Crozat in 1712, and the *Compagnie du Canada*. Extensive powers over the area drained by the Mississippi, the Ohio and the Missouri were granted, and in 1718 they were extended by the company's purchase of the tobacco monopoly. The success of this scheme was sufficient to arouse hostility in Paris, resulting in the formation of a rival company, and a consequent drop in the shares of Law's undertaking. He proceeded with his plans, however, and in Dec. 1718, when the *Banque générale* was converted into the *Banque royale*, whose notes were guaranteed by the king. he became director of the new institution. A further step was made towards consolidation in the following year, when the *Compagnie d'Occident* absorbed the *Compagnies des Indes Orientales et de la Chine*, taking the name of the *Compagnie des Indes*. Shortly after, the company was granted the management of the mint and the coin issue for nine years, and the farming of the national revenues, on undertaking the payment of the national debt. Speculation reached an unparalleled height, and when the climax came in 1720, with the amalgamation of the *Compagnie des Indes* and the *Banque royale*, reaction had already set in. The public becoming alarmed, drastic measures were taken to check the drain of coin, but the decree of May 21, 1720, by which the value of the bank notes was to be gradually reduced to one half, precipitated the panic, and a week later the bank suspended payment. Law was removed from his office, and the whole system was demolished by his enemies. In Dec. 1720 Law left France secretly, resumed his wandering life, and died at Venice on March 21, 1729.

Of Law's writings the most important is *Money and Trade Considered* (1720). Though subject to the errors of his time, he was undoubtedly a financial genius.

The fullest account of the Mississippi scheme is that of Thiers, *Law et son système des finances* (1826, American trans. 1859). *See* also Heymann, *Law und sein System* (1853); Pierre Bonnassieux, *Les Grandes Compagnies de commerce* (1892); S. Alexi, *John Law und sein System* (1885); E Levasseur, *Recherches historiques sur le système de Law* (1854); and Jobez, *Une Préface au socialisme, ou le système de Law et la chasse aux capitalistes* (1848). Full biographical details are given in Wood's *Life of Law* (1824). All Law's later writings are to be found in Daire, *Collection des principaux économistes*, vol i. (1843). Other works on Law are: A W Wiston-Glynn, *John Law of Lauriston* (1908); P. A. Cachut, *The Financier Law, his Scheme and Times* (1856); A. Macf. Davis, *An Historical Study of Law's System* (Boston, 1887); A. Beljame, *La Prononciation du nom de Jean Law le financier* (1891); A Martineau, *Mém. sur quelques affaires de L'Empire mogol, 1756–61* (1913); G. Oudard, *La très curieuse Vie de Law* (1927). *See* also article on Law by W. A. S. Hewins in Palgrave's *Dictionary of Political Economy* (1925).

LAW, WILLIAM (1686–1761), English divine, was born at King's Cliffe, Northamptonshire. In 1705 he entered as a sizar at Emmanuel college, Cambridge; in 1711 he was elected fellow of his college and was ordained. He resided at Cambridge, teaching and taking occasional duty until the accession of George I., when his conscience forbade him to take the oaths of allegiance to the new government and of abjuration of the Stuarts. His Jacobitism had already been betrayed in a tripos speech (1713) which led to his being suspended from his degrees; and he was now deprived of his fellowship and became a non-juror. For the next few years he is said to have been a curate in London. By 1727 he was domiciled with Edward Gibbon (1666–1736) at Putney as tutor to his son Edward, father of the historian, who says that Law became "the much honoured friend and spiritual director of the whole family." In the same year he accompanied his pupil to Cambridge, and resided with him for the next four years. His pupil then went abroad, but Law was left at Putney, where he remained in Gibbon's house for more than ten years, acting as a religious guide not only to the family but to a number of earnest-minded folk. The most eminent of these were the two brothers John and Charles Wesley, John Byrom the poet, George Cheyne the physician and Archibald Hutcheson, M P. for Hastings. The household was dispersed in 1737. Law was parted from his friends, and in 1740 retired to King's Cliffe, where he had inherited from his father a small property.

Law's writings fall under three heads:—1. *Controversy.*— In this field he had no contemporary peer save perhaps Richard Bentley. The first of his controversial works was *Three Letters to the Bishop of Bangor* (1717), a most powerful contribution to the Bangorian controversy *(see* HOADLY, BENJAMIN) on the high church side. In his *Remarks on Mandeville's Fable of the Bees* (1723), Law vindicates morality on the highest grounds; for pure style, caustic wit and lucid argument this work is remarkable; it was enthusiastically praised by John Sterling, and republished by F. D. Maurice. Law's *Case of Reason* (1732), in answer to Tindal's *Christianity as old as the Creation* is to a great extent an anticipation of Bishop Butler's famous argument in the *Analogy.* In this work Law shows himself at least the equal of the ablest champion of Deism.

2. *Practical Divinity.*— *The Serious Call to a Devout and Holy Life* (1728), together with its predecessor, *A Treatise of Christian Perfectzon* (1726), deeply influenced the chief actors in the great Evangelical revival. The Wesleys, George Whitefield, Henry Venn, Thomas Scott and Thomas Adam all express their obligation to the author. Samuel Johnson, Gibbon, Lord Lyttelton and Bishop Horne all spoke enthusiastically of its merits; and it is still the only work by which its author is popularly known. It has high merits of style, being lucid and pointed to a degree. His tract *The Absolute Unlawfulness of Stage Entertainments* (1726) provoked some effective criticism from John Dennis in *The Stage Defended.*

3. *Mysticism.*—Though the least popular, by far the most interesting and original of Law's works are those which he wrote in his later years, after he had become an enthusiastic admirer (not a disciple) of Jakob Bohme (*q.v.*). These mystical works include *A Demonstration of the Gross and Fundamental Errors of a late Book called a "Plain Account, Etc., of tlze Lord's Supper"* (1737); *The Spirit of Prayer* (1749, 1752); *The Way to Divine Knowledge* (1752); *The Spirit of Love* (1752,1754); a *Dialogue between* a *Methodist and a Churchman* (1760); and *An Humble, Earnest and Affectionate Address to tlze Clergy* (1761).

See the edition of his *Works* by *G. H.* Morgan (1892–93). *See* C. Walton, *Notes and Materials for a Complete Biography of W. Law* (1848); Sir Leslie Stephen, *English Thought in tlze 18th century* (1876); W. H. Lecky, *History of England in the 18th Century* (1878 foll); C. J Abbey, *The English Church in the 18th Century;* J. H. Orerton, *William Law, Noniuror and Mystic* (1881); A. Whyte, *Character and Characteristics oj William Law, Nonjuror and Mystic* (1893; a selection with introd. by Whyte).

LAW, a word used in English in two main senses—(I) as a rule prescribed by authority for human action, and (2) in scientific and philosophic phraseology, as a uniform order of sequence (*e.g.,* "laws" of motion). In this work the laws of uniformities of the physical universe are dealt with in the articles on the various sciences. The general principles of law in the legal sense are discussed under JURISPRUDENCE. What may be described as "national systems" of law are dealt with historically and generally under ENGLISH LAW; AMERICAN LAW; ROMAN LAW; GREEK LAW; ISLAMIC LAW; INDIAN LAW; etc. Certain broad divisions of law are treated under COKSTITUTION AND CONSTITUTIONAL LAW; CANON LAW; CIVIL LAW; COMMON LAW; CONFLICT OF LAWS; CRIMINAL LAW; ECCLESIASTICAL LAW (ENGLISH); EQUITY; INTERNATIOKAL LAW, PCBLIC; MILITARY LAW; MARTIAL LAW; etc. And the particular laws of different countries on special subjects are stated under the headings for those subjects (BANKRUPTCY, etc.). For courts of law and procedure, *see* JURISPRUDENCE; QUEEN'S BENCH, COURT OF; PRACTICE AND PROCEDURE; etc.

In science and philosophy, law has several meanings, all of which are different from the sense it has when used with reference to legislation. (1) In most sciences a law is simply the formulation of some uniform character, mode of behaviour, or uniform correlation of certain natural phenomena or events. The uniformity is in the nature of things themselves. and there is po law outside them to obey or disobey. If there is no such objective uniformity, then the law is a blunder on the part of those men of science who have formulated or accepted it. In science, then, the term law has nothing whatever to do with an imperative or a command, backed by sanctions or not. To speak of natural phenomena as "obeying" certain laws is just loose-thought or loose language influenced by legal analogy. (2) In the more complex biological and human sciences (including psychology, sociology and economics) the term law must be understood to denote the formulation of a certain general tendency rather than a rigid uniformity. in the sense of (1) above. It may be that such uniformities are actually operative under certain conditions. but the conditions may be partly variable, and in any case, owing to the extreme complexity of the phenomena and the impossibility of studying them under sufficiently controlled and varied conditions, the laws actually formulated cannot be regarded as expressing uniformities, less still as expressing ideals or norms, in sense (3) below, but just certain general tendencies which are subject to modification with changing conditions. When people speak of "iron laws of economics" they confound economic lams with the laws of mechanics; and when they exploit them with a good conscience, they confound economic with moral laws. (3) In the so-called philosophical sciences. or normative sciences, logic, ethics and aesthetics, the term lam is used rather in the sense of a regulative ideal or norm.

See J S. MacKenzie, *Manual* of *Ethics* (1924). (A. WO.)

LAW (PRIMITIVE). Primitive law is the lam of peoples whose culture does not include the art of writing. Civilized law is the law of peoples whose culture has developed to the point that it does include writing. *(See* LAW.) Archaic lam is the law of early civilizations.

Law **and** Culture.— Law is essentially an aspect of culture. Each human society possesses its own distinctive culture consisting of standardized modes of action in accordance with which individual behaviour is to be patterned.

Such patterns of behaviour, called social norms. are popularly known as customs. Law is generically similar to custom in that it also consists of patterns of behaviour. It is a characteristic of human social life that what is done by the majority of persons in a given situation takes on the quality of what ought to be done. The "is" becomes an "ought." The norm takes on the quality of the normative.

All customs or social norms are sanctioned; *i.e.,* are supported by rewards or penalties for conformity or nonconformity. The human nervous system is so plastic and the organism so adaptable to a variety of behaviours that the potential range of human activities is almost infinite. Organized social living, therefore, requires arbitrary and imperative narrowing donn of the actual range of behaviour that may be alloned expression in any society. Social control consist5 of all the means a society utilizes to induce its members to think and act in accordance with the norms that make up its culture.

Lan- is a major but by no means the sole instrument of social control. It is diitinguished from mere custom by the nature of its

sanctions and by the character of the persons who may apply the sanctions.

The distinctive and ultimate sanction of law is the application of physical force, be it whipping, mutilation, imprisonment, exile or death.

In primitive as well as in civilized legal systems it is not necessary in every instance to utilize the sanction of force in all legal proceedings. Such sanctions as the exaction of damages and the imposition of fines are extensively relied upon. Konetheless, if law is operative, refusal to pay damages or an imposed fine results in the use of the sanction of force.

Physical coercion is not of itself legal coercion. It may be illegal as in gangsterism or simply nonlegal as is the spanking administered within the family home. To be legal the application of physical coercion must have the quality of being applied officially or quasi-officially on behalf of the entire society and with general social acceptance of its legitimacy. It is important, therefore, that the individuals who undertake to apply the sanctions be persons who. by virtue of their particular status, are recognized as rightfully acting with reference to the wrong at issue and to the alleged wrongdoer.

The socially recognized privilege of applying force constitutes the official element in law. In primitive law the prosecutor is frequently the very individual who has suffered the alleged wrong rather than the holder of an established public judicial or executive office. Nevertheless, if the wrong is real and of an illegal nature, and if the injured party proceeds in accordance with due process, he may with impunity apply the sanction of physical force. As reported for the Ifugao of northern Luzon in the Philippines by R. F. Barton, "If a family conduct its case faultlessly, even though the issue be only a debt, and especially if a *monkalun* [go-between] be sent, they may, at the termination of the truce. slay the culprit. Public opinion will uphold, and the kin of the slain are not very likely to retaliate." (Roy F. Barton, *Half-Way Sun,* p. 115, Harcourt, Brace and Company, Inc., 1930.) The private prosecutor is, on this occasion and for this offense, a representative of social authority endowed with the element of officialdom, even though he wears no constable's badge, policeman's uniform or judicial robe.

In sum, the essential elements of law are: (1) regularity (law is a social norm); (2) the element of official authority; and (3) the application of the sanction of physical force as a privileged possibility. Law exists in these terms in virtually every primitive society.

Substantive and Adjective Law.—Law always has two aspects: the substantive and the adjective (procedural). The substantive defines the content of the norms of behaviour that are to be legally enforced. The adjective defines how the substantive norms are to be enforced and by whom.

The content of substantive law varies tremendously from primitive society to primitive society. Two features, however, are universal. Homicide within the tribe in one form or another is legally punishable everywhere. Adultery, with a few possible exceptions, also comes universally within the scope of legal action. It should be realized, however, that just what constitutes illegal homicide and adultery is relative to each culture. Thus, among the Eskimos infanticide, senilicide and invalidicide are legally privileged if done by a relative or close friend. Among these same people, sexual intercourse between a married woman and a man not her husband is not illegal adultery when her husband has lent her to a friend; it is, on the other hand, most definitely illegal if performed with a man to whom the husband has not, at least implicitly, extended permission for the act.

Sorcery, or antisocial witchcraft. is also a widespread object of legal control among primitive societies. The reason for this is not to be found in notions of heresy as crime but rather in the fact that sorcery is a form of vicarious homicide and aggression against the physical well-being of another

Inasmuch as homicide is universally subject to legal control, sorcery as a form of homicide is subject to such control also. The only difference is that while some killing takes place from time to time in even the most peaceful of societies, there are a few primitive societies, such as that of the Cheyenne Indians, in which there is no sorcery.

Theft, interestingly enough. is not a subject of major concern in primitive law. This is mostly because of the fact that among the simpler people access to the available economic resources is generally open to all on an equal footing. Furthermore, food and implements are freely shared.

Primitive substantive law among the food gatherers and hunters is, therefore, mostly concerned with direct personal relations of the order of homicide, bodily assault, sorcery and adultery rather than with goods. Among primitives who have achieved horticulture or extensive reliance on animal husbandry the law of property and inheritance burgeons.

The vital factor is the development of concepts of cultural items as capital that may be borrowed and lent—and misappropriated. Unlawful conversion and indebtedness are great breeders of litigation among the higher primitives. Entry into contractual relations is a common undertaking at this level of cultural development.

The greatest degree of contrast between primitive law and civilized law in general is in the area of procedure. The forms of law are everywhere intimately related to other forms of social structure.

The simpler primitive societies are characterized by decentralized, segmentary units of organization devoid of an over-all political authority. Each kindred, lineage or clan exercises a high degree of autonomy. Each has its own headmen and elders who function as leaders and guides to the group's activities. Where several kinship groups exist in a village, the elders may form a village council, and one of them may also serve as a village headman or chief. The scope of such village or tribal authority is, however, usually quite limited when compared to the autonomy of the kinship groups.

This means that in primitive law the primary authority for institution of most legal actions is the kinship group in support of its individual members. Hence, private law, so-called, dominates most primitive law.

At the same time, almost every primitive society recognizes some acts which must be and are legally punishable by the society at large or on its behalf by some explicitly delegated public officials. Illegal acts punished by public prosecution are crimes, as against the torts of private law.

The great trend in the development of law from the most primitive societies to the most civilized is not so much a movement from status to contract, as envisaged by Sir Henry Maine in his *Ancient* Law (1861), but rather a continuous shifting of the privilege rights of prosecution and the imposition of legal sanctions from the wronged individual and his kinship group over to clearly defined public officials representing the society as such. The shift is less substantive in emphasis than a shift in the locus of procedural responsibility.

Law and Feud.—Although primitive societies have well-developed concepts of due process of law and although their law systems are frequently ingenious and quite adequate to their social needs, there is a fatal defect inherent in the nature of primitive private law systems. Private law litigation involves direct negotiation and arrival at mutual agreement by two parties who are in mutual disagreement and conflict to begin with. The defendant must agree to some form of punishment or restitution or there can be no settlement.

If. for any reason, the defendant is recalcitrant or the plaintiff is unreasonably demanding, agreement will not be reached and the case will not be settled. Procedure breaks down. Two outcomes are then possible. Either the defendant drops the suit and justice is not realized at all, or the plaintiff attacks the defendant. Because the defendant has already indicated that he does not accept the legitimacy of the plaintiff's claim, it automatically follows that the defendant will fail to recognize the legitimacy of the plaintiff's resort to force.

Feud or internecine war, with all its attendant ill effects, may then start.

Legal historians have traditionally seen primitive society as

marked by a constant state of feud, as rent by violent retaliation and blood revenge—an arena of violence ruled by the lam of the jungle and *talionis* ("An eye for an eye and a tooth for a tooth"). Feud and the prevalence of the law of blood revenge represent either an absence of law or the breakdown of legal procedure where legal institutions do exist. Feud, however, never persists unchecked or uninhibited. Legal procedures or other ritual devices for avoiding or terminating feud, once started, are found always to be present in every culture.

Recourse to the good offices of a ritual chief, as among the Nuer of the African Sudan, or to the mediation services of an outstanding and neutral citizen, as among the Ifugao, is the first step in the development of the primitive judicial use of a disinterested third party.

The emergence of a lineage, clan or subtribe to political dominance and chieftainship within the society has the collateral effect of providing the wherewithal for authoritative third party intervention in private law actions. The tendency becomes strong to symbolize the whole society in the person of the chief and to look upon offenses against the chief no longer as private wrongs but as crimes against the society. More and more offenses are looked upon as breaches of the king's peace. The scope of royal courts becomes wide and penetrating as may be seen in the law of many of the African social systems. Centralized political and judicial authority not based upon the dominance of a kinship group may also be developed within a tribe. Among the Cheyenne Indians, for example, such authority was vested in the tribal council of self-appointed chieftains. The heads of the military fraternities also directed their groups in legal actions on behalf of the entire tribe.

Among the Pueblo Indians in the southwestern U.S. and Mexico, the central legal authority resides in the high priest, or in the cacique, and in the council of ranking priests of the religious fraternities. In conquest-originated caste societies of the type that were common in Africa and the Mediterranean of antiquity centralized legal authority in the hands of the caste of conquerors was easily and regularly achieved.

Primitive Legal Sanctions.—The most striking feature of primitive legal sanctions is the absence of imprisonment. Imprisonment is a cultural invention of civilization. Primitive law aims at deterrence and restitution. Imprisonment does not effect restitution. Under primitive conditions of living imprisonment is too troublesome to be relied upon for its possible deterrent effects.

The sanction for persistent and dangerous antisocial activity in primitive law is quite generally exile or death. Otherwise, the exaction of damages is the most widespread sanction used. Nor is such composition a secondary substitute for feud as many 19th-century writers on legal history assumed.

Feud, as has been noted, follows upon the breakdown of legal procedure. It is also significant that in a number of primitive societies in which the ideal norm is for the killing of the defendant, a fine may be levied or compensatory damages accepted instead. The real adjective norm is not the death penalty but an economic payment.

Ritual combat, as exemplified by the Australian aborigines, allows for formal retribution through a mild mutilation of the wrongdoer at the hands of the person he has aggrieved.

The Sources of Primitive Law.—Law is generated in conflict and dispute. It centres in trouble cases. Substantively, law determines which course of action between the two alternatives posed by the disputants shall be allowed to prevail in the society and which one shall be ruled out and suppressed by legal penalty. Rules of law emerge from cases in action. They are formulated with reference to deep-lying assumptions as to the nature of the universe and man within it, and as to the nature of what is desirable and what is undesirable.

These are the basic existential and normative postulates that are at the foundation of each cultural system.

Although some legislation of a conscious order does occur among primitives, most primitive law is case-created rather than legislated. Primitive law is therefore predominantly a type of common law. As common law it is neither more nor less "customary" than is the common law of Great Britain and the United States. It is by the nature of primitive culture unwritten.

Religious belief is not an outstanding source of primitive law as such. Societies whose cultures include elaborately developed ancestral cults are prone to work religious prescripts into law, thus utilizing legal sanctions to induce conformity to the ancestral norms. In almost all primitive societies, however. the area of tabu (*q.v.*) is much wider than is the area of law, and many legal injunctions have no counterparts in religious or magical tabus.

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LAWES, HENRY (1596–1662), English musician, was born at Dinton in Wiltshire in Dec. 1595, and received his musical education from John Cooper, better known under his Italian pseudonym Giovanni Coperario (d. 1627), a famous composer of the day. In 1626 he was received as one of the gentlemen of the chapel royal, a place he held until the Commontvealth put a stop to church music. Lawes wrote the music for Thomas Carew's masque *boelum Britannicum*, produced at court on Feb. 18, 1634, and for the more famous production of Milton's *Comus* at Ludlow Castle (1634). the music to George Sandys' version (1637) of the Psalms; and in 1648 the *Choice Psalmes put into music*, composed by Henry and William Lawes. This latter contained elegies on William. Henry's half-brother, killed at Chester in 1645, and among the commendatory verses printed with it is Milton's sonnet: "Harry, whose tuneful and well-measured song." The famous collection of his vocal pieces. *Ayres and Dialogues for One, Two and Three Voyces*, was published in 1653, and was followed by two other books under the same title in 1655 and 1658 respectively. In 1656 he was one of those who provided the music for Davenant's first entertainment at Rutland House. When in 1660 the king returned, Lawes once more entered the royal chapel, and composed the anthem *Zadok the Priest*, for the coronation. He died on Oct. 21, 1662, and was buried in Westminster Abbey. In the famous sonnet already referred to Milton exactly indicates the great merit of Lawes.

His brother, WILLIAM LAWES, (d. 1645), was also a pupil of Coperario. He was in the choir of Chichester cathedral until 1602. and afterwards became a gentleman of the Chapel Royal. The music to Shirley's masque *The Triumph of Pence* (performed in 1634) he composed with Simon Ives. The music to D'Avenant's masque *The Triumph of the Prince d'Amour* (performed in 1633 in the Middle Temple) was also of his composition. He lost his life fighting for the Royalist cause in the Civil War, Sept. 1645. None of his music was published until after his death, the first to appear being his brother Henry's edition of "Choice Psalmes" (1648). Many of his songs, among which the best known is *Gather ye Rosebuds while ye May*, are contained in books published by Playford: *Court Airs* (1656), *Courtly Masquing Ayres* (1662), etc. His most important works are short pieces for viols, lutes, etc.. but his *Royal Consort*, containing a collection of 66 of these, exists only in manuscript.

LAWES, SIR JOHN BENNET, BART. (1814–1900), English agriculturist, was born at Rothamsted Dec. 28, 1814. Before leaving Oxford he became interested in growing medicinal plants on the Rothamsted estates, which he inherited on his father's death in 1822. About 1837 he began to experiment on the effects of manures on plants growing in pots, and a year or two later the experiments were extended to field crops. In 1842 he patented a manure, generally known as "superphosphate," formed by treating phosphates with sulphuric acid. and thus initiated the artificial manure industry. In the succeeding year he enlisted the services of Sir J. H. Gilbert, with whom he carried on for more than half

a century those experiments in raising crops and feeding animals which made Rothamsted famous *(see* AGRICULTURAL EDUCATION AND RESEARCH). In 1854 he was elected a fellow of the Royal society. which in 1867 bestowed a Royal medal on Lawes and Gilbert jointly, and in 1882 he was created a baronet. In 1889 he took measures to ensure the continuation of the Rothamsted experimental farm by setting aside £100,000 for that purpose and constituting the Lawes Agricultural trust. Lawes died Aug. 31, 1900; his work was carried on and expanded with the aid of the government.

See also ROTHAMSTED EXPERIMENTAL STATION.

LAW MERCHANT or **LEX MERCATORIA,** originally customary rules and principles relating to merchants and mercantile transactions. adopted by merchants themselves for the purpose of regulating their dealings. The lam merchant owed its origin to the fact that trade in pre-medieval times was practically in the hands of those who might be termed cosmopolitan merchants. who wanted a prompt and effective jurisdiction. It was administered for the most part in special courts. such as those of the guilds in Italy. or the fair courts of Germany and France or, as in England, in courts of the staple or piepowder. *(See* also MARITIME LAW.)

The history of the law merchant in England is divided into three stages: the first prior to the time of Coke, when it was a special kind of law—as distinct from the common law—administered in special courts for a special class of the community (*i.e.*, the mercantile): the second stage was one of transition, the law merchant being administered in the common law courts, but as a body of customs, to be proved as a fact in each individual case of doubt; the third stage, which has continued to the present day, dates from the presidency over the king's bench of Lord Mansfield (*q.v.*), under whom it was moulded into the modern mercantile lam.

LAWN, a very thin fabric made from level linen or cotton yarns. It is used for light dresses and trimmings, also for handkerchiefs.

The terms lawn and cambric (*q.v.*) are often intended to indicate the same fabric. In this sense of the term the derivation is from the name of the French town. Laon.

LAWNS, CARE OF. Lawns are cultivated for decoration. for golf courses (greens and fairways), ball fields, tennis courts and a number of other purposes.

Whatever the kind of lawn, its plants are necessarily crowded together; and problems of cultivation arise which do not occur with wild grass. A single plant of wild grass may occupy as much as a square foot of land, whereas in home lawns as many as 100 plants may be crowded into the same area. These plants must compete with each other for food. light, air and moisture; their crowding together produces conditions favourable to fungal growth and subsequent disease.

In order to thrive, grass must have proper nutrition. Only the fescues will tolerate poor soil, and they may even become diseased if overfed with fertilizer. Bermuda, common Kentucky bluegrass, Merion Kentucky bluegrass, the bent grasses and zoysia all grow best if they receive at least four pounds of nitrogen to each 1,000 sq.ft. (about four times the amount once recommended). The single-application forms of mixed ureaform chemicals are easiest for the homeowner to use.

A typical mixture of this type contains 20 parts nitrogen, 5 parts potassium and j parts phosphorus (designated 20–5–5) and should usually be applied at the rate of 100 lb. to each 5,000 sq.ft. of lawn early in the spring. This fertilizer permits gradual release of nitrogen throughout the summer without injury to the turf. Therefore, it needs to be applied only once during a growing season.

If older types of fertilizers (*i.e.*, 5–10–5 or 4–12–4) are used. four applications—in early spring. early June. early July and in the beginning of September—will space the feedings at about the proper intervals.

Mowing of grass compacts the soil. drives out the air and makes the entry of nater difficult; it also removes the most vigorous part of the plant—the growing tip. The effects of compaction. however, can be lessened by use of spiking devices which loosen the soil and permit aeration. Top-dressing or black soil should not be applied over an old lawn because it usually introduces weeds. Despite the disadvantages of mowing it is important because regular removal of the tips forces the formation of a crown, and builds up a solid lawn surface. Grass should be cut once a week even though it may not show growth.

Excessive watering should be avoided; a moist surface favours the spread of disease. Except for the bents, most grasses do not need regular watering under normal moisture conditions. If rain does not fall for two or three weeks, however, the lawn should be soaked deeply, and no water added thereafter for at least a week except under arid or semiarid conditions. Overwatering is especially damaging to the fescues and Merion Kentucky bluegrass.

Fungicides control a wide range of grass diseases. One of these chemical mixtures applied before the start of winter will prevent "snow mold," a disease which works at low temperatures, particularly when the grass is covered by snow. In summertime common Kentucky bluegrass is often infected with one of the leaf spot diseases, called summer dormancy. It can bc prevented by applying fungicide at the time of the last spring frost. Where turf diseases are common, organic fertilizers such as sewerage sludge, sheep manure and blood and bone should be avoided because they feed the disease organisms as well as the lawns. Straight chemical plant foods do not. Commercial preparations containing 85% calcium arsenate will kill many injurious insects and will control some persistent lawn meeds. Best control of broad-leaved weeds can be had with 2,4-D. See also GRASSES; HORTICULTURE : *Horticulture and the Home.* (R. M. C.)

LAWN TENNIS AND TENNIS. These two games are closely connected by origins—lawn tennis may be regarded as the descendant of tennis—but they are widely different. Lawn tennis, the more popular, will be considered first.

As an independent member of the family of ball games of which the parent root was probably buried in Egypt or Persia. joo years before the Christian era, lawn tennis is relatively modern and it had its beginning in England. It is played by men and women, at night as well as day, indoors as well as outdoors, on various surfaces—dirt, grass, clay, concrete, wood and on courts made of a composition. The name lawn tennis. especially in the United States, has been contracted to the word tennis.

The inventor of lawn tennis was an Englishman, Major Walter Wingfield. In 1874 he devised and patented a "new and improved portable court for playing the ancient game of tennis." It was an hour-glass shaped court. introduced as Sphairistike, or as its enemies liked to call it, "Sticky." About this time the All England Croquet club, located in Wimbledon, a suburb of London, discovered that its exchequer was empty. or almost so. and added the term "Lawn Tennis" to its title and several grass courts to its facilities. The first of all championships was held on these courts in June 1877, on a surface measuring 26 yd. long and 9 yd. wide, with a net 3 ft. 3 in. high at the centre. There were 22 competitors, of whom the majority were either tennis or rackets players. The winner, Spencer W. Gore, was a former rackets star and a native of London.

It is interesting to note that the dimensions of the lawn tennis court remained unchanged after that time. In 1878 the height of the net was reduced to 4 ft. 9 in. at the posts, and 3 ft. at the centre. In 1880 the net was lowered to 4 ft. at the posts, and in 1884 to 3 ft. 6 in.

From the start until 1907, the championships at Wimbledon were won by natives of the British Isles. The early Wimbledon, however, with its bleacherlcss courts and general air of calm, bore little resemblance to its successors. Yet from the start the All England club had a decisive influence on the game. The Lawn Tennis association (English) was founded in 1886, the International Tennis federation not until 1912. In the interim, the game had spread to other continents.

Lawn tennis was said to have been introduced into the United States by Miss Mary E. Outerbridge. who spent the winter of 1874 in Bermuda and there saw the game played by British officers of the garrison. She returned with a lawn tennis net, some rackets and balls, obtained from the regimental stores through

the courtesy of the colonel. One of her brothers, A. Emilius Outerbridge, helped her lay out a court on the grounds of the Staten Island Cricket and Baseball ciub. James Dwight and F. R. Sears, Jr., of Boston, Mass., obtained a set from England and laid out a court at Nahant, a seaside resort in Boston harbour, a little later. The first tournament in the United States, a handicap event, was played at Nahant in Aug. 1876. The first official championships of the United States, playing under English rules and with English balls, was held at the Casino, Newport, R.I., on Aug. 31, 1881. There were 25 competitors entered in the singles and 13 pairs in the doubles. The singles was won by Richard D. Sears of Boston, who held the title every year until 1888. In 1881, the United States National Lawn Tennis association, with Gen. R. S. Oliver of the Albany Tennis club as president, was formed.

This period might be called the age of innocence of lawn tennis. In both England and the United States, the players were amateurs and sportsmen, the tournaments few in number, and watched by small galleries. In the United States, from the time of Sears until 1900, most U.S. champions were volleyers, Oliver S. Campbell and Robert D. Wrenn, who held between them seven singles titles in the 1880s and 1890s, especially so. During this period the game was played chiefly along the eastern seaboard. In 1900 a cup was donated by Dwight F. Davis, then an undergraduate at Harvard, for international competition. (From the start, all Davis Cup ties consisted of four singles and one doubles match.) The first contest was played in Longwood, near Boston, on Aug. 8, 9 and 10, 1900, and was won by the United States, three matches to none. (One was not played, and one left unfinished.)

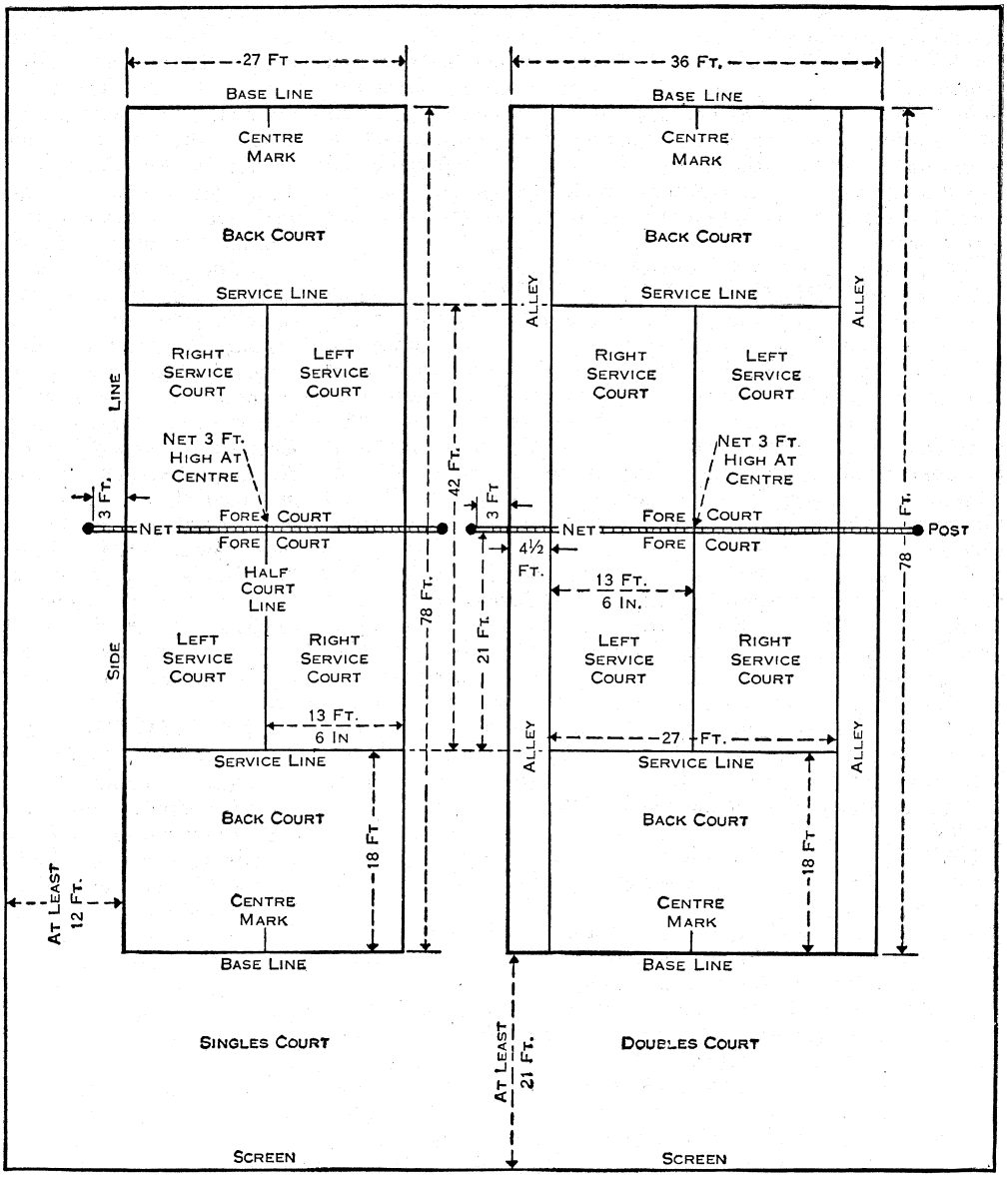


DIAGRAM OF TENNIS COURT

In 1907, Norman E. Brookes of Australasia became the first overseas player to win the Wimbledon title. Meanwhile in the United States there was a swing away from the net game. Both William A. Larned, who held the U.S. title from 1907 to 1912, and William T. Tilden, who dominated world tennis from 1920 to 1925, were able to play the net and play it well. Yet both won the majority of their titles from the base line. In 1912 a new influence was felt in the game. For the first time in U.S. tennis the champion did not come from the eastern seaboard. That year the title mas won by Maurice E. McLoughlin, a Californian trained on courts of asphalt. He introduced the cannon ball service, a weapon used by every U.S. star since then.

By this time tennis may be said to have come of age. In 1915 the national championships of the United States were removed from the tranquillity of the Casino at Nenport, R.I., to the urban setting of the West Side Tennis club at Forest Hills, Long Island. Attracted by the spectacular playing of McLoughlin, crowds turned out for the matches. At the same period, interest grew in the Davis Cup matches. In 1903, when it had been captured by the Doherty brothers for Great Britain at the Longwood Cricket club, in Brookline, Mass., only two nations were represented, and hardly 2,000 spectators saw the contests each afternoon. In 1914, seven nations from three continents competed, and the challenge round played at Forest Hills just as World War I broke out, was witnessed by 10.000 people. Australasia with the left-handed veteran Brookes, and Capt. Anthony Wilding (killed in action in Flanders in 1915) met McLoughlin and R. Norris Williams, an undergraduate at Harvard. There have perhaps been greater matches in tennis history; but few so dramatic, so grim or so spectacular. The speed of shot on both sides was tremendous. The rallies were few. It was a different game from the poised, accurate, garden-party tennis of the Dohertys. Tennis had changed as the world was changing.

Tilden won the title at Wimbledon in 1920, the first but not the last male American to do so. He repeated the next year, and in 1923 the first Californian, William M. Johnston, won the men's singles. In 1920 Tilden and Johnston beat the Australasians at Auckland, N.Z., taking the Davis Cup back to the United States. With Williams and Vincent Richards they formed the best balanced team ever to appear on a court in an international match, and through their efforts Australian, Japanese and French challengers for the trophy were regularly defeated until 1927. The U.S. influence on sport at this period was visible in many ways. Money was no an important factor in competitive tennis. Huge crowds

attended national championships and Davis Cup matches in every land. As an example, the old grounds seating several thousand spectators under wooden roofs at the Worple road, Wimbledon, were abandoned in 1921 for a new, modern: concrete tennis stadium, a few miles away, seating 15,000. This stadium which was opened by King George V on June 22, 1922, attracted players from Spain, France, the United States, Italy, Ireland. Scotland, Sweden, Holland, South Africa, Belgium, Rumania, Denmark, Greece, New Zealand, Australia and England that summer. It cost £140,000, and was probably paid for in a few years. Likewise in 1923 the wooden stands of the West Side Tennis club at Forest Hills were replaced by a concrete stadium seating more than 13,000. The first Wightman Cup matches inaugurated the stadium.

The money received by various national tennis associations was used for different purposes. It was found necessary to spend considerable sums to train, equip and transport teams of four, five or six players to cross oceans for the purpose of competing in these international events. In 1903 two nations battled for the Davis Cup; in 1914 there were seven; in 1927, when it was won by the French, there were 26. With the exception of Turkey and the U.S.S.R. no nation was impervious to the prestige accruing to a country from a victory in the Davis Cup. In 1927 teams competed from Denmark, Poland and Sweden; from the antipodes; from below the Tropic of Capricorn; from India and Japan; from Italy and Greece on the shores of the Mediterranean; from Mexico and Cuba; from the Balkan states; from Canada and the United States.

By this time France had come to the front. Young Frenchmen were advancing in the technique of the game, and a French team composed of J. R. Lacoste, J. Borotra, H. Cochet and J. Brugnon (the "Four Musketeers") reached the challenge round of the Davis Cup for the first time in 1925. Two years later they were the survivors of 21 nations, and crossing the ocean found themselves for the third time challenging the holders, the United States, at Philadelphia, Pa. This time they discovered that age had stemmed the power of the two great U.S. stars, Tilden and Johnston. They carried the cup back to France. For the first time a Latin nation had beaten an Anglo-Saxon country in its own specialty — in the field of sport. This was the first of six years of French successes in tennis.

In 1933, a total of 32 different countries challenged France for the Davis Cup. The trophy was finally won by Great Britain, who defeated the French in the challenge round at Paris. For the first time in 20 years this international sporting cup was returned to the land which gave the game birth.

With its young stars Fred Perry and "Bunny" Austin, Great Britain was in the driver's seat until the arrival of another star from California, J. Donald Budge. Perry had won three successive championships at Wimbledon (1934–36) and three times at Forest Hills (1933, 1934 and 1936).

Budge not only succeeded Perry as Wimbledon and U.S. champion but set a new record when in one year (1938) he won the four major singles championships of the world — Australia, France, Great Britain and the United States. One of Budge's most noted victories was his defeat of Baron Gottfried von Cramm, German star, in the deciding match of the Davis Cup Interzone final at Wimbledon in 1937. Tilden declared aftenvard that it was one of the finest matches he had ever seen. Von Cramm won the first two sets and Budge evened the score. Then the German took a commanding 4–1 lead in the final set, but Budge again pulled even and finally, after having had five match points in the 14th game, he won it for the set and match. Budge again defeated Von Cramm in the 1937 final at Forest Hills to win his first U.S. championship.

The loss of Budge to the professional game in 1938 after he had repeated his Wimbledon, Forest Hills and Davis Cup victories, proved to be a severe blow to U.S. Davis Cup play. In 1939 Robert L. Riggs, who had won at Wimbledon and was to become U.S. champion about ten days later, and Frank Parker, who had two years of challenge round experience. let the cup slip from their grasp after they had led Australia 2–0 in the challenge round tie at Merion Cricket club, Haverford, Pa.

So again, as in 1914, Australia captured the Davis Cup as World War II halted international competition, this time for six years. Bombs damaged the Wimbledon grounds and other clubs throughout Europe. In the United States, the U.S. Lawn Tennis association helped keep tennis alive during the war by co-ordinating its activities with the war effort. After Pearl Harbor, the USLTA was one of the first amateur sports bodies to decide to carry on rather than to abandon play. This decision enabled the association to concentrate on raising funds at tournaments for the American Red Cross and other war relief agencies, on providing balls and rackets for men in the armed forces at home and overseas, and on helping boys and girls under military age learn a game which. to quote the army aviation training command, "contributes greatly to endurance, speed, agility and coordination." During the USLTA championships, play-by-play descriptions of the matches were broadcast over a nation-wide, sponsored hookup, and also by short wave to the armed forces overseas.

The development of junior tennis, a major activity of the USLTA, was emphasized during the war years. A nation-wide program provided opportunities for thousands of boys and girls under 18 yr. of age to learn the game. Films were made to show how the experts drive, serve, volley and smash. Tennis clinics at many centres were established to give free instruction. Junior Davis Cup and Junior Wightman Cup squads were organized in key cities to provide practice, coaching and competition for players up to 21 yr. of age.

The USLTA championships were held during the war period. Most of the leading players were in the armed forces but a few on furlough or stationed near Forest Hills competed with the younger players. The wartime champions included. (in U.S. navy) Lt. Donald McNeill; Seaman Robert L. Riggs; Lt. Frederick R. Schroeder, Jr.; and Lt Joseph R. Hunt (killed in a plane accident); and Sgt. Frank A Parker (U.S. army).

After the war, interest in the game revived quickly throughout the world. Twenty nations challenged Australia for the Davis Cup in 1946 and the United States' team headed by John A. Kramer, new U.S. singles champion, defeated Australia 5–0 in the challenge round at Melbourne.

Wimbledon again attracted record breaking crowds to watch the new crop of players in the first championship after the war. Yvon Petra of France won the men's singles and U.S. players captured the other four titles. Likewise Forest Hills stadium was jammed to capacity as it had been in the Tilden era for its first postwar meeting in 1946 as U.S. players swept the field and Kramer won his first national title. After winning the Wimbledon crown and successfully defending his U.S. title, Kramer, like Budge, switched to professional tennis and another war-reared Californian. Richard A. Gonzales, became U.S. champion. While four Americans (Falkenburg, Schroeder, Patty and Savitt) were taking the spotlight as Wimbledon champions from 1948 to 1951 inclusive, Australia continued to challenge the U.S. for the Davis Cup and in 1950 succeeded in its quest. Two young men, Frank Sedgman and Kenneth McGregor with the experienced John E. Bromwich and the guiding hand of an astute manager, Harry Hopman, defeated Ted Schroeder, Tom Brown and Gardnar Mulloy and took the famous trophy to Australia for the fourth time. After twice successfully defending the cup against the U.S. and capturing between them most of the major tennis titles of the world (making a record sweep in 1951 of the world's four most important doubles championships — Australia, France, Great Britain and U.S.), Sedgman and McGregor left the amateur ranks in January 1953, to join Kramer and Francisco (Pancho) Segura in a long professional tour in the U.S. and other countries. Left to continue Australia's supremacy was its young champion, Ken Rosewall and Lewis Hoad, both then only 18 years old.

With the exception of Petra's unexpected victory at Wimbledon in 1946, France and England (the only other nations to have held the Davis Cup) greatly handicapped by the effects of the war were unable to approach the former exalted positions they once held in the tennis world when Perry and Austin and the French musketeers were in their prime.

Women Players. — Tennis was played by women from the start; but their entry into competitive tournaments was delayed, and it

was not until **1884,** seven years after the championships began, that Maud Watson became the first woman's champion at Wimbledon by winning from an entry of **13** players. In the United States a tournament for women was held at the Philadelphia Cricket club, and was won by Ellen Hansell in **1887.** This was a tournament held again in **1888** and it became the first official championship for women in **1889.** It was won by Bertha Townsend. Elisabeth Moore, later singles champion, describes the costumes of the period in this way: "The girls were wearing lawn dresses with leg of mutton sleeves, sailor hats, and ornamental tennis shoes. My dresses, which were of white lawn, swept just clear of the grass on ordinary shots; but brushed it when I stooped. These dresses were much more feminine than the highly coloured flannels, big blouses and felt hats previously in vogue, and were also much cooler."

In those days the game was played chiefly from the base line. In England the standard of play was and remained for some time much higher than in the United States, yet women still served underhand. In 1904 a new star appeared, May Sutton, a girl of 17 and the first of a long line of Californian champions who revolutionized U.S. and world tennis. She was gifted with a strong constitution and a heavily topped forehand drive which enabled her to win the American title that year, and also to defeat Miss D. K. Douglas (afterward Mrs. Lambert Chambers) at Wimbledon in 1905, thus becoming the first American ever to capture an English title. She again defeated her rival to win the championships in 1907. Not the least remarkable feat was her return to Wimbledon in 1929, **22** years later. when she reached the quarter-finals of the singles in a strong field.

An important influence on the game for women was Suzanne Lenglen, a French girl who first appeared at Wimbledon in 1919. Born at Compiègne, France, in **1899,** she won her first championship at St. Cloud in **1914.** Between 1919 and **1926** she dominated the game as Tilden dominated play for men, winning at Wimbledon six times. In 1925, her last year there, she played five matches, losing only five games in the entire tournament. Seven sets were won to love, and she defeated the holder, Kathleen McKane, in the semifinals without the loss of a game.

The next player who pointed the path for women was Helen Wills, later Helen Wills Moody Roark. She played Mlle. Lenglen only once, at Cannes in **1926,** when she was a young girl far from her peak. Like her rival she had every stroke, supported by a more powerful forehand drive, the weapon of every champion. She had a matchless record in competitive tennis, winning the American title in 1923, 1924, 1925, 1927, **1928,** 1929, 1931. The title at Wimbledon she won in 1927, **1928,** 1929, 1930, 1932 and 1933. In that year she suffered a severe back injury, but recovered and returned to win at Wimbledon in 1935 and again in 1938.

Another great woman player, also an American and a Californian, was Alice Marble. Despite illnesses which would have discouraged most players, she persevered and ended as Wimbledon and U.S. titleholder in 1939. She was the first feminine champion to develop a really hard service like that of a man, and possessed an all-round game to which she added unusual severity at the net and overhead. The strength of her service and volleying attack made her a player to be ranked with Miss Sutton, Mlle. Lenglen, Miss Wills and the other stars of her sex in lawn tennis.

Miss Marble won her fourth and last U.S. championship in 1940, defeating for the third time the resolute Helen Jacobs, who had succeeded Mrs. Moody as U.S. titleholder in 1932 and as Wimbledon champion four years later. The next ten years failed to produce any great woman champion. During the war years Mrs. Sarah Palfrey Cooke, an easterner, and Pauline Betz, a Californian, led the field. Mrs. Cooke winning her second championship in 1945 and Miss Betz her fourth in **1946,** after which they turned professional and Mrs. Margaret Osborne duPont, Louise Brough, Doris Hart and Shirley Fry, sometimes referred to as "the big four," dominated the game at Forest Hills, Wimbledon and in other countries wherever they competed, including France. England, South Africa and Australia. Then in **1951** Maureen ("Little Mo") Connolly from California, like Miss Sutton in 1904, took complete command even before she had graduated from the girls' ranks. Winning her first women's title at Forest Hills before she had reached her 17th birthday, Miss Connolly was the second youngest player to capture the title. Miss Sutton was two months younger when she won the championship in 1904 and Miss Wills was almost a year older when she captured her first U.S. title in 1923.

On her first try at Wimbledon the following year Miss Connolly won the crown, and repeated her 1951 performance at Forest Hills. Later she won the Australian and French titles and became the first woman to hold the four major titles at one time.

Wightman Cup.—In 1923 a cup was donated by Mrs. George Wightman, the former Hazel Hotchkiss of California and herself national singles champion of the United States in 1909, 1910 and 1911, for competition between teams of women players from the United States and England. The Wightman Cup was first contested at Forest Hills, Long Island, on Aug. 11 and **13,** 1923. The annual contest is held alternately in the two countries, with five singles and two doubles matches. The first contest was won by the United States. There was no competition from 1940 to 1945 inclusive because of World War II. Of the 24 matches played in the postwar years through 1952, all except four were won by the U.S.

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STANDARD GRIPS AND STROKES*

Forehand Groundstroke Grip.—Hold the racket as if it were standing on the edge of the frame, the handle pointing toward you, the short strings perpendicular to the ground, the long strings parallel to it. Then "shake hands" with it—literally. The handle settles comfortably into your palm. Close your fingers tightly around the handle. The racket is then, or should be. part of the straight line of your arm. There should be no angle at your wrist. The hand rests along the outside, or right side, of the handle, the thumb and fingers wrapped around the handle, naturally and comfortably. The racket thus becomes an extension of the arm that can be moved as easily as if it belonged there.

The Backhand Groundstroke Grip.—Obviously, the forehand grip. as described in the foregoing paragraph, is impossible for a backhand shot, since it would be swung against the back of the hand itself. Therefore, a change is necessary. Move the hand one-quarter of a circle on the handle, backward, so that the hand rests directly on top of the handle, the knuckles of the hand pointing to the sky. Grip the handle tightly. If it is more comfortable to run the thumb up the handle, do so. If not, wrap it around as in the forehand grip. The shot off the backhand travels directly across the wrist with this grip. Swing freely from the shoulder with both these grips and keep the wrist stiff and locked on all drives. The grip is about the same for a volley.

Service Grip.—The grip for service is just midway between the forehand and the backhand grip. Take your forehand grip and then turn the hand half way back to the backhand position.

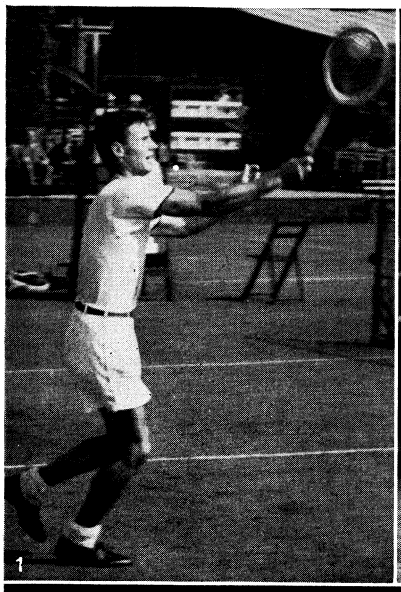
On all grips, hold the racket tight at the moment of impact with the ball. Loosen your grip between shots so as not to cramp the hand from too great a strain.

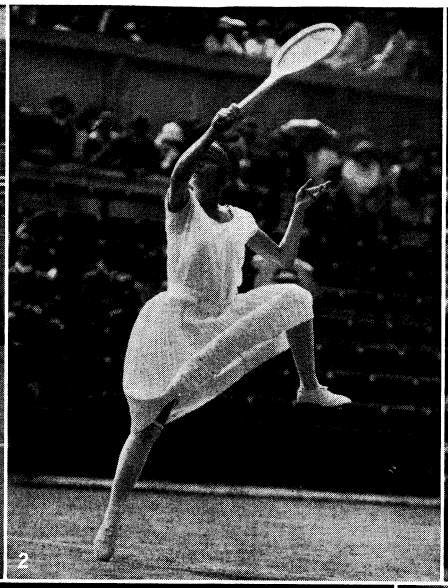
Forehand Drive.—The forehand drive is one continuous swing, which is considered in three sections:

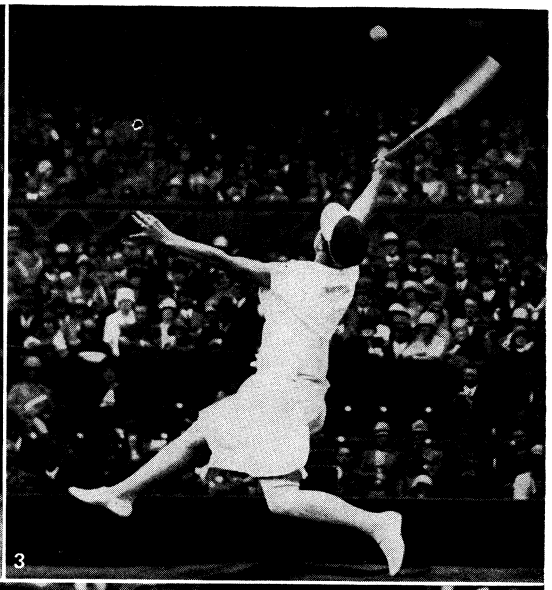
The speed of the shot is decided by the length of the swing behind the body. The farther back you start your swing the faster the racket will move forward, and the speedier your shot will be.

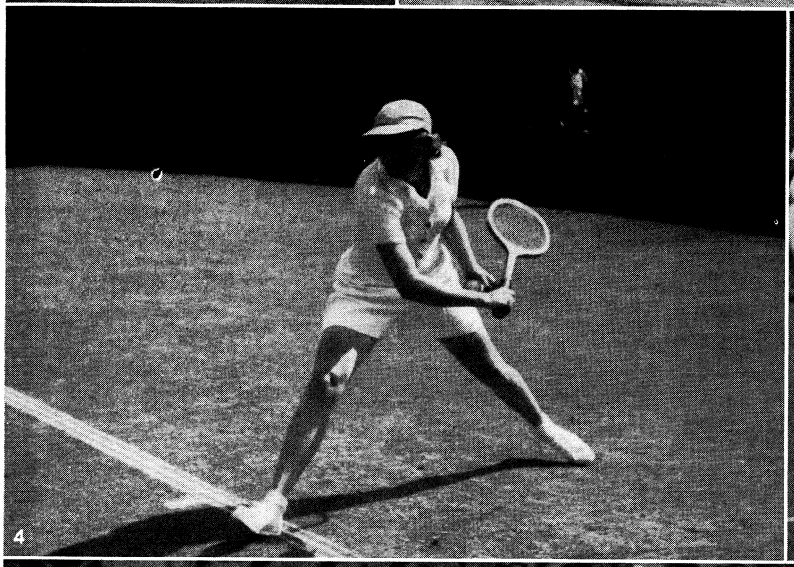
The direction of your stroke, whether it is hit straight or cross-court, is determined by that portion of the swing in front; that is, alongside your body. In other words. as you face offcourt, it is the space within the lines from your hips. If you meet the ball back near your right hip, the shot goes toward the right; if you meet it directly in front of the belt buckle, it goes on a straight

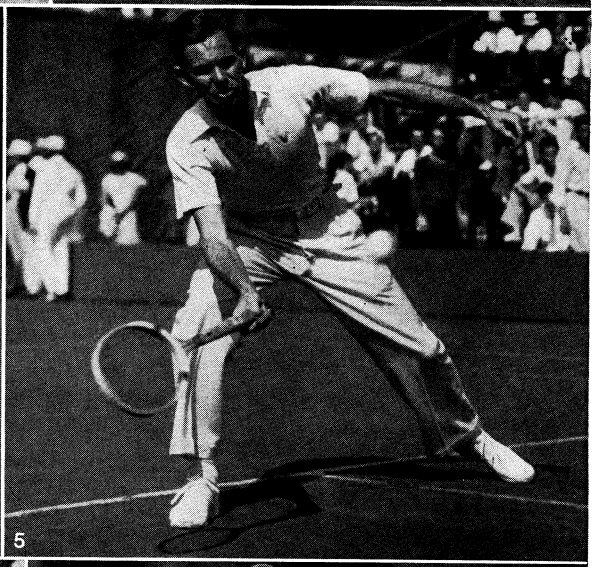
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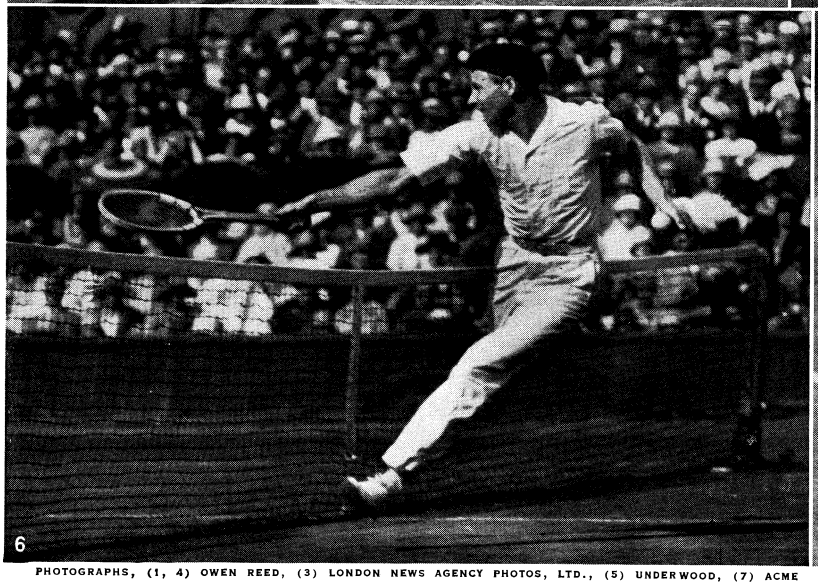


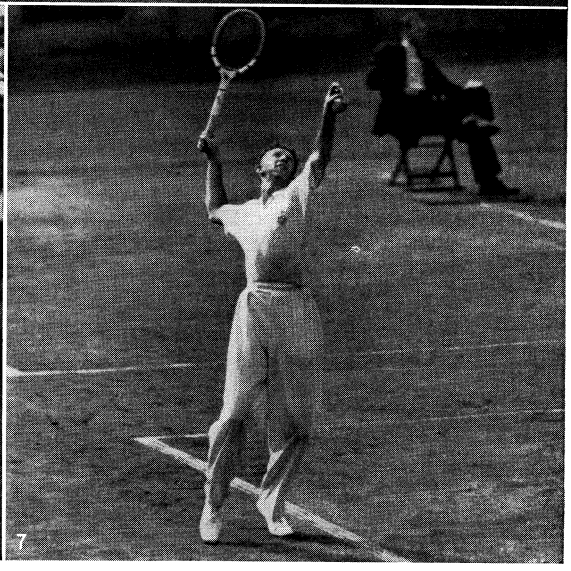










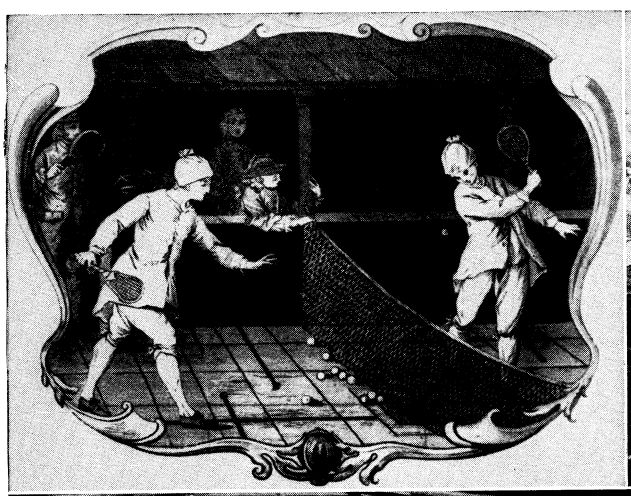


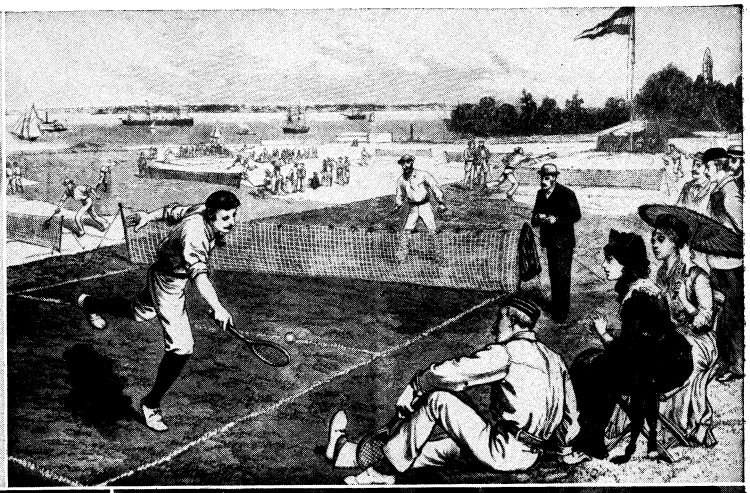
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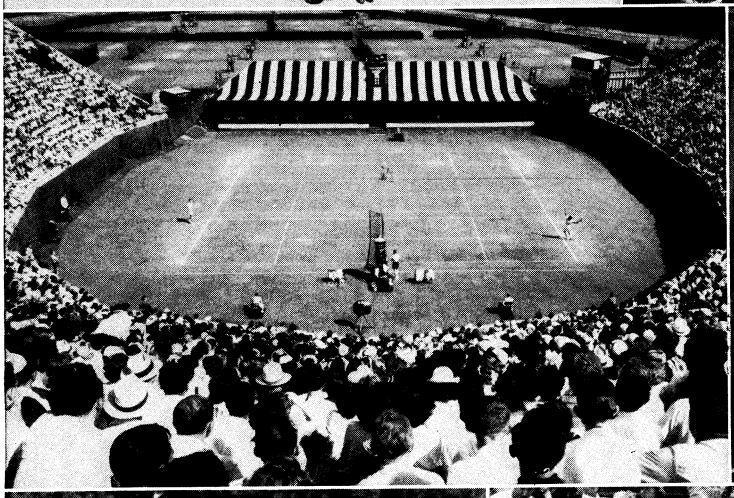
TENNIS STROKES

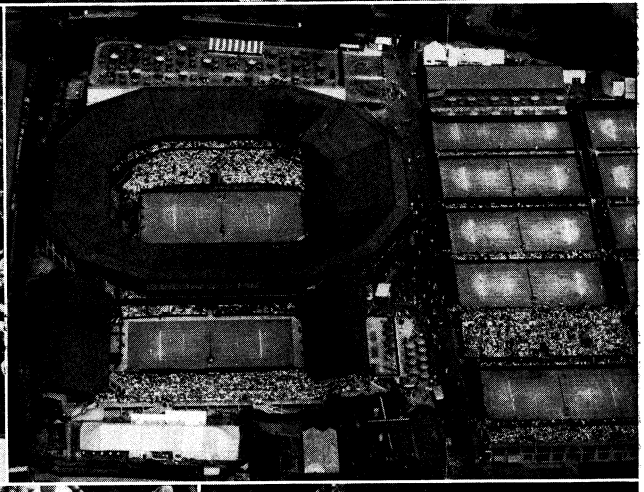
1. Forehand volley. Frederick R. Schroeder. Jr., American
2. Backhand smash. Suzanne Lenglen, French
3. Overhead smash. Helen Wills Moody, American
4. Start of backhand drive. Alice Marble. American
5. Low volley. Ellsworth Vines, American
6. Finishing volley. J. Borotra, French
7. Serve. J. Donald Budge, American

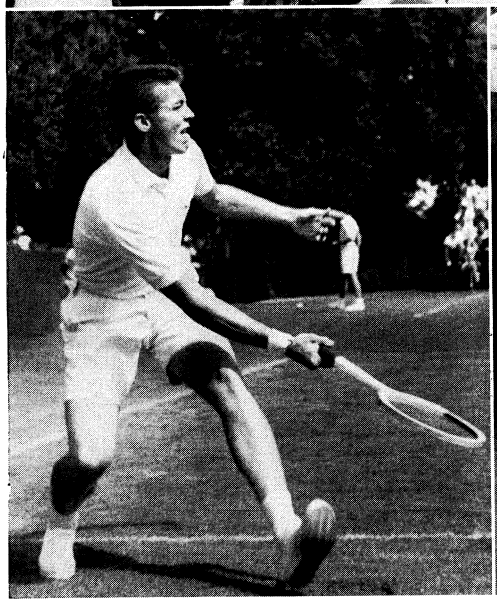
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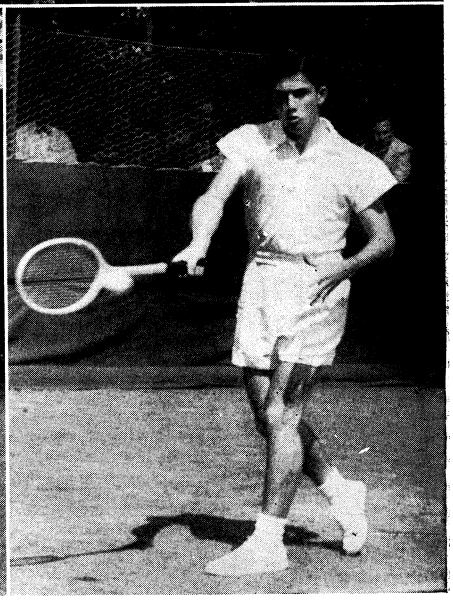












BY COURTESY OF (CENTRE LEFT) THE WEST SIDE TENNIS CLUB: PHOTOGRAPHS (TOP LEFT, TOP RIGHT) BETTMANN ARCHIVE (CENTRE RIGHT) AEROFILMS LTD., (BOTTOM LEFT, BOTTOM CENTRE, BOTTOM RIGHT) EUROPEAN

TENNIS COURTS AND PLAYERS

Top left: A game of court tennis, the ancient game from which lawn tennis was adapted; from an illustration dated 1623

Top right: Early U.S. lawn tennis tournament, New Brighton, Staten Island, N.Y., 1880

Centre left: View of tournament courts at Forest Hills, N.Y.

Centre right: Aerial view of All England club, Wimbledon

Bottom left: Tony Trabert, U.S., completing forehand stroke

Bottom centre: Maureen Connolly, U.S., completing forehand drive

Bottom right: Ken Rosewall, Australia, making a forehand drive

line; and if you meet it up in front of your left hip, the shot goes crosscourt to your left.

When awaiting the ball, face your opponent across the net. As soon as you see the ball coming toward you, decide which side, fore or backhand, you will play it. Then change your body position accordingly so that you face off the sideline, while your shoulders are along the line of the shot you are going to make. As the ball reaches you, drop your weight to your back foot and commence your swing well behind your body. meeting the ball with the racket in its forward flight just in front of your body and follow through to the end of your swing.

This brings us to the third portion of the swing, the portion beyond or nearer the net than the body, which is called the follow-through. This determines the spin or twist on the shot and is the factor that holds the ball in court. For the drive the racket meets the ball flat and passes up and over the top of the ball, thus spinning the ball away from you and downward. It is the same spin as a pitcher's drop in baseball. The racket passing under the ball, making it float or drag, is the "chop" or "slice" stroke (see below).

The swing, as described, is in three parts, but is made in one free movement that carries the whole body along with it. It is as essential in tennis to follow through from the beginning of your swing to the extreme end of your reach as it is in golf or baseball, It gives direction and control of length.

There is a certain height at which to hit a tennis ball correctly. There are other heights at which one should never hit it unless caught out of position. The drive should be hit at a height never lower than your knees or higher than your shoulders. If the ball must be met at either of these heights, do not drive. Merely defend it and put it back and wait for another chance to drive. The height at which a tennis ball may be driven hardest is about waist high and at a distance about three feet from your body.

In making the drive, first be certain your form is correct. See to it that your feet are correctly placed so that you are sideways to the net. Next make sure your racket face meets the ball flat and that your racket passes up, over and slightly outside the ball, thus pulling it toward you. Do not try to hit hard until you have learned to hit correctly. Speed will come later, but correct form can be learned only before you have formed bad habits in stroking that are almost impossible to break.

Backhand Drive.—The laws of footwork are exactly the reverse of those applying to the forehand drive. The back foot is now the left, while the front foot is the right. The swing is from well behind the body, as in the forehand shot. The grip, as previously explained, is changed one-fourth on the handle, so that the hand is on top of the handle. while the shot travels across the wrist, which is locked and stiff. The racket head should be slightly in advance of the hand when it meets the ball. and the face of the racket is flat. The ball travels across the short strings. There is less topspin to this stroke than the forehand, because the follow-through is less. Use your left hand as a balance. well behind your body and he sure to keep your body well away from the ball, so as not to cramp your swing. Bend to meet the ball with the racket head slightly on the side away from you and pull it toward you crosscourt.

Service.—Service is the "opening gun" in tennis. It is putting the ball in play, and every man should learn a service that will be a distinct advantage. Service has made many players famous. Maurice E. McLoughlin, the "California Comet," nas world renonned for his service. Robert Lindley Murray, Elia Fottrell, Harold Throckmorton, S. Howard Voshell and many other players were noted for their services. All these men hit their deliveries hard, but they never sacrificed accuracy to mere speed. They were always careful to put the ball in court. They served very few double faults.

Foot faults should be avoided. The easiest way to serve legally is to remember that one foot must be on the ground and both behind the line until your racket has struck the ball. Stand at least six inches behind the base line and you will not foot fault.

Slice Service.—This is the most common form of service. It requires the least effort and has the greatest chance of going in court.

To hit this service, stand behind the base line with your feet at an angle of about 45° to the line. Drop your weight back on your right foot. Toss the ball well above your head and slightly to the right in advance of it. Swing your racket up and forward with one rhythmic movement, at the same time shifting the weight forward toward the left foot. Meet the ball as high above your head as you can comfortably reach. The racket face is outside, or on the right side of the ball, and slightly over it. It travels from right to left. Swing directly through this, imparting a twist to the ball to spin it from left to right. This tends to hold the ball in court.

American Twist Service.—The stand and grip for this service are the same as for the slice. The ball is thrown slightly to the left of the head and almost directly above it. If anything. it may be slightly behind. The body is bent backward and the ball hit at a point more to the left than in the slice. The racket travels up and over the ball which is below and inside the strings. The ball is really between your face. turned upward to watch it. and the face of your racket which is travelling from left to right away from your body. This service carries extreme twist and a high bound, but with not so much speed as a slice or flat service. There is more wrist turn to this service than in the slice. The body movement causes a distinct pull on the stomach muscles and those along the right side. The slice service is hit with the shoulder and arm muscles.

Reverse Twist.—This delivery is a totally different style of service and is not one for regular use. The server, to deliver this service, should stand facing the net with both toes on a line with the base line. The ball is thrown about shoulder high. The ball is caught and carried on the strings for a short space. The racket passes up and over the ball, which is outside the racket face from the server. This service carries extreme twist but little speed or control. The hitting plane is about shoulder high instead of over the head. The weight control is faulty. In fact, it is not a service for a beginner to learn.

Volley—Forehand and Backhand.—The volley is the shot made by taking the ball in the air before it has struck the ground. It is "hitting it on the fly," as the common expression goes. The laws of footwork and body position are the same for volleys as for groundstrokes, the body always sideways to the net-and weight moving fonvard.

The groundstroke or drive is made from the back of the court. The volley is made from the front of the court or net position. Volleys should not be made from behind the service line if it is possible to drive.

The drive has a distinct follow-through and a long swing. The volley has little or no follow-through and a very short swing. All volleys should be blocked or undercut and not stroked or topped.

The shot is made with a short sning from behind the body. The racket face meets the ball flat or, if the shot must be made from below the top of the net and lifted, slightly under the ball. The wrist is stiff and locked. The angle of the shot is determined by the angle made by the flight of the ball coming to you and the racket face. The racket moves forward, meets the ball and stops completely. It does not follon through. It blocks the ball which rebounds by its own speed plus the body weight behind the racket.

Smash.—The overhead smash is the stroke killing the ball in the air when it is lobbed over your head. This shot should be modelled as nearly after your service as you can do it, except that it is hit with less twist and more speed. (W. T. T.)

RULES OF LAWN TENNIS AND CASES AND DECISIONS

The following code of rules and cases and decisions, revised as of 1952, is the official code of the International Lawn Tennis federation, of which the United States Lawn Tennis association is a member.

The explanations while not official utterances may be considered a correct guide for interpreting the rules. They were prepared by the Tennis Umpires association to amplify and explain the formal code.

THE SINGLES GAME

Rule 1.—The court shall be a rectangle 78 ft. long and 27 ft. wide. It shall he divided across the middle by a net, suspended from a cord or metal cable of a maximum diameter of one-third of an inch, the ends of which shall be attached to, or pass over, the tops of two posts, 3 ft. 6 in. high, which shall stand 3 ft. outside the court on each side. The height of the net shall be 3 ft. at the centre, where it shall be held down taut by a strap not more than 2 in. wide. There shall be a band covering the cord or metal cable and the top of the net for not less than 2 in. nor more than 2½ in. in depth on each side. The lines bounding the ends and sides of the court shall respectively be called the base lines and the side lines. On each side of the net, at a distance of 21 ft. from it and parallel with it, shall be drawn the service lines. The space on each side of the net between the service line and the side lines shall be divided into two equal parts called the service courts by the centre service line, which must be 2 in. in width, drawn halfway between, and parallel with, the side lines. Each base line shall be bisected by an imaginary continuation of the centre service line to a line 4 in. in length and 2 in. in width called the centre mark, drawn inside the court and at right angles to and in contact with such base line. All other lines shall be not less than 1 in. nor more than 2 in. in width, except the base lines, which may be 4 in. in width, and all measurements shall be made to the outside of the lines.

NOTE.—In the case of the International Lawn Tennis championship (Davis Cup) or other official championships of the international federation, there shall be a space behind each base line of not less than 21 ft., and at the sides of not less than 12 ft.

Explanation of Rule 1.—The posts in doubles should be 3 ft. outside the doubles court.

The net should be 33 ft. wide for a singles court and 42 ft. wide for a doubles court. It should touch the ground along its entire length and come flush to the posts at all points.

It is well to have a stick 3 ft. 6 in. long, with a notch cut in at the 3 ft. mark, for the purpose of measuring the height of the net at the posts and in the centre. These measurements, as well as the measurements of the court itself, always should be made before starting to play an important match.

Rule 2.—The permanent fixtures of the court shall include not only the net, posts, cord or metal cable, strap and band, but also, where there are any such, the back and side stops, the stands, fixed or movable seats and chairs round the court, and their occupants, all other fixtures around and above the court, and the umpire, foot fault judge and linesmen when in their respective places.

NOTE.—For the purpose of this rule, the word "umpire" comprehends the umpire and all those persons designated to assist him in the conduct of a match.

Rule 3.—The ball shall have a uniform outer surface. If there are any seams they shall be stitchless. The ball shall be more than 2½ in. and less than 2⅝ in. in diameter, and more. than 2 oz. and less than 2 1/16 oz. in weight. The ball shall have a bound of more than 53 in. and less than 58 in. when dropped 100 in. upon a concrete base, and a deformation of more than .265 in. and less than .290 in. when subjected to a pressure of 18 lb. applied to each end of any diameter.

NOTE.—How often may the players have new balls?

According to tournament regulation 14(g) the umpire, subject to the approval of the referee, may decide when new balls are required to insure fairness of playing conditions. In matches where there is no umpire, the players should agree beforehand on this matter.

Rule 4.—The players shall stand on opposite sides of the net; the player who first delivers the ball shall be called the server and the other the receiver.

CASE 1.—Does a player, attempting a stroke, lose the point if he crosses an imaginary line in the extension of the net, (a) before striking the ball, (b) after striking the ball?

Decision.—He does not lose the point in either case by crossing the imaginary line and, provided he does not, enter the lines bounding his opponent's court. (*See* rule 18[e].) In regard to hindrance, his opponent may ask for the decision of the umpire under rules 19 and 23.

CASE 2.—The server claims that the receiver must stand within the lines bounding his court. Is this necessary?

Decision.—No. The receiver may stand wherever he pleases on his own side of the net.

Rule 5.—The choice of sides and the right to be server or receiver in the first game shall be decided by toss.

The player winning the toss may choose, or require his opponent to choose: (a) the right to be server or receiver, in which case the other player shall choose the side; or (b) the side in which case the other player shall choose the right to be server or receiver.

Rule 6.—The service shall be delivered in the following manner. Immediately before commencing to serve, the server shall stand with both feet at rest behind (*i.e.*, farther from the net than) the base line, and within imaginary continuations of the centre mark and side line. The server shall then project the ball by hand into the air in any direction and before it hits the ground strike it with his racket, and the delivery shall be deemed to have been completed at the moment of the impact of the racket and the ball. A player with the use of only one arm may utilize his racket for the projection.

CASE 1.—May the server in a singles game take his stand behind the portion of the base line between the side lines of the singles court and the doubles court?

Decision.—No.

CASE 2.—If a player, when serving, throws up two or more balls instead of one, does he lose that service?

Decision.—No. A let should be called, but if the umpire regards the action as deliberate he may take action under rule 19.

CASE 3.—If a ball in play becomes broken, should a let be called?

Decision.—Yes.

CASE IV.—May a player serve underhand?

Decision.—Yes. There is no restriction regarding the kind of service which may be used: that is, the player may use an underhand or an overhand service at his discretion.

Rule 7.—The server shall throughout the delivery of the service: (a) not change his position by walking or running; (b) maintain contact with the ground; and (c) keep both feet behind (*i.e.*, farther from the net than) the base line.

NOTE.—The following interpretation of rule 7 was approved by the International federation on March 15, 1929:

(a) The server shall not by the following movements of his feet be deemed "to change his position by walking or running" viz., slight movements oi the feet which do not materially affect the location originally taken up by him; or an unrestricted movement of one foot so long as the other foot maintains continuously its original contact with the ground.

(b) At no time during the delivery of the service (*i.e.*, from the taking up of the stance to the movement of impact of the racket and the ball—see rule 6) may both feet be off the ground simultaneously.

(c) The word "feet" means the extremities of the legs below the ankles and at all times during the delivery of the service (as before described) every part of such extremities must be behind (*i.e.*, farther from the net than) the base line.

Rule 8.—In delivering the service the server shall stand alternately behind the right and left courts, beginning from the right in every game. The ball served shall pass over the net and hit the ground within the service court which is diagonally opposite, or upon any line bounding such court, before the receiver returns it.

Explanation of Rule 8.—In the absence of a linesman and umpire, it is customary for the receiver to determine whether the service is good or not.

Rule 9.—The service is a fault: (a) if the server commit any breach of rules 6, 7 or 8; (b) if he miss the ball in attempting to strike it; or (c) if the ball served touch a permanent fixture (other than the net, strap or band) before it hits the ground.

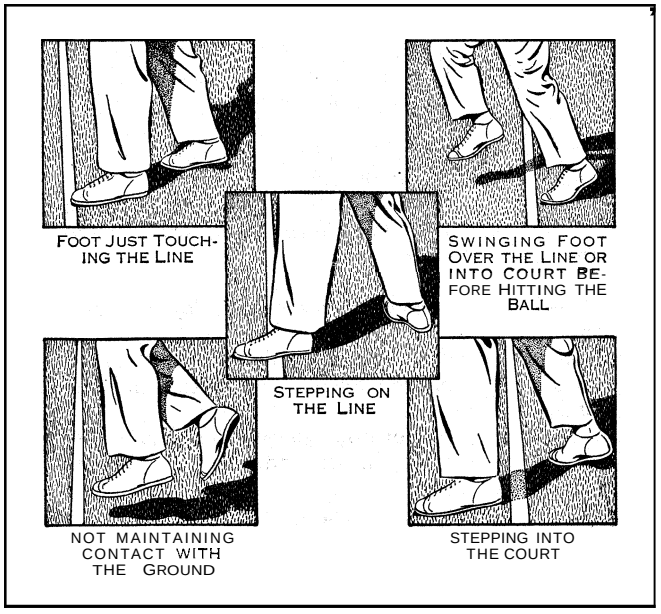
CASE 1.—After throwing the ball up preparatory to serving, the server decides not to strike at it and catches it instead. Is it a

fault?

Decision.—No.

CASE 2.—In serving in a singles game played on a doubles court with doubles and singles net posts, the ball hits a singles post and then hits the ground within the lines of the correct service court. Is this a fault or a let?

Decision.—In serving it is a fault, because the singles post, the doubles post, and that portion of the net, strap or band between them are permanent fixtures (see rules 2 and 9, and note to rule 22).



EXAMPLES OF FOOT FAULTS

Rule 10.—After a fault (if it be the first fault) the server shall serve again from behind the same half of the court from which he served that fault unless it was a fault because he served from behind the wrong half—then he shall be entitled to deliver one service from behind the other half. A fault may not be claimed after the next service has been delivered.

CASE 1.—A player serves from a wrong court. He loses the point and then claims it was a fault because of his wrong station.

Decision.—The point stands as played and the next service should be from the correct station according to the score.

CASE 2.—The point score being 1 j all, the server, by mistake, serves from the left court. He wins the point. He then serves again from the right hand court, delivering a fault. The mistake in station is then discovered. Is he entitled to the previous point? From which court should he next serve?

Decision.—The previous point stands. The next service should be from the left court, the score being 30-15 and the server has served one fault.

Rule 11.—The server shall not serve until the receiver is ready. If the latter attempt to return the service, he shall be deemed ready. If, however, the receiver signify that he is not ready, he may not claim a fault because the ball does not hit the ground within the limits fixed for the service.

Explanation of *Rule 11.*—The server must wait until the receiver is ready for the second service as well as the first and if the receiver claims to be not ready and does not make any effort to return a service, the server may not claim the point even though the service was good.

Rule 12.—In all cases where a let has to be called under the rules, or to provide for an interruption to play, it shall have the following interpretation: (a) when called solely in respect of a service, that one service only shall be replayed, and (b) when called under any other circumstance, the point shall be replayed.

Rule 13.—The service is a let: (a) if the ball served touch the net, strap or band, and is otherwise good, or, after touching the net, strap or band, touch the receiver or anything which he wears or carries before hitting the ground; or (b) if a service or fault be delivered when the receiver is not ready (see rule 11). In case of a let, that particular service shall not count, and the server shall serve again, but a service let does not annul a previous fault.

Rule 14.—At the end of the first game the receiver shall become server, and the server, receiver; and so on alternately in all the subsequent games of a match. If a player serve out of turn, the player who ought to have served shall serve as soon as the mistake is discovered, but all points scored before such discovery shall be reckoned. If a game shall have been completed before such discovery, the order of service remains as altered. A fault served before such discovery shall not be reckoned.

Rule 15.—A ball is in play from the moment at which it is delivered in service. Unless a fault or a let be called it remains in play until the point is decided.

CASE 1.—A ball is played into the net; the player on the other side, thinking that the ball is coming over, strikes at it and hits the net. Who loses the point?

Decision.—If the player touches the net while the ball is still in play, he loses the point.

Rule 16.—The server wins the point: (a) if the ball served, not being a let, under rule 13, touch the receiver or anything which he wears or carries before it hits the ground; or (b) if the receiver otherwise lose the point as provided by rule 18.

Rule 17.—The receiver wins the point: (a) if the server serve two consecutive faults; or (b) if the server otherwise lose the point as provided by rule 18.

Rule 18.—A player loses the point if: (a) he fail, before the ball in play has hit the ground twice consecutively, to return it directly over the net, except as provided in rule 22(a) or (c); or (b) he return the ball in play so that it hits the ground, a permanent fixture or other object outside any of the lines which bound his opponent's court (except as provided in rule 22[a] and [c]); or (c) he volley the ball and fail to make a good return even when standing outside the court; or (d) he touch or strike the ball in play with his racket more than once in making a stroke; or (e) he or his racket (in his hand or otherwise) or anything which he wears or carries, touch the net, posts, cord or metal cable, strap or band, or the ground within his opponent's court at any time while the ball is in play; or (f) he volley the ball before it has passed the net; or (g) the ball in play touch him or anything that he wears or carries, except his racket in his hand or hands; or (h) he throw his racket at and hit the ball.

CASE 1.—In delivering a first service which falls outside the proper court, the server's racket slips out of his hand and flies into the net. Does he lose the point?

Decision.—If his racket touches the net while the ball is in play, the server loses the point (see rule 18[e]).

CASE 2.—In serving, the racket flies from the server's hand and touches the net before the ball has touched the ground. Is this a fault, or does the player lose the point?

Decision.—The server loses the point because his racket touches the net while the ball is in play (see rule 18[e]).

CASE 3.—*A* and B are playing against *C* and D. A is serving to ***D.*** C touches the net before the ball touches the ground. A fault is then called because the service falls outside the service court. Do C and D lose the point?

Decision.—The call "fault" is an erroneous one. C and D lose the point before "fault" can be called, because C touches the net while the ball is in play (see rule 18[e]).

CASE 4.—May a player jump over the net into his opponent's court while the ball is in play and not suffer penalty?

Decision.—No; he loses the point (see rule 18[e]).

CASE 5.—*A* cuts the ball just over the net, and it returns to A's side. B, unable to reach the ball, throws his racket and hits the ball. Both racket and ball fall over the net on A's court. A returns the ball outside of B's court. Does B win or lose the point?

Decision.—B loses the point (see rule 18[e] and [h]).

CASE 6.—A player standing outside the service court is struck by the service ball before it has touched the ground. Does he win or lose the point?

Decision.—The player struck loses the point. (See rule 18[g],

except as provided under rule 13[a].)

CASE 7.—A player standing outside the court volleys the ball or catches it in his hand and claims the point because the ball was certainly going out of court.

Decision.—In no circumstance can he claim the point because: (a) if he catches the ball he loses the point under rule 18(g); (b) if he volleys it and makes a bad return he loses the point under rule 18(c); and (c) if he volleys it and makes a good return, the rally continues.

Rule 19.—If a player commits any act either deliberate or involuntary which, in the opinion of the umpire, hinders his opponent in making a stroke, the umpire shall in the first case award the point to the opponent, and in the second case order the point to be replayed.

CASE 1.—Is a player liable to a penalty if in making a stroke he touches his opponent?

Decision.—No, unless the umpire deems it necessary to take action under rule 19.

CASE 2.—When a ball bounds back over the net, the player concerned may reach over the net in order to play the ball. What is the ruling if the player is hindered from doing this by his opponent?

Decision.—In accordance with rule 19, the umpire may either award the point to the player hindered, or order the point to be replayed. (See also rule 23.)

Rule 20.—A ball falling on a line is regarded as falling in the court bounded by that line.

Rule 21.—If the ball in play touch a permanent fixture (other than the net, posts, cord or metal cable, strap or band) after it has hit the ground, the player who struck it wins the point; if before it hits the ground, his opponent wins the point.

CASE 1.—A return hits the umpire, or his chair or stand. The player claims that the ball was going into the court.

Decision.—He loses the point.

Rule 22.—It is a good return: (a) if the ball touch the net, posts cord or metal cable. strap or band, provided that it passes over any of them and hits the ground within the court; or (b) if the ball—served or returned—hit the ground within the proper court and rebound or be blown back over the net, and the player whose turn it is to strike reach over the net and play the ball, provided that neither he nor any part of his clothes or racket touch the net, posts. cord or metal cable, strap or band or the ground within his opponent's court, and that the stroke be otherwise good; or (c) if the ball be returned outside the post, either above or below the level of the top of the net, even though it touch the post, provided that it hits the ground within the proper court; or (d) if a player's racket pass over the net after he has returned the ball, provided the ball pass the net before being played and be properly returned; or (e) if a player succeed in returning the ball, served or in play, which strikes a ball lying in the court.

NOTE.—In a singles match if, for the sake of convenience, a doubles court be equipped nith singles posts for the purposes of a singles game, then the doubles posts and those portions of the net, cord or metal cable and band outside such singles posts shall at all times be permanent fixtures, and not regarded as posts or parts, of the net of a singles game.

A return that passes under the net cord between the singles and adjacent doubles post without touching either net cord, net or doubles post and falls within the area of play, is a good return.

CASE 1.—A ball going out of court hits a net post and falls within the lines of the opponent's court. Is it a good return?

Decision.—If a service; no, under rule 9(c). If a stroke; yes, under rule 22(a).

CASE 2.—IS it a good return if a player returns the ball holding his racket in both hands?

Decision.—Yes.

CASE 3.—The service, or ball in play. strike; a ball lying in the court. Is the point non or lost thereby?

Decision.—No Play must continue. If it is not clear to the umpire that the right ball is returned a let should be called.

CASE 4—May a player use more than one racket at any time during play?

Decision.—No; the whole implication of the rules is singular.

CASE 5.—May a player request that a ball or balls lying in his opponent's court be removed?

Decision.—Yes, but not while a ball is in play.

Rule 23.—In case a player is hindered in making a stroke by anything not within his control, except a permanent fixture of the court, or except as provided for in rule 19, the point shall be replayed.

CASE 1.—A spectator gets into the way of a player, who fails to return the ball. May the player then claim a let?

Decision.—Yes, if in the umpire's opinion he was obstructed by circumstances beyond his control, but not if due to permanent fixtures of the court or the arrangements of the ground.

CASE 2.—A player is interfered with as in case 1 and the umpire calls a let. The server had previously served a fault. Has he the right to two services?

Decision.—Yes; as the ball is in play, the point, not merely the stroke, must be replayed as the rule provides.

CASE 3.—May a player claim a let under rule 23 because he thought his opponent was being hindered, and consequently did not expect the ball to be returned?

Decision.—No.

CASE 4.—IS a stroke good when a ball in play hits another ball in the air?

Decision.—A let should be called unless the other ball is in the air by the act of one of the players, in which case the umpire will decide under rule 19.

CASE 5.—If an umpire or other judge erroneously calls "fault" or "out." and then corrects himself and calls "play," which of the calls shall prevail?

Decision.—A let must be called.

CASE 6.—If the first ball served—a fault—rebounds, interfering with the receiver at the time of the second service, may the receiver claim a let?

Decision.—Yes. But if he had an opportunity to remove the ball from the court and negligently failed to do so, he may not claim a let.

CASE 7.—IS it a good stroke if the ball touches a stationary or moving object on the court?

Decision.—It is a good stroke unless the stationary object came into court after the ball was put into play in which case a let must be called. If the ball in play strikes an object moving along or above the surface of the court a let must be called.

CASE 8.—What is the ruling if the first service is a fault, the second service correct, and it becomes necessary to call a let either under the provision of rule 23 or if the umpire is unable to decide the point?

Decision.—The fault shall be annulled and the whole point replayed.

Rule 24.—If a player wins his first point, the score is called 15 for that player; on winning his second point, the score is called 30 for that player; on winning his third point, the score is called 40 for that player; and the fourth point won by a player is scored game for that player, except as follows: (a) if both players have won three points the score is called deuce, and the next point won by a player is called advantage for that player; (b) if the same player wins the next point, he wins the game, but if the other player wins the next point, the score is again called deuce, etc., until a player wins the two points immediately following the score at deuce, when the game is scored for that player.

Rule 25.—A player (or players) who first wins six games wins a set, except that he must win by a margin of at least two games over his opponent and where necessary a set shall be extended until this margin be achieved.

Rule 26.—The players shall change sides at the end of the first, third and every subsequent alternate game of each set, and at the end of each set, unless the total number of games in such set be even, in which case the change is not made until the end of the first game of the next set.

Rule 27.—The maximum number of sets in a match shall be five or, where women take part, three.

Rule 28.—Except where otherwise stated, every reference in

these rules to the masculine includes the feminine gender.

Rule 29.—In matches where an umpire is appointed, his decision shall be final; but where a referee is appointed, an appeal shall lie to him from the decision of an umpire on a question of law, and in all such cases the decision of the referee shall be final.

The referee, in his discretion, may at any time postpone a match because of darkness, the condition of the ground or the weather. In any case of postponement the previous score and the previous occupancy of courts shall hold good unless the referee and the players unanimously agree otherwise.

Rule 30.—Play shall be continuous from the first service till the match be concluded, provided that after the third set (or when women take part, the second set) either player is entitled to a rest, which shall not exceed 10 min., or in countries situated between 15° N. and 15° S. lat., 45 min.,* and provided further that when necessitated by circumstances not within the control of the players, the umpire may suspend play for such a period as he may consider necessary. If play be suspended and not resumed until a later day, the rest may be taken only after the third set (or when women take part, the second set) of play on such later day, completion of an unfinished set being counted one set. These provisions shall be strictly construed, and play shall never be suspended, delayed or interfered with for the purpose of enabling a player to recover his strength or his wind or to receive instruction or advice. The umpire shall be the sole judge of such suspension, delay or interference, and after giving due warning he may disqualify the offender.

Explanation.—In men's events there is no rest in a two out of three set match, but in a three out of five set match, a 10-min. rest may be taken only after the third set. It may not be taken before the third set or at any time after the fourth set has been started. It must be taken aiter the third set or not at all.

In women's matches a rest of 10 min. may be taken after the second set or not at all.

All matches for juniors shall be the best two out of three sets with no rest. In the case of tennis centre championships or interscholastic, state and sectional tournaments, equivalent to tennis centres, and in National Junior championships the final round shall be the best three out of five sets. If such final requires more than three sets to decide, there must be a rest of 10 min. after the third set.

Matches for boys and girls, up to and including 15 years of age, shall be the best two out of three sets, and there must be a 10-min. rest aiter the second set.

The United States Lawn Tennis association has approved a modification of the first provision in rule 30 to provide that after the second set in tournaments exclusively for veterans and in tournaments for fathers and sons, either player or doubles team is entitled to a rest which shall not exceed 10 min.

The players must be back on the court 10 min. after play has ceased.

Should a player, because of physical unfitness or an unavoidable accident, not within his control, be unable to continue play, he must be defaulted.

Stalling is one of the hardest things to deal with. The rules say that play shall be continuous. An umpire should determine whether the stalling is deliberate, and for the purpose of gaining time. If he decides that it is, he should warn the player to stop his unfair practice; if this does not end it, he should then default him.

The umpire has the power to suspend a match for such period as he may think necessary if, in his judgment, the play is interfered with by circumstances beyond the players' control. Such circumstances might be the passing of an aeroplane, moving of spectators in the stands, etc.

CASE 1.—A player's clothing, footwear or equipment becomes out of adjustment in such a way that it is impossible or undesirable for him to play on. May play be suspended while the maladjustment is rectified?

Decision.—If this occurs in circumstances not within the control of the player, of which circumstances the umpire is the sole judge, a suspension may be allowed.

CASE 2.—If, owing to an accident, a player is unable to continue immediately, is there any limit to the time during which play may be suspended?

Decision.—No allowance may be made for natural loss of physical condition. Consideration may be given by the umpire for accidental loss of physical ability or condition.

CASE 3.—During a doubles game, may one of the partners leave the court while the ball is in play?

Decision.—Yes, so long as the umpire is satisfied that play is continuous within the meaning of the rules, and that there is no conflict with rules 33 and 34.

*Any nation is at liberty to modify the first provision in rule 30, or omit it from its regulations governing tournaments, matches or competitions held in its own country, other than the International Lawn Tennis championship (Davis Cup).

THE DOUBLES GAME

Rule 31.—The foregoing rules shall apply to the doubles game except as below.

Rule 32.—For the doubles game, the court shall be 36 ft. in width; *i.e.*, 4½ ft. wider on each side than the court for the singles game, and those portions of the singles side lines which lie between the two service lines shall be called the service side lines. In other respects the court shall be similar to that described in rule 1, but the portions of the singles side lines between the base line and the service line on each side of the net may be omitted if desired.

CASE 1.—In doubles the server claims the right to stand at the corner of the court as marked by the doubles side line. Is the foregoing correct or is it necessary that the server stand within the limits of the centre mark and the singles side line?

Decision.—The server has the right to stand anywhere between the centre mark and the doubles side lines.

Rule 33.—The order of serving shall be decided at the beginning of each set as follows: The pair who have to serve in the first game of each set shall decide which partner shall do so, and the opposing pair shall decide similarly ior the second game. The partner of the player who served in the first game shall serve in the third; the partner of the player who served in the second game shall serve in the fourth, and so on in the same order in all the subsequent games of a set.

CASE 1.—In doubles, one player does not appear in time to play, and his partner claims to be allowed to play single-handed against the opposing players. May he do so?

Decision.—No.

Rule 34.—The order of receiving the service shall be decided at the beginning of each set as follows:

The pair who have to receive the service in the first game shall decide which partner shall receive the first service, and that partner shall continue to receive the first service in every odd game throughout that set. The opposing pair shall likewise decide which partner shall receive the first service in the second game and that partner shall continue to receive the first service in every even game throughout that set. Partners shall receive the service alternately throughout each game.

Explanation of Rule 34.—The receiving formation of a doubles team may not be changed during a set; only at the start of a new set. Partners must receive throughout each set on the same sides of the court which they originally select when the set begins. The first server is not required to receive in the right court; he may select either side, but must hold this to the end of the set.

CASE 1.—Is it allowable in doubles for the server's partner to stand in a position that obstructs the view of the receiver?

Decision.—Yes. The server's partner may take any position on his side of the net in or out of the court that he wishes.

Rule 35.—If a partner serve out of his turn, the partner who ought to have served shall serve as soon as the mistake is discovered, but all points scored, and any fault served before such discovery, shall be reckoned. If a game shall have been completed before such discovery, the order of service remains as altered.

Rule 36.—If during a game the order of receiving the service is changed by the receivers, it shall remain as altered until the end of the game in which the mistake is discovered, but the partners shall resume their original order of receiving in the next game of that set in which they are receivers of the service.

Rule 37.—The service is a fault as provided for by rule 9, or if the ball served touch the server's partner or anything which he wears or carries; but if the ball served touch the partner of the receiver or anything which he wears or carries, not being a let under rule 13(a), before it hits the ground, the server wins the point.

Rule 38.—The ball shall be struck alternately by one or other player of the opposing pairs, and if a player touch the ball in play with his racket in contravention of this rule, his opponents win the point.

TENNIS

History.—Tennis may well be called a royal game, having been popular with various kings oi England and France. In the ball games of the Greeks and Romans we may see the rudiments of the French *jeu* de *paume,* which is in all probability the ancestor of modern tennis in a direct line. The origin of the name is quite obscure. The most probable derivation is from the word *Tenez!* (Take it! Play!), especially when we remember the large number of French terms that adhere to the game; *e.g.,* grille, tambour (drum, from the sound on the board that formed the face of that buttress), and dedans. Further, a poem dealing with the game, written in Latin elegiacs by R. Frissart, makes the striker cry *"Excipe!"* (Take it!) after each stroke; this seems to correspond with the custom which enjoins the racket marker to call "play" whenever a legitimate stroke has been made. In the *Alexiad* of Anna Comnena (about A.D. 1120) is a reference to a game played on horseback in which a staff, curved at the end and strung with strings of plaited gut was used. This game was played in a court called "a court for goff" (sic) (according to the Lexicon of Alexandrine Greek) and some similar game, corrupted through tchangan into *chicane,* was played in France. Good authorities also find a more ancient derivation of the game in Egypt, in Persia and among the Arabs before Charlemagne. In A.D. 1300 the game was also known as La *boude.* Through-

out the century indeed it was played in France and by the highest in the land. Thus Louis X died from a chill contracted aiter playing, and Charles V was devoted to the game. In England the game, or some form of it, was known, Chaucer alluding to it in the words "But canstow playen racket to and fro."

Tennis was at this epoch frequently played in some crude form in the moats of castles where Charles VIII used to watch the game. Henry II is described as the best player in France, and worthy of the silver ball given to the finest players. Later, Henry IV and Louis XIV (who kept a regular staff to look aiter his court) were patrons and players of tennis; indeed, in Henry VI's reign so popular was the sport that it was said that there were "more tennis-players in Paris than drunkards in England." The 16th and 17th centuries were the heyday of the game both in France and England. The word tennis—the game having hitherto been described as *lusus* pilae—is first iound in Gower's "Balade unto the worthy and noble kynge Henry the fourth" (1400), but Shakespeare's allusion to tennis as known to Henry V must not be omitted. Henry VII played the game and revoked the edicts that forbade it; there was a court at Windsor castle in his time, which still existed in 1607. It was in that reign that the king of Castile played a match with the marquis of Dorset; the king, who used a racket, conceded 15 to the marquis, who played with his hand. The king won the set. Henry VIII built the court at Hampton Court palace, 1529–30. This court is still in use today. In 1615 there were a number of courts in London of various sizes, and a picture of James II as a boy represents him standing in a tennis court holding a short-handled racket strung diagonally. Pepys frequently alludes to tennis at a time when there were two courts at Oxford and five at Cambridge. In the 19th century the game lost some of its popularity, mainly through the demolition of courts as building operations increased; moreover, courts complete in every detail alone were built, the play being consequently confined to the members of the clubs that could afford the expense.

Tennis was introduced to the U.S. in the 1870s. The game was played regularly at the Racquet Court club in New York in 1876 where Robert Moore was the professional instructor. The club merged about 1890 with the Racquet and Tennis club, which became the foremost club in America sponsoring court tennis and other racquet games. Courts were built in Boston, Mass. (the first in 1876), Newport, R.I. (1880), Chicago, Ill. (1893) and later at Tuxedo, N.Y.

Among the early champions were Tom Pettitt, professional title-holder from 1885 to 1898, and Jay Gould, only amateur ever to win the world's professional championship. For 20 years (1906–1926) Gould lost only one singles match. Other famous proiessionals were Walter Kinsella and Jock Soutar in the U.S. and G. F. Covey in England. Richard D. Sears (first lawn tennis champion of the United States whose record of seven consecutive wins of that title [1881–1887] was not equalled) was U.S. amateur court tennis champion in 1892.

In 1928 Pierre Etchebaster, a French Basque, won the world's open championship and continued a long domination of the game without serious challenge. In 1952 at the age oi 58, Etchebaster defeated the fourtime national amateur champion, Alastair B. Martin, in a challenge match to retain his title as world's open court tennis champion.

Among other amateur champions in the U.S. were James H. Van Alen, Ogden Phipps, Robert Grant and E. M. Beals, Jr. Phipps who won the singles title six times, and Francis X. Shields, top-ranking U.S. lawn tennis player in 1933, held the national amateur and Etchebaster and Esmond Martin the amateur-professional doubles titles in 1952. Alastair B. Martin won the Tuxedo Gold Racquet event in 1953.

General Description of Came.— Tennis is played in a walled and roofed court, 110 ft. by 38 ft. 8 in.; the floor, however, measures but 96 it. by 31 ft. 8 in., the difference being the width of a roofed corridor (the "penthouse") which runs along the two end walls and one of the side walls. Across the middle of the court a net is stretched and the first object of the game is to strike the ball over this with a racket. The net is 5 ft. high at the ends, 3 it. at the middle, and divides the floor into two equal parts—the "service" side and the "hazard" side. The floor and walls are made of cement and should be smooth, but not polished.

There is no standard size for a tennis court, and courts vary considerably in dimensions, though the more modern ones have all been built on the same plan. The dimensions given here are those of the most suitable existing courts.

The court is lighted from the roof and sides. The height of the court to the tie beam is 30 ft. The height of the play line, above which the ball must not go, is 18 it. at the sides and 23 it. at the ends. The roof of the penthouse, which is made of wood, slopes downward toward the court, the lower edge being 7 it. 1½ in. from the floor, the upper edge ro ft. 7 in., the width 7 ft The dedans consist of an opening in the end wall on the service side, under the penthouse, where provision is made for spectators, who are protected by a net. It is 21 ft. 8 in. in width; the upper edge is 6 ft. 10 in. fi n the floor, the lower edge 3 it. 3 in. The opening of the dedans is 4 ft. 6 in. from the main wall and 5 ft 6 in. from the other side wall. Looking irom the dedans (*i.e.,* irom the service side), the right-hand or main wall has one peculiarity, the tdmbour, a sloping buttress, to form which the wall is built inward, reducing the breadth of that part of the court to 30 it. 2 in. In the right-hand corner of the hazard side-end wall (as viewed from the dedans) is the grille, an opening lined with wood, 3 it. 1 in. square; and on this wall is painted a continuation of the pass line. The left-hand wall, along which runs the penthouse, is not continuous, being broken by a long opening between the floor and the penthouse similar to the dedans, and at the same height from the ground. The low walls under this opening and the dedans are called the batteries. There is no wall in iront of the marker's box, through which the court is entered on either side of the net post. This long opening in the left-hand wall is divided into galleries and doors, the latter situated where the entrances to the court used to be in early times. The measurements in order from the dedans are as follows (the numbers of the galleries being counted from the net): service side.—last gallery y it. 6 in.; second gallery 9 ft. 6 in.; door 3 ft. 6 in.; first gallery 5 ft. 8 in.; marker's box or line opening 7 it. 10 in.; hazard side.—first gallery 5 ft. 8 in.; door 3 ft. 6 in.; second gallery 9 ft. 6 in.; last gallery (also called winning gallery) 9 ft. 6 in. The last galleries are 15 ft. 11 in. each irom their respective end malls. The galleries are marked by posts, which also serve to support the penthouse. The galleries, dedans and grille are known as the openings; three of these—the grille, dedans and winning gallery—are winning-in openings, for if a ball in play is struck into one of these, the striker scores a point. In the earlier French courts there were other winning openings such as: *l'ais* (the board), an upright board 9 ft. by 1 ft. in the leit-hand corner of the dedans wall; le petit trou or le trou, a hole 16 in. square at the bottom of the other side of the wall; and la lune, a round opening high up by the play line, one at each end of the court. The regulation court has certain lines painted on the floor which are also continued perpendicularly on the walls. On the hazard side is the hali-court line, the pass line and the service line. The first is only required when one player gives the other the odds oi "half the court" (see below, Scoring and Handicapping). The pass line is drawn 7 it 8 in. irom the main wall, the service line 21 it. 1 in. from the grille wall. The rectangle contained by the pass and service lines forms the service court. The other lines, both on the hazard side and service side, mark the chases, which will be explained below.

Equipment.— The balls vary in the three countries where the game is chiefly played—England, United States and France. In England balls weigh approximately 2½ oz. and are 2¼ in. in diameter. They are made of strips of cloth wound tightly together and tied with twine. Over this tie is placed a little more twine wound around the ball, and the outside cover is of white Milton cloth. Black balls are used in two courts (neither full sized) where the floor of the court is white. The French ball is harder and faster than the English, and the American ball, which is machine made, lies somewhere between the two. The racket is usually about 27 in. long and weighs about 16 oz. The head is about 9 in. long and 6 in. broad, but there are no restrictions as to size or weight. The head is somewhat pear-shaped, but its centre line does not correspond with the centre line of the handle, since the head is curved upward. Some of the early rackets were strung diagonally (i*e.,* in diamonds); later, vertical-horizontal stringing was universally adopted; then followed knotting at the points of intersection, a practice which later disappeared.

Scoring and Handicapping.— A match in England and the U.S. consists ordinarily of the best of three or the best of five sets, a set being scored by the player who gets six games first. Sets of "eight games"; *i.e.,* the set won by the player who gets eight games first, are generally played in France and sometimes in England.

Often vantage sets are played; *i.e.,* when each player has scored five games or seven games as the case may be; the set continues until one player gets an advantage of two games. In these conditions sets sometimes continue for a very long time, and sets where over 60 games have been played are recorded. In matches for the world's championship the best oi 13 sets of six games are generally played on three different days with an interval between them. A game consists ordinarily of four winning strokes, called by the marker as "15," "30," "40," "game"; if the score is "40-all" the marker calls "deuce" and two strokes have to be won in succession by one of the players. When one has won a stroke his score is called "vantage"; if he wins the next, he wins the game; if he loses it, the score reverts to deuce. The score of the player who won the last stroke or made the last chase is called first.

The Game and Hints on Play.— The players decide who shall serve by spinning a racket on its head. One spins and the other calls "rough" or "smooth," the rough side oi the head of the racket showing the knots of some of the lower strings. The winner takes the service side, service being an advantage. In four-handed games the winners of the spin often take the hazard side, since by doing so they can decide which oi their opponent's service each one will elect to take. He serves from any part of the court and in any way he thinks best, and the ball must go over the net, strike the side penthouse, and fall into the service court. His opponent ("striker-out") tries to return the hall over the net before it has touched the ground a second time; he may volley or half-volley it. For a stroke to be good, it must be made before the second hound of the ball, and the ball must go over the net (even if it touches it), and must not strike the wall above the play line, nor touch the roof or rafters. The first point to be attained is to be sure of getting the ball over the net, the next to do so in such a way as to defeat the opposing player's attempt to make a good return

It often happens that a player, either intentionally or irom inability, does not take or touch a ball returned to him over the net. In

this event, chiefly on the service side, a chase (in Italian *caccia,* in French *chasse)* is made, the goodness or the badness of which depends upon the spot on the floor which the ball touches next after its first bound. The nearer this spot is to the end wall the better the chase. The chase lines are numbered, being one yard apart, the shorter lines representing the hall-distance. The chases are noted and called by the marker. Thus if a ball fell on the line marked 4, he would call "chase 4"; if between 4 and 3, he would call "better than 4," if it fell nearer to 4 than the short line; "worse than 3" if it fell on the short line or between the short line and 3, for if the ball falls on a line the striker is credited with the better stroke. Strokes into the galleries and doors, with the exception of the winning gallery (last gallery, hazard side), count as chases. The making or, in technical language, the "laying down" of a chase does not immediately affect the score; it has to be won first; *i.e.,* the other player tries to make a better chase; if he fails, the original maker wins. For this purpose after two chases have been laid down (or one, if either player's score is at 40) the players change sides; *e.g.,* if X has been serving and Y has laid down two chases, Y becomes the server and tries to defend them, X to win them by making the ball fall nearer to the back wall after its first bound than Y did. Either player wins the chase if he "finds" (hits the ball into) one of the winning openings, or if his opponent fails to make a good return. The winner of the chase scores a point. The chases are played off in the order in which they are made. Should X in trying to win a chase make the same chase as Y originally laid down, the chase is off and neither side scores. In France the chase is played again. The rest goes on till one of the players fails to make a good return, or deliberately leaves the ball alone in order that his opponent may lay down a chase (a procedure to be followed at the discretion of a player in whose judgment the chase will be a bad one), or lose a chase already laid down and in the course of being played off. Either player can score, there being no hand-in or hand-out as at rackets. A point is scored by the player whose opponent fails to make a good return stroke in a rest, or who strikes the ball into a winning opening, or wins a chase, or to whom two faults are served in succession. A player loses a stroke who strikes the ball twice, or allows it to touch himself or his clothes.

(E. S. BR.)

LAW OF HIGHWAY, THE: *see* RULE OF THE ROAD.

LAW OF SUCCESSION. Succession, in law, is the transmission or passing of rights from one to another.

Succession, or the partition or redistribution of the property of a former owner is the subject of many rules, which may be based on the will of a deceased person and are detailed in such articles as ADMINISTRATION; ESTATES, ADMINISTRATION OF; INHERITANCE; INTESTACY; LEGACY; WILL; etc. There are cases, however, in which a will cannot be expressed; this eventuality is discussed in the present article, and there can be no doubt that it is the most characteristic one from the point of view of social conditions. It represents the view of society at large as to what *ought to be* the *normal* course of succession in the readjustment of property after the death of a citizen. We shall dwell chiefly on the customs of succession among the nations of Aryan stock. Other customs are noticed in the articles on VILLAGE COMMUNITIES; INDIAN LAW; etc.

In Primitive Conditions.—We have to start from a distinction between personal goods and the property forming the economic basis of existence for the family which is strongly expressed in early law. War booty, proceeds of hunting, clothes and ornaments, implements fashioned by personal skill, are taken to belong to a man in a more personal way than the land on which he dwells or his herds. It is characteristic that even in the strict law of paternal power formulated by the Romans an unemancipated son was protected in his rights in regard to things acquired in the camp (*peculium castrense)* and later on this protection spread to other chattels (*peculium quasi-castrense).* The personal character of this kind of property has a decisive influence on the modes of succession to it. This part of the inheritance is widely considered in early law as still in the power of the dead even after demise. We find that many savage tribes simply destroy the personal belongings of the dead (Post, *Grundriss der ethnologischen Jurisprudenz,* pp. 174–5), and sometimes the goods of deceased persons have to be taken away by strangers which leads to curious customs of looting the house of the dead. Such customs were prevalent, *e.g.,* among the Indians of the Delaware and Iroquois tribes; the nearer relations dared not take over such things on account of *tabu,* while strangers might appropriate them, as it were, by right of conquest.

The continuance of the relation of the deceased to his former belongings gives rise in most cases to provisions made for the dead out of his personal succession. The habit of putting arms, victuals, clothes and ornaments in the grave seems almost universal, and there can be no doubt that the idea underlying such usages consists in the wish to provide the deceased with all matters necessary to his existence after death. A very characteristic illustration of this conception'may be given from the customs of the ancient Russians, as described about 921 by the Arabian traveller Ibn Fadlan. The whole of the personal property was divided into three parts: one-third went to the family, the second was used for making clothes and other ornaments for the dead, while the third was spent in carousing on the day when the corpse was cremated The corpse was gorgeously dressed and put into a boat in which were placed intoxicants, fruit, bread, meat and a dog cut into two parts. Then, all the weapons of the dead man were brought in, as well as the flesh of two horses, a cock and a chicken; the concubine of the deceased was also sacrificed, and ultimately all were burned in a huge pile, and a mound thrown up over the ashes. This description is the more interesting because it starts from a division of the goods of the deceased, one part of them being affected, as it were, to his personal usage; the rule continues to be observed in Germanic law in later times and became the starting point of the doctrine of succession to personal property in English law. According to Glanville (vii. 5, 4) the chattels of the deceased have to be divided into three equal parts, of which one goes to his heir, one to his wife and one is reserved to the deceased himself. The last named reservation is observed in Magna Charta *(c.* 26) and in Bracton's statement of Common Law (fol. 60), but in Christian surroundings the reservation of "the dead man's part" was taken to apply to the property which had to be spent for his soul and of which, accordingly, the Church had to take care. This lies at the root of the common law doctrine observed until the passing of the Court of Probate Act 1857. On the strength of this doctrine the bishop was the natural administrator of this part of the personalty.

The succession to real property, if we may use the English legal expression, is not governed by such considerations or the needs of the dead. Roughly speaking, three different views may be taken as to the proper readjustment in such cases. Taking the principal types in a logical sequence, which differs from the historical one, we may say that the aggregate of things and claims relinquished by a deceased person may—(I) pass to relatives or other persons who stood near him in a way determined by law; should several persons of the kind stand equally near in the eye of the law the consequence would be a division of the inheritance. The personal aspect of succession rules in such systems. (2) The deceased may be considered as a subordinate member of a higher organism—a kindred, village, state, etc. In such a case there can be no succession proper as there has been no individual property to begin with; there will be only a relapse of certain goods used by the member of a community to that community, and a consequent rearrangement of rights of usage. The law of succession will again be constructed on a personal basis, but this basis will be supplied not only by the single individual whose death has had to be recorded but by some community or union to which this individual belonged. (3) The aggregate of goods and claims constituting what is commonly called an inheritance may be considered as a unit having an existence and an object of its own. The circumstance of the death of an individual owner will, as in case 2, be treated as an accidental fact. The unity of the inheritance and the social part played by it will constitute the ruling considerations in the arrangement of succession. The personal factor will be subordinated to the real one.

In practice pure forms corresponding to these main conceptions occur seldom, and the actual systems of succession mostly appear as combinations of these various views. We shall try to give briefly an account of the following arrangements. (1) the *joint family* in so far as it bears on succession; (2) *voluntary associations* among co-heirs; *(3) division* of inheritance; *(4)* united succession in the shape of *primogeniture* and of *junior right.*

In the East, Greece and Rome.—The large mass of Hindu juridical texts representing customs and doctrines ranging over nearly 5,000 years contains many indications as to the existence

of a *joint family* which was considered as the corporate owner of property and therefore did not admit in principle of the opening of succession through the death of any of its members. In practice it was otherwise. For conflicting theories, *see* the article INDIAN LAW. In Greek law the most drastic expression of the joint family system is to be found in the arrangements of Spartan households, where brothers clustered round the eldest or "keeper of the hearth" (ἑστιοπάμων, a term illustrating the intimate connection between inheritance and household religion in ancient Aryan custom), and not only the management of family property but even marriages were dependent on the unity of the shares and on the necessity of keeping down the offspring of the younger brothers. With the Romans there are hardly any traces of a primitive family community excluding succession, but the Celtic tribal system was to a great extent based on this fundamental conception. During three generations the offspring of father, grandfather and great-grandfather held together in regard to land. The consequence was that, although separate plots and houses were commonly reserved for the uses of the smaller families included within the larger unit, the death of the principal brought about an equalization of shares first *per stirpes* and ultimately *per capita* until the final break-up of the community when it reached the stage of the great-grandsons of the original founder.

But the most elaborate system of family ownership is to be observed in the history of the latest comers among the Aryan races—the Slavs In the mountain regions of the Balkan Peninsula and the forests and moors of Eastern Europe they developed many characteristic tribal institutions and, among these, the joint family, the *Zadruga, inokoshtina,* a huge community of which there can be no doubt that their roots go back to a distant past (*see* VILLAGE COMMUNITIES). There was no room in them for succession proper: what had to be provided for was the continuity of business management by elders ancl the repartition of rights of usage and maintenance, a repartition largely dependent on varying customs and on the policy of the above-mentioned elders. In Russia the so-called *large family* appeared as a much less extensive application of the same idea

Early European Systems.—In Germanic law we catch a glimpse of a state of things in which side relations were not admitted to succession at all The Frankish Edict of Chilperic (AD. 571) tells us that if somebody died without leaving sons or daughters, his brother was to succeed him and not his neighbours (*non vicini*), which must be construed as a modification of an older rule of succession by neighbours Under "neighbours" we cannot understand merely people connected with a person by proximity of settlement, but rather his kinsmen, and the fact that kinsmen forming a settlement have precedence of brothers is characteristic enough, especially as even sons and daughters are mentioned in a way which shows that there was still some doubt whether neighbouring kinsmen should not take inheritance instead of them. These are systems of a very archaic arrangement based on a close tribal community between the members of a kindred; such a community is not apparent in later legal custom, but there are many signs of a close union between members of the same family. The law of Scania, a province of southern Sweden, shows us a group settled around a grandfather; his sons even when married hold part of the property under him and it is with some difficulty that they and their wives succeed in separating from the rest of the household property goods acquired by personal work or by marriage (Scanian Law, Dan. text i. 5); the same arrangement appears in Lombard law as regards brothers who remain settled in a common house (Edict of Rothari c. 16;) Of course, in all such cases there could be no real inheritance and succession, but merely the stepping in of the next generation into the rights and duties of the representative of an older generation on the latter's demise. In legal terminology this is accretion, not succession.

The next stage in the development of succession is presented by an arrangement which was common in Germany, viz., by the management of property under the rule of so-called *Ganerbschaft. Ganerben* is the same as the Latin *coheredes, comparticipes, consortes.* A capitulary of 818 mentions such communities of heirs holding in common (*cf.* Boretius Capitularia, i. 282). While the community lasted none of the shareholders could dispose of any part of the property by his single will. Legally and economically all transactions had to proceed from common consent and common resolve. This did not preclude the possibility of any one among the shareholders claiming his own portion, in which case part of the property had to be meted out to him according to fair computation (*swascara*). There was no legal constraint over the shareholders to remain in common; division could be brought about either by common consent or by claims of individuals, and yet the constant occurrence of these settlements of co-heirs shows that it was more profitable to keep together and not to break up the unit of property by division. The customary union of co-heirs appears in this way as a corrective of the strict legal principle of equal rights between heirs of the same degree. In English practice the joint management of co-heirs is not so fully described, but there can be no doubt that under the older Saxon rule admitting heirs of the same degree to equal rights in succession the interests of economic efficiency were commonly preserved by the carrying on of common husbandry without any realization of the concurrent claims which would have broken up the object of succession 'This accounts for the fact that notwithstanding the prevalence among the early English of the rule admitting all the sons or heirs in the same position to equal shares in the inheritance, the organic units of hides, yardlands, etc., are kept up in the course of centuries. In the management of the so-called *gavelkind* succession in Kent partition was legally possible and was sometimes effected, but there was the customary reaction against it in the shape of keeping up the "yokes" and "sulungs." A trace of the same kind of union between co-heirs appears in the so-called *parage* communities so often mentioned in Domesday Book.

In all these cases the principle of union and joint management is kept up by purely economic means and corisiderations. The legal possibility of partition is admitted by the side of it. It is interesting to watch two divergent lines of further development springing from this common source; on the one side we see the full realization of individual right resulting in frequent divisions; on the other side we watch the rise of legal restraints on subdivision resulting in the establishment, in respect of certain categories of property, of rules excluding the plurality of heirs for the sake of preserving the unity of the household. The first system is, of course, most easily carried out in countries where individualistic types of husbandry prevail. In Europe it is especially prevalent in the south with its intense cultivation of the arable and its habits of wine and olive growing. We shall not wonder, therefore, that the unrestricted subdivision among heirs is represented most completely by Roman law. Not to speak of the fact that already in the XII. Tables the principal mode of inheritance was considered to be inheritance by will while intestate succession came in as a subsidiary expedient, we have to notice that there is no check on the dispersion of property among heirs of the same degree. The only survival of a régime of family community may be found in the distinction between *heredes sui* (heirs of their own) and *heredes extranei* (outside heirs of the deceased). The first entered by their own right and took possession of property which had belonged to them potentially even during their ancestor's life; the latter drew their claims from their relationship to the deceased, which did not give them a direct hold on the property in question. Apart from that, the civil law of ancient Rome favoured complete division and the same principle is represented in all European legislation derived from Roman law or strongly influenced by it Sometimes, as in the French *Code Civil,* even the wish of the owner cannot alter the course of such succession as no person can make a will depriving any of his children of their legal share

Odal.—In contrast with this mode of succession in romanized countries we find the nations proceeding from Germanic stock and strongly influenced by feudalism developing two different kinds of restraints un subdivision. In Scandinavian law this point of view is expressed by the Norwegian customs as to Odal. The principal estates of the country, which, according to the law of

the Gulathing have descended through five generations in the same family, cannot be dispersed and alienated at pleasure. They are considered as rightly belonging to the kindred with which a historical connection has been established. In order to keep these estates within the kindred they descended chiefly to men; women could inherit only in exceptional cases, such as the daughter of a man who has left no sons or the sister of one who has left no children and no brothers. Nieces and first-cousins were admitted in the sense that they had to pass the property to their nearest male heir, and they might, in certain eventualities, be bought out by the nearest male relative. A second peculiarity of Odal consists in the right of relations descending from one of the common ancestors to prevent strangers from acquiring Odal estate. Among the peasants however it is felt that a farm ought not to be parcelled up into smaller holdings, and in the common case of several heirs succeeding to the farm, they generally decide among themselves who is to remain in charge of the ancestral household; the rest are compensated.

Mediaeval Europe.—In mediaeval England, France and Germany the same considerations of economic efficiency are felt as regards the keeping up of united holdings, and it may be said that the lower we get in the scale of property the stronger these considerations become, till it is almost impossible to break up the smaller holdings. By such process land loses in value, and it is impossible to divide one ox or one horse *in specie* without selling it. No wonder that we find practices and customs of united succession arising in direct contradiction with the ancient rule that all heirs of the same degree should be admitted to equal shares. Glanville mentions expressly that the socagers of his time held partly by undivided succession and partly by divided inheritance. The relations of feudalism and serfdom contributed strongly towards creating such individual tenancies. It was certainly in the interest of the lord that his men, whether holding a military fief or an agricultural farm, should not weaken the value of their tenancies by dispersing the one or the other among heirs. The question whether the successor should be the eldest son or the youngest son is a secondary one. The latter practice was very prevalent all through Europe and was known in England as the rule of Borough English (*q.v.*). The succession of the youngest appears very characteristic in so far as it illustrates the break up into small tenancies, as the youngest in the family is certainly not a fit representative of hierarchy and authority and could not have been meant to rule anything but his own restricted household.

Woman and Succession.—One more feature of the ancient law of succession has to be noticed, viz., the exclusion of women from inheritance in land. There can be no doubt that as regards movable goods women held property and transmitted it on a par with males from the earliest time; but their exclusion from inheritance in land seems as ancient as the patriarchal system itself, whatever we may think about the position of affairs in prehistoric times when rules of matriarchy were prevalent. A common-sense explanation of one side of this doctrine is tendered by the law of the Thuringians (*Lex Anglorum* et *Werinorum*, c. 6), where it is stated that inheritance in land goes with the duty of taking revenge for the homicide of relatives and with the power of bearing arms. One of the most potent adversaries of this system of exclusion proved to be the Church. It favoured all through the view that land should be transmitted in the same way as money or chattels. A Frankish formula (Marculf) shows us a father who takes care to endow his daughter with a piece of land according to natural affection in spite of the strict law of his tribe. Such instruments were strongly backed by the Church, and the view that women should be admitted to hold land on certain occasions had made its way in England as early as Anglo-Saxon times.

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LAWRENCE, SAINT (d. 258), one of the most famous Roman martyrs, was a deacon of Pope Sixtus II, whom he followed to death during the persecution of Valerian. It is said that when ordered to give up the church goods of which he had charge, Lawrence assembled the poor and infirm and proffered them as the church's treasure; and that when he was being roasted to death on a gridiron he said, "I am cooked on that side; turn me over, and eat." These details are recorded by St. Ambrose, the poet Prudentius and others, but their authenticity is far from certain; he was probably beheaded. The basilica of S. Lorenzo, outside the walls of Rome, was built over his burial place. He is named in the canon of the Roman Mass and his feast day is Aug. 10.

See H. Thurston and D. Attwater (eds.), *Butler's Lives of the Saints*, vol. iii, pp. 297–299 (1956). (D. AR.)

LAWRENCE, AMOS (1786–1852). **U.S.** merchant and philanthropist, was born in Groton, Mass., April 22, 1786. In 1799 he went to Boston and set up in business in Dec. 1807. In the next year he employed his brother Abbott, whom he made his partner in 1814. In 1831 Amos retired. The firm became the greatest American mercantile house of the day, and did much for the establishment of the cotton textile industry in New England: in 1830 by coming to the aid of the financially distressed mills of Lowell, Massachusetts, where Luther Lawrence, the eldest brother, represented the firm's interests; and in 1845–47 by establishing and building up Lawrence, Massachusetts, named in honour of Abbott Lawrence, who was a director in the Essex company which controlled the water power of Lawrence, and afterwards was president of the Atlantic Cotton Mills and Pacific Mills there. In 1842 Amos Lawrence decided not to allow his property to increase any further. He gave freely to Williams college, to Bowdoin college, to the Bangor theological seminary, to Wabash college, to Kenyon college and to Groton academy, which was renamed Lawrence academy in honour of the family, and especially in recognition of the gifts of William Lawrence, Amos's brother; to the Boston children's infirmary, which he established, and to the Bunker Hill monument fund. He died in Boston on Dec. 31, 1852.

His brother ABBOTT LAWRENCE (1792–1855) was born in Groton, Mass, on Dec. 16, 1792. Besides being a partner in the firm established by his brother, and long its head, he promoted various New England railways, notably the Boston and Albany. The town of Lawrence, Mass., was named after him. He was a representative in congress (1835–37, 1839–40); in 1842 he was one of the commissioners for Massachusetts who settled with Lord Ashburton, the British plenipotentiary. the question of the northeastern boundary. In 1542 he was presiding officer of the Massachusetts Whig convention; he broke with President Tyler, rebuked Daniel Webster for remaining in Tyler's cabinet after his colleagues had resigned and recommended Henry Clay as the nominee of the Whig party in 1844—an action that roused Webster to make his famous Faneuil Hall address. He refused the portfolios of the navy and of the interior in President Taylor's cabinet, but from 1849 to 1852 he served as United States minister to Great Britain.

Lawrence died in Boston on Aug. 18, 1855, leaving as his greatest memorial the Laarence scientific school of Harvard, which he had established in 1847.

LAWRENCE, AMOS ADAMS (1814–1886). American philanthropist, son of Amos La rence. was born in Groton, Mass.. on July 31, 1814. He graduated from Harvard in 1835, went into business in Lowell, and in 1837 established in Boston his own counting-house. Lawrence established a hosiery and knitting mill at Ipswich—the first of importance in the country. In 1849 he founded at Appleton, Wis., a school named in his honour—Lawrence university (now Lawrence college). He contributed to funds for the colonization of free Negroes in Liberia. In 1854 he became treasurer of the Massachusetts Emigrant Aid

Company (reorganized in 1855 as the New England Emigrant Aid Company), which sent 1,300 settlers to Kansas, where the city of Lawrence was named in his honour. He contributed personally for the famous Sharp rifles, which, packed as "books" and "primers," were shipped to Kansas and afterwards came into the hands of John Brown, who had been a *protégé* of Lawrence. Though he deplored John Brown's fanaticism, when Brown was arrested he appealed to the governor of Virginia to secure for him a lawful trial. He repeatedly urged the necessity of offering no armed resistance to the Federal Government. Till the very outbreak of the Civil War he was a "law and order" man, and he did his best to secure the adoption of the Crittenden compromise. In 1862 he raised a regiment of cavalry which became the 2nd Massachusetts Regiment of Cavalry. Lawrence built (1873–80) Lawrence hall, Cambridge, for the Episcopal theological school, of which he was treasurer. From 1857 to 1862 he was treasurer of Harvard college, and from 1879 to 1885 was an overseer. He died in Nahant (Mass.) on Aug. 22, 1886.

LAWRENCE, DAVID HERBERT (1885–1930), British novelist, was born at Eastwood, Nottinghamshire, on Sept. 11, 1885, and educated at Nottingham high school and University college, Nottingham. With his first books, *The White Peacock* (1911), *The Trespasser* (1912) and *Sons and Lovers* (1913), it became evident that a writer of great force and originality was rising in the younger generation. A police prosecution of *Tlze Rainbow* (1915) seemed for a time to check Lawrence's fertility, but he issued *Amores*, poems, and travel impressions, *Twilight in Italy*, in 1916, further poems, *Look! We have Come Through!* in 1917, and another novel, *The Lost Girl*, 1920. Hereafter Lawrence's outlook and style were being deeply influenced by a study of psychoanalytical doctrine and by travel in Italy, Sardinia, New Mexico and Australia. A new note is evident in *Women in Love* (1921), *Aaron's Rod* (1922), *Kangaroo* (1923), *The Ladybird* (1923), *England, My England!* (1924), *St. Mawr* (1925) and *The Plumed Serpent* (1926). Miscellaneous writings include *Sea and Sardinia* (1921), *Psychoanalysis and tlze Unconscious* (1921), *Fantasia of the Unconscious* (1922), *Studies in Classic American Literature* (1923); three plays, *The Widowing of Mrs. Holroyd* (1914), *Touch and Go* (1920) and *David* (1926); and a volume of essays, *Mornings in Mexico* (1927); *Pansies* (1929). He wrote also *Movements in European History*, issued as by "Lawrence H. Davison" in 1921, and under his real name in 1925. Lawrence, considered by some critics one of the most powerful modem English novelists, died at Vence, near Nice, France, March 2, 1930. He was increasingly obsessed by the problems of sex, as in his famous novel *Lady Chatterley's Lover* (1928). His analysis of the sex motive was possibly the most characteristic feature of his work; but his interpretation of natural scenery and many descriptive passages show spiritual insight and artistic power.

See H. J. Seligmann, *D. H. Lawrence* (1924); *The Collected Poems of D. H. Lawrence* **(1928)**; Stephen Potter, *D. H. Lawrence: A First Study* (1930).

LAWRENCE, ERNEST ORLANDO (1901–1958), U.S. physicist, winner of the 1939 Nobel prize in physics for his invention of the cyclotron, was born on Aug. 8, 1901, in Canton, S.D. In 1925 he took his Ph.D. degree at Yale university, where he was a National Research fellow in physics, 1925–27. Appointed assistant professor of physics at Yale, he was associate professor at the University of California in 1928, becoming a full professor in 1930 and director (1936) of the Radiation laboratory, which at his death had a staff of over 5,000. An authority on nuclear, biological and medical physics, he was a pioneer in the development of the cyclotron, a device for accelerating nuclear particles to high speeds. The university's first 80-ton cyclotron (1933), its second 225-ton cyclotron (1938), the third cyclotron (1942) and various World War II cyclotrons used by the U.S. government were built under his supervision. For this achievement, in addition to his research on artificial radioactive elements, he was awarded the Nobel prize in physics in 1939. Lawrence also played a key role in the development of the atomic bomb. He died in Palo Alto, Calif., on Aug. 27, 1958. *See* ACCELERATORS, PARTICLE.

LAWRENCE, GERTRUDE (GERTRUD ALEXANDRA DAGMAR LAWRENCE KLASEN) (1898–1952), English entertainer and actress. one of the most popular in the first half of the 20th century, was born in London, on July 4, 1898. daughter of Alice (Ranks) and Arthur Lawrence Klasen. a singer in variety and musicals under the name of Lawrence. She made her first stage appearance in Dec. 1910 in *Babes in the Wood* and toured in variety and musicals until 1916. when she was engaged for one of André Charlot's early London revues. Two years later she took over the lead in another Charlot revue when Beatrice Lillie was injured. With Miss Lillie and Jack Buchanan she was costarred in the first Charlot revue to reach New York (1924), and then starred in the Gershwin musical *Oh, Kay!* (1926). Her first straight role was in *Icebound* (London. 1928). Later she played in *Candle-Lzght, Private Lives* (written for her). *Tonight at 8:30* and *Susan and God*, among others. Perhaps her greatest triumph was as Liza Elliot in Moss Hart's musical play *Lady in the Dark* (1941). Her last appearance was as Anna in *The King and I* (1951). An early marriage to Francis Gordon-Howley. English director, ended in divorce. In 1940 she married Richard Aldrich. U.S. producer. She died in New York on Sept. 6, 1952.

(B. HT.)

LAWRENCE, SIR HENRY MONTGOMERY (1806–1857), British soldier and statesman in India, was born at Matura, Ceylon, June 28, 1806. He served in the First Burmese War and, after a short period at home, was appointed revenue surveyor by Lord William Bentinck. He saw service in the First Afghan War (1839–42) and then became assistant to the envoy at Lahore, at Umballa, where he reduced to order the lapsed territory of Kaithal. Soon he received the office of resident at the protected court of Nepal where he began a series of contributions to the *Calcutta Review*, a selected volume of which forms a classic account of the British in India.

Lawrence had published the results of his experience of Sikh rule and soldiering in a vivid work, the *Adventures of an Officer in the Service of Ranjit Singh* (1845). In the First Sikh War, Lawrence was summoned from Nepal to take the place of Maj. George Broadfoot, killed at Ferozeshah. Then came the victories of Aliwal and Sobraon. Lawrence spoke not for annexation but for the reconstruction of the Sikh government and was himself appointed resident at Lahore and president of the council of regency till the maharaja Dhuleep Singh should come of age. Soon disgusted by the "venal and selfish durbar" that included his Sikh colleagues, he summoned to his side assistants like John Nicholson, James Abbott and H. B. Edwardes, till they all did too much for the people, as he regretfully confessed. But "my chief confidence was in my brother John . . . who gave me always such help as only a brother could." Worn out, he went home with Lord Hardinge when he was made K.C.B. The Second Sikh War summoned him back at the end of 1848, to see the whole edifice of Sikh reconstruction collapse. Lord Dalhousie proclaimed the Punjab up to the Khyber British territory on March 29, 1849. But still another compromise was tried. Henry Lawrence was made president of the new board of administration with charge of the political duties, and his brother John was entrusted with the finances. John could not find the revenue necessary for the rapid civilization of the new province so long as Henry, for political reasons, insisted on granting life pensions and allocating large estates to the needy remnants of Ranjit Singh's court. Lord Dalhousie therefore removed Sir Henry Lawrence and installed John as chief commissioner.

In the comparative rest of Rajputana he wrote two important articles (March–Sept. 1856) on army reform, the outcome of conversations with Lord Dalhousie at Calcutta. Henry Lawrence pointed out the latent causes of mutiny and uttered warnings to be too soon justified. In March 1857 he took the helm at Lucknow, but it was too late. In ten days his rule put down administrative difficulties, as he had done at Lahore. On May 30 mutiny burst forth in Oudh.

On June 29 Lawrence led 336 British soldiers and 220 natives out of Chinhat to reconnoitre. The natives defected and the residency was besieged. On July 2 a shell struck him, and he died two days later.

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LAWRENCE, JAMES (1781–1813), U.S. naval hero of the War of 1812 (*q.v.*), was born in Burlington, N J.. Oct. 1, 1781. He entered the navy as a midshipman in 1798 and saw extensive action against the Barbary pirates. He was first lieutenant to Stephen Decatur (*q.v.*) when the U.S.S. "Philadelphia," which had been captured by the Tripolitans, was destroyed in Tripoli harbour by Decatur-led forces in 1804. During the War of 1812 Lawrence commanded the U.S.S. "Hornet" in the capture of H.M.S. "Peacock." Shortly thereafter he was promoted to captain of the frigate "Chesapeake." In June 1813 the "Chesapeake" accepted H M.S. "Shannon's" challenge to a sea fight off Boston. The "Chesapeake" was decisively defeated and Lawrence was mortally wounded. His dying words, "Don't give up the ship," became one of the U.S.navv's most cherished traditions. Lawrence died June 1, 1813. (R. M. LA.)

LAWRENCE, JOHN LAIRD MAIR LAWRENCE, 1ST BARON (1811–1879), viceroy and governor general of India, was born at Richmond, Yorkshire, March 4, 1811, and in 1830 became assistant collector at Delhi. When not administering justice in the city courts or under the village tree, Lawrence was scouring the country after the marauding Meos and Muslim freebooters. The first 19 years, from 1830 to 1849, during which he acted as magistrate and land collector of the most turbulent part of India at that time. coincided with the period of Lord William Bentinck's reforms. Intermitting his work at Delhi, he became land revenue settlement officer in the district of Etawah, buying out or getting rid of the talukdars. This and a quiet persistent hostility to the oppression of the people by their chiefs formed the two features of his administrative policy. When the First Sikh War broke out, Lawrence was still collector at Delhi. During the early months of 1846 he found men, munitions and supplies. The victory of Sobraon was the result. and at 35 Laarence became commissioner of the Jullundur Doab, the fertile belt stretching from the Sutlej north to the Indus. He restored the newly annexed territory to order without one regular soldier, organized levies of the defeated Sikhs and so welded the people into a loyal mass that he was ready to repeat the service of 1846 when the Second Sikh War ended (1849) in the conversion of the Punjab up to Peshawar into a British province. Lord Dalhousie made Laurence chief commissioner of the new province in 1853. Revenue was raised on principles so fair to the peasantry that Ranjit Singh's exactions were reduced by a quarter. while agriculture improvements were encouraged. A police force was organized, roads were cut through every district and canals were constructed. Commerce followed on increasing cultivation and communications, the courts brought common justice and crime greatly decreased. Seven years of this work prepared the lately hostile and always anarchic Punjab under Lawrence to weather the mutiny of 1857. On May 12 the news of the revolts at Meerut and Delhi reached him at Rawalpindi. Of his 50,000 native soldiers, 38,000 were Hindustanis of the very class that had mutinied elsewhere, and British troops were few and scattered. Not an hour was lost in disarming the Hindustani at Lahore. The remembrance of the ten years' war which had closed only in 1849, a bountiful harvest, the old love of battle, the offer of good pay and, above all, the personality of Lawrence and his officers raised the Punjabi force into a new army of 59,000 men. Delhi was invested, but for three months the rebel city did not fall. Under John Nicholson, Lawrence sent on still more men to the siege, till every available European and faithful native soldier was there, while a movable column swept the country, and the border was held by militia. At length, when even in the Punjab confidence became doubt, Lawrence was ready to consider whether he should not give up the Peshawar valley to the Afghans under Dost Mohammed as a last resource and send its garrison to Delhi. But on Sept. 20 the city and palace of Delhi were again in British hands. Lawrence received a baronetcy, the G.C.B. and a life pension of £2,000 a year in addition to his ordinary pension of £1,000. He was sent out again in 1864 as viceroy and governor general on the death of Lord Elgin. In 1855 Lawrence had, in obedience to Lord Dalhousie but against his judgment, signed a treaty of peace and friendship with Dost Mohammed. When in 1863 Dost Mohammed's death let loose the factions of Afghanistan he recognized both the sons, Afzul Khan and Sher Ali, at different times, and the latter fully only when he had made himself master of all his father's kingdom. The steady advance of Russia from the north, notwithstanding the Gorchakov circular of 1864, led to severe criticism of his cautious buffer policy. When, nine years after, the Second Afghan War unexpectedly broke out, the retired viceroy gave the last days of his life to an unsparing exposure. in the house of lords and in the press, of a policy which he had striven to prevent and which he did not cease to denounce in its course and consequences. On his final return to England early in 1869 he was created Baron Lawrence of the Punjab and of Grately, Rants. He sat on the London school board, of which he was the first chairman. Lawrence died on June 27, 1879, and was buried in the nave of Westminster abbev.

LAWRENCE; STRINGER (1697–1775), English soldier. was born at Hereford on March 6, 1697. He seems to have entered the army in 1727, and served in Gibraltar and Flanders, and at Culloden. In 1748 he went out to India to command the East India company's troops. Lawrence foiled an attempted French surprise at Cuddalore, but was captured by a French cavalry patrol at Ariancopang near Pondicherry and kept prisoner till the peace of Aix-la-Chapelle. In 1749 he was in command at the capture of Devicota. On this occasion Clive served under him and a lifelong friendship began. In 1750 Lawrence returned to England, but in 1752 he was back in India. Here he found Clive in command of a force intended for the relief of Trichinopoly. As senior officer Lawrence took over the command, but allowed Clive every credit for his share in the operations, which included the relief of Trichinopoly and the surrender of the entire French besieging force. In 1752 with an inferior force he defeated the French at Bahur (Behoor) and in 1753 again relieved Trichinopoly.

For the next 17 months Lawrence fought a series of actions in defense of this place, finally arranging a three months' armistice, which was afterward converted into a conditional treaty. He was commander in chief up to the arrival of the first detachment of regular forces of the crown. In 1757 he served in the operations against Wandiwash, and in 1758–1759 was in command of Ft. St. George during the siege by the French under Lally. After two years at home he resumed his command in 1761 as major general and commander in chief. He retired in 1766, and died in London on Jan. 10. 1775

LAWRENCE, SIR THOMAS (1769–1830), the most successful English portrait painter of his day, was born at Bristol, on Bfay 4. 1769. He was the son of an innkeeper. who in 1773 took over the "Black Bear" at Devizes, and there he won a reputation as a prodigy who made profile portraits in pencil. Later he began to work in pastel and in 1782, when his family moved to Bath, he set up professionally. He had very little regular education or artistic training. He began to practise in oils only when he moved to London in 1786. There he studied at the Royal Academy schools for a short time and was given encouragement by Sir Joshua Reynolds. He was handsome, charming and exceptionally gifted. His early success was phenomenal and in 1789, when he was 20. he was summoned to Windsor to paint Queen Charlotte. This portrait, in the National gallery, is one of the masterpieces of the time. He was elected associate of the Royal Academy in 1791, academician in 1794, and on the death of Reynolds in 1792 succeeded him as painter in ordinary to the king. and painter to the Dilettanti society.

Lawrence was a skilled draftsman. He abandoned pastel painting early but continued to make portraits in pencil and chalks. These were separate commissions and were very rarely studies for paintings, as it was his usual practice to make a careful drawing of the head and sometimes the whole composition on the canvas itself. and to paint over it. There are highly interesting references to his working methods in Joseph Farington's Diary.

After the death of Reynolds, Lawrence quickly became the fashionable portrait painter of the day. He presented his sitters

in a dramatic, sometimes theatrical, manner which at its best produced romantic portraiture of a high order. At the same time he was anxious to succeed as a history painter in the grand manner but his most ambitious attempt, "Satan" (1797, Royal Academy), was a failure. His uork was always uneven in quality and. partly through pressure of debts, he accepted far more commissions than he could execute. There is, however, a clear development in his style and with "Sir Francis Baring and His Associates" (1807, Northbrook collection) he produced a group in the great academic tradition. After the death of John Hoppner in 1810 he was patronized by the prince regent, who knighted him in 181 j and sent him in 1818 to the continent to paint the allied military leaders and heads of state. These portraits are now in the Waterloo chamber at Windsor castle. By them Lawrence was recognized as the first portrait painter of Europe and one of them, "Pope Pius VII," is his masterpiece and a work of European distinction. On his return to England in 1820 he was elected president of the Royal Academy in succession to Benjamin West. He died in London on Jan. 7, 1830.

Lawrence was a distinguished connoisseur. His collection of old-master drawings was one of the finest ever made, and he was instrumental in securing the Elgin marbles for the nation and in the founding of the National gallery. It should be recorded that he was consistently generous to artists younger than himself.

See also PAINTING: *Great Britain: Portraitists.*

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LAWRENCE, THOMAS EDWARD (1888–1935), British explorer and scholar, was born in Wales on Aug. 15, 1888, of a Leicestershire family, one branch of which had moved to the neighbourhood of Dublin and thence to Oxford. The second of five brothers, he was educated at the Oxford high school and at Jesus college, Oxford, where, in 1910, he took a first class in modern history. In order to study Crusading architecture he made in that year a tour through Syria on foot; and the colloquial Arabic, which he then picked up, and his interest in and knowledge of archaeology, commended him to D. G. Hogarth, who was about to lead an expedition to Jerablus on the Euphrates and excavate the site of Carchemish for the British Museum. Thither Lawrence went in 1911, with the assistance of a post-graduate endowment at Magdalen college; and at Carchemish he worked on and off till 1914, taking several opportunities to explore Syria and Mesopotamia in native company and accepting for a few weeks an appointment under the Palestine Exploration Fund, which attached him to the Survey of North Sinai carried out by Col. Newcombe, R.E., for the War Office in the winter of 1913–14. Though naturally inclined to scholarship and letters, he showed singular practical ability and capacity for leadership, and a remarkable power of inspiring confidence in Arabs.

On the outbreak of the World War. Lawrence. beina below standard height, obtained at first no more active service than a post in the geographical section of the War Office. But soon after Turkey had joined the Central Powers he was sent by Lord Kitchener to Egypt and attached to a rudimentary Military Intelligence Section. He was a moving spirit in the negotiations leading to an Arab revolt and in organizing the Arab Bureau which, as finally constituted early in 1916, acted as staff and intelligence office for the Arab campaigns. In the autumn Lawrence, feeling that stalemate would ensue if closer liaison between the British and the Arabs were not effected, asked leave to go down to Jidda, and once there, was transferred to the Arab Bureau which was under the foreign office. Hearing good accounts of the Amir Faisal, he persuaded Sharif Husain to let him go inland and visit the force-which had been driven back from Medina. He soon won the confidence of Faisal, and induced him to reorganize his army and move north so as to threaten the communications of Medina by attacking the Hejaz railway. With his chief established at Wejh, and the army of another brother, Abdullah, brought to Wadi Ais to co-operate, Lawrence rode off into the interior to raise the northern tribes, and so extend the area to be held and defended against the Turks. He pushed right **up** to and beyond Baʿalbek; *i.e.,* behind the enemy lines in Syria, and on his return, having picked up a Huweitat force under the famous raider, Auda Abu Tayyi, he routed a Turkish battalion near Maʿan, and forced a passage to 'Aqaba which was occupied for Faisal in Aug. 1917. For this exploit he was promoted to field rank and given decorations, British and French, which, however, he would not accept.

Lawrence, now cordially helped by Gen. Edmund Allenby, prompted the successive forward moves made by Faisal's force, after ʿAqaba had become its base, and himself organized and led a battle in Wadi el-Hesa, near Esh Shobek, in which the enemy suffered his worst defeat in the open. He turned his attention in particular to train-wrecking and had such success that Medina became virtually isolated, and a large reward was advertised for the capture of "El-Orens, destroyer of engines."

Early in 1918 he made a desperate attempt to cut the Turkish Palestine army's railway communication with Damascus, and failed only by a hair's breadth. In that summer, in concert with Allenby, he induced Faisal to move up to Qasr Azraq and organize a new force to advance on Damascus. This duly moved up in the autumn side by side with Allenby and after breaking up the enemy's Trans-Jordan army, entered Damascus several hours ahead of the British. Lawrence took charge of the city till Allenby could reach it, and suppressed attempts at reaction.

Called to the peace conference, Lawrence became one of its outstanding figures during the spring of 1919. His legendary fame as organizer and inspirer of guerrilla tactics was enhanced by the forcible part that he played when Faisal, whom he had accompanied on a British tour, came to Paris, But fight as Lawrence might against French plans for Syria, he could not prevail in that milieu and at last, retiring to his tent, he sat down to write the narrative of his adventures. The first manuscript was subsequently lost; but he began again, and after many recensions it was announced that the book, under the title the *Seven Pillars* of *Wisdonz,* would be issued in 1926.

He was elected a research fellow of All Souls, Oxford, in 1919, and resided there for a year, but without entering much into the college life. In 1921 Winston Churchill called him to the colonial office as adviser on Arab affairs, in which capacity he had a large share in making Faisal king of Iraq. But, disgusted with the failure of the Allies to fulfil adequately what he considered their moral obligations to the Arabs, and remorseful for his own part in leading them on, Lawrence abruptly left government service in 1922 and enlisted as a mechanic in the royal air force. In 1923 he sought refuge from publicity in the tank corps, but was retransferred to the R.A.F. in 1925, and served on the northwest frontier in India. In 1927 he changed his name by deed poll to Shaw. He was recalled to England in April 1928, and left the R.A.F. in March 1935. On May 13, 1935, he met with a motorcycling accident in Moreton, Dorsetshire, and died on May 19.

(D. G. H.; X.)

The *Seven Pillars of Wisdom* was published in 1926 in a limited edition and fetched fantastic prices. A much abridged edition was published for the public under the title *Revolt in the Desert* in **1927.** *A* larger trade edition of the *Seven Pillars* of *Wisdom* appeared in Sept. 1935. His translation of the *Odyssey* was published in 1932. *See* also R. Graves, *Lawrence and the Arabs* **(1927).**

LAWRENCE, WILLIAM (1850–1941), U.S. Episcopalian bishop, was born in Boston, Mass.. on May 30, 1850. He studied at Harvard, Andover Theological seminary and the Episcopal Theological school at Cambridge. After serving as rector of Grace church, Lawrence, Mass., he became professor of homiletics (1884–93) and dean (1888–93) at the Episcopal Theological school. He was also preacher at Harvard university, 1888–91. On Oct. 5, 1893, Lawrence was consecrated bishop of Massachusetts, resigning in 1926. He died Nov. 6, 1941. Lawrence wrote *Life of Amos A. Lawrence* (1889), his father (*q.v.*); *Visions and Service* (1896); *Life of Roger Wolcott* (1902); *The American Cathedral* (1921); *Henry Cabot Lodge* (1925); *Memories of a Happy Life* (1926); and *Life of Phillips Brooks* (1930).

LAWRENCE, a city of eastern Kansas, U.S.45 mi. W. of Kansas City; the seat of Douglas county. Lawrence is a New

England town on the western prairies, founded on the south bank of the Kaw river in 1854 by a few wagonloads of antislavery radicals. The first citizens were attracted to the site by the flat-topped hill near which the trail to California passed. They had come to the Kansas plains under the auspices of the New England Emigrant Aid company to outvote proslavery settlers and thus make Kansas a free state.

Lawrence was named for Amos A. Lawrence, wealthy New England textile manufacturer, who had invested heavily in the enterprise. The town's north and south streets were named for the states. the main thoroughfare being Massachusetts street.

In the national struggle over slavery the hamlet became a symbol of the free-state cause. Its partisans, called Jayhawkers, opposed the proslavery Border Ruffians. It was a noted station on the underground railway by which slaves escaped from Missouri and other slave states into free territory.

The town was sacked in 1856 by proslavery militia under Democratic Sen. David Rice Atchison and in 1863 by the Confederate guerrilla William Clarke Quantrill, who massacred 150 unarmed men and boys.

In 1866 the University of Kansas was opened on the hill overlooking Lawrence, and in 1883 Haskell institute was established to provide academic training for American Indians. Strong traditions of education and culture have marked the town's development; there are a few small factories, but Lawrence is essentially a college town. whose mid-Victorian mansions have been converted into student rooming houses.

For comparative population figures *see* table in KANSAS: *Population.* (JA. M.)

LAWRENCE, a city of Massachusetts, U.S., on the Merrimack river. 30 mi. from its mouth, about 25 mi. N.N.W. of Boston; the ,seat of Essex county. Pop. (1960) city 70.933, Lawrence-Haverhill standard metropolitan statistical area 187.601. In the early 19th century Daniel Saunders, realizing the industrial potential of the site of Bodwell's falls on the Merrimack. began buying land and in 1845, with a group of Boston industrialists, formed the Essex company. The settlement was first known as Werrimack and was comprised of land to the north of the river in Methuen and on the southern bank in Andover. By 1848 the Essex company had constructed the dam across the river and began selling power to manufacturers. The town was built and populated with the rapidity of a boom town and incorporated as the city of Lawrence in 1853. having a population of 14,181.

Lawrence became one of the greatest textile centres in the U.S. and was also engaged in papermaking and the manufacture of shoes, machinery and factory supplies. In the latter part of the 20th century it continued to be of major importance as a textile centre but sought. as well, to diversify its economic base by attracting other industries. Leading types of manufactures are electrical machinery, leather and leather products, textile-mill products, paper products and apparel and other finished goods.

For comparative population figures see table in MASSACHUSETTS: *Population.* (L. *G.* BA.)

LAW REPORTS, under the common-law system, are the principal repository of the rules, including the construction and interpretation of statutes; developed in the course of judicial decision. A report is "the production of an adequate record of a judicial decision on a point of law, in a case heard in open court, for subsequent citation as a precedent" (Clarence G. Moran, The *Heralds* of *the Law,* p. 13. Stevens & Sons. Ltd.. London, 1948). In the United States the decisions of most appellate courts are reported and published unless they deal with settled propositions of law. Trial courts do not ordinarily write opinions, and their findings and conclusions are not ordinarily reported; but where it is the practice for the trial court to prepare opinions in a substantial number of cases, as in New York, Pennsylvania and the federal district courts, such opinions are reported and published. By 1960 the number of published U.S. decisions had reached about 4,000,000, with new cases being added at the rate of about 40,000 a year.

The earliest English court reports were the *Yeur Books,* covering the period about 1282–1537. From 1537 to 1865 there were hundreds of series of English reports, each published under the name of the reporter. During both of these periods reporting was a disorganized private enterprise. The reporters were volunteers who made and circulated notes of proceedings in court and of the court's disposition of the case. They have been called "the great casuists and reporters of cases—certain grave and sad men" (Moran, *op cit.,* pp. 1-15). Their work was of very uneven quality, and their reports were often overlapping and irreconcilable. The greatest of them was Edward Coke (*q.v.*), whose reports covered the period 1572–1616. The form of the modern report was standardized by James Burrow (covering the years 1757–71). In 1865 the *Law Reports* were established, and since that time this series has been regarded as semiofficial, although parallel series are also published. A law reporter must be a barrister-at-law, whose initials on the report signiiy that he has followed the hearing of the case and can vouch for the accuracy of the report. Although all the decisions of the highest appellate court, the house of lords, are reported, those in the court of appeal are reported only if they reveal a new principle of law or a new application of an existing principle; and comparatively few decisions of courts of first resort are reported.

In the United States also the first reports, state and federal, were privately published under the name of the reporter, although the appointment of an official reporter was an early development. One of the early U.S. supreme court reporters brought an action against his successor for copyright infringement. and the court took occasion to declare the principle that "no reporter has or can have any copyright in the written opinions delivered by this court" (*Wheaton* v. *Peters,* 33 U.S. [8 Pet.] 591, 668 [1834]). In modern times reported opinions are almost invariably written by the court, though they are sometimes read or summarized orally from the bench, and are officially published. Late in the 19th century a private publishing enterprise began unofficial publication of all state and federal reports in the National Reporter System.

The report of a decision contains the title of the case, a statement of the facts giving rise to the litigation and its history. It then reproduces the opinion of the court, which is a reasoned exposition of the relevant legal principles and of their applicability to the factual situation. It concludes with a statement of the judgment of the court; *e.g.,* affirming or reversing the judgment of the court below. The report of a modern decision is usually preceded by a headnote, *i.e.,* an analytical summary of the opinion, stating the points decided. Whether these are prepared by the official reporter or an unofficial editor, they are not authoritative, except in a very few jurisdictions where they are prepared by the court, or under its supervision, and are said to be controlling if there is a discrepancy between the headnote and the opinion.

The great mass of reported decisions gives rise, of course, to acute need for research tools to aid the search for relevant precedents. Fortunately these exist in abundance and variety in both England and the United States. Legal materials are perhaps the best indexed of any comparable body of library materials, and ingenious special reference tools have been devised. A basic device is the digest, an analytical arrangement of editorially prepared headnote paragraphs by means of which the lawyer may readily locate all published decisions dealing nith a particular problem from the earliest times to the past month. Citators provide information as to how each case has been treated for purposes of precedent, and descriptive word indexes allow a factual approach to finding the law when the analytical approach is difficult. By mid-century there was discussion of the possibility of adapting the "information retrieval" capacity of electronic computers to the needs of legal research.

Formerly, one of the serious problems was the time lag between the rendition of a decision and its publication. Today "slip opinions" are often available on the day of decision; private enterprises report the decisions of important courts, or any decision in a selected field. such as taxation, within days after they are announced; and paper-bound "advance sheets," to be superseded later by the regular bound volume, appear at frequent intervals.

Citation of Reports.—The layman may be puzzled at first by the distinctive legal conventions used for citation, but will soon

find that a substantial amount of information is contained in the brief references. There are many variations, but a typical modern American citation is: *Bartholomew* v. *Universe Tankships*, Inc., 263 F. 2d 437 (2d Cir. 1959). This consists of the title (names of the parties), in which v. is the abbreviation for the Latin versus ("against"); the series in which the case is reported (here the Federal Reporter, second series, privately published); the volume and page (the volume number always precedes, and the page number always follows, identification of the series of reports); identification of the court (here the United States court of appeals for the second circuit); and the date of decision.

See also COURT REPORTING.

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LAWS, CONFLICT OF: see CONFLICT OF *LAWS*.

LAWS OF REAL PROPERTY AND CONVEYANCING. The division of property into "real" and "personal:" like so much in English law, can only be explained historically. In early law, property was deemed real if the courts would restore to a dispossessed owner the thing itself, the *res,* instead of merely giving compensation for its loss. All interests in land fell within this category, with the exception of leaseholds, which were at first regarded more as mere contractual rights than as interests in land (see *LANDLORD AND* TENANT). Indeed, not until late in the 13th century could a dispossessed leaseholder recover even damages against any save his lessor. and when by the end of the 15th century it was finally decided that he might recover the land itself, the classification of leaseholds as personal property had become too firmly established for it to be altered. Thus if today a testator dies leaving all his realty to R and all his personalty to P, the reason for his leaseholds passing to P instead of R lies in a rule which ceased to exist more than four centuries ago. Real property is traditionally classified as being. either corporeal or incorporeal. **A** right is corporeal where it is accompanied by physical possession of land and incorporeal where it is not. Thus a fee simple in possession is corporeal, whereas a fee simple subject to a life interest is incorporeal, and so are rights over the land of another, such as easements (*e.g.*, a right of way) and profits *à prendre* (*e.g.*, a right to pasture cattle).

Tenures and Estates.—The main distinguishing features of the English law of real property are the two doctrines of tenures and estates. The basis of these doctrines is the rule (which in theory still exists) that all land is owned by the crown and that subjects may hold land as tenants but cannot own it. There is no allodial land in England: *nulle terre* sans seigneur. In days when land and its rents and profits constituted most of the tangible wealth of the country, the whole social organization was based upon tenants holding land from a lord in return for various services. However varied the services may have been originally, they became to some extent standardized. and each set of services became known as a tenure, for it showed how the land was held.

The doctrine of estates was directed to the length of time for which the land was held. Each estate could exist in land of any tenure. The two main estates were the fee simple, which endured as long as the tenant or any of his heirs survived (whether his descendants or not), and the life estate, which ended with the tenant's death. The Statute De *Donis* Conditionalibus, 1285 (13 Edw. I. c.1), created a third estate, the fee tail, which endured so long as the tenant or any of his descendants lived. All three estates existed in a number of variant forms, but all exemplified the central principle that what a subject could own was not the land itself but merely an estate in that land. This conception of an abstract estate rather than the corporeal land being the subject-matter of ownership was a remarkable and distinctive achievement of early English legal thought which contributed greatly both to the triumphant flexibility of the English system and to its undoubted complexity. The description of that system as "an ungodly jumble." a phrase usually attributed to Oliver Cromwell, is understandable but misleading.

HISTORY

Without too much inaccuracy, the history of the English law of real property may be put under seven main heads: (1) before the Conquest; (2) the formative period (until the end of the 14th century); (3) the growth of equity (1400–1533); (4) development under the Statute of Uses (1535–1660); (5) development of the modern law (1660–1830); (6) the age of reform (1830–1926); and (7) social control of land (the 20th century).

Before the Conquest.—The principal features of English land law before 1066 were (1) liberty of alienation of such land as could be alienated (mainly or entirely bocland), either inter *vivos* or by will; (2) publicity of transfer by enrolment either in the shire book or church book; (3) equal partition of the estate of a deceased person among his sons, and, in default, among his daughters; (4) cultivation mainly by serfs of various degrees, owing rents in money or labour; (5) variations by custom, tending to become uniform through the similarity of approach of local courts; (6) the *trinoda necessitas—i.e.*, the tenant's obligations of military service, repair of bridges and maintenance of fortifications. The ownership of land was the basis of political privilege, conferring territorial jurisdiction on the landowner.

In relation to folkland, this jurisdiction became vested in the king as ultimate arbiter: and in many cases he delegated powers to the great landowners.

The Formative Period.—The *Common* Law.—The main effect of the Norman Conquest upon land law was the integration of a system already largely feudal. The rule that all land was owned by the crown was firmly established, and although there might be any number of subinfeudations and so any number of mesne lords. there was always a complete chain of seigniory between the occupying tenant and the king as lord paramount. Further, tenures tended to become stereotyped. When the full effects of the Conquest had been felt, it was possible to classify tenures with some degree of exhaustiveness. The main division of tenures was into free and unfree. The three main classes of free tenure were (1) tenures in chivalry (principally grand sergeanty and knight service); (2) tenures in socage (principally petty sergeanty, common socage, burgage, and customary socage, *i.e.*, socage subject to special customs such as gavelkind and borough English); and (3) spiritual tenures (principally frankalmoign and divine service). Grand sergeanty obliged the tenant in person to perform some honourable service for the king, while in petty sergeanty the service to the king was of a nonpersonal nature. Knight service involved providing military service to the king or other lord, though by the middle of the 12th century this was usually commuted for a payment called scutage. In common socage, the principal service was usually agricultural in nature, such as performing so many days' ploughing each year for the lord. Burgage was a variant of common socage in boroughs, and under gavelkind and borough English the land descended on intestacy to all the sons equally and to the youngest son, respectively, instead of to the eldest son. In addition to the principal service, all these tenures were subject to a number of feudal incidents, such as relief, primer seisin, escheat and, in the case of tenures in chivalry, wardship and marriage. The spiritual tenures were appropriate to ecclesiastical corporations such as bishops or monasteries, their sole obligation being to pray for the souls of the grantor and his heirs; the number of prayers was specified for divine service and unspecified in frankalmoign ("free alms").

The two unfree tenures were villein tenure (which later was called copyhold (*q.v.*) and customary freehold (*q.v.*). The essence of unfree tenure was that although the tenant's services were fixed as to quantity (*e.g.*, as to so many days' work per week), they were uncertain as to quality, so that the lord might set the tenant to whatever type of work he wished.

The Legislation of Edward *I.*—The first Statute of Mortmain, 1279 (7 Edw. I. St.2. c.13), prohibited the conveyance of land to religious bodies without licence from the crown. This avoided the lord's losing his feudal dues by the land's passing into the "dead hand" of a monastery which was never under age, never died and could never be attainted. But the two statutes in the reign of Edward I of prime importance to the subject are De Donis

Conditionalibus, 1285 (13 Edw. I. c.I.), and Quia Emptores, 1290 (18 Edw. I. c.1); each is still in force, and they may with some justice be regarded as two of the main pillars of the law of real property. Before 1285, if land was conveyed to "X and the heirs of his body," the birth of heirs of his body was treated as a condition, so that once issue had been born, X was able to convey the whole fee simple and defeat the expectations of his issue. De Donis provided that the land should descend to X's issue successively *secundam formam* in *carta* doni *expressam*, and on failure of heirs of the body revert to the grantor. This produced a "cut down fee" (*feodum talliatum*). By means of collusive actions known as "fines" and "recoveries," it had become possible two centuries later for a tenant in tail to "bar the entail" and obtain a fee simple; but the fee tail remained to provide the foundation for the strict settlement as a means for keeping land in the family. Quia Emptores prohibited subinfeudation, the process whereby one tenant granted land to another to hold of the grantor as lord. Thus if after 1290 A granted land to B in fee simple, B's lord would be not A but A's lord. This prevented the growth of the feudal pyramid, and in the course of time most land came to be held from the crown and not from mesne lords.

The Growth of Equity.—Uses (or trusts) became fairly common during the 13th century, and early in the 15th century the chancellor began to enforce them (see TRUST). By vesting the legal estate in a number of reliable "feoffees to uses:" it was possible to avoid many of the rules governing real property, especially feudal burdens such as reliefs and wardships! and the prohibitions against conveyances into mortmain, and devises; for these rules governed only the legal estate and not the equitable interests in the use. Uses were thus employed to subvert the well-settled law and defeat the feudal claims of the lord; and when the lord paramount was Henry VIII and parliament submissive, legislation intended to destroy uses was ine itable.

The Statute of Uses, 1535.—This act (27 Hen. VIII. c.10) converted equitable interests in realty into corresponding legal estates: if A was seised to the use of B, the statute "executed" the use and converted B's equitable interest into a legal estate, A dropping out. This would have made it possible to convey the legal estate in land secretly without the publicity and need for entry upon the land which attended a feoffment with livery of seisin. the normal mode of conveyance at common law. Accordingly, the Statute of Enrolments. 1535 (27 Hen. VIII. c.16), required the public enrolment of any "bargain and sale," the normal transaction by which a vendor became seised to the use of a purchaser. Early in the 17th century a means of avoiding the statute was evolved. V bargained and sold to P a lease for one year; this was outside the statute and gave P a legal lease without publicity or entry on the land. The next day V conveyed the reversion to P by a simple "release" by deed. This "lease and release" remained the normal mode of conveyance until the Real Property act, 1845, s.2, enabled all land to be conveyed by a simple conveyance by deed.

The Statute of Uses was also thought to have abolished the power to devise land, and the resulting outcry produced the Statute of Wills. 1540 (32 Hen. VIII. c.1), which permitted a testator to devise all socage land and two-thirds of land held in knight service. The Tenures Abolition act, 1660 (12 Car. II. c.24), in effect made all land devisable; it converted tenures in chivalry into common socage, subject to preserving the honourable incidents of grand sergeanty.

Development of the Modern Law.—The Statute of Frauds, 1677 (29 Car. II. c.3), provided that certain transactions relating to land should be in writing or evidenced by writing; and in the reign of Anne, the Middlesex and Yorkshire deeds registries were established (see TITLE TO LAND). But perhaps the most striking feature of this period was the perfection of the settlement and resettlement as a device for keeping land in the family. The core of a marriage settlement was that the husband (H) was given a life estate. with remainder to his first and other sons successively in tail. The wife was given an annual income by means of rent charges, providing for "pin money" during H's life, and a larger sum by way of jointure after his death. 411 the children save the eldest son who succeeded to the land were given lump sums of money known as portions, protected by a portions term (a long lease) vested in trustees. When the eldest son attained full age, H persuaded him to join with him in barring the entail and resettling the resultant fee simple on H for life, with remainder to the son for life, and then with remainder to the son's sons successively in tail. The land was thus tied up for another generation. The common law had evolved a rule that it was not possible to create an unbarrable entail, but con eyancers circumvented this by ensuring that no person entitled under the settlement should have an entail unless he was an infant and so incapable of barring it. By these methods, great family estates could be built up by ensuring that the land passed as a whole to each eldest son in turn, and yet provision was made for the other members of the family. One disadvantage of this system was that in the absence of express provision there was no person with power to dispose of any of the land or to grant leases which would be binding after the grantor's death. Often the tenant for life was given a series of express powers, but sometimes these were defective, and in any event their presence made the settlement a document of formidable bulk.

The Age of Reform.—In the century after 1830 there were three main groups of statutory reforms; namely, the statutes of 1832 to 1845, the statutes of 1881 and 1882, and the statutes of 1922–25. The two main features of the legislation were (1) to eliminate anomalies and (2) to shorten documents by enacting as law those provisions which had become common form.

1832–45.—The Prescription act, 1832, achieved a qualified success in providing greater certainty in the law governing the acquisition of easements and profits by long enjoyment, and the Real Property Limitation act, 1833, reformed the law governing the acquisition of title to land by long possession. The Fines and Recoveries act, 1833, substituted a simple conveyance for the dilatory and expensive methods of barring entails by fines and recoveries. The Dower act, 1833, enabled a husband to dispose of land free from his wife's prospective claim to dower (a life interest in one-third of his land) on his death, while the Inheritance act, 1833, reformed and clarified the law governing the descent of land to the heir on intestacy. The Wills act, 1837, made many improvements in the law of wills, particularly as to formalities. Finally, the Real Property act, 1845, abolished some outworn technicalities.

1881–82.—The Conveyancing act, 1881, did much to shorten conveyances by enacting many provisions which formerly had to be set out expressly. But it was the Settled Land act, 1882, which was the great achievement of this period. It extended some rather timid legislation of 1856 and 1867, and gave to every tenant for life of settled land wide powers of selling, leasing and otherwise dealing with the land. On such a dealing, the interests of the various beneficiaries under the settlement were "overreached"; *i.e.*, transferred from the land to any capital money, which had to be paid to the trustees of the settlement and not the tenant for life.

1922–25.—Great changes in the law were made by the Law of Property act, 1922, most of which, however, was repealed and re-enacted before it had come into force. On Jan. 1, 1926, there came into force the unrepealed portions of the act of 1922. together with the Law of Property act! 1925, the Settled Land act, 1925, the Trustee act, 1925, the Administration of Estates act, 1925, the Land Charges act, 1925. the Land Registration act, 1925, and the Universities and College Estates act, 1925. These acts, often collectively called "the 1925 property legislation," were drastic, far-reaching and wholly successful in bringing the law into accord with modern needs. The main features of this legislation were (1) the abolition of unnecessary historical survivals; (2) the partial assimilation of the law of real property to that of personal property; and (3) the simplification of conveyancing. These will be taken in turn.

Abolition of *Unnecessary* Historical *Survivals.*—First, all tenures were in effect converted to common socage, though the honourable incidents of grand and petty sergeanty were preserved. Copyhold was the one tenure which was still of practical impor-

tance, and the tenant was required to pay compensation for most of the incidents of any real value which were abolished. Second, the Statute of Uses was repealed. Third, a number of technical rules of no intrinsic value were repealed, such as the Rule in Shelley's Case (1581), 1 Co.Rep. 88b, the rule in *Whitby* v. Mitchell (1890), 44 Ch. D. 85, and the doctrine of interesse termini. Fourth, the technical and complex rules governing legal future interests in land, derived partly from feudal law and partly from the operation of the Statute of Uses, were discarded by making it possible for future interests in land to exist only in equity.

Assimilation of the Law of Real Property to that of Personal Property.—The difference in nature between land and chattels makes impossible any close assimilation of the differing legal rules to which they are subject. Nevertheless, some degree of approximation has been achieved. First, both realty and personalty now devolve on the same persons on an intestacy. Formerly, realty passed to the heir, whereas personalty was divided among the next of kin; the new system is in the main a modified version of the former system governing personalty. Second, the grantor's whole interest will now normally pass on a conveyance of land, even if he fails to use words of limitation which were formerly required to pass it. Third, personalty can now be entailed in the same way as realty.

Simplification of Conveyancing.—There has been a reduction in the number of legal estates and interests in land which can exist. The only two estates which can exist at law today are a fee simple absolute in possession and a term of years absolute (see LANDLORD AND TENANT; MORTGAGE); thus an entail or life interest is now necessarily equitable. In addition, only five classes of interests in land can now exist at law; the most important are rentcharges, easements and similar rights, if either perpetual or for a term of years absolute. A purchaser without notice of a right takes free from it if it is equitable, but subject to it if it is legal, so that this change effects some reduction of the risk to a purchaser. Second, there has been an extension of the curtain principle, whereby a purchaser of land is concerned only with the legal estate, and the rights of those with equitable interests, which are kept "behind the curtain," are overreached. Third, a tenancy in common (which arises where two or more persons are entitled to property in equal or unequal shares) can now exist only in equity; the legal estate vests in trustees upon trust for sale, and the tenants in common are behind the curtain. This means that a purchaser need deal only with a few trustees instead of a multitude of tenants in common, ivhose interests are overreached. Fourth, many more interests in land now require registration as land charges if they are to bind a purchaser. Fifth, the areas in which registration of the title to land is compulsory have been extended (see TITLE TO LAND). Sixth, no legal estate in land may now be vested in an infant; the land is made alienable by treating it as settled land or subjecting it to a trust for sale, according to whether the infant is entitled solely or jointly with others.

Settled Land and Trust for Sale.—The 1925 property legislation made many changes in the law governing settlements of land. During the 19th century, the trust for sale had emerged as an alternative form of providing for persons in succession. In the case of settled land, control of the land was in the tenant for life; any capital money which arose on any transaction had to be paid to the trustees of the settlement, but it was the tenant for life who had both the day-to-day control of the land and the various statutory and other powers, such as to sell, lease or otherwise dispose of the land. In the case of a trust for sale, it was the trustees who had the control and the powers, and the main interest of any life tenant was merely to receive the income from the land. This form of settlement, sometimes called a trader's settlement, was appropriate to a row of suburban villas, whereas the rural estates of the nobility and gentry were held as settled land.

The Settled Land act, 1925, provided that the legal estate in settled land should be vested in the tenant for life as trustee, and required every settlement to be made by two documents, the vesting instrument and the trust instrument. The vesting instrument is a short document containing the few particulars as to the trustees, the tenant for life, the powers and the land itself, which a purchaser needs to know. The trust instrument in addition sets out all the trusts of the settlement, but it is behind the curtain and does not concern a purchaser. If there is no tenant for life, or the tenant for life is an infant, the statutory owner (usually the trustees of the settlement) takes the place of the tenant for life. The act also repeats and extends the powers conferred by the Settled Land act, 1882, and makes the machinery of the act apply to virtually all cases where persons are entitled to land in succession, even if no life interest exists, provided the land is not held on trust for sale. When the settlement comes to an end, the trustees should execute a deed of discharge unless there is a document on the title which shows that the land is no longer settled.

No great changes have been made in trusts for sale, save that the trustees now have all the powers of a tenant for life of settled land. A power to postpone sale indefinitely is now implied in all trusts for sale, and many such trusts are created with the intention that the land shall be retained rather than sold..

Social Control of Land.—Apart from the many reforms of the substantive law, the predominant feature of the 20th century has been the emergence and statutory recognition of the doctrine, developed piecemeal and .never explicitly set forth. that under modern social conditions in an overcrowded country the right of a landowner to do as he wishes with his own must be subordinated to the public interest. Thus many important provisions have been enacted to protect tenants of dwelling houses, business premises and agricultural land from being evicted when their tenancies expire and from suffering increases of rent (see LANDLORD AND TENANT). From the landowner's point of view, these provisions fetter his freedom of action. Again, even if the landowner farmed the land himself, until 1958 he was liable to dispossession for failing to attain the required standard of efficiency (see LAND TENURE: ECONOMIC AND AGRARIAN ASPECTS). Yet again, under the legislation governing town and country planning, any development of land is subject to stringent control. Although this subject is dealt with elsewhere (see CITY PLANNING), the extent to which it affects the beneficial title to land is of such importance that its main features must be mentioned here. The Town and Country Planning act, 1947, imposed on all land in England and Wales as from July 1, 1948, a comprehensive system of control, unrecognizable by those who drafted the first timid planning statute, the Housing, Town Planning, etc., act, 1909.

Subject to certain exceptions no development may be carried out without the perinission of the local planning authdrity. usually the county council; and '(development" is widely defined to include any building, engineering, mining or other operaiions on land or the making of any material change in the use of land. The act also imposed a liability to pay to the state a development charge in respect of any planning permission granted. representing the increased value of the land due to the permission; but this liability, together with provisions for making some compensation to landowners for this new burden. was repealed as from Nov. 18, 1952, by the Town and Country Planning act, 1953. Legal opinion was divided about the effect of the act of 1947 on the fee simple to land. Some even urged that a landowner no longer had a fee simple in the land, but only in the existing use in the land; others held that no alteration had taken place in the estate in the land. and that the only change was that the fruits of ownership had become less sweet, which was nothing new in land law. This latter view had the allegiance of the great majority of practitioners, and is almost certainly also correct in theory.

International Law.—In general, land is governed by the law of the country in which it is situate (lex *loci* rei sitae), and English courts will not adjudicate upon the title to foreign land. Like so many rules of the common law, however, this rule has been qualified by equity. If the propoied defendant to an action is within the jurisdiction, and he is bound by some equitable obligation, equity will assume jurisdiction even though the subject matter of the dispute is foreign land; for equity acts in *personam*. Thus in *Penn* v. Lord *Baltimore* (1750), 1 Ves.Sen. 444, a decree of specific performance was made against a defendant in England in respect of an agreement relating to the boundaries of Pennsyl-

vania and Maryland. Again, where the defendant is within the realm, jurisdiction has been assumed over equitable rights under mortgages of foreign land. But bare questions of the title to foreign land. or damages for trespass to it, are left to the courts within whose jurisdiction the land lies.

Conveyancing. — Conveyancing is the art or science of creating and transferring interests in property, especially in land. The two main divisions of the subject are investigation of title and drafting. Before a transaction such as a purchase or mortgage can be completed, the purchaser or mortgagee must be satisfied that the vendor or mortgagor is able to convey or mortgage the land. and for this purpose his title must be investigated; *i.e.*, his documents of title must be examined and considered, and any necessary inquiries and searches of registers must be made. Only if this investigation is satisfactory will the necessary conveyance or mortgage be drafted. Leases, settlements and wills also occupy much of a conveyancer's time. In the work of drdfting great reliance is placed on well-tried precedents to be found in the books of model forms which have been collected and published since printing became common.

The practice in modern English conveyancing may best be illustrated by taking as an example the simple transaction of purchasing a house. After negotiating, the parties usually strike a bargain subject to contract. This morally commits them to the sale and purchase of the house at the agreed price, but neither is legally bound; usually the parties then proceed to the preparation of a formal contract. The vendor's solicitors first prepare and send to the purchaser's solicitors a draft contract, providing for the mode in which the transaction is to be carried through, the title which the vendor will show, and any special provisions such as the imposition of restrictive covenants on the purchaser or the retention of easements by the vendor. The purchaser's solicitors then send to the vendor's solicitors written inquiries on draft contract, which are mainly concerned with matters such as the existence of rights adverse to the property, whether public (*e.g.*, burdens under town-planning legislation) or private (*e.g.*, the rights of tenants under rent restriction legislation). The purchaser's solicitors often at this stage search the appropriate land charges registers and other public registers. If the answers to these inquiries and searches are satisfactory and the terms of the contract are agreed, the draft contract is engrossed in two parts, the vendor and purchaser each sign one part, and upon the exchange of these parts the parties are legally bound by the contract. Where the property is sold by auction, this procedure is somewhat varied. The auction is conducted on the footing of particulars and conditions of sale prepared by the vendor's solicitors. These describe the property to be sold ("particulars") and state the terms upon which it is to be sold ("conditions"); and the purchaser to whom the property is knocked down is required at the conclusion of the auction to sign an agreement to'purchase the property upon these terms. The purchaser accordingly has no opportunity for making preliminary inquiries except any that he may be able to make before the auction as a possible prospective purchaser. Whether the sale is by private treaty or by auction, the contract normally requires the purchaser to pay a deposit, usually amounting to 10% of the purchase price. This may be made payable to an agent for the vendor or to a stakeholder, but in either case it is treated as a token of good faith by the purchaser and will usually be forfeit to the vendor if the purchaser defaults; otherwise, it is treated as an advance payment of part of the purchase money.

Once the contract has become binding. the vendor must within the time provided by the contract deliver to the purchaser the abstract of title. This consists in part of an epitome of the various documents uhereunder the vendor has become entitled to the property, and partly of a recital of various events such as deaths and grants of probate affecting the title to the property. The abstract must start with a good root of title (e g , a transaction such as a sale or mortgage) and trace the devolution of the property from this root to the vendor. Cnless otherwise agreed the root of title must be at least 30 years old The purchaser's solicitors then examine the abstrdct against the various documents upon which it is based, and send to the vendor's solicitors written requisitions on title. These are a series of questions seeking explanation or confirmation on any difficulties or discrepancies which have emerged from 'considering the abstract. With the simplification of conveyancing effected by the property legislation of 1925 and the modern growth of public and social control of land, requisitions have tended to deal less and less with the title to the land in the conveyancing sense and more and more with the existence of rights and duties adverse to the beneficial enjoyment of the land by the purchaser; it is common for requisitions to repeat most or all of the matters dealt with in the inquiries on draft contract. The vendor must deliver written replies to requisitions on title within the time stated in the contract, and the purchaser is entitled to make further requisitions on any points not satisfactorily dealt with.

When the title has been examined and accepted, the purchaser's solicitors prepare a draft conveyance of the property, which is sent to the vendor's solicitors for amendment and approval. The following is a precedent of a very simple conveyance.

THIS COKVEYANCE is made the 1st day of May, 1963, BETWEEN Orlando Gibbons of No. 1 Morley Street, Dowland in the County of Tallis, Clerk (hereinafter called "the Vendor") of the one part and John Bull of No. 1 Weelkes Street Farnaby in the County of Tye, Civil Servant (hereinafter called "the Purchaser") of the other part

WHEREAS—

(1) The Vendor is the estate owner in respect of the fee simple of the property hereby assured for his own use and benefit absolutely free from incumbrances

(2) The Vendor has agreed with the Purchaser to sell to him the said property free from incumbrances for the price of £4000

NOW THIS DEED WITNESSETH that in consideration of the sum of £4000 now paid by the Purchaser to the Vendor (the receipt whereof the Vendor hereby acknowledges) the Vendor As Beneficial Owner hereby conveys to the Purchaser ALL THAT messuage or dwellinghouse with the yard gardens offices and outbuildings thereto belonging known as No. 1 Byrd Street Purcell in the County of Norcome which premises are more particularly delineated and coloured pink on the plan annexed to these presents TO HOLD the same unto the Purchaser in fee simple

IN WITNESS WHEREOF the parties to these presents have hereunto set their hands and seals the day and year first above written.

SIGNED SEALED and DELIVERED)
by the Vendor in the presence)
of Edward Elgar, Clerk to) Orlando Gibbons (Seal)
Messrs. Delius, Field &)
MacDowell Solicitors)

The constituent parts of this conveyance are as follows: (1) First, there is the commencement ("This Conveyance") and date. (2) Next, there are the parties. Each person or group of persons with a distinctive function is expressed as being parties of a particular "part," with the parties who do the conveying set out first and the parties receiving mentioned last. Thus if the property is settled land subject to a mortgage, the parties would be the vendor of the first part, the trustees of the settled land of the second part, the mortgagees of the third part and the purchaser of the fourth part. (3) The recitals ("Whereas-") explain how the vendor became entitled to the land (narrative recitals) and how and why the existing state of affairs is to be altered; *e.g.*, because there is an agreement to sell (introductory recitals). The modern tendency is to reduce recitals to the minimum, though the old practice of inserting elaborate recitals sometimes proved useful in later years when documents were lost or destroyed or facts had been forgotten. (4) The testatum ("Now this Deed Witnesseth") indicates the beginning of the operative part of the conveyance, while (5) the consideration and (6) the receipt clause record the payment and receipt of the purchase price. The receipt clause makes it unnecessary to have a separate receipt; and a solicitor who produces a deed containing a receipt clause executed by his client is deemed to have his client's authority to receive the money payable. (7) The operative words ("the Vendor As Beneficial Owner hereby conveys") effect the actual conveyance of the property. The words "As Beneficial Owner," however, have an important technical effect, for their use imposes upon the vendor certain covenants for title. In general, it is for the purchaser to

satisfy himself before completion that the conveyance will effectually carry out the terms of the contract, and if it does not, he usually cannot after completion rely upon any provision in the contract; the contract is said to be merged in the conveyance. However, the covenants for title give him a limited measure of protection. Four covenants are normally implied; namely, that the vendor has power to convey the land, that the purchaser shall have quiet enjoyment of the land, that the land is free from any incumbrances other than those subject to which it is expressed to be conveyed, and that the vendor will execute any further conveyance or other document needed to perfect the purchaser's title. If the property sold is leasehold, there is also implied a covenant that the lease is valid, the rent has been paid and the covenants in the lease duly performed. These covenants are not absolute warranties, however, for the vendor's liability is normally limited to the acts of himself and of those claiming under him; he is not liable for the acis of any of his predecessors in title except those through whom he claims by an unbroken chain of gifts or marriage settlements. He is thus not liable for the acts of previous vendors, though the benefit of the covenants for title given by them runs with the land and passes to the purchaser. (8) The "parcels" describe the land conveyed, usually by reference to a plan. (9) The habendum ("to hold . . . ") shows whether the purchaser takes for his own benefit or upon trust for others. and contains the words of limitation ("in fee simple") which limit, or mark out, the estate which he takes. Before the Conveyancing act, 1881. the fee simple could normally be conveyed only by using the word "heirs"; *e.g.*, "to A and his heirs." That act introduced "in fee simple" as an alternative, and the Law of Property act, 1925, s.60, made words of limitation unnecessary by providing that the fee simple was to pass unless a contrary intention was shown. In practice, however, it is usual to employ the words 'in fee simple" to avoid doubt. If the property is being conveyed subject to any lease, mortgage or other incumbrance, or free from some previously existing incumbrance, this is stated in the habendum. And where any special covenants or stipulations are to be entered into, or the vendor is to give the purchaser an acknowledgment of his right to the production of any deeds retained by the vendor, and an undertaking for their safe custody, this follows the habendum. (10) Finally there is the testimonium ("In witness whereof. . . ") and the attestation clause ("Signed sealed and delivered. . ."); these need no explanation.

When the draft conveyance has been agreed, the transaction is ready for completion. The conveyance is engrossed, normally by having a fair copy typed on parchment substitute. This is executed by the vendor and delivered to his solicitor in escrow (*i.e.*, on condition that it is not to be effective unless the transaction is duly completed). If the purchaser is to enter into any covenants or other obligations with the vendor, a further copy will be engrossed and executed by the purchaser in escrow. A completion statement is prepared, apportioning the rates, taxes and other outgoings up to the day fixed for completion and showing the balance of purchase money payable, and the purchaser obtains a banker's draft for the amount due. Completion normally takes place at the offices of the vendor's solicitors or, if the property is mortgaged. at the office of the mortgagee's solicitors. In return for the banker's draft the conveyance executed by the vendor is delivered to the purchaser's solicitors, with the title deeds relating to the property; the purchaser is then free to take possession of the property. He next has the conveyance stamped under the Stamp act, 1891; with certain mitigations where the consideration does not exceed £6,000, the normal rate of duty since the Finance act, 1947. has been 2% of the purchase price. The transaction is then complete.

Substantially the same procedure is followed where the property conveyed is leasehold instead of freehold, though the assignment which takes the place of the conveyance is somewhat different in form. Subject to any agreement to the contrary, the vendor need not show title to the freehold out of which the lease nas created. Unless otherwise agreed, he must commence his abstract of title with the lease. however old, and trace its devolution for at least 30 years prior to the sale; the purchaser must assume, unless the contrary appears, that the lease was duly granted; and on production of the receipt for the last payment due for rent before actual completion, he must assume, unless the contrary appears. that all the provisions of the lease have been observed up to the date of actual completion. The purchaser is subject. to an implied covenant to pay the rent and observe and perform the covenants and provisions of the lease and keep the vendor indemnified in these respects. On the other hand, where the transaction consists of the grant of a lease, there is normally no contract and no investigation of title; the parties negotiate the terms of the lease and not until completion is either party legally bound to the other. The same applies to mortgages and settlements, except that sometimes marriage settlements are preceded by marriage articles, which set out in brief form the main provisions of the settlement and make it possible for the drawing up of the formal settlement to be postponed until after the marriage has been solemnized. Other conveyancing transactions, such as exchanges, wills, appointments of trustees and the like, need not be discussed here.

Conveyancing Counsel to the Court.—These are appointed by the lord chancellor under the Supreme Court of Judicature act, 1925, s. 217, as amended by the Administration of Justice act, 1956. s. 14; there may be any number from three to six. They must have practised as conveyancing counsel for at least ten years, and their function is to assist the chancery division of the high court in matters of conveyancing; *e.g.*, in investigating 'title or settling deeds. Under order 51 of the rules of the supreme court, business is referred to them in rotation, and the court may act on the opinion given'by conveyancing counsel in any matter referred to him, though any party may require the matter to be referred for decision by the judge at chambers or in court.

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UNITED STATES

The law of real property of all the U.S. states except Louisiana (whose legal system was based upon the Code Napoléon) was derived principally from the common law of England. The colonies were either established or conquered by England, and for generations American property lawyers relied upon the standard English texts; *e.g.*, Sir William Blackstone's *Commentaries,* Sir Edward Coke's *Coke Upon* Littleton, William Cruise's Digest of *the* Laws of England Respecting Real Property and Charles Fearne on *Contingent* Remainders. Even after James Kent's Commentaries on *American* Law and other important U.S. treatises were available, students of property in the U.S. continued to use the English textbooks of the day, such as Joshua Williams on Principles of the Law of Real Property, until those books came to be so cluttered with expositions of the English statutes of the 19th and 20th centuries (*e.g.*, the Settled Land act, 1882, the Law of Property act, 1925, and the other comprehensive acts of 1925, the Agriculture act, 1947, and the Town and Country Planning act, 1947) that they were no longer helpful either as introductions or guides to the U.S. law.

But the U.S. law of real property, even though derived principally from the English law, was not uniform from state to state. Under the constitution of the United States, jurisdiction of land was vested primarily in the states rather than in the federal government. Conditions. both physical and social. varied greatly from state to state and problems' relating to land were traditionally deemed to be peculiarly of local rather than national concern. The American Bar association sponsored a variety of uniform or model acts, such as the Uniform Acknowledgment act, which were designed to achieve uniformity in a few isolated fields. These acts aere not generally adopted and, as late as the 1950s, there was little sentiment, even among the members of the organized bar, in favour of making the law of real property of the **U.S.** uniform.

Tenure. — The colonial charters usually provided that the lands in North America were to be held of the English crown in "free and common socage," the least burdensome of the English forms of tenure. Military and copyhold tenures did not obtain a foothold in America. Indeed, so distasteful to the Americans were the notions of feudalism that the attempt to collect the rents and enforce the other obligations which were incidents of socage tenure either caused or contributed to serious incidents such as Bacon's rebellion in Virginia in 1676 and the antirent disturbances in New York in the early years of the 19th century. Following the Revolution, feudal tenure was either abolished by statute or, if not formally abolished, became for most purposes obsolete.

Although tenure early ceased to be an important institution of the American land law, many of the archaic rules of law which had been developed in England to further feudal policies were adopted in America and continued for many years to be vital elements of the American law of property. The history of the U S. law consists, very largely, of the substitution of modern rules for the ancient feudal rules which should have been, but were not, abolished when feudalism became obsolete. In 1936 the American Law institute reported in the Restatement of the ***Law*** of Property that the rule of law which required that a deed include the ancient formula of words of inheritance (*i.e.* "and to his heirs") in order to transfer an interest larger than a life estate, and the equally technical rule, known as the Rule in Shelley's Case, which, when controlling, caused an estate of inheritance to be vested in a transferee who was intended to acquire only a life estate, were still a part of the U.S. common law. Fortunately, most of the states had abolished these rules and others like them before 1936, though in a few jurisdictions they had survived. In Illinois, for example, the Rule in Shelley's Case was not abolished until the enactment of a statute in 1953.

Estates. — The English scheme of estates in land was adopted with but few changes although that system, even at the time when it was transplanted in America, included many relics of feudalism uhich had no relationship to conditions in America. The English classification of estates as freehold and nonfreehold was adopted with the result that leasehold interests in land (*e.g.*, a term for 99 years) were considered personal property, designated by the term "chattels real" and treated for many purposes as chattels rather than land. The term "real property" was reserved, as it had been in England, for the freehold interests in land. These included the fee simple, the fee tail and the life estate.

Fee Simple. — The fee simple was the largest estate which could be created. Subject only to the general limitations which were imposed upon owners of property, the owner of an estate in fee simple absolute might use the land as he wished. The estate was freely transferrable and, unless conveyed or otherwise encumbered, it passed upon the death of the owner either to the beneficiary designated by the owner in his mill or, in the absence of a valid gift by will, by operation of law to the owner's heirs at law. Primogeniture, though it had been recognized in some sections of America in the colonial period, was not deemed to be consistent with American ideals, and it, together with the preference of males over females, was abolished for most purposes during the period of the Revolution.

Fee Tail. — The fee tail was introduced into some or perhaps most of the American colonies at an early date and brought with it the distinguishing features that it had in England including the elaborate paraphernalia of fines and common recoveries by which the owner of such an estate might, if he wished, bar the entail and convert his estate tail into an estate fee simple. In most of the states, entails were abolished by statutes which provided either that the donee who was intended to have an estate tail should have an estate in fee simple or that the donee should acquire a life estate and that the issue of the donee should take an estate in fee simple.

By 1936 the estate tail was recognized in only half a dozen states and a simple disentailing deed had long since been substituted for the fine and the common recovery as a means of converting the estate tail into an estate in fee simple. In Iowa, Nebraska, Oregon and South Carolina the courts had held that a conveyance to one and his bodily heirs created a fee simple conditional, the ancient common-law estate which had been abolished in England by the enactment of the Statute de Donis Conditionalibus in 1285. In Nebraska the fee simple conditional was abolished in 1941 when the state enacted the Uniform Property act which substituted an ordinary fee simple for the fee simple conditional.

Life Estate. — The smallest of the freehold estates was the life estate. an estate the duration of which, as the name indicates, was limited to the lifetime of a natural person. The measuring life might be either that of the owner of the estate or the life of another person than the owner, in which case it was known as an estate pur autre vie. Life estates might be created either by a conveyance which was' executed for the purpose of creating such an estate or by operation of law as were the estates of dower and curtesy which were common-law incidents of a marriage relationship and entitled the surviving spouse, under certain circumstances, to life estates in some or all of the real estate which the deceased had owned at any time during the marriage.

Future Interests. — The complicated and largely archaic English system of future interests was adopted in colonial America with only a few alterations. The reforms which had been effected by the enactment of the Statute of Uses, 1535, were, of course, incorporated into the American law, but with few other exceptions the ancient common-law rules which had been developed to meet the needs of feudal England governed the creation of future interests in America. This branch of the law of property became, in America as it was in England, notorious for distinctions which were so technical*and refined that they were difficult even for the most experienced conveyancers to apply. Consequently, the attempt to create any future interests except the simplest types would often occasion great uncertainty concerning title and serve not only to impede the development of the land out of which they had been created but also to defeat the wishes of the transferor.

The Revised Statutes of New York, 1828, abolished many of the feudal rules which encumbered this branch of the law of property. Unfortunately, the attempts of the commissioners who drafted the New York revision of 1828 to reform the law of future interests were not so successful as they should have been because they attempted to improve the relatively modern rule, known as the Rule against Perpetuities, which the English judges had developed to control the creation of the modern types of future interests which had been introduced into the law of England by the enactment of the Statute of Uses. The English Rule against Perpetuities was far from perfect, but the statutory substitute which the New York commissioners devised created more problems than it solved. Nevertheless, the New York statutes of 1828 and the Field Civil code, which New York rejected in 1856, were copied by a number of the states, especially those in the west. But reform in the law of future interests, as in the law of real property generally, was slow, for courts and legislatures were reluctant to abandon the ancient rules.

Fortunately, future interests were not commonly created and, though now and then complicated settlements were executed, they did not become customary as they were in England where title to much of the land in the realm was fettered by marriage settlements, a form of transfer which had been devised by the English conveyancers as a means of keeping land within the family. Thus, even though the English law of future interests was outmoded when it was received in North America, it did not seriously stifle the development of the country because, at any one time, only a very few tracts were burdened by future interests.

Though the marriage settlement was seldom used in America to keep land within a family, the various gift, estate, inheritance and income taxes of the 20th century afforded a strong incentive to owners of substantial amounts of property to resort to various types of settlements as a means of protecting the family, not from an irresponsible member, but rather from the tax collectors. The mill of Pres. Calvin Coolidge by which he left all his property to his widow was a model of brevity and simplicity, but, as conveyancers noted, even a simple form of family settlement would

have reduced substantially the estate and inheritance tax liability of the Coolidge family. The will of Sen. Robert A. Taft, which was executed a quarter of a century later than the Coolidge will. established a fairly elaborate family settlement; but it was drafted with such skill that the liability of the Taft family for estate and inheritance taxes was very much less than it would have been had the Coolidge will been used as a model.

Conveyances. — By the time the American colonies were established, deeds had in England very largely supplanted the ancient feudal formalities for conveying real property. In America, the rule that title to land might be transferred by the execution of a deed was established at an early date. The form of the deed which was used might be one which had been developed by the English conveyancers or it might be one which was prescribed by an American statute. It might be either a warranty deed. which included covenants for title by which the grantor undertook to protect the grantee and his successors against defects in the title, or a quitclaim deed which was used to transfer the grantor's interest, if any, without any warranty as to title. Such deeds, whether warranty or quitclaim, operated either as a modern counterpart of a common-law conveyance by livery of seisin or as a conveyance to uses which was within the operation of the Statute of Uses. The statutes usually required that the deed, if it was to be effective for all purposes, should be signed by the grantor, witnessed and acknowledged before a notary public or other public official.

Recording Acts. — Secret conveyances, though they were usually valid as between the parties, were not enforceable against bona fide purchasers for value without notice because recording systems had been established by legislation in all of the American states. The investigation of title to lands in the U.S. was greatly simplified, not only because the records of conveyances were available for inspection by the public but also because a large portion of the land within the United States had been surveyed by the federal government under a uniform, rectangular system which was established by an act of congress of 1796 as a part of the program to transfer the lands of the United States from public to private ownership.

Abstracts of Title. — As the years passed the public records became more and more voluminous and cumbersome. To facilitate land transfers it became customary in many localities to rely, for evidence of ownership, upon abstracts of title which summarized in convenient form the public records of the. deeds and other instruments which affected the title to the particular tract which was being transferred. The abstracts of title were made either by lawyers or perhaps more frequently by specialists who were not members of the bar.

Title Insurance. — Toward the end of the 19th century the practice developed for the large title companies, which dominated the business of searching the public records in the larger urban areas, to issue insurance policies to indemnify purchasers against loss occasioned by defects in title which the examination of the title had not revealed but which were, nevertheless, enforceable against purchasers. Title insurance business flourished in the 20th century and title guarantee policies were commonly used in the closing of transactions relating to land.

Torrens Titles. — The determination of title to land either by the examination of the public records, or by the examination of an abstract of title, or by the procurement of a policy of title insurance was often either slow, or expensive, or both. In an effort to avoid these difficulties. many of the states adopted statutes which were known as Torrens acts because Sir Robert Richard Torrens was primarily responsible for the development of the system in Australia in the middle of the 19th century. These statutes permitted the substitution of registration of title and the issuance by public officials of certificates of title for the recording of deeds and other transactions which affected title to land. Under this system, transfers were made either by the endorsement of the new interest on the certificate of title or by the cancellation of the old certificate and the issuance of a new certificate in the name of the new owner. The older recording systems had not been repealed when the Torrens acts were adopted, and, though the Torrens system had worked well in Australia, New Zealand and Canada and though registration of title had had some vogue in California. Illinois, Massachusetts and Minnesota, it did not supplant the older systems. Some of the earlier Torrens acts had been held to be unconstitutional; though these had been replaced by acts which were clearly constitutional, the original enthusiasm for registration of title waned. The Commissioners on Uniform State Laws withdrew their Uniform Land Registration act in 1934, and Nebraska repealed its Torrens statute in 1943.

Mortgages. — Mortgages in the United States took the form either of a transfer of title to the creditor or to a trustee for the creditor subject to a provision that the transfer would be nullified if the debtor should pay the debt as he had undertaken to do. As in England, the form of the deed concealed the fact that the effect of the transaction had been revolutionized by the development by courts of equity of a right to redeem, known as the equity of redemption, which enabled the mortgagor to recover his property even though he had failed to pay the obligation at the time specified in the mortgage or trust deed. A number of states, following the lead of New York, established the rule that, whatever the form of the deed which had been executed, the mortgagor continued to own the land subject only to a lien which. though it provided a basis for a decree of foreclosure should the mortgagor default, did not entitle the mortgagee, qua mortgagee, to have possession of the land. In many jurisdictions. the decree of foreclosure directed that the land should be sold by an officer of court to the highest bidder and that the proceeds, if any, which remained after the mortgage debt and the expenses of the foreclosure had been satisfied should be paid to the mortgagor. Frequently, the mortgagor's equity to redeem the property even after he had defaulted was supplemented by a statutory right of redemption which entitled the mortgagor, if he wished, to retain the property free from the lien of the mortgage by paying, not the amount of the debt, but rather the price which had been obtained at the judicial sale.

During the depression of the 1930s, moratoria statutes were enacted in many states to shield mortgagors from the hardships occasioned by the collapse of the economy. Some extended the time within which mortgagors might redeem the security. Others protected them from personal liability upon the debts which were secured by mortgages. Under the Frazier-Lemke amendment to the Bankruptcy act, 1935, farmers were given the opportunity to retain possession of their farms pending an arrangement in bankruptcy and permitted to wipe out the mortgage by paying, not the amount due on the debt, or the price obtained at a foreclosure sale, but, instead, the value of the property as determined by appraisers under the supervision of the bankruptcy court.

Rights of Enjoyment. — In the United States, as in England. the rules of law which governed the use and development of land were based upon the assumption that the owner should have the fullest possible freedom to use the land as he wished. As an owner, he was entitled to use the land as he chose without obtaining either consents from his neighbours or licences from the state. He might let the land remain unused, or, if he preferred, he might alter or destroy its substance.

Tracts of lands are not, however, independent. The development of one tract, especially if it is small, may often affect the enjoyment of other tracts. If, therefore, owners were to be secure in the privilege of using their land, the power of each must be restrained to the extent that was necessary to ensure that each would have the maximum freedom which might be attained in a civilized society. It was therefore established that, although an owner of land might leave it in its natural state even though this occasioned harm to others, he was not privileged to harm others either by using it in a careless or negligent manner, or, as it became clear in the 20th century, by devoting it to uses that were ultrahazardous even though those were conducted with the greatest possible care.

Nor would ownership of land justify an encroachment, even though innocent, upon the land of another, whether the encroachment was on the surface, underground or in the air This limitation did not mean, as some once thought, that all flight over land without the consent of the owner was unlawful It meant, instead, that such flight at low altitudes mas unlawful even though the upper boundary of the air space which must not he invaded could not be fixed as precisely as boundaries upon the surface could be marked out by a surveyor

Moreover, the owner of land might be held accountablr even though

he had kept within his boundaries and his use had been neither negligent nor ultrahazardous. He was required, in addition, to refrain from any use, however carefully it might be conducted, which interfered unreasonably with the enjoyment of neighbouring lands. The difficulty inherent in this limitation upon the freedom of the owner was that it was so general that it was vague and hence extremely difficult to apply.

In some situations, the standards of reasonableness were definite. An obstruction of a vista or of the access of light and air to an adjoining tract by building close to the boundary was held not to be an unreasonable use. Some courts, apparently misled by the colourful language of Blackstone's *Commentaries,* announced that even a "spite fence," which had been built only to annoy a neighbour, was not actionable if it had been carefully constructed and did not extend beyond the boundary. This rule had been generally repudiated by the 20th century, although the supreme court of Pennsylvania applied it in a case decided in 1947.

On the other hand, an excavation or mining operation which, by disturbing the lateral or subjacent support, caused the soil of neighbouring land to subside was usually deemed to be unreasonable and hence actionable even though the work had been done most skilfully.

In most instances, however, the limitations imposed upon the owners of land with respect to the use and development of their tracts mere extremely vague. The test of legality was the reasonableness of the particular use. The standard was that of "give and take, live and let live," and its application required the difficult adjustment of the correlative and interdependent interests of competing owners. Among the factors which were to be considered was the character of the neighbourhood. A use which might be appropriate in one locality might be unreasonable and hence unlawful in another. The application of the common-law rules thus tended to segregate uses and to impose upon landowners a crude system of zoning.

Waste.— The freedom of an owner to use his land might also be limited because his interest was not a fee simple absolute. The owner of a life estate, for example, was ordinarily accountable for waste and was not entitled to use the land in a way which would unreasonably interfere with its enjoyment by the owner who would be entitled to have possession when the life estate ended.

Easements and Restrictive Covenants.— The owner's privilege of use would also be curtailed if his estate, although a fee simple, was encumbered by a property right which entitled another person either to use the land for a limited purpose (*e.g.,* a right of way) or to require that the owner refrain from using the land in a particular way (*e.g.,* a right of access of light to a window).

Originally these restrictions were confined within narrow limits, but in the second half of the 19th century the courts, influenced by the famous Leicester Square case which the English court of chancery decided in 1848, concluded that many types of agreements concerning the use of land should bind not only the parties to the agreement but also successors in title except bona fide purchasers who took without notice of the restriction. In the 20th century covenants were often relied upon in the development of land for residential use to assure prospective purchasers that a wide variety of uses which were thought to be undesirable would be barred from the district. Sometimes covenants were used in an attempt to keep members of a particular race from moving into an area, but these attempts failed because the supreme court decided in *Shelley* v. *Kraemer* (1948) and *Barrows* v. *Jackson* (1953) that enforcement of such restrictions by the courts was unconstirutional.

Statutory Controls.— The freedom of an owner to use and develop his land might also be limited by the necessity of submitting either to its regulation or appropriation far the public good. Under the U.S. system the powers of government agencies were restricted by the provisions of the state and federal constitutions; but subject to those limitations, private property in land, as well as other private interests, was subordinated to the interests of the state.

Eminent Domain.—The owner's enjoyment of land was therefore subject to the power of eminent domain and his land, or an interest in it, might be taken from him so that it might be used for a project which he did not approve. The appropriation must have been authorized by a statute which satisfied the various requirements of a valid a-t including. first, that the appropriation was for a public use and, second, that the owner was paid a just compensation for the interest which was taken from him. Because of the power of eminent domain, owners were required to make their lands available for a long and varied list of uses which included millponds, canals, railroads, highways, parks, monuments, drainage and irrigation ditches and housing, neighbourhood redevelopment and slum clearance projects.

Police Regulations.— The owner of land v as also required to submit to police regulations. Even though the loss which the regulation caused an owner was very large he was not entitled, as of right, to be compensated for the sacrifice which he had been required to make for the benefit of the public. Thus in *Miller* v. *Schoene* (1928), 276 *U.S.* 272, the supreme court held that the Virginia landowner who was required to destroy his cedar trees to protect apple orchards in the vicinity from rust was not entitled to be reimbursed either for the value of the trees or the depreciation in the value of his land.

In the earlier period the typical police regulations which affected the use of land were building codes and other safety regulations which were intended to protect the health and safety of those who lived in cities. At one time it was doubtful whether such regulations might be applied to existing structures, but that doubt was resolved in favour of the power by the decision of the New York court of appeals in the Trinity Church case (1895).

Zoning.— In the 20th century the scope of police regulations imposed upon owners of land was vastly extended. In the famous *Village of Euclid* v. *Ambler Realty Co.* case (1926) the supreme court upheld the power of the states to classify communities into zones and to impose different regulations as to use within the various zones. Planning commissions were established to formulate programs for the development of communities, and their policies were put into effect by the enactment of comprehensive zoning and subdivision ordinances which regulated many aspects of the use of land in metropolitan areas.

In most instances, the courts insisted that these regulations be justified by a showing that they were reasonably related to the protection of the health, safety and morals of the public, and not infrequently regulations were held to be unenforceable in particular situations because the requisite showing had not been made. Frequently, regulations were justified on the ground that they had an important relationship to the maintenance by the community of the various public services such as streets, schools, fire protection and sewage disposal systems.

The efforts to justify land use restrictions upon purely aesthetic grounds were generally rejected by the courts, but the fact that the enforcement of such regulations would enhance the attractiveness of the locality was often one of the factors which would be noted by the judges in upholding the restrictions.

The power of the state to conserve natural resources by police regulations was widely rerognized, and many statutes were enacted to outlaw land uses which were wasteful in either the physical or the economic sense. The best examples of such legislation were the prorating and marketing schemes which were adopted in the oil-producing states during the depression of the 1930s to protect the petroleum industry from the difficulties which had been created by the collapse of the economy.

Police regulations not only imposed drastic controls upon landowners, but, in many instances, subjected them to the necessity of limiting the use of their land to those purposes for which government permits might be obtained But in spite of all the controls and the restrictions to which landowners had been subjected, private property in land continued to be a vital institution of the U.S. legal system and was commonly regarded as an indispensable element of a free society.

(*See* also FORECLOSURE; HUSBAND AND WIPE; INHERITANCE; JOINT TENANCY; LANDLORD AND TENANT; POLICE POWER; WASTE.)

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LAWS OF WAR. Attempts to extend the moderating influence of law into the sphere of international conflict began early in the history of civilizations. The ancient monuments of Roman law, like those of earlier societies, contained rules designed (1) to limit recourse to war and (2) to control in some degree the conduct of hostilities. To the first class belonged the requirement that before an opponent was attacked, an ultimatum should be delivered, putting clearly the demands made upon him. If he complied, he should not be molested. An example of the second class was the immunity from hostile action demanded for heralds and ambassadors. From these remote beginnings began a slow development, interrupted by periods of unmitigated ferocity and cynically disregarded by many warring princes, toward a fairly elaborate body of usage and doctrine. This body defined legal occasions for war, prescribed forms of declaration and purported to outlaw certain of the more hideous instruments and modes of warfare.

"Just War".—From St. Augustine in the 4th century to Hugo Grotius in the 17th, the apostles of universal law concentrated upon the problem of war. Rules for the peaceful relations of princes and republics were a by-product of the endeavour to control armed conflict. The rules defined those rights the violation of which justified a declaration of war. Rulers were exhorted not to take up arms except for a just cause. A just war was one fought to vindicate a violated or threatened right and conducted by means and methods not condemned by the law of nations. Only the just belligerent acquired rights by war. and only he might legally complain of assistance rendered to his enemy.

As a restraint upon the ambitions of princes, the just-war doctrine was of little avail. At its best, this body of ambiguous

precepts was clearly exhortation, not law. Material force could hardly be mustered in its support for, as Emeric de Vattel observed in Le Droit des gens (1758), any outsider presuming to decide the just and the unjust was assuming the role of judge over sovereign entities. These were by definition independent of any human authority, and a government presuming to judge them was itself dangerously near giving a just cause for war. The developing doctrine of neutral rights and duties tended to exclude any difference in the treatment accorded belligerents. It became obligatory to treat both belligerents alike in order to preserve neutral rights. The view that prevailed in the 19th century, therefore, placed them on precisely the same legal footing. Regardless of cause, it was not contrary to the law of nations to go to war.

By Vattel's time, the writers had become somewhat less preoccupied with war and more disposed to expound and develop rules for the peaceful, day-to-day relations of governments. The rights and duties of states in regard to territory and persons, freedom of the seas, the usages of diplomatic intercourse, arbitration and mediation got more attention. Plans were sketched to banish international violence from Europe and the world. Slowly, in the literature of the law of nations (or international law, as it began to be called after the 18th century) peace assumed the place of normal relation between states.

Codification. — The rules of war were not yet forced into the background, however, either by the bankruptcy of the just-war doctrine or by increasing interest in an international law of peace. In the so-called law-making conferences of the last half of the 19th and first decade of the 20th century, rules of war assumed the priority which they had once had in the literature. The declaration of Paris, 1856, outlawed privateering and established clearer rules on blockade and the carriage of neutral and enemy goods by sea. The years 1863 and 1864 witnessed the series of meetings at Geneva, Switz., that established the Red Cross and drew up the first code for the care of sick and wounded soldiers irrespective of the side on which they fought. In 1868 the declaration of St. Petersburg prohibited explosive bullets. The Brussels congress of 1874 produced an elaborate declaration which, though it was never itself brought into force, provided material for the later Hague regulations on land warfare. Finally, peace conferences convening at The Hague in 1899 and 1907 concentrated upon rules of war for land and sea.

National Codes. — This also was the period when governments began issuing manuals on the laws of war for the use of commanders. In this they followed the lead given by the United States uhen it promulgated in 1863 Francis Lieber's Instructzons *for* the Government *of* the Armies *of* the United States in the Fzeld. Besides serving as a model for manuals in other countries, the U.S. Instructtons was the starting point for the Brussels draft, which in turn was used in the Hague regulations. Later manuals incorporated the international conventions and declarations and probably did more than any other formulation to promote their observance.

Just-War Revival. — This progressive codification was arrested and, many thought, proved useless by World War I. In the peace conferences of 1919–20, in the interwar period, and again in 1944–4j, the main effort in international legislation took another direction. It reinstated the old doctrine that war was illegal except in approved circumstances and could win no legal advantages for a belligerent without approved cause. Between the covenant of the League of Nations and the United Nations charter, the Paris pact of 1928 and the Argentine antiwar pact of 1933 kept the same theme to the fore. In this revival the doctrine of just war was no longer remotely academic; it had strong official support and was to be implemented by appropriate machinery of enforcement. Governments were induced by a popular revulsion from war to enter into agreements not to resort to force in their international relations except in self-defense or in execution of collective obligations, and, further, to establish and support international organization for keeping the peace. The charters of the international military tribunals which sat in Nuremberg and Tokyo after World War II declared aggressive war an international crime, and defendants found guilty on this charge were sentenced to death. The principles recognized in the charter and judgment of the Nuremberg tribunal were endorsed by the general assembly of the United Nations and reformulated by its international law commission.

These developments in doctrine and practice were accompanied by a diminution of interest in rules purporting not to outlaw war but merely to govern the way ih which it should be launched and conducted. No better illustration of this indifference could be found than the failure to establish any international code regulating mar in the air. A draft completed at The Hague in 1923 failed to obtain a single ratification. Governments were under no pressure. Such public interest as there was in the advancement of international institutions was focused upon machinery to prevent war.

Atomic War. — Yet, despite all the development of international organization before and after 1945, there continued to be a universal fear that war would come again, and in a form more devastating than any previous conflict. The invention and refinement of atomic weapons revived the debate on the utility of laws intended to curb military practice. Now that the secret of such destructive instruments was known, some thought it foolish to hope that a great power hard pressed in war would not procure and use them. With this prospect of wholesale destruction and slaughter, it might well seem vain to go on elaborating codes on the treatment of sick, wounded and captive soldiers, on the immunity of open cities and noncombatants. on neutral rights of trade and belligerent rights of capture and confiscation; it would be better, perhaps, to concentrate on the effort to abolish war. On the other hand, many students of history were convinced that the laws of war had in the past exercised a moderating influence, a conviction reinforced by the judgments of the international military tribunals. It was argued therefore that nations should not forego the least possibility of tempering the cruelty and destructiveness of methods and weapons that threatened unimaginable sufferings. This line of thought stimulated a fresh attempt at control.

Therefore, while the International Committee of the Red Cross prepared the way for elaborate revision of the convention regulating the treatment of casualties and captives and for the extension of equivalent protection to noncombatant populations, the governments, working under the auspices of the United Nations, explored ways of preventing the use of atomic weapons. The efforts of the Red Cross led to the Geneva conventions of 1929 and 1949, but the drive against the new instruments of war ran into formidable obstacles.

Such progress as had been achieved in the direction of an operative law of war had taken place along three main lines. The rules formulated bore upon: (1) the commencement of war and its immediate effects; (2) the conduct of hostilities; and (3) relations between belligerents and neutrals.

Declaration of War. — The middle ages continued the ancient practice of notification, and an interval of three days was usually allowed before hostilities began. Thereafter, though the most respected writers still insisted upon a formal declaration, this custom was less and less observed.

For the lawyers, declaration had the advantage of fixing a date when the grave implications of war for persons, property and trade could be regarded as coming into effect. For all who objected to war on principle, it had the virtue of offering a last chance of peaceful settlement. But for the military commander it meant sacrificing the high value of surprise.

The lawyers and humanitarians won at least a temporary victory at the second Hague peace conference in 1907. Convention III, adopted there, stipulated "previous and explicit warning, in the form either of a reasoned declaration of war or of an ultimatum with a conditional declaration." The record of observance in World War I was remarkably good — j6 declarations as against 3 omissions. Germany launched its attack upon Poland in 1939 and upon the U.S.S.R in 1941 without warning, while Japan opened hostilities on Dec. 7, 1941, as at Port Arthur in 1904, with a surprise bombardment. A government undeterred by the interwar accumulation of texts forbidding aggression was not likely to sacrifice the profits of unheralded assault. It was still less likely, after Hiroshima and Nagasaki, that a government which had decided to

launch an atomic war would give warning. The new weapon had enlarged the premium on surprise. If the practice of declaration was to be firmly reestablished, it would probably have to await effective surrender of this type of warfare.

Enemy Persons and Property. — In the middle ages the ancient practice of imprisoning enemy subjects and confiscating their property on the outbreak of war was set aside for the benefit of merchants. On condition of reciprocity, they were left free and their goods were not taken. Gradually this immunity, granted to encourage trade, was extended to persons not engaged in commerce. By the 18th century so many treaties had been concluded securing to enemy aliens the liberty to settle their affairs and depart within a reasonable time, or to remain and carry on business on condition of good behavior, that this liberty came to be asserted by jurists as a general right.

When World War I broke out in 1914, a new factor had entered the calculation of interest. This was the spread of universal military service and the institution of the citizen army. It was easy to justify a limiting of the right of departure on the ground that a belligerent could not be expected to contribute to the fighting manpower of his enemy. So, although Great Britain and some other belligerents permitted departure within a week after the declaration of war, Germany and Austria-Hungary detained enemy aliens of the male sex.

This was the first step in a change back toward. the ancient practice. The next step was the policy of internment resorted to in increasing measure by most belligerents as the war proceeded, though in some cases this action mas taken as much to protect resident enemies from mob violence as to prevent hostile activity on their part.

At the beginning of World War II, France, in fear of "fifth columns," adopted a policy of mass internment. Great Britain allowed departure up to Sept. 9, and for those enemy aliens who chose to remain, instituted a system of careful selection. Those found by special tribunals to be genuinely friendly were left at liberty. Doubtful persons were restricted in their movements to a specified distance from their place of residence and required to report at intervals to the police. Those classified as real enemies were interned. In the U.S., a presidential proclamation of Nov. 14, 1941, forbade the departure of any alien not in possession of a valid permit or exempted by special regulation from this requirement. This was followed, after Dec. 7, by further proclamations subjecting aliens of enemy nationalities to summary apprehension if deemed dangerous to the public peace or safety by the attorney general or secretary of war, and establishing a selective system much like that adopted in Great Britain [1]

Selective Internment. — The danger of espionage, sabotage and subversion, already demonstrated in the course of World War I and greatly increased by skilled nazi tactics of penetration, was responsible for part of the change. On the other hand, there were in France, England and the U.S. large numbers of refugees from totalitarian regimes who were ready to put valuable skills at the disposal of their host countries. Considerations of humanity and expediency alike demanded for these a kind of treatment which would assimilate them with nationals. Thus a selective pattern of practice came to be approved, in which the principal criterion was frankly the security of the host country, tempered by a general obligation to avoid cruelty and by a trend toward treatment for civilians of enemy nationality not less favourable than that due'to prisoners of war. On charges of violating these principles in respect both of civilians and of war-prisoners, German and Japanese leaders were tried and punished by the international courts for the trial of war criminals at Nuremberg and Tokyo.

Geneva Convention, 1949. — These were the broad principles upon which the Geneva conference of 1949, for the first time officially formulating a multilateral agreement for the protection of civilians on lines long established for captive troops, drafted its *Convention* Relatzve to the Protection *of Civilian* Persons in *Time* of *War*. Article 35 of that instrument did indeed rule that enemy nationals were to be allowed to depart like other aliens. But the proviso — "unless their departure is contrary to the national interests of the state" — left the belligerent free to make his selection. Again, though internment was not to be resorted to as a matter of course, it was permitted in cases where the national security "makes it absolutely necessary" (article 42). Finally, enemy aliens were to be given the opportunity, subject to considerations of security, to find paid employment. If security controls prevented them from earning a living, they and their dependents were to be supported by the host state. They must in all cases be allowed to receive allowances from home and from relief societies (article 39).

Enemy Property. — The belligerents in World War I adopted a practice which led to substantially the same effects as the ancient action of general confiscation. Though no general confiscation was proclaimed by the victorious powers, enemy property was placed in the hands of custodians and subsequently liquidated under provisions of the peace treaties. Against the resulting fund were charged established claims of Allied nationals against enemy subjects or governments. The defeated powers, on the other hand, were compelled to restore the property of Allied nationals and at the same time to undertake repayment to their nationals of what they lost through the seizure of their assets in Allied territories.

This procedure was repeated in World War II (treaties of peace, Italy, articles 53–79; Bulgaria, articles 23–25; Hungary, articles 26–29; Rumania, articles 24–27). While the victors were unlikely to display any zeal in enforcing a clause of repayment to enemy nationals, it did at least give these persons the basis of a legal claim against their governments. The absence of this clause in the peace treaty with Japan (1951) was only a minor example of the way in which that settlement, in the hope of rehabilitating the country as a strong ally, lightened the exactions normally imposed on a loser.

The treaties of peace after both world wars took care not to disburb any steps taken in the course of hostilities by the victor governments in relation to enemy property. They confirmed a practice which recognized full power in the belligerents to deal with such property as they deemed expedient. But the treaties after World War II also made it clear that this power had not been pushed to the limit or used without discrimination. While the custodians seized and administered enemy property and enterprises where the national interest was thought to demand such action, they left resident enemy nationals, whose friendship was established, in full possession and use of their properties (treaties of peace, Italy, article 79, 6[c]; Bulgaria, 25, 5[c]; Hungary, 29, 5[c] ; Rumania, 27, 5[c] ; Japan, 14[a]2).

Merchant Ships. — Throughout the greater part of the long period when the practice of most states left the property of enemy nationals on land exempt from seizure, it was the custom to confiscate at once any merchant vessels under the enemy flag lying in port at the outbreak of hostilities. Governments even imposed embargos in antitipation of war in order to catch more ships. It was only in the Crimean War (1853–56) that the practice of allowing days of grace for loading and departure mas introduced. This concession to the general interest in the ocean-carrying trade was repeated in subsequent major wars up to and including that between Russia and Japan (1904–05), although Russia then reduced the period of grace to 48 hours.

At the Hague conference of 1907, an attempt was launched to make an obligatory rule of what was still regarded in some of the greatest maritime countries as a matter of grace. The opposition of France, Great Britain, and Japan, supported by Argentina, forced a compromise which presaged subsequent retrogression from the liberal practice of the preceding 50 years. Whether as auxiliary warships or as part of the supply systems of naval formations, merchant vessels were recovering much of their earlier importance among the elements of war potential. Great Britain in particular insisted that seizure or permission to depart must be left for decision by governments according to circumstances at the time. The text of Hague Convention VI, article 1. stating that "it is desirable" that merchant ships should be allowed to depart freely, and that "the same rule should apply in the case of a ship

[1] *See* U S. Code, title jo, sec. 22-24, and U.S. Statutes at Large, vol. 55, pt. 2, pp. 1696-1709 (1941-42) and vol. 56, pt. 2, pp. 1933-34 and 1970-72 (1942).

which has left its last port of departure before the commencement of war and entered a port belonging to the enemy while still ignorant that hostilities had broken out," left the matter entirely dependent upon the belligerent's notion of his national interest. Articles 2 and 3, on the other hand, categorically prohibited the confiscation of enemy merchant ships unable to leave port within the period of grace or which were "encountered on the high seas while still ignorant of the outbreak of hostilities." Such vessels might, however, be detained for restoration at the end of the war, or requisitioned with compensation. All three articles were severely tested in World War I.

Some belligerents immediately granted days of grace. Others, like Great Britain, made permission to depart conditional on assurance of the same treatment for their shipping. When the U.S. entered the war in 1917, there were nearly 100 enemy merchantmen in U.S. ports under circumstances which exemption could not relieve. They had not been trapped by the outbreak of war; on the contrary, they had taken refuge two years earlier from the imminent danger of capture by British and French warships. Days of grace for departure would have been irrelevant. They were requisitioned and paid for by the U.S.

Strictly speaking, no part of Hague Convention VI was binding in World War I, even upon those belligerents who, unlike the U.S., had ratified it. The fact that some of the powers engaged had not ratified the conventipn made it inapplicable, as provided in article 6 of its text. But the judicial committee of the privy council, acting on appeals from British prize courts, held that it nas in force, by implied agreement, between Great Britain and Germany (The Blonde, Hercules, and Prosper, III British and Colonial Prize Cases, pp. 1034–48.) Ships not allowed to depart on the outbreak of war were therefore not confiscated. But because international practice in the matter had been inconsistent, the British government denounced the convention in 1925.

In September 1939, a German motor vessel, the "Pomona," was seized in the port of London immediately after Great Britain's entry into World War II. The prize court held that there nas no rule of customary international law to prevent confiscation, and that since Hague Convention VI had been denounced, the crown was entitled to take the ship without compensation (Hersh Lauterpacht, Annual Digest and Reports of Public International Law Cases, case no. 159 [1941–42]). In the "Naptha Shipper," the German prize court of Hamburg on March 19, 1943, rendered a similar decision condemning a British vessel seized without days of grace in the port of Hamburg (H. Lauterpacht, Annual Digest, case no. 17j [1943–45]). It is significant that the German court cited the British precedent. Reciprocity counted heavily there, as in most matters touching enemy interests.

On June 6, 1941, when more shipping had become an urgent need, a statute was enacted in the U.S. providing for the requisition of foreign vessels lying idle in the country's ports. The measure struck future friends and foes alike. Thus, six months before the Japanese attack on Pearl Harbor, 26 Italian and 3 German vessels were taken over, along with others from Denmark, Finland and Estonia and the French "Normandie," all subject to payment to the owners of the value assessed by the U.S. maritime commission.

As in relation to enemy nationals, belligerents had clearly reasserted the ancient right of dealing as they saw fit with enemy merchant shipping that had freely entered their ports. No convention controlled the chief maritime states on this matter, and some of them denied the existence of any customary rule.

Conduct of **Hostilities.**—Grotius, writing early in the 17th century, observed that the law of nations had long condemned the use of poisoned weapons and the poisoning of wells. Nor aas it permitted to hire assassins to kill an enemy. There was an informal convention among princes against a danger which could not be met by military skill or strength, and which brought war uncomfortably home to those responsible for it.

A later motive for limiting instruments and modes of warfare was that of avoiding "unnecessary suffering." This meant suffering for which no adequate counterweight was gained in the form of military advantage. Thus, explosive bullets which caused wounds of great severity and were more often fatal than ordinary bullets, were prohibited by the St. Petersburg declaration of 1868. Ordinary bullets were sufficient to secure the essential military objective; *i.e.*, to put the target out of action. The same consideration appeared again in the Hague declarations of 1899 condemning expanding bullets and projectiles designed exclusively for the "diffusion of asphyxiating or deleterious gases." The Hague declarations of 1899 and 1907 against the discharge of explosives from balloons "or by other new methods of a similar nature," like that of 1899 against gas projectiles, were designed to protect innocent civilians from implication in a form of attack which as yet seemed quite unlikely to produce valuable military results. The growing protest against indiscriminate destruction and slaughter found further expression in the conventions of 1899 (II) and 1907 (IX) prohibiting the bombardment of undefended ports, towns, villages! dwellings or buildings, as well as in convention VIII of 1907 forbidding the laying of floating mines unless they became harmless within an hour and anchored mines which did not become harmless on breaking away.

Weapon Violations, *1914–18.*—More or less substantiated charges of violating all these declarations and conventions were hurled across all fronts in World War I. It was established that explosive or expanding bullets were used from time to time; there could be little doubt that the use of mines was not kept within Hague limits; gas was employed on several fronts; and undefended places were bombarded from land, sea and air. Most belligerents defended their action as retaliation against prior offences by the enemy. Possibly there was less use of explosive and expanding bullets than there would have been in the absence of the agreements cited; but this was of minor consequence. The improvement of old weapons and the invention and development of new ones offered the chance of military results not imagined at The Hague, and war rapidly developed into a struggle engaging not merely armed forces but more and more nearly the whole strength of nations. With national existences believed at stake, and mass hatred at fever heat, the paper obstacles to the employment of every available means of destruction were frail indeed.

Submarines.—Before 1914 it had long been regarded as established international custom that no merchant vessel, enemy or neutral, should be sunk unless provision existed for the safety of crew and passengers. To surface warships this was not too serious a restriction, since personnel not otherwise provided for could usually be taken on board. The submarine, on the other hand. was said to be too vulnerable to wait while crew and passengers gained a place of safety, and it could offer no room for refuge. With such arguments, supported by doctrines of reprisal for enemy violations of the laws of maritime warfare, the German government asserted for its submarines the right to sink ships on sight, regardless of the plight of those on board. The result was perhaps the worst horror of a war which spurned so many civilized restraints.

After Germany's defeat this problem was attacked at the Washington disarmament conference of 1922. A treaty was drafted declaring the rule that "a merchant vessel must not be destroyed until the crew and passengers have first been placed in safety." If submarines were unable to satisfy this requirement in any given case, they must "desist from attack and from seizure." This agreement did not come into force, but its terms were incorporated in the London treaty of 1930 for the limitation and reduction of naval armaments and again in the London protocol of Nov. 6, 1936. Forty-two countries, including all the chief belligerents in World War II, became parties to the London protocol. It failed to withstand the unprecedented strains of that struggle.

Air *Warfare.*—The Washington Disarmament conference, which initiated the unsuccessful attempt to curb the submarine. also turned its attention to war in the air. In the articles aimed at controlling air bombardment, the Hague air rules of 1923, the code adopted followed with some modifications the Hague convention of 1907 on bombardment by naval forces. The chief object was to secure immunity for civil populations. churches, hospitals and historic and artistic monuments by confining air attack to "military objectives" (article 24). No power proved willing to take the initiative in so restricting the air arm, and the Hague rules re-

mained unratified. Whether, they would have been any more effective than the protocol on submarines is most doubtful. Much. reliance had come to be placed by all the belligerents on the destructive potentialities of aircraft. Many of' the great munitions factories which constituted a principal target formed part of dense urban conglomerations. There were different degrees of accuracy in the several modes of air bombardment, but all involved high civil casualties and the destruction of nonmilitary property. After 1945, when atomic bombs were first used, the trend in air warfare was toward lower rather than higher selectivity of targets.

Gas.--One self-denying ordinance of the nations in the matter of weapons was to some extent effective. The victors emerged from World War I with a horror of gas. It was rightly thought that this mode of warfare was only in the earliest stage of development, and that the clumsy experiments of 1914–18 might nell be followed by improvements devastating to both armed forces and civilians. Article 171 of the treaty of Versailles prohibited "the use of asphyxiating, poisonous or other gases and all analogous liquids, materials or devices." A similar prohibition appeared in the treaties of St. Germain (1919), Neuilly (1919) and Trianon (1920), in the Treaty of Washington, 1922. and in a protocol of 1925 in which more than 40 states participated. Italy violated this convention in the war against Ethiopia in 1935–36. This illegal action contributed to winning the war because Ethiopia had no means either of defense or of retaliation against the use of poison gas.

It was known that the Great Powers between 1939 and 1945 were prepared to place at the disposal of their armies improved mechanisms of projection and gases more deadly than any used in the previous conflict. This knowledge probably counted at least as much as the solemn prewar agreements in dissuading all belligerents from recourse to this weapon. Any government contemplating a gas attack had to reckon with retaliation of incalculable effect. The same was true of the dreaded bacteriological warfare.

The experience uith gas and bacterioiogical weapons encouraged some hope, even after the checks suffered by the Atomic Energy commission of the United Nations, that if general war again broke out, atomic weapons would not be used. The likelihood of highly destructive retaliation might prove a sufficient deterrent.

Military Occupation.—Until the 19th century, a belligerent who succeeded in occupying enemy territory was regarded as at least temporarily sovereign there. Even before acquiring such territory by conquest and annexation or by cession in a treaty of peace, he was conceded the right to impose oaths of allegiance upon the inhabitants, to levy troops there and to use public and private property as he saw fit. The more humane principles which won increasing recognition from 1840 on were codified in articles 42–56 of the 1907 Hague regulations respecting the laws and customs of war on land. That text placed strong emphasis on the positive duty of the occupying power to ensure public order, to maintain, "unless absolutely prevented," the laws in force, and especially to respect the lives and private property of the inhabitants, their family honour and rights, and their religious beliefs and practices. No oath of allegiance nas to be exacted nor was military information to be demanded of the population. The costs of administration were to be defrayed so far as possible out of normal taxes. Seizure or destruction of property dedicated to religion, charity, education, arts and sciences, or of historic monuments and works of art and science, was forbidden. No general penalty was to be inflicted for acts of individuals for which the population could not be regarded as responsible.

Much of this text could be summed up as a commandment to preserve the conditions obtaining before occupation. Concessions to the brutal facts of war appeared only by way of exception. Thus the collection of money contributions over and above taxes was permitted "only for the needs of the army or of the administration of the territory . . ." Requisitions of property and services were not to be made "except for the needs of the army of occupation." These exceptions, however (coupled with the phrases—"as far as possible," and "unless absolutely prevented"—qualifying other obligations of the occupant) left a wide discretion. In World Wars I and II, over and above the advantage taken of this discretion, the letter and the spirit of the Hague regulations were repeatedly violated. The international military tribunals at Nuremberg and Tokyo found defendants guilty of atrocities in occupied territory. Yet in both conflicts the regulations, reproduced as they were in the manuals issued by the belligerents, gave spokesmen of the inhabitants a code to appeal to, and the appeal was not always in vain. Many commanders made a faithful effort to rnaintain a regime of occupation as favourable as that aimed at in the texts. The Geneva convention of 1949 relative to the protection of civilian persons in time of war established a more elaborate code to govern relations between an occupying power and the inhabitants. By express prohibition of many practices adopted by German armies of occupation between 1939 and 1945, and by special authority given to "protecting powers," it sought to prevent recurrence of such atrocities as mass extermination, deportation and prison camp brutality.

The Hague regulations on occupation were designed primarily for periods of military control of enemy territory while hostilities were still in progress. They were less appropriate for the regime established by a victor under an armistice or treaty of peace and intended to secure fulfilment of the terms imposed. In any event, there was nothing to prevent setting them aside by armistice or treaty accepted by the loser. Though the main principles codified at The Hague might be regarded as applicable by analogy, the victors in 1919 assumed powers over the Rhineland and in 1945 over all Germany greater than could be justified under the text of 1907. It was particularly obvious in 1945 that no obligation to retain the nazi system of law was appropriate, and after the "unconditional surrender" of Germany, the four Allies by a declaration of June 5, 1945, "assumed supreme authority with respect to Germany," but without effecting "the annexation of Germany."

Treatment of Wounded *and* Prisoners.—Of all humane restraints upon military action by land and sea the most effective were those touching the treatment of wounded and captured members of the 'enemy forces. As late as the 17th century, the practice of nations left the fate of those taken or disabled in battle to the discretion of the belligerents. The first inroad on this liberty began in the growing revulsion against the slaughter or mutilation of the wounded, and by the 18th century treaties stipulating humane care had become numerous. Methods were too primitive and casual, however, to cope with the agonies of the wounded. In 1863 a conference was convoked at Geneva to draw up the plan of organization and action which was to become known under the name Red Cross.

The first Geneva convention on the treatment of the wounded was concluded in 1864. Accepted by almost all states, it was amended and improved in 1906, 1929 and 1949. The Hague conferences of 1899 and 1907 adapted its provisions to naval warfare, and a Geneva conference of 1929 extended them to war in the air. The text of 1949 reaffirmed in greater detail the principles of its predecessors and ruled them applicable also to civil war. It stipulated humane and equal treatment of all sick and wounded without discrimination of sex, race, nationality, religion or political opinions. Military hospitals and ambulances were declared immune from attack. Medical personnel and chaplains must be especially protected, left free to pursue their duties and returned as soon as possible to their own side. Red Cross and other authorized voluntary aid societies were entitled to the same immunities and privileges as official medical personnel.

From solicitude for the wounded, it was a short step to concern with the fate of those who fell uninjured into enemy hands. The early liberty to kill or make slaves of prisoners gave way in the 17th century to exchange and ransom. A hundred years later treaties began to regulate the conditions of their confinement. The Hague conferences of 1899 and 1907 elaborated a code which was expanded and improved at Geneva in 1929 and 1949. Like the conventions on the wounded, this series of agreements embraced most countries of the world. It called for full information about prisoners taken, and it ruled that they must be housed in sanitary quarters, provided with sufficient and wholesome food, given medical attention, paid on an agreed scale graduated according to rank, and allowed to send and receive letters and to receive

parcels. Elaborate regulations were included to prohibit the employment of prisoners in excessive or dangerous work or in tasks of a military character, to establish rates of remuneration, and to ensure healthful working conditions.

The international military courts set up after World War II found many instances in which these conventions had been violated. It is none-the-less true that partly by their direct influence upon governments and partly by facilitating the labours of the International Committee of the Red Cross and the corresponding national societies, they substantially mitigated the cruelties of war.

Neutrality. — Profound changes in belligerent-neutral relations occurred in the period 1914–1945. The concept of neutrality prevailing in 1914 had been long in developing. In the first quarter of the 19th century it was still thought possible for a government to retain the legal position of a neutral and yet, in compliance with a prewar treaty, assist one belligerent and not the other with supplies of food and munitions, money loans, special facilities of passage and sojourn, even troops and warships. A consensus was developing, however, that only the prior obligation could justify such partiality. By the end of the century the consensus excluded aid even under treaty. The resulting position was set forth in Hague conventions V and XIII of 1907, which defined the rights and duties of neutral powers and persons in war on land and sea.

The neutral was no longer free. as he had been up to the middle of the 19th century, to allow passage to belligerent forces. Warships of either side might still pass through territorial waters, but troops entering neutral territory must be interned. No troops, warships, ammunition or war material of any kind might be supplied to a belligerent by a neutral government. With one exception, however, there was no obligation to prevent private individuals or groups from supplying arms and munitions. The exception, supported by the verdict in the famous Alabama claims arbitration between the U.S. and Great Britain (1872) required states to prohibit the fitting out of men-of-war for belligerents.

Belligerents, for their part, were forbidden to use neutral territory, ports or territorial waters as a base of operations. They must perform no act of war within neutral boundaries. The liberty of belligerent men-of-mar to take on fuel and other supplies or merely to remain in neutral ports was curtailed.

Neutral governments were bound to use the means at their disposal to prevent violation of these rules, and steps taken for this purpose were not to be considered unfriendly acts.

In World Wars I and II belligerents made frequent use of neutral land, water and air for military passage and as bases of operations. Ships were sent to the bottom or captured in neutral waters, and prizes brought in for shelter from recapture.

As for the neutrals, the U.S. between 1939 and 1941 led the way in a return to the ancient liberty of assistance to a belligerent deemed to have resorted to war in violation of legal obligation. "All aid short of war" to the victims of aggression and their allies was a sharp reversal of that earlier U.S. policy which had been the chief factor in building up neutrality as a status of passive impartiality excluding governmental help to either side. As belligerents multiplied their power and extended their operations around the globe, that status took on the quality of an obsolete abstraction. In the period of international organization that began in 1944, the argument was heard, as it had been in 1920, that neutrality was legally incompatible with membership in an association to prevent war.

Contraband. — From ancient times belligerents were conceded extensive rights of interference with neutral commerce on the high seas. Their warships were permitted to visit and search merchant vessels, and to seize any contraband goods found on board. Where such goods made up a considerable part of the cargo, the vessel itself might be brought in for trial and possible condemnation in a prize court. Acquiescence in such interference was the price paid by neutral governments, somewhat unwillingly and with frequent haggling, for freedom from any obligation to prevent their nationals from supplying belligerents. Proclamations issued by the belligerents enumerated the things that would be taken in this way.

Many treaties were concluded to limit these lists of contraband. It was easy to agree that weapons and munitions should be exposed to seizure; but the distinction was not clear concerning goods innocent in their existing form but easily turned to warlike use. Great Britain with naval strength sufficient to enable it to protect its own vital supplies and at the same time to cut off those of an enemy, usually pressed for such expansion. It was that country. seconded in the 19th century by the U.S., that won recognition for conditional contraband — goods such as food which, though not otherwise subject to seizure, became so if on their way not simply to a port of the enemy but directly to his forces.

Another Anglo-American extension of belligerent rights was developed under the heading of continuous voyage. This was the doctrine that goods might be condemned not only, as before, if captured on their way to an enemy port, but also if bound for a neutral port to be transhipped there and sent on to an enemy.

Each successive war brought its disputes about contraband. When the Hague conference of 1907 drafted its unratified convention to establish an international prize court, it was decided that a special conference would be needed to settle these differences, and the London Naval conference of 1909 was convened for that purpose. Britain itself refused to ratify the resulting declaration and it never came into force. It nevertheless acquired considerable authority and was applied with qualifications in the early months of World War I.

The declaration had proposed three lists. The first enumerated the weapons and military equipment that might be seized as absolute contraband. The second was made up of articles (conditional contraband) which might be appropriated if destined for enemy government or forces. It included not only food, clothing, money and vehicles, but balloons and flying machines. Finally came a list of things that must not be taken as contraband. This included raw cotton, rubber and ores.

Between 1914 and 1918, however, advancing technology and changing conceptions of the nature and scope of war completely altered the declared lists. Within the first two years following the outbreak of hostilities, the distinction between absolute and conditional contraband lost all practical significance. As nations were mobilized for the conflict, any commodity serving the supreme purpose became contraband; and all kinds of supplies consigned to neutrals but intended eventually to reach an enemy, or to replace goods delivered to an enemy, were seized and confiscated.

Blockade. — At first merely the maritime part of siege operations, blockade was expanded through successive wars into the commercial blockade, by which 19th century belligerents claimed the right to stop all supplies, contraband or not, directed to any point in an entire enemy coast line. The expansion went on in the face of repeated protests against "paper" or "cabinet" blockades unsustained by adequate naval force. In deference to this resistance, the declaration of Paris (1856) laid down the rule that no blockade was binding unless maintained "by forces sufficient to prevent access to the enemy coast line."

Subsequent practice refused to be limited to the literal meaning of this clause. In the U.S. Civil War, ships were condemned as lawful prize for breaking through a line guarded by an average of one man-of-war for every 6 mi. The fact that many vessels passed undetected was not held to make these seizures illegal. The declaration of London repeated the rule laid down at Paris. But submarines and aircraft made it impracticable to station warships for any length of time in narrowly defined areas. The institution of blockade merged with the newly extended concept of contraband. and belligerents in World War I used their wide-ranging fleets to stop all sea commerce with their enemies.

The declaration of London had condemned any extension of blockade by the doctrine of continuous voyage. Article 19 declared that "whatever may be the ulterior destination of a vessel or of her cargo, she cannot be captured for breach of blockade if, at the moment, she is on her way to a non-blockaded port." So limited, blockades, strictly speaking, could not serve the needs of the Allied and associated powers in the war of 1914–18. The forces maintaining the blockade could not touch shipping bound for neutral ports. But if all supplies useful in an enemy's war effort and intended to reach that enemy directly or indirectly

might be defined as contraband, there was no need to stretch the liberties conceded to belligerents under the rubric of blockade. The British government nevertheless argued that blockade also must continue advancing with the times. If it would be made effective by extending it to neutral ports, the extension should be recognized as legal.

Germany's unrestricted use of the submarine was cited as justification for mounting interference with neutral trade. The legality of retaliatory measures which fell at least as heavily on neutrals as on the offending enemy was of course contested; but the necessities of powerful belligerents prevailed over juristic argument.

The liberties thus asserted by belligerents in World War I were consolidated in World War II. The one effective protection of the neutral shipper was the "navicert." Beginning in 1916, certificates were issued by representatives in neutral countries which had the effect of permitting approved vessels and cargoes to pass through the Allied naval cordon. The scope and the use of this device were greatly expanded between 1939 and 1945. Though it was a modern form of the safe-conduct occasionally given, after the 17th century to approved shippers, its elaboration and wide, organized use emphasized more sharply than any previous practice the inescapable fact that when great maritime powers were at war, neutral commerce on the seas became a matter of their grace and favour. *(See* also HAGUE CONFERENCES; INTERNATIONAL LAW, PUBLIC; NEUTRALITY; PRIZE COURTS AND PRIZE LAW; WAR.)

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(P. E. C.)

LAWSON, SIR JOHN (d. 1665). British sailor, born at Scarborough, joined the parliamentary navy in 1642. During 1654–55 he commanded in the North sea and the channel. Appointed in Jan. 1656 as Robert Blake's second-in-command off Cadiz, Lawson was a few weeks later summarily dismissed from his command. probably for political reasons. He was a Republican and Anabaptist. and thereiore an enemy to Oliver Crornmell. In 1657, with Thomas Harrison and others, he was arrested and, for a short time, imprisoned for conspiring against Cromwell. During the troubled months following the fall of Richard Cromwell, Lawson, first as commander in chief and then as vice-admiral of the Channel fleet, played a marked political role. His ships escorted Charles II to England, and he was knighted in Sept. 1660. In 1661 he began a series of campaigns against the Barbary pirates. Summoned to a command in the Dutch War. he was mortally wounded at Lowestoft and died at Greenwich on June 29, 1665.

See John Charnock, *Biographia navalis,* i, 20. 6 vol. (London, 1794–98); John Campbell, *Lives of the Admirals,* ii, 251, 4 vol. (London, 1742–44).

LAWSON, VICTOR FREMONT (1850–1925), U.S. editor and philanthropist, was born in Chicago. Ill., Sept. 9, 1850, the son of Iver H. Lawson, a Norwegian immigrant, and was educated at Phillips academy, Andover. Mass. He took charge of his father's interest in the daily *Skandinaven,* and in July 1876 bought one-third of the stock of the faltering *Chicago Daily News,* which had been organized six months before by Melville E. Stone as the first one-cent newspaper in the west. Under Lawson's business management, the paper reached a circulation of 20.000 within a year.

In 1881 Lawson and Stone started a morning edition, later (1883) called the *Chicago Record,* subsequently discontinued. In 1888 Lawson bought Stone's interest. and remained sole proprietor until his death. August 19, 192 j. His advocacy of a postal savings bank caused him to be called the father of the law that established it. Lawson supported Stone in his development of the Associated Press. was its president from 1894 to 1900, and a director until his death.

LAWS RELATING TO SEAMEN. The laws of the United States of America are not unlike those of the United Kingdom and are set out in the Navigation Laws of the United States. British Commonwealth and empire legislation is largely based upon that of the United Kingdom, but in many cases there are important differences concerning which the appropriate local statutes should be consulted, while the laws of other maritime nations may be found in their commercial codes.

UNITED STATES

Naval Seamen. — In the late 19jos the engagement of seamen in the U.S. navy was by voluntary enlistment, but they could be inducted under the Selective Service regulations. Officers and enlisted men were required to be citizens of the United States and to take an oath of allegiance. The statutory age for enlistment in the naval service was: men, 14 years; women, 18. Administrative regulations, however, prohibited the enlistment of any man below the age of 17. Minors were required to have the consent of their parents or guardians except when inducted under the Selective Service regulations. Persons who had been confined in federal or state prisons or similar institutions, or who had been discharged from any of the armed services by reason of unsuitability, inaptitude, unfitness or misconduct, or under other than honourable conditions, could not be enlisted.

Enlistment was for terms of four or six years at the option of the individual, re-enlistment being for a like period. A seaman could be discharged for ten formal reasons: expiration of enlistment, convenience of the government, dependency, minority, disability, unsuitability, inaptitude, unfitness, misconduct or sentence of court-martial. He might obtain his discharge for reason of expiration of enlistment three months or less prior to the normal date of expiration, provided that such early discharge was for the convenience of the government. An enlisted person serving in the regular navy was entitled to be placed on the retired list of the regular navy after completion of 30 years of federal service. Persons on the retired list were entitled to not more than 75% of active duty base and longevity pay which was received at the time of transfer to the retired list. A person on the retired list might be ordered to active duty in time of war or national emergency. When an enlisted person who completed the necessary service wished to transfer to the fleet reserve. his application had to be submitted to the chief of naval personnel not more than six months in advance of the date of the desired transfer. Upon completion of 30 years of combined active and inactive service, individuals were transferred to the retired list. Retainer pay for fleet reservists could not exceed 75% of active duty and longevity pay. Upon the death of any enlisted person on active duty, his estate was entitled to receive six months' pay. While under enlistment a seaman was permitted to engage in any other employment only when specifically authorized by proper authority.

Hospitals are maintained throughout the United States and the territories for sick and injured seamen; and hospital ships usually accompany naval forces to provide medical service. Medical care is made free to persons of the naval service and to their dependents when conditions permit. Hospitalization is provided enlisted personnel on active duty, when members of the fleet reserve and when on the retired list. Treatment may be obtained at any hospital of the armed forces or at marine hospitals maintained by the public health service.

Merchant Seamen. — The word "seaman" was defined in the Revised Statutes as follows:

Every person having command of any vessel belonging to any citizen of the United States shall be deemed to be the "master" thereof; and every person (apprentices excepted) who shall be employed or engaged to serve in any capacity on board the same shall be deemed and taken to be a "seaman"; and the term "vessel" shall be understood to comprehend every description of vessel navigating on any sea or channel, lake or river, to which the provisions of this Title may be applicable (Revised Statutes 4612).

In addition to the regular crew. the following persons have been held to be seamen: a musician, a fisherman, a bartender, and the wife of the cook serving as second cook. The provisions of U.S. statutes with regard to seamen apply to all seamen generally. Specific exceptions are made in the application of certain sections

to seamen employed on fishing or whaling vessels and yachts, for which it is necessary to consult the statutes.

Engagement.—Seamen employed on vessels bound from a port of the United States to a foreign port other than a port in Canada, the West Indies or the republic of Mexico, or on any vessel of the burden of 7j tons or upward bound from a port on the Atlantic to a port on the Pacific or vice versa, are required to be engaged in the presence of a shipping commissioner by an agreement in writing in a form prescribed by statute. The written agreement is commonly known as the "articles." It is signed in duplicate and one copy is retained by the shipping commissioner and the other by the master of the ship, who is required to post a copy in such part of the vessel as to be accessible to the crew

However. in the case of all vessels not classified as above, the owner, master or consignee may perform the duties of a shipping commissioner. Moreover, none of the above-mentioned provisions with respect to the engagement of a crew is applicable to the coastwise trade (except the coastwise trade between the Atlantic and Pacific coasts) or in the lake-going trade touching at foreign ports or otherwise, or in the trade between the United States and Canada, or in any case in which the seamen by custom or agreement are entitled to participate in the profits or result of a cruise or voyage.

However. shipping commissioners may, at the request of the master or owner, engage or discharge crews of vessels engaged in the coastwise trade or the trade between the Cnited States and Canada. the West Indies or the republic of Mexico. and, when so doing, are reauired to observe manv of the reauirements of the statutes applicable to those vessels which must compulsorily engage seamen with the supervision of a shipping commissioner. Furthermore, vessels of a burden of 50 tons or over bound from a port in one state to a port in any other than an adjoining state! except vessels of a burden of 75 tons or over bound from a port on the Atlantic coast to ports on the Pacific coast or vice versa, are required in the engagement of seamen to make an agreement in writing declaring the voyage or term of time for which the seamen shall be shipped.

Where the contents of the written agreement are regulated by statute, it is required to show the nature and duration of the intended voyage, the port of termination, the number and description of the crew, the time at which each seaman is to be on board, the capacity in which each seaman is to serve, the wages, a scale of provisions which are to be furnished to each seaman. the requirements as to conduct. the regulations as to fines or other lawful punishments and stipulations as to allotment of wages.

Seamen may also be engaged in ports outside the United States in which there is a consular officer, provided the sanction of the consular officer is obtained and the seamen are engaged in his presence. In such cases the rules governing the employment of such seamen are the same as those governing the engagement of seamen in the United States before a shipping commissioner.

Discharge.—The discharge of sailors in the United States from vessels engaged in foreign voyages, or from vessels of the burden of 7j tons or upward engaged in voyages between the Atlantic and Pacific coasts of the United States, must take place before a shipping commissioner, except nhere some competent court otherwise directs. In foreign ports either the master or the seaman may apply to the consul for a discharge of the seaman. and, if it appears to the consul that the shipping agreement has been completed or that the seaman is entitled to his discharge under an act of congress or the principles of the maritime law, the consul must discharge the seaman and require at the same time the payment of wages due. If the discharge is not for neglect of duty. incompetency or injury incurred on the vessel, the master must provide the seaman with employment on another vessel agreed to by the seaman or provide him with one month's extra wages. If the discharge is by voluntary consent, the seaman is entitled only to uages up to the time of his discharge. If the discharge is a result of injury or illness the expenses of the seaman's maintenance and transportation to the United States are paid from the fund for the maintenance and transportation of destitute U.S. seamen. If the discharge takes place by reason of the vessel's being sold in a foreign country, the master must provide the seaman with adequate employment on board some other vessel bound to the port of original shipment or to some other port agreed upon or must provide him with passage home or leave with the consul a sum of money sufficient to pay for the seaman's maintenance or passage home.

Whenever the discharge of a seaman in a foreign country takes place by reason of the consul's finding that the voyage is continued contrary to the original agreement or that the vessel is badly provisioned and unseaworthy or that the officers have cruelly treated the seaman, the master is required to pay the seaman one month's extra wages and to provide him with employment on board some other vessel or with passage either to the port of original shipment or to the most convenient port of entry in the United States or to a port agreed to by the seaman.

Wages.—The written articles of agreement in cases where they are subject to statutory regulation are required to contain the rate of wages to which the seaman is entitled. At the termination of the service, the master is required to pay the seaman in the presence of the shipping commissioner, and both the master and seaman are required to sign a mutual release of all claims for wages. Wages are not dependent upon the earnings of freight.

In case the service of a seaman terminates before the end of the engagement by reason of the loss or wreck of the vessel, the seaman is entitled to wages only up to the termination of his service. However, under such circumstances he is entitled to transportation to the port of shipment as a destitute seaman. If a seaman has signed an agreement and he is discharged before the commencement of the voyage or before one month's wages are earned without fault on his part or without his consent, he is entitled only to a sum equal in amount to one month's wages as compensation and may recover that compensation as if it were wages earned.

Wages of a seaman engaged in coastal voyages must be paid within two days after the termination of the agreement or at the time such seaman is discharged, whichever happens first. In the case of vessels making foreign voyages or voyages between the Atlantic and Pacific coasts of the United States. wages must be paid within 24 hours after the cargo has been discharged or within four days after the seaman has been discharged, whichever happens first. The refusal or neglect on the part of the master to make such payment without sufficient cause makes the master and owner liable to the seaman for a sum equal to two days' pay for each and every day for which payment is delayed beyond the period due, which sum is recoverable as wages.

A seaman is entitled to receive on demand from the master one-half the balance of the wages earned and remaining unpaid at the time when such demand is made at any port where such vessel, after the voyage has been commenced. shall load or deliver cargo before the voyage is ended. A demand may not be made oftener than once in five days or more than once in the same harbour on the same entry. This section is applicable alike to seamen on U.S. vessels and seamen on foreign vessels while the foreign vessels are in a U.S. port.

For the recovery of his wages, a seaman may sue the owner in *personam* ("against a specific person") at common law or in admiralty, and may also sue the vessel in *rem* ("against all concerned") in admiralty. For this purpose he has a lien which takes precedence over nearly every other lien against the vessel. In case the wages are not paid within ten days after they are due, or any dispute arises between the master and seaman touching wages, the seaman may obtain the intervention of a district judge of the judicial district where the vessel is present, who may summon the master of the vessel to appear before him and show cause why the vessel should not be attached.

It is a misdemeanour to pay a seaman wages in advance of the time when he has actually earned them or to pay such wages or make any evidence of indebtedness to any other person or to pay any person for the shipment of the seaman when the payment is deducted or to be deducted from the seaman's wages. In the case of U.S. vessels. such advances in wages or allotment of wages, whether made within or without the United States, are illegal.

In the case of foreign vessels they are illegal only when made in the United States. Moreover. the seaman may recover his wages in full without any deductions on account of advances. However: the seaman may stipulate in the articles for the allotment of a portion of his wages to his dependent relatives provided the allotment has the approval of the shipping commissioner. The wages of a seaman are not subject to attachment.

Duties of *Seaman* and *Shipowner.*—A seaman is required to obey the lawful commands of his superiors in the navigation of the ship and may be punished for the following offenses: desertion; neglecting or refusing without reasonable cause to join his vessel; absence without leave under certain conditions; quitting the vessel without leave after her arrival at the port of delivery and before she is placed in security; willful disobedience to any command at sea: continued willful disobedience to lawful commands and continued neglect of duty at sea; assaulting any master or mate; willfully damaging the vessel; embezzlement or damage to any of the cargo; and smuggling.

The shipowner is required to provide the seaman with food according to a scale enacted by statute. Provision is made whereby seamen may complain to an officer of the navy, a consul of the United States, a shipping commissioner or a chief officer of customs, in case the provisions for the use of the crew are of bad quality or deficient in quantity. There is further provision for the correcting of any failure on the part of the master to observe the law with respect to provisions and water. Vessels on foreign voyages and on voyages between the Atlantic and Pacific coasts are required to carry a sufficient quantity of lime and lemon juice or other antiscorbutics, to be served to the seamen according to the provisions of the statute. Such vessels are also required to be provided with a so-called slop chest or shop containing a complement of clothing for each seaman employed and also a full supply of tobacco and blankets. The contents of the slop chest are sold to seamen at a reasonable profit.

It is unlawful for the owner to send his vessel to sea in such unseaworthy condition that the life of any person is likely to be thereby endangered, unless he proves that he used all reasonable means to ensure seaworthiness of the vessel or that the sending of the vessel to sea in an unseaworthy condition was under the circumstances reasonable and justifiable. For the enforcement of these provisions further legislation was passed by which inspection of the vessel may be obtained either at domestic ports or foreign ports: legislation also provides for the discharge of the crew in case the vessel is unfit to go to sea.

The statutes prescribe the number of cubic feet which must be allotted in the crew's quarters to each seaman and regulate the lighting and ventilation. Merchant vessels which ordinarily make voyages of more than three days' duration between ports and which carry a crew of 12 or more seamen are required to have a compartment for hospital purposes, having at least one bunk for every 12 men and not more than six bunks in any case. All merchant vessels constructed after March 3. 1897, and having more than ten men on deck must have a mashing place provided with at least one washing outfit for every two men of the watch.

Manning of *Merchant Vessels.*—Merchant vessels of more than 100 tons gross while at sea are required to divide their officers, sailors, coal passers, firemen, oilers and water tenders into two watches. While such a vessel is in a safe harbour seamen cannot be required to do unnecessary work on Sundays or on the following named days: New Year's day, Independence day. Labor day, Thanksgiving day and Christmas day. While in a safe harbour, nine hours. inclusive of the anchor watch. constitute a day's work.

Of each department of the crew 75% must be able to understand any order made by the officers. and of the deck crew 65%, exclusive of licensed officers and apprentices. must be of a rating not less than able seaman. A person may be rated an able seaman and qualified for service as such on the seas who is 19 years of age and who has had three years' service on deck. The requirements for able seamen on the Great Lakes are less.

In case of desertion or casualty resulting in the loss of one or more seamen, the master before proceeding to sea must ship others to take their places, if they are obtainable.

Officers on U.S. vessels must be citizens of the United States, and this applies to the chief engineer and assistant engineers of vessels propelled by steam who may be in charge of a watch. Honever on foreign voyages vacancies may be filled by otherwise properly qualified persons who are not citizens, until the first return of the vessel to its home port. All officers, including the master and the engineers, are required to obtain licences from the coast guard. such licences being issued only after an examination into the qualifications of the applicant.

Remedies of *Seamen* in Cases of *Injury in Course* of *Employment.*—For every injury and illness incurred while in the service of the vessel and not attributable to his onn vice. a seaman is entitled to the reasonable expenses of his maintenance and cure, including medical attention and board and lodging for a reasonable period. In the construction of the reasonableness of the period, there is a tendency to allow a seaman maintenance and cure for that period during which physicians hold that treatment could produce a cure In addition thereto, if the seaman's injury or illness is caused by the unseamorthiness of the vessel, or by breach of the obligation to furnish good food and water and prompt and proper medical attention, the seaman may recover damages Under the Merchant Marine act of 1920, commonly known as the Jones act, a seaman may recover against his employer if he is injured through the negligence of the employer or of anyone employed by him. Likewise the representatives of a deceased seaman may recover damages against the employer if the death was caused by the unseaworthiness of the vessel, or if there was a breach of the obligation to furnish good food and provisions or prompt and proper medical attention. or. under the Jones act, if the death was caused by the negligence of the employer or anyone employed by him.

The seaman may enforce his right to obtain maintenance and cure, or damages. either in *personam* against the employer or in rem against the vessel, or he may sue at common law either in the federal or state courts. He may not, however, recover under the Jones act by a proceeding in rem in the admiralty courts. The representative of a deceased seaman may recover damages for the death of a seaman by an action in *personam* in admiralty or an action at common law. Where death statutes give no lien, and they generally do not, the representative may not sue in rem in admiralty to enforce a cause of action for death.

The federal government provides a number of marine hospitals at the more important ports of the United States, at which seamen may obtain free hospital and medical attention in case of injury or illness occurring while in the service of a merchant vessel. Formerly shipowners were required to contribute to the maintenance of this hospital service. but the requirement mas later discontinued In case a seaman is injured and unable to continue in the service of the ship while she is in a foreign port, the shipowner has the primary duty of rendering the seaman proper medical attention and arranging for his transportation to a port in the United States. By act of congress however, the U.S. consuls are also required. in case disabled seamen are discharged, to transport them to a port in the United States at the expense of the government. In case the consul refuses to discharge a seaman, the shipowner must bear the expense of returning him to the United States.

U S seamen rendered destitute in a foreign country for any reason whatever are entitled on application to the U.S. consul to be furnished with subsistence and passage to some port in the United States. The consul is empowered to require the master of any U S vessel to take such destitute seamen on board at the expense of the government.

Formerly masters of vessels were permitted to flog seamen in order to enforce discipline Such practice is now prohibited Desertion was formerly an offense carrying the penalty of arrest and imprisonment The seaman is now subject only to the loss of his clothing left on board and his nages. Moreover, no provision is made whereby deserters from either C.S. or foreign vessels may be compelled to rejoin their vessels. This situation is designed to approximate in the case of seamen the freedom of obtaining and leaving employment existing in shore employments.

See Martin J. Norris, ***The Law*** of *Seamen* (New York, ***1951***).

(V. S. J.; R. PAR.; C. P. N.)

BRITISH COMMONWEALTH

For legislative purposes, seamen may be divided into three classes: seamen in the royal forces, merchant seamen and fishermen.

Seamen in the Royal Forces.—Most of these serve in the royal navy and its reserves, with which are classified the royal marines and reserves while in H.M. ships. Both the army and royal air force, however, also operate numerous vessels manned by their onn personnel qualified to act as seamen.

Impressment of men for naval service, a prerogative power, is still lawful but has been dormant for more than 100 years; unused in the Crimean War, its exercise was declared impracticable by the Royal Commission on Manning the Navy, 1859. In emergency, officers and men of the coast guard and of revenue cruisers, seaman riggers and pensioners may be required to serve in the navy (Naval Volunteers act, 1853; Coastguard act, 1925). Voluntary enlistment (Naval Enlistment acts, 1835, 1853 and 1884) is no longer, even in peacetime, the only other method of recruitment, for the National Service acts, 1948–55, supply the navy as well as the other royal forces. The maintenance of discipline in the navy is regulated by a permanent statute, the Naval Discipline act, 1866 (including the Articles of War), as amended by later acts and by certain delegated legislation; discipline is further governed by the Queen's Regulations and Admiralty Instructions, the Criminal Justice act, 1948, which abolished sentences of corporal punishment (suspended earlier in the navy), and the Courts-Martial (Appeals) act, 1951.

Merchant Seamen.—Most of the numerous acts concerning merchant seamen, commencing with 8 Eliz. I c. 13, 1566, were repealed by the Merchant Shipping Repeal act, 1854, and the law was consolidated and extended by the Merchant Shipping act, 1854. The many amending statutes enacted in the succeeding 40 years were mostly repealed and the law was again consolidated by the Merchant Shipping act, 1894. Many of the provisions of this act which directly or indirectly concern seamen uere later repealed, amended or added to not only by numerous subsequent merchant shipping acts but also by other legislation. By the late 1950s a new consolidating statute was therefore considerably overdue. Moreover, the law is to be found not only in statutes but also in the great mass of rules and regulations made ministerially under powers delegated by parliament and in the law reports.

The principal act defines a "seaman" as including "every person (except masters, pilots and apprentices duly indentured and registered) employed or engaged in any capacity on board any ship," and "ship" as including "every description of vessel used in navigation not propelled by oars." Most of the relevant sections are in part ii of the act. Special provisions exist regarding sea apprenticeship. Only persons licensed or authorized by the act of 1894 may supply or engage seamen. Seamen are engaged by their signing, after the master, a statutory contract of service which, with few exceptions, is obligatory in all ships and is commonly called the ship's articles. Articles must be in the form approved by the ministry of transport and civil aviation (hereinafter called "the ministry") except in the case of lascars, for whom special provisions are enacted. Engagement and discharge in the United Kingdom must be effected in the presence of an official superintendent or his deputy, save that in the case of home-trade ships, as defined in the act, of less than zoo tons gross, masters may elect to forgo this requirement. The act makes provision to ensure that every seaman understands the articles before signature, and a copy must be posted in some part of each ship accessible to the crew. As a rule, where articles are opened in the United Kingdom in the case of ships of 200 tons gross and over, they incorporate by reference the further detailed terms and conditions of service, established and revised from time to time by the National Maritime board as the result of agreement between shipowners' organizations and officers' and men's unions. A ship may be detained unless a certificate of due execution of articles is obtained by the master from the superintendent, who retains a duplicate copy of the articles. The act of 1906 provides that before a seaman or apprentice can be discharged outside the United Kingdom, except in the country where he was shipped, the master must obtain the sanction. endorsed on the articles, of a local British consular officer (if any) or of a British merchant in a foreign country, or of a superintendent (if any) or chief officer of customs in a British possession. Provision is made for the relief, maintenance and return to a proper port of seamen and apprentices discharged, shipwrecked or in distress abroad; a proper return port is one where the seaman or apprentice was shipped or one in his own country or, if he is discharged. a port agreed to by him; he may either be placed in a British ship or be given a passage in any ship or passage money, and is allowed expenses of necessary land travel.

Wages.—The National Maritime board by agreement establishes, revises and maintains national rates of wages and overtime applicable to most seamen. The acts of 1894 and 1906 contain numerous provisions regarding wages, regulating advances, allotments, time and methods of payment, deductions, etc. Thus, where a seaman is discharged before a superintendent in the United Kingdom. his wages must be paid through or in the presence of the superintendent and, in the case of home-trade ships of less than 200 tons gross, may be so paid if the master or owner desires. The master of every merchant ship must deliver to the superintendent or to the seaman a full account, in a form approved by the ministry, of wages and deductions; deductions will be allowed only if entered by the master during the voyage in a book kept for the purpose together with a statement of the reason for each deduction. Where a seaman is left abroad because unfit or unable to proceed on the voyage, the wages account must be delivered to whoever grants the sanction, endorsed on the articles, to leave the seaman behind. The act of 1925 entitles any person not paid solely by sharing profits or gross earnings of a fishing boat, who is unemployed because of the wreck or loss of his ship and is unable to obtain other suitable employment, to wages for every day he is so unemployed up to a maximum of two months from the termination of his services. Seamen, since the Marine Insurance act, 1906, may insure against loss of wages as a result of shipwreck; masters had this right before the act and retained it.

Seamen have several remedies under English law for recovery of wages due and unpaid, principally the following: below £5, or by agreement over £5, a superintendent may adjudicate; below £50, seamen may sue in courts of summary jurisdiction; below £1,000, or by agreement above £1,000, they may sue in *rem* or in *personam* (an action *in personam* is more akin to a common-law action) in admiralty county courts; without restriction of amount, but subject to certain provisions concerning costs, they may sue *in rem* or in *personam* in the admiralty court. (The Administration of Justice act, 1956, repeals former restrictions upon claims below £50 in admiralty county courts and the admiralty court.) An action in rem for wages is the admiralty proceeding whereby the seaman's maritime lien on ship and freight is enforced; the writ may be served on the vessel and if necessary she may be arrested and sold by order of the court to meet proved or admitted claims. Masters by statute have the same rights, liens and remedies as seamen and their "wages" may include necessary disbursements and liabilities. In Scotland the system of judicature differs but the remedies available are not less favourable.

Safety.—Certificates of competency are granted after examination by the ministry for the following grades: master, first mate, second mate or only mate of a foreign-going ship; first- or second-class engineer; able-bodied seaman; ship's cook. By virture of orders in council under section 102 of the act of 1894, certain certificates granted in the British Commonwealth and empire have the same force. Certificates may be suspended or canceled on grounds set out in the same act, which also provides for appeals and powers of reissue. There are detailed provisions regarding the minimum numbers and grades of certificated persons to be carried in vessels of various types. The act of 1894 provides that "if any person sends or attempts to send, or is party to sending or attempting to send, a British ship to sea in such an unseaworthy state that the life of any person is likely to be thereby endangered, he shall in respect of each offence be guilty of a misdemeanour, unless he proves either that he used all reasonable means

to insure her being sent to sea in a seaworthy state, or that her going to sea in such an unseaworthy state was, under the circumstances: reasonable and justifiable . . . ." The act also imposes upon owners. by contractual implication in favour of masters, seamen and apprentices, a heavy civil obligation respecting seaworthiness. The act of 189; gives power to detain ships unseaworthy because undermanned. The act of 1906 extends many of the provisions concerning seaworthiness to foreign ships. which, like British ships, may be detained if unsafe. Many safety provisions in the acts (*e.g.*, as to lifesaving appliances: load lines, dangerous cargoes. etc.) mere repealed. extended and added to by the acts of 1932 and 1949, which were enacted as the result of international conventions and give wide ministerial powers to make regulations.

The international convention of 1948 also led to the enactment of revised regulations for preventing collisions at sea which came into force on Jan. 1. 1954. The act of 1948 provided for considerable improvements in the standards of crew's living conditions in ships. The Merchant Shipping acts enact minimum requirements. to be entered in the ship's articles. regarding crew's food and water, and officials may inspect and detain ships in which the quality is deficient; monetary compensation is payable by owners for short or bad provisions, and crews can raise complaints and enforce official inspection; foreign-going ships having 100 persons or more on board must carry a doctor. and medical stores and medicines must be provided in all ships on prescribed scales. If a master or seaman is hurt or injured in the service of the ship, or suffers illness. not being illness resulting from his own willful act or default or from his own misbehaviour, the expense of medical attendance, maintenance and repatriation falls on the shipowner and cannot be deducted from wages. The National Insurance (Industrial Injuries) acts. 1946–53 (replacing the former workmen's compensation legislation and closely connected with the National Insurance acts. 1946–56), and numerous regulations made thereunder apply to "mariners" of British ships registered in Great Britain (excluding Northern Ireland. which. however. has its own analogous legislation) or whose owner resides or has his principal place of business there. or of other ships which may be prescribed. under certain conditions. by regulation. The right of seamen injured. or, if killed. of their executors. administrators or dependents. to sue negligent owners for damages in the courts is not removed by these acts. Seamen may in certain circumstances be entitled to share in salvage awards. They are privileged in the matter of wills. Continuity of residence of aliens seeking naturalization is not interrupted by service in British ships, but their former privilege regarding fees. introduced in 1904, was revoked in 1915 and was not revived. Conscription of seamen: as of others, into the royal forces is regulated by the National Service acts. 1948–55.

Discipline.—Seamen in British ships remain subject to the general criminal law. The acts of 1894 and 1906 also make special provision for the summary punishment of certain offenses unrelated to civilian life ashore; *e.g.*, misconduct endangering ship or life, neglect or refusal to join ship. desertion and willful disobedience to lawful coniniands. Punishments include imprisonment. fine, forfeiture of n-ages or effects, entry of the offense in the official logbook and grant of an unfavourable discharge certificate. Corporal punishment may in no circumstances be inflicted. but in certain circumstances deserters and absentees may be forcibly taken on board. The master has certain common-law powers to arrest and confine persons n-ho are in his ship.

Fishermen. — Part iv of the Merchant Shipping act. 1894, consolidates earlier enactments. from 1868, relating to fishing boats. It is of general application in the United Kingdom (though not in any British possession), having been extended to Scotland. with certain formal modifications. by the act of 1920. Its provisions are mostly in lieu of those relating to merchant seamen in part ii; thus. for example, skippers are punishable for several offenses against discipline as if they were seamen; skippers and seamen giving notice of intended absence more than 48 hours before sailing time cannot be forcibly taken on board; and. wages being often on a profits basis, provision is made for ascertainment of profits and calculation of wages in statutory form. Part iv defines "fishing boat" as "a vessel of whatever size, and in whatever way propelled. which is for the time being eniployed in sea fishing or in the sea-fishing service, but save as otherwise provided, that expression shall not include a vessel used for catching fish otherwise than for profit.'!

Fishing boats are usually "ships" as defined in the act and subject to the same rules regarding lifesaving appliances.

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(K. C. McG.)

LAWTON, a city of southwest Oklahoma. U.S., 105 mi. S.W. of Oklahoma City. the seat of Comanche county, was originally part of the Choctaw-Chickasaw leased lands in the old Indian territory. In 1869 the Kiowa and Comanche Indians were settled in the area and Ft. Sill was established to control them. A settlement of traders, guides and soldiers' families was located near the fort. and in 1901, when 3.500.000 ac. of Indian lands were opened by lottery to white settlers. the town of Lawton grew up in a day. It was named for Gen. Henry W. Lawton, sent to capture the Apache leader. Geronimo. Lawton is located in a grazing and farming region and is the site of Cameron State Agricultural college. a two-year college founded in 1901. The Ft. Sill military reservation, 4 mi. N. of the city. is now an artillery centre. Lawton is the home of the Wichita Mountain Easter Pageant. Recreational facilities include a fishing resort and the Wichita Mountain wildlife refuge.

Pop. (1960) 61.697. For comparative population figures see table in OKLAHOMA: *Population.* (AN. L.)

LAWYER: *see* LEGAL PROFESSION.

LAXNESS, HALLDÓR KILJAN (1902–). Icelandic writer, awarded the 1955 Nobel prize for literature. was born in Reykjavik on April 23, 1902. He wrote his first book. a romanticized peasant novel. at 17, but his style was still impersonal. Restlessly searching. he spent his youth in Europe after World War I and became a Roman Catholic. He remained abroad for several years. in France and the United States. The religious commandment to love one's neighbour took on political significance for him when he made the acquaintance of communism, whose ideas formed a recurrent pattern in his subsequent work. In 1930 he settled down in his native island. where, in quick succession. he completed the mature and important works which laid the foundation of his position as Iceland's leading author: *Salka Valka* (1934), which describes. in vigorous and realistic strokes. life in an Icelandic fishing village; *Sjalfstaet folk* (1934–35; trans.. Independent *People*), a moving epic about the Icelandic small holder's struggle against nature and the community for his right to exist as a free human being; *Islands Klukkan* (1943; *The* Bell of *Iceland*), which deals graphically with a dark phase of the island's history under Danish rule in the 18th century. Gerpla (1952) is set in the Viking age and is an ironic pastiche on the Icelandic sagas. A regenerator of language. Laxness restored his Icelandic mother tongue as a sensitive instrument for great storytelling. (A. L. BR.)

LAYAMON (more strictly *Lagamon,* modernized *Lawman*). Early English poet. the author of the romance-chronicle, the Brut (c. 1200), the outstanding literary product in English of the new patriotism which developed in the 12th century. Layamon describes himself as a priest, son of Leovenath and living at Ernlege (now Arley Kings) in Worcestershire. Le *Roman* de *Brut,* the Anglo-Norman translation by Robert Wace. of Geoffrey of Monmouth's *Historia Regum Britanniae,* controls Layamon's composition throughout, but detail is freely handled and often amplified from local tradition and personal knowledge. In some 16,000 long

alliterative lines (often broken into short couplets by rhyme), the *Brut* relates the legendary history of Britain from the landing of Brutus. great-grandson of the Trojan Aeneas, to the final Saxon victory over the Britons under Cadwallader in 689. (Layamon follows Geoffrey of Monmouth in confusing Cadwallader and Cædwalla.) A third of the poem deals with the story of Arthur; but Layamon's is not a high chivalric treatment: mass war is the staple, with Arthur the splendid mar-leader.

The *Brut* is preserved in two manuscripts. one roughly contemporary with the original, preserving the original language: the other, written 50 years later, showing an extensive simplification of diction, much of which must have been archaic when Layamon composed his unsophisticated and grimly fantastic history.

BIBLIOGRAPHY.—The *Brut*, edited by Sir F. Madden for the Society of Antiquaries (3 vol., 1847) was re-edited for the Early English Text society (1961). L. A. Paton's *Arthurian Chronicles*, Everyman's Library (1912) contains an incomplete translation. See also J. S. P. Tatlock, *The Legendary History of Britain*, chap. 23 (1950). J. E. Wells, *A Manual of Writings in Middle English, 1050–1400* (1916) with Supplements (1919–51) contains a full bibliography. (G. SD.)

LAYARD, SIR AUSTEN HENRY (1817–1894), British author and diplomatist, the excavator of Nineveh, was born in Paris on March 5, 1817, son of Henry P. J. Layard, of the Ceylon civil service. Much of his boyhood was spent in Italy, where he received part of his schooling, and acquired a taste for the fine arts and a love of travel; but he was at school also in England, France and Switzerland. After spending nearly six years in a solicitor's office in London, he started in 1839 with the intention of making an overland journey across Asia to Ceylon, where he was to enter the civil service. But, after wandering for many months, chiefly in Persia, he returned in 1842 to Constantinople, where Sir Stratford Canning employed him in various unofficial diplomatic missions in European Turkey. In 1845, encouraged and assisted by Canning, Layard left Constantinople to explore the ruins of Assyria. This expedition fulfilled a design which he had formed, when, during his earlier travels in the East, he had seen the ruins of Nimrud on the Tigris, and the great mound of Kuyunjik, near Mosul, already partly excavated by Botta.

Layard remained in the neighbourhood of Mosul, excavating at Kuyunjik and Nimrud, and investigating the condition of various tribes, until 1847. Returning to England in 1848, he published *Nineveh and its Remains: with an Account of a Visit to the Chaldaean Christians of Kurdistan, and the Yezidis, or Devil-worshippers; and an Inquiry into the Manners and Arts of the Ancient Assyrians* (2 vol.. 1848–49), accompanied by *Illustrations of the Monuments of Nineveh* (1849). After a few months in England, Layard returned to Constantinople as attaché to the British embassy, and, in Aug. 1849, started on a second expedition, in the course of which he investigated the ruins of Babylon and the mounds of southern Mesopotamia. His record of this expedition, *Discoveries in the Ruins of Nineveh and Babylon* (1853), was accompanied by a volume of illustrations, *A Second Series of the Monuments of Nineveh*. During these expeditions Layard sent to England the splendid specimens which now form the greater part of the collection of Assyrian antiquities in the British Museum. Apart from the archaeological value of his work in identifying Kuyunjik as the site of Nineveh, these two books of Layard's are among the best-written books of travel in the language.

Layard entered parliament for Aylesbury in 1852. He was for a few weeks under-secretary for foreign affairs, but afterward freely criticized the government, especially in connection with army administration. He was present in the Crimea during the war, and was a member of the committee appointed to inquire into the conduct of the expedition. In 1853 he refused from Lord Palmerston an office not connected with foreign affairs. was elected lord rector of Aberdeen university, and on June 15 moved a resolution in the House of Commons (defeated by a large majority) declaring that in public appointments merit had been sacrificed to private influence and an adherence to routine. Defeated at Aylesbury in 1857, he visited India to investigate the causes of the Mutiny. He unsuccessfully contested Tork in 1859, but was elected for Southwark in 1860, and from 1861 to 1866 was under-secretary for foreign affairs in the successive administrations of Lord Palmerston and Lord John Russell. In 1866 he was appointed a trustee of the British Museum, and in 1868 chief commissioner of works in W. E. Gladstone's government and a member of the Privy Council. He retired from parliament in 1869, on being sent as envoy extraordinary to Madrid. In 1877 he was appointed by Lord Beaconsfield ambassador at Constantinople, where he remained until Gladstone's return to power in 1880, when he finally retired from public life. In 1878 he received the G.C.B. Layard's manner was brusque, and his advocacy of the causes which he had at heart, though always perfectly sincere, was vehement to the point sometimes of recklessness. Layard retired to Venice. where he devoted much of his time to collecting pictures of the Venetian school, and to writing on Italian art. On this subject he was a disciple of his friend G. Morelli, whose views he embodied in his revision of F. Rugler's *Handbook of Painting, Italian Schools* (1887). In 1887 he published, from notes taken at the time, a record of his first journey to the East. entitled *Early Adventures in Persia, Susiana and Babylonia*. An abbreviation of this delightful book was published in 1894, shortly after the author's death. with a brief introductory notice by Lord Aberdare. Layard died in London on July 5, 1894.

(A. GL.; X.)

LAYNEZ (or LAINEZ), **DIEGO** (1512–1565), the second general of the Society of Jesus, mas born in Castile, and after studying at Alcala joined Ignatius of Loyola in Paris, being one of the six who with Loyola in Aug. 1534 took the vow of missionary work in Palestine in the Montmartre church. After the order had been definitely established (1540) Laynez was sent to Germany. He was one of the pope's theologians at the council of Trent (*q.v.*), where he played a weighty and decisive part. When Loyola died in 1556 Laynez acted as vicar of the society, and two years later became general. Before his death at Rome, on Jan. 19, 1565, he had strengthened the despotic constitution of the order and developed its educational activities. (*See* JESUS, SOCIETY OF.) His *Disputationes Tridentinae* were published in 2 vol. in 1886.

See H. Miiller, *Les Origines de la Compagnie de Jésus: Ignace et Lainez* (1898).

LAZAREV, PETR PETROVICH (1878–1947), Russian physicist. was born in Moscow, April 1, 1878. A doctor of medicine of Moscow university, he did research work in science at Strasbourg and in 1907 was appointed *Privatdozent* in physics and assistant to P. N. Lebedev at the University of Moscow. In 1912 he became professor at the technical college in Moscow, and in 1917 member of the Russian academy of sciences and director of the research institute of physics and biophysics in Moscow. Lazarev's early investigations were in photochemistry; he showed by experiment that the velocity of photochemical reactions is proportional to the absorbed energy and does not depend on the wave length of light. Another series of his investigations was in molecular physics.

Lazarev's main work was on the stimulation of living matter. His ionic theory of stimulation explains the process of senses and of muscular contraction and forms the basis of his theory for the functions of the central nervous system. In 1918 Lazarev became head of the geophysical survey of the Kursk magnetic and gravimetric anomaly.

Some of his papers were published in French (*Comptes rendus de l'Académie*, 1923–24) and in English (*Journal of General Physiology*, 1924).

LAZARITES (LAZARISTS or LAZARIANS), the popular names of the "Congregation of Priests of the Mission" in the Roman Catholic Church. It had its origin in the successfui mission to the common people conducted by St. Vincent de Paul (*q.v.*) and five other priests on the estates of the Gondi family. Archiepiscopal recognition was obtained in 1626, by a papal bull of the 12th of January 1632, the society was constituted a congregation. with St. Vincent de Paul at its head. About the same time the canons regular of St. Victor handed over to the congregation the priory of St. Lazarus (formerly a lazar-house) in Paris, whence the name of Lazarites or Lazarists. Within a few years they had acquired another house in Paris and set up other

establishments throughout France. A fresh bull of Alexander 1-11 in April 16j j further confirmed the society: this was followed by a brief in September of the same year. regulating its constitution. The rules then adopted. which were framed on the modei of those of the Jesuits. were published at Paris in 1668 under the title *Regulae seu constitutiones communes congregationis missionis.* The special objects contemplated were the religious instruction of the lower classes. the training of the clergy and foreign missions. During the French Revolution the congregation n-as suppressed and St. Lazare plundered by the mob; it was restored by Napoleon in 1804 at the desire of Pius VII, abolished by him in 1809 in consequence of a quarrel with the pope. and again restored in 1816. Foreign missions are still maintained in various parts of the world.

BIBLIOGRAPHY.—*See* P. Hélyot, *Dict. des ordres religieux,* viii. 64–77; M. Heimbucher, *Die Orden und Kongregationen der katholischen Kirche,* ii (1897); C. Stork in Wetzer and Welte's *Kirchenlexikon* (Catholic). vii.; E. Bougaud, *History of* St. *Vincent de Paul* (1908); and art. "Congregation of the Mission" in the *Catholic Encyclopaedia.*

LAZARUS, a contracted form of the Heb. name Eleazar ("God has helped," *cf.* 1 Macc. ii. 5; frequent in Josephusj, is a name which occurs in the New Testament in two connections.

1. LAZARUS OF BETHANY, brother of Martha and Mary. John xi. relates the story of his being raised from the dead after four days. In the fourth century the house and tomb of Lazarus were shown to pilgrims, and the gospel narrative. which defines the localities with care (John xi. 18,30, 32, 38), may be based on the story told to first century visitors to Palestine.

2. LAZARUS is the name given by Luke (ch. xvi.) to the beggar in the parable of "Dives" and Lazarus. It is the only proper name attached to a character in the parables of Jesus.

LAZARUS, EMMA (1849–1887), U.S. poet. was born in New York city. July 22, 1849. Her first book (1866) included poems and translations written in her teens. At the age of 21 she published *Admetus and Other Poems* (1871), inscribed to Ralph Waldo Emerson. Much of her earlier n-ork appeared in *Lippincott's Magazine.* In 1874 she published a prose romance (*Alide*) based on Goethe's autobiography, n-hich was praised by Ivan Turgenev. Two years later she visited Concord and made the acquainiance of the Emerson circle. and while there read the proof sheets of her tragedy *The Spagnoletto.* In 1881she published he: excellent *Poems and Ballads of Heinrich Heine.* Another vigorous drama. *The Dance to Death,* is based on the accusation brought against the Jews of poisoning the wells. and thus causing the Black Death. This was included with some translations of medieval Hebrew poems, and such shorter pieces as "The Crowing of the Red Cock" and "The Banner of the Jew" in *Songs of a Semite* (1882), dedicated to George Eliot. She devoted much of the short remainder of her life to the cause of Jewish nationalism and visited Europe in 1883 and 1885–87. In 1887 appeared *By the Waters of Babylon,* a series of prose poems, full of prophetic fire. She died in New York on Nov. 19, 188;. She is noted a; the author of "The New Colossus." the sonnet engraved on a memorial tablet on the Statue of Liberty.

See E. C. Stedman's tribute in his *Genius and Other Essays* (1911); and *Emma Lazarus, Selections from Her Poetry and Prose,* ed. with *an* introduction by Morris U. Schappes. (I. A.)

LAZARUS, MQRPTZ (1824–1903), German philosopher, was born on Sept. 15, 1824, at Filehne. Posen. The son of a rabbinical scholar. he was educated in Hebrew literature and history. and subsequently in law and philosophy at Berlin. He was professor at Berne (1860–66), at the Kriegsakademie in Berlin (1868–73), and at Berlin university (1873) The fundamental principle of his philosophy was that truth must he sought not in metaphysical or *a priori* abstractions but in psychological investigation. and further that this investigation cannot confine itself successfully to the individual consciousness. but must be devoted primarily to society as a whole. The psychologist inust study mankind from the historical or comparative standpoint. analysing the elements which constitute the fabric of society. with its customs. its conventions and the main tendencies of its evolution. In support of this *Völkerpsychologie* (folk- or comparative psychology) he founded, with H. Steinthal, the *Zeitschrift für Völkerpsychologie und Sprachwissenschaft* (1859). His chief work was *Das Leben der Seele* (1855–57; 3rd ed.. 1883). Lazarus was pre-eminent among the Jews of the so-called Semitic domination in Germany. Like Heine. Auerbach and Steinthal, he took a leading place in German literature and thought. He protested against the violent anti-Semitism of the time in his *Treu und Frei, Reden und Vorträge über Juden und Judenthum* (1887). In 1869 and 1871 he was president of the first and second Jewish Synods at Leipzig and Augsburg.

LAZEAR, JESSE WILLIAM (1866–1900), U.S. physician and member of the commission which proved that yellow fever (*q.v.*) was transmitted by a mosquito vector, was born in Baltimore county. Md., on May 2, 1866. He attended Johns Hopkins university (A.B., 1889) and Columbia college of physicians and surgeons. New York city (M.D., 1892). He concluded his studies by two years internship at Bellevue hospital and a year's additional study in Europe. including some time at the Pasteur institute in Paris. Returning to the U.S., he set up practice in Baltimore and joined the medical staff of Johns Hopkins hospital, where he was among the first to investigate the structure of the malarial parasite. In 1900 he went to Cuba as acting assistant surgeon in the U.S. army. assigned to laboratory duty. There he was asked to join the Yellow Fever commission set up on that year which included Maj. Walter Reed. James Carroll and Aristides Agremonte. Lazear was given responsibility for the care and handling of the insects believed to be possible carriers of yellow fever. and was in charge of their application to volunteers and fever patients for experimental purposes. In the course of his work he was accidentally bitten by one of the mosquitoes. though he saw it alight on his hand and could have warded it off. He contracted the fever and died on Sept. 2j. 1900, after a week's illness.

Lazear's contribution to the solution of the yellow fever scourge was ranked by Reed as equal to that of each of the other members of the commission, and he was memorialized by a tablet erected at Johns Hopkins hospital.

LEA, HOMER (1876–1912), U.S. soldier who, 30 years before World War II, accurately foretold a U.S.-Japanese war and the early course it would take. Born at Denver. Colo., on Nov. 17, 1876, he was educated at Occidental college, Los Angeles, Calif., and at Stanford university. where he studied law. Intensely interested in military history and strategy, and unable to join the U.S. army (he-was a hunchback), he went to China in 1899 .where he soon was in command of a body of volunteers of K'ang Yu-wei (*q.v.*), who was plotting the overthrow of the Manchus. The plot was discovered and Lea fled to Hong Kong, where he met Sun Tat-sen. He went with Sun to Japan and later became his chief of staff. In 1901 he returned to the United States. He was back in China in 1904 for a short time, then returned permanently to California. where he wrote a novel of the Manchu regime. *The Vermilion Pencil* (1908), and dictated his well-known *The Valor of Ignorance,* published in 1909. In the latter, often termed one of the most brilliant of military analyses, Lea dwelt at length on the inordinate ambitions of the Japanese army.

Lea predicted a U.S.-Japanese war in which Hawaii would be the key position. and specified how the Japanese would conquer the Philippines and attempt an invasion of the Cnited States proper along the coast of Washington and Oregon. Lea died Nov. 1, 1912.

LEACOCK, STEPHEN BUTLER (1869–1944), Canadian humourist. historian and economist. was born Dec. 30. 1869, at Swanmoor. Eng., and emigrated to Canada with his parents at the age of six. From the family farm near Lake Simcoe. Ont.. he was sent to Upper Canada college (1882–87) and later attended the University of Toronto. where he was graduated B.A. in 1891. After teaching for eight years at Upper Canada college. he entered The University of Chicago. In 1903, having Seen (according to his own account) "examined for the last time and . . . pronounced completely full." he was awarded the Ph.D. Appointed in the same year to the staff of McGill university in Montreal, he became head of the department of economics and

political science in 1908 and served in that capacity until his retirement in 1936. He died at Toronto, March 28, 1944.

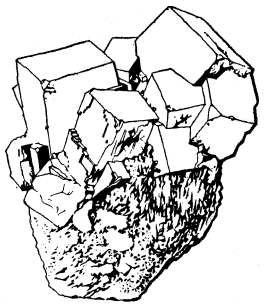
A prolific writer, Leacock was the author of nearly a score of monographs in the fields of history and political economy. Rut his true calling was humour, both as a public lecturer and as an author, and his fame now rests securely on work begun with the beguiling fantasies of *Literary Lapses* (1910) and *Nonsense Novels* (1911) and continued in some 30 books of humorous sketches and essays. Leacockian humour is typically a humour of "mellowed vision." Deeply impressed by what he called "the appalling inequalities of our human lot," he saw in the "higher" forms of humour a power to comfort and to heal. The spirit of sarcasm is foreign to his work; the laughter provoked is the laughter that unites rather than divides the human family. Leacock's weakness was that he created no plots for his books, and they therefore lack a dimension found in the writings of Dickens and Mark Twain. But for sheer youthful zest and perceptiveness in comic invention he has few rivals.

Important titles! in addition to the two mentioned, are *Sunshine Sketches of a Little Town* (1912); *Behind the Beyond* (1913); *Arcadian Adventures With the Idle Rich* (1914); *The Unsolved Riddle of Social Justice* (1920); *My Discovery of England* (1922); and *The Boy I Left Behind Me* (unfinished autobiography, 1946).

See Gerhard *R.* Lomer, 4 *Check List and Index of the Writings of Stephen Leacock* (1954). A comprehensive collection of Leacock material is housed at the Redpath library, McGill university.

(R. L. McD.)

LEAD. Man's metallurgical knowledge of the metallic element lead antedates recorded history. Coins or medallions of lead are found in ancient Egyptian ruins and it seems probable that the extraction of lead from its ores by smelting was the first such practice recognized by man. The combination of an easily reducible metal and a low melting point would not have taxed the resources or skill of any civilization that had learned to use fire adjacent to suitable ore outcroppings, of which there were many scattered throughout the world. Even at mid-20th century, the process, commonly used on certain high-grade pure concentrates of lead utilizing the ore hearth or Scotch hearth. consists of little more than adding the concentrate with suitable fuel to a fire under forced draft. Certainly the discovery of this process would have called for no great mental powers of deduction nor would it have demanded the development of special equipment to attain necessary temperatures or to contain the molten metal.



FROM HARN, "LEAD, THE PRECIOUS METAL," THE CENTURY CO

CRYSTALS OF GALENA

By the time of the Roman civilization the use of lead was widespread for both utilitarian and ornamental purposes. Numerous examples of lead water pipe. still in serviceable condition, have been discovered in Roman ruins. and ornamental castings of lead 2.000 years old are not uncommon in several parts of the world.

Ores of Lead and Refining Methods. — The lead mineral most commonly mined is galena, the sulfide of lead (PbS). (For mining methods. *see* MINING, METAL.) It contains in the pure form 86.5% lead. resembles lead in its gray colour and has a metallic reflective lustre so that its relationship to lead must have been recognized at a very early date. In spite of such easy recognition of the mineral's value and the fact that most deposits were worked assiduously from their date of discovery, galena continues to be the principal source of lead, although in mid-20th century the ores from which the galena is concentrated prior to smelting have changed materially. Originally galena for smelting was obtained by hand picking large crystals or aggregates of crystals from the ores. Those deposits containing galena intimately mixed with other minerals. such as sphalerite (zinc sulfide). were avoided since they were too difficult to separate by hand and too difficult to smelt intermixed. As methods of grinding were developed and procedures were discovered for separating light from heavy minerals. as by agitating with water, the very heavy galena was among the first, if not the first, mineral to be concentrated to a workable degree from ores in which it was too finely dispersed for hand selection. Thus, ores that were formerly rejected became commercially valuable sources of lead and the availability of lead from such ores increased many-fold. With increased ability to mine ores cheaply on a large scale and to subdivide them by fine grinding to release smaller and smaller particles of the mineral and with more ingenious and economical processes for gravity separation of the heavy minerals from the gangue. the mineral resources from which lead can be extracted have not decreased with time; on the contrary they have actually increased.

Perhaps even more important, and certainly more spectacular than the mechanical and gravity separation improvements, was the advent of flotation, at the start of the 20th century, which permitted lead concentration from low-grade and highly disseminated galena mineralizations. Flotation belies its name in that the lighter gangue (worthless rock) is not floated away from the heavy mineral but just the reverse. The heavy mineral in most cases (and certainly in the case of lead the mineral is far heavier than the gangue) is floated away from the gangue by taking advantage of the tendency of certain oily or soapy materials or compounds, when dissolved or suspended in water, to selectively wet the surface of the mineral in preference to the gangue material and to attach such mineral to air bubbles which carry it to the surface in the form of a froth from which the mineral is readily separated. Frequently. the desired mineral can be obtained with astonishingly little contamination of extraneous material. In fact, selective reagents have been developed which permit the removal of different minerals from the same ore in sequential or selective operations. For example, it is not at all uncommon for both zinc and copper concentrates to be obtained. in addition to lead, from lead ores that formerly would have been of little value due to contamination of the lead concentrate by zinc since the mixture is difficult if not impossible to smelt. Furthermore, quite finely dispersed and intergrown mineralizations are amenable to the flotation process for, indeed, fine grinding is almost essential to the process.

In addition to the improved recoveries from ores made possible by the flotation process, smelting and refining processes have been so improved and modified in the 20th century that "dirtier" concentrates can be accepted by smelters because increased costs due to impurities are compensated for, at least in part, by the recovery of these same impurities in salable form. Without these technological improvements lead, over the years, would have decreased in importance because of higher costs and decreased supply. for prospecting methods and new ore body discoveries have not kept pace with demands for the metal. In fact, unless new prospecting methods do develop additional ore bodies of lead, the metal is bound to decrease in importance over the years, for it seems certain that most of the world's ore bodies. as manifested by outcroppings on the surface, had by the late 1950s been discovered. Only by discoveries of lead mineralization hidden from the surface can the world's supply of lead be sufficiently augmented in the future to satisfy the growing demand.

Production. — On the basis of tonnage, lead is the world's fifth most important metal, being exceeded in tonnage only by iron,

TABLE *I.* — *World Production of Lead*
(approximate figures for 1950–56)

Country	Tons
United States (domestic and foreign ore)	525,000
Canada	165,000
Mexico	225,000
South America	80,000
Europe (excluding U.S.S.R.)	560,000
Asia	70,000
Africa	250,000
Australia	225,000
Total	2,150,000

copper. aluminum and zinc. In 1936 the world's production of lead was 2,349,145 tons, approximately one-quarter of which was produced in the United States from domestic (371,552 tons) and foreign (192.318 tons) ores. However; the use of lead in the Cnited States in the same year was roughly double this amount, the difference being accounted for by the very large amount of lead from secondary sources smelted and refined in the United States and to a much lesser degree by the excess of imports over exports of pig lead. amounting to about 265.000 tons in 1956.

The price of lead has varied in the United States from a low in 1932 of 2.6 j cents per pound to a high in 1948 of 21. j cents per pound.

The importance of lead must not be judged by either its tonnage or price. for the metallurgy of this metal is so interrelated with other elements that both its production rate and market price are influenced to a marked degree by the supply and demand of several related elements, among which are zinc, silver, copper. gold. bismuth and antimony.

Extractive **Metallurgy.**—While it is true, as has been stated. that high-grade clean lead concentrates can be smelted satisfactorily with elementary. almost primitive techniques, it is also true that there are relatively few places in the world where such concentrates can be produced in sufficient quantity to justify such simple smelting installations. The usual blast furnace smelting of lead permits not only the smelting of ores and concentrates in which lead is the element of principal value, but also lead ores in which other elements. particularly silver and gold. are of greater value than the lead. In some cases a portion of the charge smelted in the lead blast furnace are ores which contain little or no lead. Usually in these cases the ores or concentrates are of silver or gold associated with silica, limestone or iron pyrite and are economically added to the blast furnace charge for two reasons: first, because the silica, iron or lime is needed to balance the furnace charge to produce a satisfactory slag when smelted; and. second. because the lead in the balance of the charge is such a splendid collector for silver and gold that higher recoveries of these elements can be made than if an attempt were made to recover them directly from their ores or concentrates. Indeed it is safe to say that in many cases these silver and gold ores could not he economically handled except in a lead smelter. In addition to silver and gold, other elements are found in many lead concentrates and the smelting and refining operations must be designed to tolerate these elements and to produce eventually a refined lead acceptably free of impurities. Preferably. the impurity elements will be separated in either the smelting or refining operation in sufficient concentration to permit economical recovery of these elements for the market. In a few cases the additional cost for an element beyond a certain minimum is more than offset by its value. In most cases. either due to the low market price for the element or due to the complex metallurgy imposed by its presence, the smelting costs limit the permissible tolerance for the element even though it is of necessity recovered and eventually sold.

Thus, from lead smelting and refining operations the following elements are recovered, but there is probably no single smelter or refinery that recovers all of them: lead, silver, gold, copper, zinc, antimony, bismuth, nickel, arsenic, sulfur (in the form of one or more of its compounds), cadmium, indium. tin. selenium, tellurium, the platinum metals and possibly others. It is evident that the complete picture of the extractive metallurgy of lead would embrace. at least in part, the extractive metallurgy of many of the useful elements known to man. Certainly the usefulness of lead is influenced to a substantial degree by the recovery of these metals. for in some cases the mining costs are justified only by the coexistence of copper and zinc that can be separately concentrated and sold, and in other instances the payments for silver and gold in the lead concentrate permit an economically sound mining operation. In almost all cases the marketing of the recovered impurity elements pays at least in part for the cost of removing them and thus permits lower smelting and refining charges. Despite their importance. no effort will be made in this article to follow the extraneous elements beyond their removal from lead. For smelting and refining of these elements, see the separate articles on them.

Roasting. — The first basic operation in the extracting of lead from its ores and concentrates is to effect the removal of sulfur by roasting in air, which converts lead sulfide to lead oxide by the volatilization of sulfur dioxide gas. This operation is usually conducted by blending the lead ores. concentrates and fluxing ores in a thin layer on a traveling endless grate through which air is sucked. A flame ignites the charge and it burns with enough heat to sinter it; *i.e.*, convert it to a porous, not too friable. cake that breaks into lumps as it is discharged from the grate. These lumps, called sinter. when mixed with coarse coke. are charged to the top of a vertical shaft or blast furnace. Such furnaces are usually rectangular in cross section and are of sufficient size to handle from roo tons to 1.000 tons of charge per day. Air is forced into the furnace through pipes in a row just above the bottom, resulting in combustion of the coke as the charge descends, heating the sinter to the point where it can react with the coke, and in reduction of the oxides of many of the metals in the charge, producing liquid lead in which is dissolved silver, gold, copper. zinc, antimony. bismuth. etc. The nonreduced elements in the charge form a liquid slag. essentially an iron-lime-silicate, which, being lighter than the liquid lead. floats on top of it, permitting easy separation of these two phases. The operation. to the novice, seems simple and indeed it is simple when correctly carried out, but the operation can be accomplished successfully only by the exercise of great skill in preparing the charge and operating the furnace. Unless the ratio of iron, lime and silica is carefully balanced, a fluid liquid slag will not result and the physical operation of the furnace and separation of the metal becomes impossible. If the proper balance of coke and sinter is not maintained. the metal is not reduced and is lost in the slag. Too much reduction is just as objectionable. resulting in a "slow furnace" and the introduction of excessive amounts of elements into the lead. If the sintering operation leaves too much sulfur in the charge. many of the recoverable elements form a matte or liquid metal sulfide which must be separately treated for recovery of values. Too much arsenic on the charge. frequently due to incorrect circulation of by-products, results in the formation of furnace speiss. or liquid metal arsenide, which has an unfortunate tendency to dissolve gold. This formation of speiss requires still further extensive treatment to recover the metal values, frequently involving expensive shipment to a plant which specializes in handling arsenical materials.

While getting the charge successfully through the blast furnace is certainly the major step in lead smelting, the liquid metal resulting therefrom is far from a useful product. Upon cooling the liquid metal, or bullion, some of the impurities separate as drosses and these have to be furnace treated to separate copper in the form of either matte or speiss, relatively low in lead. that can be shipped to a copper smelter for the recovery of this element as well as valuable impurities. such as silver and gold, that are associated with it. The furnace used for smelting dross is usually a reverberatory furnace fired with gas, oil or coal. Considerable liquid lead is separated in this furnace and joins the main flow of the lead from the blast furnace.

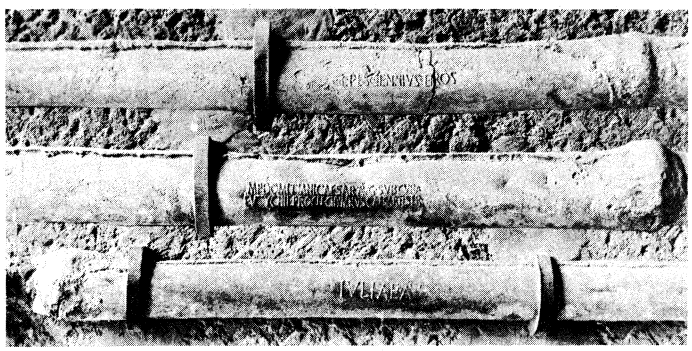
Refining. — The dross-free bullion is either transferred to an adjacent refinery as a liquid. or it may be cast in large five to ten ton blocks to facilitate transfer. However, in those cases where electrolytic refining is to be employed, the bullion is usually cast into anodes or plates of a few hundred pounds each, which can be hung directly in the electrolysis tanks. In this operation the electric current causes the lead at the anode to dissolve in the complex water solution and at the same time lead already dissolved is plated-out at the cathode in pure form. These lead cathodes are subsequently removed and melted and cast into pigs for the market. The impurities, left behind at the anode or remaining in the solution, must then be recovered in many complex operations.

In the kettle refining of bullion, as contrasted with electrolytic refining, the treatment of the lead bullion is more complex but the recovery of the by-product metals is simpler and faster; simplicity and speed are most important factors when dealing with valuable metals like gold and silver. There are several kettle

refining processes or modifications but in essence they all have the follon ing steps:

1. Softening, in which the liquid metal. held in either a furnace or cast-iron or steel pots of large capacity, is oxidized with either air or a reagent to form a liquid slag containing essentially all of the more oxidizable elements; *i.e.*, arsenic. antimony. tin and zinc (and. at times, other special elements). This oxidation step can be quite selective and result in separate slags for each of the elements if desired.

2. After softening. the liquid lead is next desilverized by adding metallic zinc and raising the temperature sufficiently to dissolve it. Upon partial cooling the zinc forms a dross or crust which will



ROMAN LEAD WATER PIPES

contain practically all the silver and gold in the original bullion plus any copper, nickel or other elements that are occasionally found in bullion. This dross is separated from the lead by skimming and the gold and silver are separated and recovered in a parting plant. The zinc is distilled off and used over and over again since only a few pounds of zinc are lost per ton of lead desilverized.

3. After the lead has been desilverized it is next debismuthized if the bismuth is too high to be left in the lead. This operation is somewhat like desilverizing, but the metals calcium and magnesium are used in place of zinc to combine and form a dross uith the bismuth uhich can be skimmed off and subsequently treated for the recovery of bismuth.

These refining processes all result in pig lead of remarkable uniformity and purity. Large quantities of lead are commercially available at 99 999% purity, but unfortunately, and unlike zinc and copper, there is seldom anything to be gained by using lead of this purity. In fact, for some purposes pure lead is quite undesirable because of such characteristic~as coarse grain size, extreme softness, low creep strength, etc.

Copper-bearing lead is widely used whenever lead structures are exposed to strong acids. When this lead is made, by leaving copper in the lead in the smelting and refining procedure, it is called chemical lead and usually contains. in addition to 0.06% copper, small amounts of silver and nickel. When copper-bearing lead is made by adding copper to fully refined lead it is called acid lead and frequently has small quantities of bismuth present in place of silver

Common lead nearly always contains a few hundredths of one percent of bismuth. which is frequently the only element present in more than a few parts per million. This is the base price lead that is most widely used in commerce and industry. It is always furnished unless copper-bearing lead or corroding lead is specified.

Corroding lead is used for making most of the compounds of lead, such as white lead. red lead, litharge, tetraethyl lead. etc. Since for these purposes the physical properties of the lead are of minor importance and chemical interference of impurities may influence both the process and the product. this lead is usually the purest available commercially and is limited by specification to a maximum of 0.05% bismuth and no more than 0.002% of any other element.

Uses.—The largest single use for lead is in storage batteries. In the United States the storage battery industry consumes between one-quarter and one-third of the lead smelted. However, a great deal of this lead originates in scrap storage batteries from which the recovery of lead is very high. The antimonial-lead grids and connectors of the automobile battery are produced almost entirely from scrap battery smelting, refining and alloying. The oxides for the paste in the plates, on the other hand, are generally produced from corroding lead, which is seldom obtained from scrap sources. Since a battery is about half oxide and half antimonial lead. so long as the number of automobiles on the road roughly doubles during the average life of a battery. a balanced market for the antimonial lead obtained from smelting storage batteries prevails and. in addition, the market for antimony metal is likewise satisfactory, for considerable antimony is needed to alloy with the 4% antimony metal obtained from smelting the battery, to supply the 6% to 8% antimonial lead used for the plates or grids. When the need for antimonial lead decreases, the more or less constant flow of scrap batteries creates an excess of the alloy, forcing the price down to a point where it is profitable to remove the antimony ("soften the lead") in order to find a satisfactory market. Thus antimonial lead can frequently be purchased for less than the combined value of its lead plus antimony contents; while in boom times a premium (or alloying charge) is obtained.

There are other uses for antimonial lead which, while important, have relatively slight impact on either the lead or antimony market. There is a considerable tonnage of lead containing 1% antimony used in the electric cable industry, particularly for sheathing telephone cable. While much of this metal eventually does come back on the market, the relatively long life and steadily expanding use for the metal as well as the simple melting procedures employed for the recovery of the alloy create no problems and it bas little impact on the basic smelting and refining industry.

Antimonial alloys of lead, particularly with the addition of small amounts of tin, are widely used for intricate ornamental castings. Alloys of the same general type also find use for bearings, for by mid-20th century it was discovered that with suitable support and with proper provisions for the prevention of corrosion, lead and its alloys provide the best and most economical bearing metal for most uses. The methods of supporting lead alloy bearing liners are most ingenious and vary from simple castings poured into cast-iron shells. through complicated keyed supports, including sintered high melting point metal matrices saturated with lead, and extend to deceptively simple structures obtained by electroplating films of lead on high thermal conductivity metals such as silver. However, all the different forms of lead bearings take advantage of the basic fact that the metal is able to maintain on its surface a thin film of lubricating oil at relatively high loads and over a wide range of speeds, successfully preventing wear of the bearing surfaces. For this purpose the alloy used must be able to maintain an oil film on its surface but not be so reactive with the oil that it dissolves and is thus corroded away. In fact, corrosion resistance is one of the principal virtues of lead and is frequently the controlling factor dictating its use.

The term "chemical lead" in the United States does not imply chemically pure lead, as the term so frequently does when applied to reagents, but rather to lead most useful in building chemical equipment. Indeed, it can be asserted that the early development of the heavy chemical industry was built around the use of chemical lead as a container for reactive chemicals. Even at mid-20th century with the advancing technology in the use of metals and plastics, lead was still most widely used because of its ease of fabrication, demonstrated corrosion resistance over a wide range of conditions, ease of maintenance and repair and, after a long and useful life, high salvage value. Wherever sulfuric acid solutions are used, lead is most frequently employed. It is also the preferred material for containing phosphoric, hydrofluoric and many other corrosive solutions. It is almost ideal for containing sea water, sewage water and all but the very soft potable waters. See Table II for chemical and physical characteristics of lead.

Frequently lead is not employed where it is eminently suited because its mechanical properties require the exercise of greater engineering skill in satisfactorily adapting it to the structure required than is demanded by stronger, more rigid materials. Thus

lead pipes to handle fluids at high pressures and particularly at higher temperatures have to be relatively thick or even be supported by more rigid materials. While alloys of lead are frequently stiffer than the soft lead, the improvement is relatively slight, particularly at elevated temperatures where in the case of the most widely used antimonial leads it fades out completely above the boiling point of water. Nevertheless, the antimonial lead alloys are frequently to be preferred because of their improved fatigue properties and, when properly prepared. higher resistance to creep or flow under moderate loads at room temperature. Properly made castings of antimonial lead often have properties superior to those that can be obtained by rolling or extrusion. It is for this reason that the grids in the automobile storage battery are still made by the casting technique instead of rolling and stamping processes, which certainly would produce a more uniform product. In some cases the use of antimonial lead has even been abandoned after successful initial trials because of failures of an "improved" wrought structure after it had been substituted for the cast structure originally tested.

TABLE 11.— Physical and Chemical Properties of Lead

Chemical symbol	Pb
Atomic number	82
Atomic weight	207.21
Stable isotopes	1.5, 23.6, 22.6, 52.3
	204, 206, 207, 208
Radioactive isotopes	209, 210, 211, 214
Crystal system	face-centred cubic
Valences	2 and 4
Melting point	327.4° C.
Boiling point	1,740° C.
Electric resistivity at 20° C.	20.65 microhm/cm.
Thermal condoctivity at 20° C	0.083 cal./sec./sq.cm./° C./cm.
Magnetic susceptibility	-0.12×10^{-6} cg.
Strength	2,000 lb./sq. in.
Modulus of elasticity	2.2×10^{6} lb./sq. in
Specific heat at 20° C.	0.031 cal./g./° C.
Latent heat of vaporization	204 cal./g.
Latent heat of fusion	5.89 cal./g.
Superconducting at	4° K.
Density at 20° C.	11.34 g./c.c.
Density at 327° C. (solid)	11.005 g./c.c.
Density at 327.4° C. (liquid)	10.686 g./c.c.
Linear coefficient of expansion	29.3×10^{-6}

The very properties that limit the application of lead in some structures are frequently responsible for its use for other purposes. Thus. its softness and ability to flow at modest temperatures permit the extrusion of lead around electric cables that are insulated with materials that would be destroyed by higher temperatures. Such cable is readily coiled, bent and straightened in transporting and installing and is most easily joined and repaired when installed.

The imperviousness of lead to moisture penetration permits the maintenance of the original dielectric properties over many years, and the corrosion resistance of lead permits the inexpensive installation of such cables under conditions that would result in rapid failure of many other materials.

The high density of lead frequently prevents its economical use in competition with the lighter metals such as zinc and aluminum, but when weight is a primary consideration then lead, the heaviest of the common metals, is indeed first choice, for it can always be economically fabricated to adapt it to any method of weighting or ballasting.

The tendency for lead to flow under sustained loads frequently prevents its use for many purposes. In others, this property demands engineering provisions in the way of supports that add to the cost and limit its application. Conversely, where a material is needed to distribute the application of load upon an irregular surface, as for instance seating iron or steel on a concrete base or where mating surfaces need to be liquid- or gas-tight, the flow properties of lead make it ideal as a pad or gasket. In addition, the corrosion resistance of the metal insures satisfactory life over very long periods. A substantial use for lead is in caulking the joints of cast-iron pipe. Here the ability to cast the metal into the joint at temperatures that will not injure the pipe plus the ability to pound or caulk it tight without at the same time making a joint so stiff that it will not yield under expansion forces or misalignment are such indispensable advantages that lead is universally preferred to all other materials.

In most uses for lead its low melting point is directly or indirectly of considerable importance either in permitting the metal to be used in the first place or in effecting an important economy in the fabrication of the metal. In some cases the low melting point is the primary reason why the metal can be used Obviously, the soft solders are a case in point since adding lead to tin lowers its melting point and incidentally its cost. Less well known are the many complex low melting lead alloys containing bismuth, tin, cadmium. indium, etc. By suitable combinations of these elements with lead the melting point can be lowered almost to room temperature and the liquid metal can be handled with no more discomfort or difficulty than the handling of hot water. Certain of these alloys containing substantial amounts of bismuth actually expand after solidification and are particularly useful for mounting tools and other objects rigidly in precise alignment at a low cost. for aithough the alloys are somewhat expensive they can be used over and over again with practically no loss.

In all phases of the metallurgy of lead its low melting point and its molten stability in air are important contributors to low cost refining and fabrication processes. For example, in refining lead the kettles frequently hold over 200 tons of metal. Powerful electric mixers effect complete temperature uniformity when desired and the temperature control of such large masses can be as precise as the measuring method with only the simplest of manual burner controls. Major changes in heat input are needed to bring about any rapid change in temperature of such large masses.

In many cases where lead and its alloys are being processed, it is customary to maintain large quantities of the alloy liquid at all times and to remove by pumping the small quantity needed for the individual castings, replacing the metal withdrawn with pig or ingot to keep the liquid metal reservoir at fairly constant level. This procedure obviously can be used only in handling a metal like lead where the fuel cost to maintain the metal molten is quite low and the stability of the molten metal is high, particularly with respect to air.

In one sense of the word, none of the uses discussed so far consumes lead. They merely borrow the lead and after a period of time varying from a few years to centuries return almost all of it in the form of scrap. This very high return is due to the corrosion resistance of lead and the ease with which lead can be separated from other contaminating material. Thus a simple stripping and melting operation will return practically all the lead used for cable sheathing into a form which permits its reuse for many purposes even without refining. With rather simple refining procedures it also can be reused again as cable sheathing metal. In fact scrap lead frequently provides the bulk of metal used in making lead alloys where contaminating elements such as tin and antimony are an asset rather than a liability. Solder, type metals, bearing alloys, etc., consume much of the lead scrap available smce these alloys are refined to very exacting standards after alloying and there is little advantage in employing high-purity metals initially.

Fortunately for the lead producers there are several truly consumptive uses for lead and much of the corroding lead produced in the United States goes into these uses. Corroding lead is correctly named, for, in spite of the fact that it is the highest purity lead commercially available and the general assumption that the highest purity metals are most resistant to chemical action, originally it was deliberately corroded to form basic lead carbonate or white lead. While by mid-20th century the manufacture of white lead aas not so important as formerly, the production of corroding lead and its use to produce various compounds of lead was more important than ever. The growth in the use of tetraethyl lead in gasoline is more than adequate consolation for the shrinking white lead market. The production of red lead and litharge has shown a steady growth over the years and of course the growth of the nonconsumptive use in battery oxides has been phenomenal. In the ceramic field the consumption is increasing due to the special properties of lead glasses and glazes. The low melting point vitreous enamels, particularly those developed in the 1950s for application to aluminum, created additional markets for the metal in subsequent years.

Nuclear Shielding.— Lead is the ultimate decomposition product of certain radioactive disintegrations. Lead from such sources has an atomic weight different from that of common lead and a demonstration of this was the first proven exception to the "law of definite proportions" that was universally accepted in the 19th century. For example lead from the uranium series has an atomic weight of about 206; that from thorium, 208. A unique characteristic of lead is its ability to absorb short wave-length radiations such as X-ray and radium emanations.

Therefore. in the nucleonics industry lead is used both in the form of metal and in glass for shielding gamma rays. Glasses have been developed containing as much as 80% lead and these are most useful for windows in radiation technology. For reactor shielding where space is important, lead is the preferred material to prevent escape of gamma radiation. It is most probable that substantial quantities of lead will be used for shielding in connection with all mobile reactors and even in stationary reactors where space considerations are important or where flexibility of design is beneficial.

See also NUCLEAR ENGINEERING.

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LEAD-CHAMBER PROCESS: *see* SULFURIC ACID.

LEADING NOTE, in music, the seventh degree of the diatonic scale, situated a semitone below the octave, and so called because the ear instinctively demands that it shall be followed by the octave, to which therefore it may be said to "lead" in a peculiarly irresistible manner. This characteristic of the note is indicated by the French name for it, *la note sensible;* other names by which it is sometimes known being the subtonic and the subsemitone.

LEAD POISONING (PLUMBISM) is almost exclusively an occupational disease which is usually chronic in nature. Occupations involving potential lead exposure include the ceramic industry (where lead glaze is used), filemaking, house painting, glassmaking. copper working, plumbing and gas fitting, printing, cutlery and storage-battery manufacture.

The poison affects the entire body but especially the nervous system. the gastrointestinal tract and the blood-forming tissues. Its victims become pallid, digestion is deranged, appetite fails and painful colic with constipation supervenes. The loss of power is generally shown first in the fingers, hands and wrists, and the condition known as "wrist drop" soon follows, rendering the victim useless for work. The palsy will extend to the shoulders, and shortly after to the legs also. Other organs frequently involved are the kidneys, which become fibrotic (granular kidney). Because of optic atrophy the sight is weakened or even lost.

Lead poisoning frequently occurs accidentally in young children from the ingestion of lead-containing paints on furniture or toys and is often manifested by severe cerebral involvement ("lead encephalopathy"). *See* INDUSTRIAL MEDICINE; POISON.

See Abraham Cantarow and Max Trumper, *Lead Poisoning* (1944). (F. L. A.)

LEADVILLE, a city of Colorado, U.S., on the headwaters of the Arkansas river at an elevation of 10.200 ft., 75 mi. S.W. of Denver, is one of the celebrated mining camps of the world. The county seat of Lake county, it is served by the Denver and Rio Grande Western and the Colorado and Southern railroads.

Gold was discovered in California gulch in 1859 and Oro City, south of the present. Leadville, had a population of 5,000 in 1860. Gold mining declined in 1866 but the discovery that the carbonate of lead ores were laden with silver caused the founding of Leadville in 1878. When the Denver and Rio Grande railroad reached the city in 1880, the population was over 15,000. More than 30 silver mines on Fryer's hill continued to yield heavily until the silver market collapsed in 1893.

About 90% of the world's molybdenum is produced at Climax (12 mi. N.E. of Leadville), where nearly a third of Leadville's male labour force was employed.

See Don L. and Jean H. Griswold, *The Caubonate Camp Called Leadville* (1951). (HY. L. C.)

LEADWORK. Lead has two main uses in which some artistic purpose may be served: in architecture. as a material for roof coverings. gutters, piping and cisterns: and in decorative art. as a material for sculpture and applied ornament. As an architectural material it has the advantage of being easily worked and yet offers great resistance to climatic conditions. It was used in the middle ages for church roofing in preference to other materials. and from the 16th century it appeared in England in the form of gutters and pipe heads. often with cast ornament. Some of the late 17th- and early 18th-century pipe heads, cast with the arms of the owner of the house and the date of erection, are important decorative features.

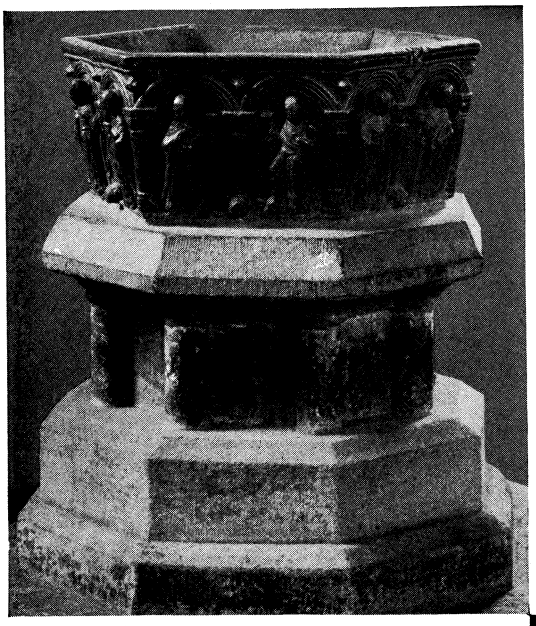
The low melting point of lead and-its freedom from contraction when cooling make it particularly suitable for casting, and it has been used as a substitute for bronze or precious metals. The earliest-known lead sculptures are small votive figures found at Troy and Mycênae. In the Hellenistic period lead sarcophagi were known, and the Romans made much use of the metal. Large amounts of worked lead in various forms have been found in those parts of England where the Romans had permanent settlements. England was indeed one of the main lead-producing areas in the middle ages and it was more widely employed there than on the continent of Europe.

In the 12th century the German monk, Theophilus, in his treatise on metalworking, refers to lead only in connection with casting rods for stained glass windows and as a material through which silver sheets might be hammered, but in England at about the same time a remarkable series of lead fonts was cast, of which 16 still survive in position, the most famous being those at Walton-on-the-Hill. Surrey, and at Wareham and Dorchester in Dorset. Lead was also used, doubtless because of its cheapness. for the small badges or medallions sold to pilgrims at the great medieval shrines. Not all religious institutions were wealthy, and a group of 14th-century caskets covered with lead tracery. gilded to look like precious metal. have survived in church treasuries. These were used as reliquaries, but were originally made for secular purposes.

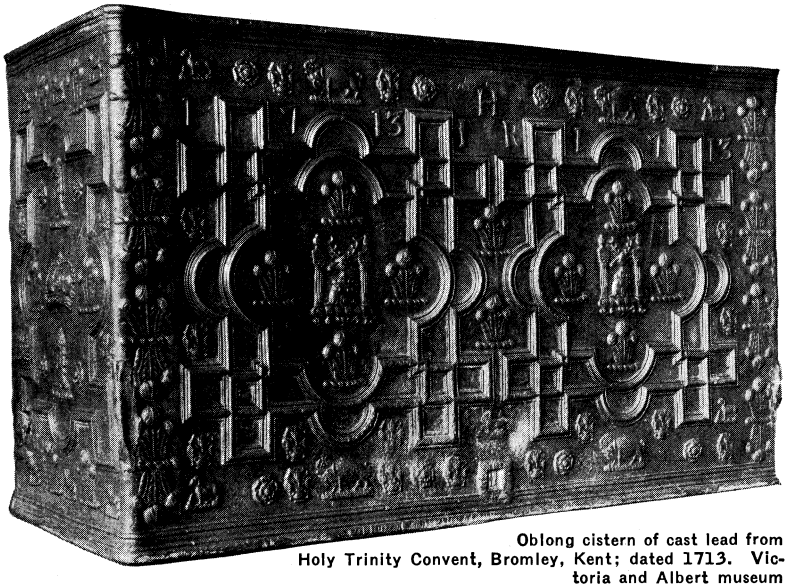
The Renaissance passion for collecting bronze medals and plaquettes led to a demand for cheap replicas. and these were made with great precision in lead. The metal also played an important role in the goldsmiths' trade. The fashion for elaborate relief ornament of the Renaissance and Mannerist periods called for a degree of skill in modeling that was beyond the powers of the average goldsmith. The practice therefore grew up for the pattern makers of Augsburg and Nürnberg, Ger.. to sell lead models of ornamental details and figures from which goldsmiths working elsewhere could in turn make molds. An extensive collection of these models is preserved in the Historisches museum, Basel, Switz. The trade expanded to include large medallions and plaquettes, the chief masters of which were the German goldsmiths, Peter Flötner, Jonas Silber and the Master H. G. (Hans Jamnitzer), and the Dutch goldsmith family of van Vianen. Lead in sculpture is more suitable for the production of small figures than of life-size statues which, if unsupported. become distorted through their on-n weight. Among the few life-size equestrian lead statues is one of Frederick Louis, prince of Wales, in the grounds of Hartwell house. Buckinghamshire. Eng.

A great extension of the use of lead took place with the introduction of lead garden sculpture in the late 17th century. Its silvery gray colour and resistance to the weather made it particularly suitable for use in the many forinal gardens that were created at this time. The model was provided by the garden sculpture of the palace of Versailles, much of which was in marble. In England these allegorical figures and vases were mostly the work of anonymous sculptors. hut some of the finer examples in the gardens of Chatsworth, Derbyshire, Castle Bromwich, Warwickshire and elsewhere were the work of Jan van Nost (d. 1700), a Belgian who had once worked for Grinling Gibbons. Sir Henry Cheere (d. 1781) had a factory for lead garden figures at Hyde Park corner. London.

LEADWORK



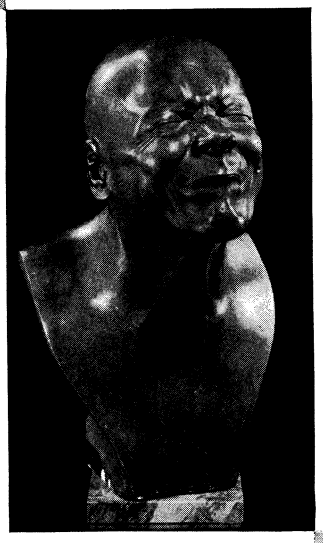
Lead font in Lady St. Mary's church, Wareham, England, 12th century



Oblong cistern of cast lead from Holy Trinity Convent, Bromley, Kent; dated 1713. Victoria and Albert museum



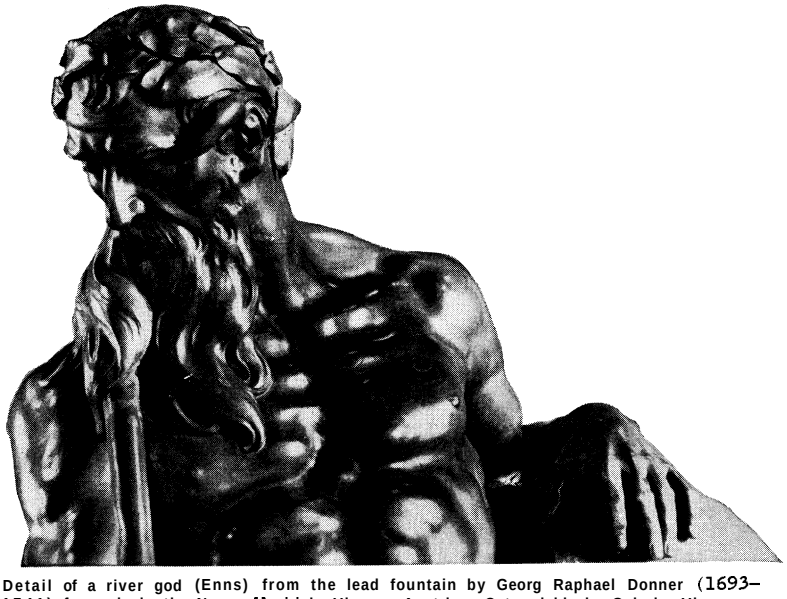
Lead medallion of Willibald Pirkheimer by Albrecht Dürer (1471–1528); German, 16th century. Victoria and Albert museum



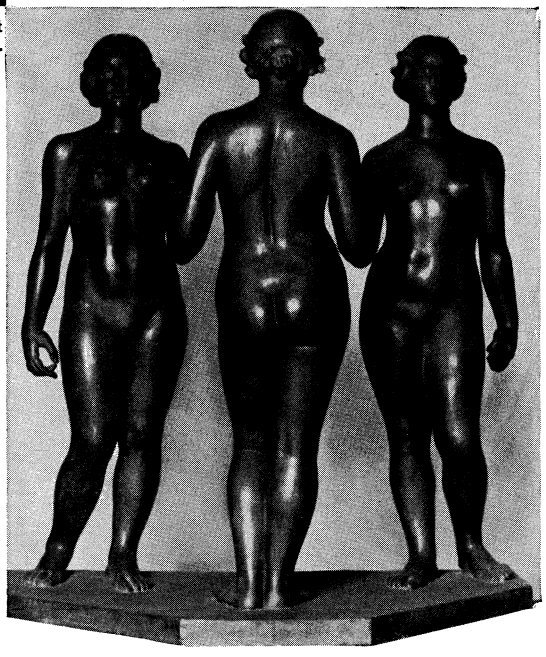
Head by Franz Xaver Messerschmidt (1736–83); Austrian, 18th century. Victoria and Albert museum



Hanging cistern of cast lead with wing-top water tap of brass; English, 17th century. Victoria and Albert museum



Detail of a river god (Enns) from the lead fountain by Georg Raphael Donner (1693–1741) formerly in the Neuen Markt in Vienna, Austria. Osterreichische Galerie, Vienna



"The Three Nymphs," lead grouo by Aristide Maillol (1861–1944); French, 20th century. Tate gallery, London

LEADWORK, 12TH TO 20TH CENTURIES

BY COURTESY OF (TOP LEFT) ALEC TIRANTI LTD., FROM GEORGE ZARNECKI, "ENGLISH ROMANESQUE LEAD SCULPTURE, (TOP RIGHT, CENTRE LEFT, CENTRE, CENTRE RIGHT) VICTORIA AND ALBERT MUSEUM, (BOTTOM LEFT) OSTERREICHISCHE GALERIE. VIENNA. (BOTTOM RIGHT) THE TRUSTEES OF THE TATE GALLERY

English garden sculpture rarely achieves any particular aesthetic status, but in 18th-century Germany and Austria lead was used by a group of artists of the highest standing. The first to abandon the traditional materials — marble, carved wood and bronze — was the Austrian Georg Raphael Donner (d. 1741), who executed in lead some of the noblest works of sculpture of the 18th century, amongst them the famous fountain in the Neue Markt, Vienna (now replaced by a bronze copy), and the immensely moving *Pietà* in front of the high altar of the Carinthian cathedral of Gurk. Donner was followed by other sculptors working in lead, among them J. N. and B. F. Moll, who created the series of lead sarcophagi of the Habsburg emperors and their families in the crypt of the Capuchin church in Vienna, and F. X. Messerschmidt (d. 1783), who executed 31 of his character studies of human types in lead (one is in the Victoria and Albert museum, London). German 18th-century works in lead include the sarcophagi of the Prussian royal family by Andreas Schliiter (d. 1714) and a pair of vases 1 j ft. high at Schloss Schleissheim in Bavaria.

In the 19th century lead was out of favour with sculptors, partly because improved transport made it possible to bring large blocks of marble from Italy at low cost. Its soft colouring and the fact that it does not reflect light give it certain advantages, and lead has been used in the 20th century by Aristide Maillol and by Jacob Epstein, who executed the important lead figure of the Virgin and Child in Cavendish square, London.

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LEAF, WALTER (1852–1927), English banker and scholar, was born at Norwood, London, on Nov. 26, 1852, and educated at Harrow and Trinity college, Cambridge. In 1877 he entered the firm of Leaf: Sons and Company, becoming in 1888 chairman of Leaf and Company Ltd. Later he became chairman of the Westminster bank. Leaf was one of the founders of the International Chamber of Commerce, of which he was elected president in 1925. In 1918–19 he was chairman of the committee of the London clearing banks, and from 1919 to 1921 president of the Institute of Bankers. He was president of the Hellenic society and the Classical association.

Leaf died on March 28, 1927.

Among his classical works are *The Iliad* (1886–88, 1900–02), with English notes and introduction, *Companion to the Iliad* (1892), *Troy* (1912), *Homer and History* (1915), *Little Poems from the Greek* (1922) and *Strabo on the Troad* (1923). In **1882** he collaborated with Andrew Lang and E. Myers in a translation into English prose of Homer's *Iliad.*

LEAF, the name given in popular language to all the green expanded organs borne upon an axis, and so applied to similar objects. Investigation has shown that many other parts of a plant which externally appear very different from ordinary leaves are, in their essential particulars, very similar to them, and are in fact their morphological equivalents. Such are the scales of a bulb, and the various parts of the flower (*q.v.*), and assuming that the structure ordinarily termed a leaf is the typical form, these other structures were designated changed or metamorphosed leaves, a somewhat misleading interpretation.

Development and Structure of Leaves.—Leaves are produced as lateral outgrowths of the stem in definite succession below the apex. This character, common to all leaves, distinguishes them from other organs. In the higher plants we can usually recognize the distinction between stem and leaf. Among the lower plants, however, it is found that a demarcation into stem and leaf is impossible, but that there is a structure which partakes of the characters of both; *i.e.,* the thallus. The leaves always arise from the outer portion of the primary meristem of the stem axis, and the tissues of the leaf are continuous with those of the stem. In some cases only the outermost layer of the apical meristem takes part in leaf development, but more often cells of the deeper layers are also involved. By division and growth these cells form a small meristematic protuberance which later develops into the leaf. In the protuberance an apical growing region is early formed, and this by continued activity increases the organ in length and lays down its fundamental structure. In most leaves apical growth is of short duration and is succeeded by general growth throughout the young leaf. The general form and the fundamental structure of most leaves are thus developed while they are still small in size. Differentiation of the vascular tissue begins at the point of divergence of the leaf from the axis and proceeds outwardly to form the veins of the leaf and downwardly as a part of the vascular system of the stem. Thus, when these vascular bundles anastomose with those of older leaves below, continuity of vascular tissue is established. Although in seed plants the increase in length of the leaf by growth at the apex is usually of a limited nature, in some ferns there seems to be a provision for indefinite terminal growth, while in others this growth is periodically interrupted. It not infrequently happens, especially among monocotyledons, that after growth at the apex has ceased, it is continued at the base of the leaf, and in this way the length may be much increased. Among dicotyledons this is uncommon.

In all cases the dimensions of the leaf are enlarged by interstitial growth of its parts.

The simplest leaf is found in some mosses where it consists of a single layer of cells. The typical foliage leaf is characteristically thin and dorsiventrally flattened. Structurally it may be divided into three regions: (1) the epidermis, which forms a protective layer covering the entire surface of the leaf and is continuous with the epidermis of the stem; (2) the mesophyll, which may be differentiated into palisade and spongy cells; (3) the veins, which consist of vascular tissues for the transfer of water (xylem elements) and food substances synthesized by the leaf (phloem). Associated with the conductive tissues of the vein are *mechanicd* elements which give strength and support to the blade and petiole. The epidermis is usually devoid of chloroplasts except for those that occur in the guard cells which bound the stomata. These are openings through which gases and vapours may pass into and out from the intercellular spaces of the mesophyll. The size of the stomata1 opening is controlled by changes in the turgor of the guard cells. When these are turgid, the stoma is open and this condition usually obtains during the hours of sunlight. Stomata may occur on both surfaces of the leaf but are generally more numerous on the under surface when the leaf is oriented dorsiventrally. Where the leaf is in a vertical position, as in many grasses, the number of stomata is about equal on both surfaces. In some leaves as in *Olea* (olive) and ***Ficus*** (rubber plant) there are no stomata on the upper surface. Chloroplasts occur in the palisade and spongy cells but are usually more numerous in the former. They are small, spherical, ovoid or discoid bodies lying in the cytoplasm and contain green pigments, known as chlorophyll, and others that are orange or yellow, carotenoids. Some submerged leaves, or leaves which are developed under water, differ in structure from aerial leaves. They have usually no fibrovascular system, but conduction takes place through cells which sometimes become elongated and compressed so as to resemble veins. Such leaves have a layer of compact cells on their surface, but no true epidermis and no stomata. Their internal structure consists of spongy tissue and sometimes the spaces are filled with air which gives buoyancy to the leaf. When exposed to the air these leaves lose moisture rapidly and become shrivelled and dry. In some cases there is only a network of filamentlike cells, the intercellular spaces between giving a skeleton appearance to the leaf, as in *Aponogeton fenestralis* (lattice plant).

Function of Leaves.—The form and arrangement of the parts of a typical foliage leaf are intimately associated with the part played by the leaf in the life of the plant. The flat surface permits the maximum amount of sunlight to fall upon it, since it is by the absorption of energy from the sun's rays by means of the chlorophyll contained in the cells of the leaf that the building

up of plant food is rendered possible: this process is knonn as photosynthesis. It is a complex process. and all the chemical reactions that take place in the synthesis of carbohydrates are not knonn. but it involves the combination of carbon dioxide and nater.

A large proportion of the water which ascends to the leaf passes out in the form of water vapour through the stomata—this process is known as transpiration Hence, the extended surface of the leaf exposing a large area to light and air is eminently adapted for the carrying out of the processes of photosynthesis and transpiration *(see* PLANTS AND PLANT SCIENCE). The arrangement of the leaves on the stem and branches (see *Phyllotaxis,* below) is such that the upper leaves do not shade the lower. and the shape of the leaf serves toward the same end—the disposition of leaves on a branch or stem often forms a "mosaic." each leaf fitting into the space betneen neighbouring leaves and the branch on which they are borne without overlapping.

GROSS ANATOMY

A leaf: whether aerial or submerged, generally consists of a flat expanded portion. called the blade, or lamina, of a narrower portion called the petiole. or stalk. and sometimes of a portion at the base of the petiole. which forms a sheath or is developed in the form of outgrowths, called stipules. The sheathing or stipulary portion is frequently wanting. When a leaf has a distinct stalk. it is petiolate; when it has none. it is sessile. and if in this case it embraces the stem, it is said to be amplexicaul. The part of the leaf nest the petiole or the axis is the base, while the opposite extremity is the apex. The leaf is usually flattened and expanded horizontally; *i.e.,* at right angles to the longitudinal axis of the shoot. In some cases leaves, as in *Iris,* or leaflike petioles, as in Australian species of *Acacia* and *Eucalyptus,* have their plane of expansion parallel to the axis of the shoot; there is then no distinction into an upper and a lower surface, but the two sides are developed alike; or the leaf may have a cylindrical or polyhedral form, as in *Mesembryanthemum* (ice plant). The upper angle formed between the leaf and the stem is called its axil; it is there that buds are normally developed.

The leaf is sometimes articulated with the stem, and when it falls off a scar remains; at other times it is continuous with it, and then decays, while still attached to the axis. In their early state all leaves are continuous with the stem, and it is only in their aftergrowth that articulations are formed. When leaves fall off annually, they are called deciduous; when they remain for two or more years, they are persistent, and the plant is evergreen. The laminar portion of a leaf is occasionally articulated with the petiole, as in the orange, and a joint at times exists between the stipulary portion and the petiole.

Venation.— The arrangement of the vascular system in the lamina constitutes the venation. In an ordinary leaf, such as that of the elm, there is a large central vein running from the base to the apex of the leaf! called the midrib, and there are lateral veins, called primary veins. The venation is described as pinnate, or feather-veined. In some cases, as in sycamore or castor-oil plant, in place of there being only a single midrib there are several large veins (ribs) of nearly equal size, which diverge from the juncture of the blade and the petiole or stem. The venation is then palmate.

In addition to the primary veins there are secondary veins and tertiary veins, and so on until a complete vascular network is produced. The larger veins are usually prominent on the undersurface of the leaf. To a distribution of veins such as this the name of reticulated, or netted. venation has been applied. In the leaves of some plants there exists a midrib with large veins running nearly parallel to it from the base to the apex of the lamina, as in grasses. or with veins diverging from the base of the lamina in more or less parallel lines. as in fan palms; or with veins extending from it throughout its whole course, and running parallel to one another in a straight or curved direction toward the margin of the leaf. as in plantain and banana. In these cases the veins are often united by cross veinlets. which do not, however. form an angular network. Such leaves are said to be parallel-veined. The leaves of monocotyledons have generally this kind of venation. while reticulated venation most usually occurs among dicotyledons. Some plants, which in most points of their structure are monocotyledonous, have reticulated venation. as in *Smilax* and *Dioscorea.* The distribution of the system of vessels in the leaf is usually easily traced. but in succulent plants, such as *Hoya,* agave, stonecrop and *Mesembryanthemum,* the veins are obscure.

In nearly all plants. except Thallophyta, leaves are present at some period of their existence. *Cuscuta* (Dodder. *q.v.*). however, is an exception. The forms assumed by leaves vary greatly, not only in different plants. but in the same plant. It is only among the lower classes of plants—mosses. Characeae, etc.—that all the leaves on a plant are similar; in the higher plants they are more variable. The structures ordinarily designated as leaves are frequently spoken of as foliage leaves. In relation to their production on the stem: they are always produced in great number when they are small. and as they increase in size their number diminishes correspondingly. The cellular process from the axis which develops into a leaf is simple and undivided: it may remain so, but in progress of growth frequently becomes segmented in various ways, either longitudinally or laterally or in both ways. By longitudinal segmentation a leaf is formed consisting of sheath. stalk and blade: or one or another of these may be absent, and thus stalked, sessile, sheathing. etc.. leaves are produced. Lateral segmentation aifects the lamina, producing indentations, lobings or fissuring of its margins. In this way two marked forms of leaf are produced: (1) simple form. in which the segmentation. however deeply it extends into the lamina. does not separate completely portions of the lamina: and (2) compound form. where portions of the lamina are separated as detached leaflets, which become articulated with the midrib or petiole. Many types of both simple and compound leaves are produced. according to the amount of segmentation and the mode of development of the parenchyma and direction of the vascular bundles.

Simple Leaves.—When the lamina is developed symmetrically on each side of the midrib or stalk, the leaf is equal: if otherwise. the leaf is unequal, or oblique. If the margins are even and present no divisions, the leaf is entire; if there are slight projections which are more or less pointed, the leaf is dentate. or toothed; when the projections lie regularly over each other like the teeth of a saw the leaf is serrate; when they are rounded the leaf is crenate. If the divisions extend more deeply into the lamina than the margin. the leaf receives different names according to the nature of the segments; thus, when the divisions extend about halfway down, it is cleft; when the divisions extend nearly to the base or to the midrib, the leaf is partite.

If these divisions take place in a simple feather-veined leaf, it becomes either pinnatifid, when the segments extend to about the middle; or pinnatipartite. when the divisions extend nearly to the midrib. These primary divisions may be subdivided again in a similar manner, and thus a feather-veined leaf will become bipinnatifid or bipinnatipartite; still further subdivisions give origin to tripinnatifid arid laciniated leaves.

The same kinds of division taking place in a simple leaf with palmate or *radiating* venation, give origin to lobed, cleft and partite forms. The name palmate is the general term applied to leaves n-ith radiating venation. in which there are several lobes united by a broad expansion of parenchyma like the palm of the hand. as in the sycamore. castor-oil plant. etc. The divisions of leaves with radiating venation may extend to near the base of the leaf and the names bipartite, tripartite, quinquepartite, etc.. are given according as the partitions are two, three, five or more. The term dissected is applied to leaves with radiating venation. having numerous narrow divisions, as in *Geranium dissectum.*

When in a radiating leaf there are three primary partitions, and the two lateral lobes are again cleft. as in hellebore, the leaf is called pedate or pedatifid. from a. fancied resemblance to the claw of a bird. In all the instances already alluded to the leaves have been considered as flat expansions in which the ribs or veins spread out on the same plane with the stalk. In some cases, however, the veins spread at right angles to the stalk, forming a peltate leaf as in Indian cress.

The form of the leaf shows a very great variety, ranging from the narrow linear form with parallel sides, as in grasses or the needlelike leaves' of pines and firs, to more or less rounded or orbicular; descriptions of these will be found in works on descriptive botany. The apex also varies considerably, being rounded, or obtuse; sharp, or acute; notched: etc. Similarly the shape of the base may vary. When rounded lobes are formed, as in dog violet, the leaf is cordate, or heart-shaped; when the apex is rounded, as in ground ivy, the leaf is kidney-shaped, or reniform. When the lobes are prolonged downward and are acute: the leaf is sagittate; when they proceed at right angles, as in *Rumex acetosella,* the leaf is halbert-shaped, or hastate. When a simple leaf has two leaflike appendages at its base, it is called auriculate. When the development of parenchyma along the margin of the leaf continues after the veins are differentiated, the margins become wavy, crisp or undulated, as in *Rumex crispus* and *Rheum undulatum.* By cultivation and selection the mesophyll tissue is often much increased, giving rise to the curled leaves of greens, savoys, cresses, lettuce, etc.

Compound Leaves.—Compound leaves are those in which the divisions extend to the midrib or petiole and each of the separated portions is articulated with it. The midrib, or petiole, resembles a branch with separate leaves attached to it, but it is considered properly as one leaf because in its earliest state it arises from the axis as a single primordium, and its subsequent development results in the formation of distinct leaflets. The leaflets are either sessile or have stalks, called petiolules. Compound leaves are pinnate or palmate, according to the arrangement of leaflets. When a pinnate leaf ends in a pair of pinnae, it is equally, or abruptly, pinnate (paripinnate); when there is a single terminal leaflet, the leaf is unequally pinnate (imparipinnate); when the leaflets, or pinnae, are placed alternately on either side of the midrib, and not directly opposite to one another, the leaf is alternately pinnate; and when the pinnae are of different sizes, the leaf is interruptedly pinnate.

When the division is carried into the second degree, and the pinnae of a compound leaf are themselves pinnately compound, a bipinnate leaf is formed.

Petiole.—The petiole is the portion between the blade and the stem. It is absent in sessile leaves, and this is also frequently the case when a sheath is present, as in grasses. It consists of the fibrovascular bundles with a varying amount of cellular tissue. The petiole varies in length, being usually shorter than the lamina, but sometimes much longer. In some palms it is 15 or 20 ft. long, and is so rigid as to be used for poles or walking sticks. Sometimes it is compressed laterally: as in the aspen, and the trembling of the leaves of this tree is caused by this peculiarity. At other times it is winged, as in lemon and *Dionaea,* or pitcherlike, as in *Sarracenia.* In certain of the Australian acacias, and in some species of *Oxalis* and *Bupleurum,* the petiole is flattened in a vertical direction, the vascular bundles separating immediately at their point of divergence from the stem and running nearly parallel from base to apex. This kind of petiole has been called a phyllode. In these plants the laminae or blades of the leaves are pinnate or bipinnate, and occur at the extremities of the phyllodes in a horizontal direction; but in many instances they are not developed, and the phyllode functions as a leaf. Some petioles are long, slender and sensitive to contact, and function as tendrils by means of which the plant climbs, as in the garden nasturtiums (*Tropaeolum*), clematis and others. The lower part of the petiole is often swollen, forming the pulvinus, the cells of which exhibit the phenomenon of irritability. In *Mimosa pudica* and other species, stimuli are transmitted to the pulvinus, irritation of which results in depression of the whole bipinnate leaf. A similar property exists in the pulvini at the base of the leaflets which fold upward.

Leaf Base.—The leaf base is often developed as a sheath which embraces the whole or part of the circumference of the stem. This sheath is uncommon in dicotyledons, but occurs in the family Umbelliferae. It is much more common among monocotyledons. In sedges the sheath forms a complete investment of the stem, while in grasses it is open on one side. In the latter plants there is also a membranous outgrowth, the ligule, at right angles to the median plane of the leaf from the point where the sheath merges into the lamina. there being no petiole.

In leaves in which no sheath is present small foliar organs, stipules, frequently occur at the base of the petiole. The stipules are generally two in number. Thus, they occur in the pea and bean family, in rosaceous plants and the family Kubiaceae. They are not common in dicotyledons with opposite leaves. Leaves having stipules are called stipulate; those having none are astipulate. Stipules may be large or small. entire or divided, deciduous or persistent. They are not usually of the same form as the ordinary foliage leaves of the plant, from mhich they are distinguished by their lateral position at the base of the petiole. In the pansy the true leaves are stalked and crenate, while the stipules are large, sessile and pinnatifid. In *Lathyrus aphaca* and some other plants the true pinnate leaves are abortive. the petiole forms a tendril and the large stipules alone perform the functions of leaves. In other instances the stipules are nondiverged and occur on the side of the stem opposite the leaf, forming an *ochrea,* as in the dock family. The stipules are sometimes so minute as to be scarcely distinguishable without the aid of a lens, and so fugacious as to be visible only in the very young state of the leaf. They may assume a hard and spiny character, as in *Robinia pseudoacacia,* or each stipule may be represented by a tendril. as in *Smilax.* At the base of the leaflets of a compound leaf small stipules (stipels) occasionally are present.

Modifications.—Variations in the structure and forms of leaves and leafstalks are produced by the increased development and differentiation of cellular tissue, by the abortion or degeneration of parts, by the multiplication or repetition of parts and by adhesion or nondivergence of parts. When parenchymatous tissue is developed to a great extent, leaves become succulent and occasionally assume a crisp or curled appearance. Such changes take place naturally, but they are often increased by the art of the gardener, and the object of many horticultural operations is to increase the bulk and succulence of leaves It is in this way that cabbages and savoys are rendered more delicate and nutritious. The leaves of barberry and of some species of *Astragalus* and the stipules of the false acacia *(Robinia)* are spiny. To the same cause is due the spiny margin of the holly leaf. When two lobes at the base of a leaf are prolonged beyond the stem as a nondiverged structure, the leaf is perfoliate, the stem appearing to pass through it, as in *Bupleurum perfoliatum* and *Chlora perfoliata;* when the bases of two leaves are nondiverged, they become connate, as in *Lonicera caprifolium;* and when leaves adhere to the stem, forming a sort of winged or leafy appendage, they are decurrent. as in thistles. The formation of peltate leaves has been traced to the nondivergence of the lobes of a leaf.

In the leaf of the *Vicforia regia* the transformation may be traced during ontogeny. The first leaves produced by the young plant are linear, the second are sagittate and hastate, the third are rounded-cordate and the next are orbicular. The cleft indicating the union of the lobes remains in the large leaves. The parts of the leaf are frequently developed as tendrils, which may twine round other plants for support. In leguminous plants (the pea tribe) the pinnae are frequently modified to form tendrils, as in *Latliyvus aphaca,* in mhich the stipules perform the function of true leaves. In *Flagellaria indica, Gloriosa superba* and others the midrib of the leaf ends in a tendril. In *Smilax* there are two stipulary tendrils.

The pitchers of insectivorous plants are formed either by petioles or by laminae, and they are composed of one or more leaves. In *Sarracenia* and *Heliamphora* the pitcher is composed of the petiole of the leaf. In *Nepenthes* the pitcher is a modification of the lamina; the petiole often plays the part of a tendril, while the leaf base is flat and leaflike. In *Utricularia* bladderlike sacs are formed by a modification of leaflets on submerged leaves.

In some cases the leaves are reduced to mere scales—cataphylls; they are produced abundantly upon underground shoots. In parasites *(Lathvaea, Orobanche)* and in plants growing on decaying vegetable matter (saprophytes), in which no chlorophyll

is formed, these scales are the only leaves produced. In *Pinus* the leaves produced on the main stem and the larger lateral shoots are scales; those on some of the short branches are acicular. In *Cycas* whorls of scales alternate with large pinnate leaves. In many plants, as already stated, phyllodes or stipules perform the function of leaves. The production of leaf buds from leaves sometimes occurs as in *Bryophyllum,* and many plants of the order Gesneraceae. The leaf of Venus's-flytrap (*Dionaea muscipula*) nhen cut off and placed in damp moss has produced buds from nhich young plants were obtained. Some species of saxifrage and of ferns also produce buds on their leaves. In *Nymphaea micrantha* buds appear at the upper part of the petiole.

Phyllotaxis.—Leaves occupy various positions on the stem and branches. and have received different names according to their situation. Thus leaves arising from an unelongated crown stem so that they appear to be coming from the root. as in the primrose, are called radical; those on the stem are cauline; on flower stalks, floral leaves *(see* FLOWER). The first leaves developed are known as seed leaves or cotyledons. The arrangement of the leaves on the axis and its appendages is called phyllotaxis.

In their arrangement leaves follow a definite order. The places on the stem at nhich leaves appear are called nodes; the part of the stem between two nodes is the internode. When two leaves are produced at the same node, one on each side of the stem or axis and at the same level, they are opposite, nhen more than two are produced, they are verticillate, and the circle of leaves is then called a verticil or whorl. When leaves are opposite, each successive pair may be placed at right angles to the pair immediately preceding. They then decussate, thus following a law of alternation. The same occurs in the verticillate arrangement, the leaves of each whorl rarely being superposed on those of the whorl next to it, but usually alternating so that each leaf in a whorl occupies the space between tno leaves of the whorl next to it. There are considerable irregularities, however, in this respect, and the number of leaves in different whorls is not always uniform, as may be seen in *Lysimachia vulgaris.* When a single leaf is produced at a node, and the nodes are separated so that each leaf is placed at a different height on the stem, the leaves are alternate. A plane passing through the point of divergence of the leaf at the node, dividing the leaf into similar halves, is the median plane of the leaf; and nhen the leaves are arranged alternately on an axis so that their median planes coincide, they form a straight row or orthostichy. On every axis there are usually two or more orthostichies. In some plants, such as the lime tree, the leaves arise at nodes and the nodes are separated from one another by internodes, the arrangement resulting in one leaf being placed above the other. In this case, then. there are two orthostichies and the arrangement is said to be distichous. When the fourth leaf is directly above the first. the arrangement is tristichous The same arrangement continues throughout the branch. so that in the latter case the seventh leaf is above the fourth, the tenth above the seventh, the fifth above the second, the sixth above the third and so on. The size of the angle between the median planes of tno consecutive leaves in an alternate arrangement is their divergence; and it is expressed in fractions of the circumference of the axis which is supposed to be a circle. In a regularly formed straight branch covered with leaves, if a thread is passed from one to the other. turning always in the same direction. a spiral is described and a certain number of leaves and of complete turns occur before reaching the leaf directly above that from which the enumeration commenced. If this arrangement is expressed by a fraction, the numerator of uhich indicates the number of turns, and the denominator the number of internodes in the spiral cycle, the fraction will be found to represent the angle of divergence of the consecutive leaves on the axis.

This is a convenient mode of expressing on paper the exact position of the leaves upon an axis. And in many cases such a mode of expression is of excellent service in an understanding of the relations of the leaves.

The spiral is not always constant throughout the whole length of an axis. The angle of divergence may alter either abruptly or gradually, and the phyllotaxis thus becomes very complicated. This change may be brought about by arrest of development, by increased development of parts or by a torsion of the axis.

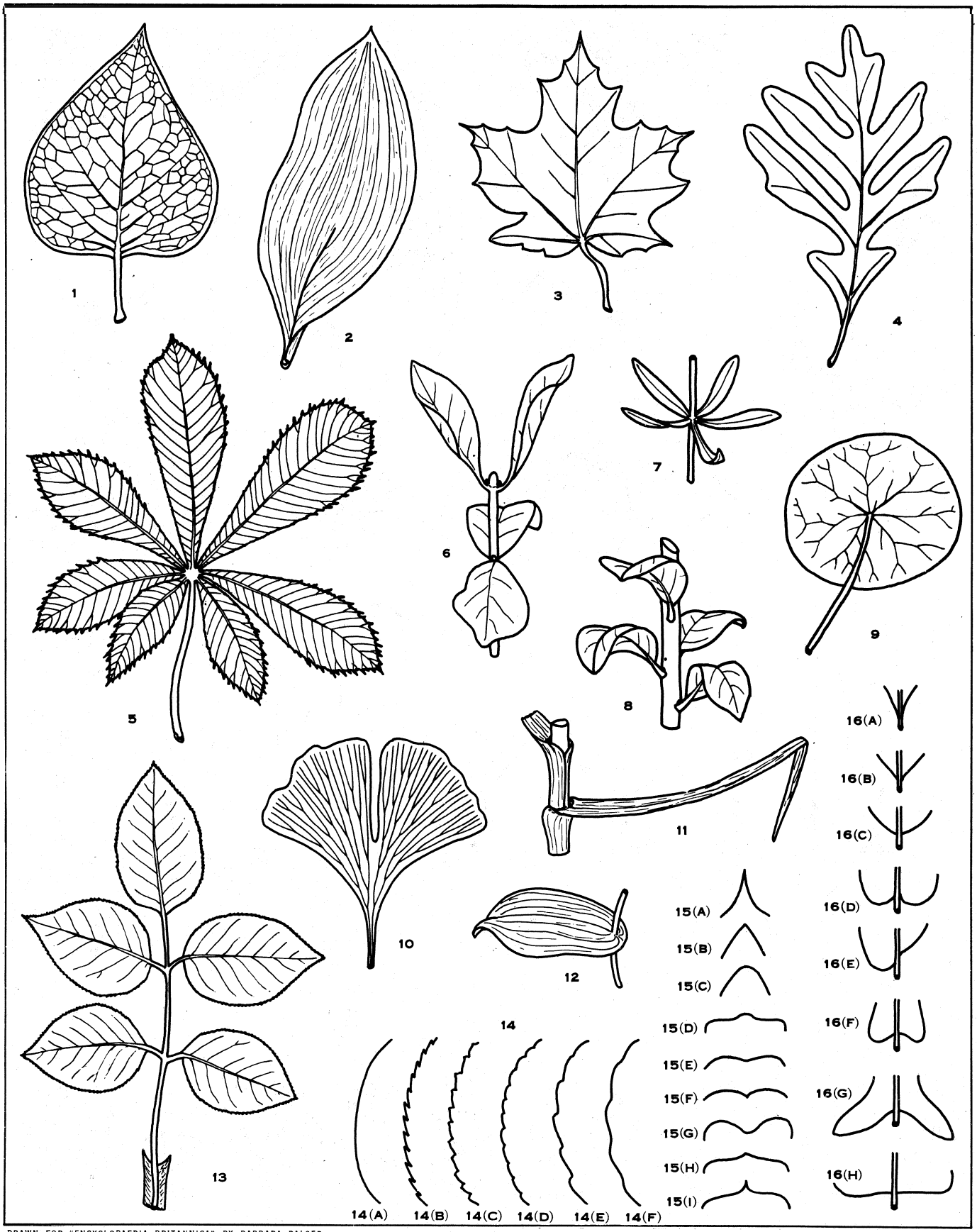
In dicotyledonous plants the first leaves produced (the cotyledons) are opposite. This arrangement often continues during the life of the plant, but at other times it changes, passing into distichous and spiral forms. Some tribes of plants are distinguished by the opposite or verticillate! others by their alternate: leaves. Labiate plants have decussate leaves, while Boraginaceae have alternate leaves and Tiliaceae usually have distichous leaves; Rubiaceae have opposite leaves. Such arrangements as $\frac{2}{5}$, $\frac{3}{8}$, $\frac{5}{13}$ and $\frac{8}{21}$ are common in dicotyledons. In monocotyledonous plants there is only one seed leaf or cotyledon, and hence the arrangement is at first alternate; and it generally continues so more or less, rarely being verticillate. Such arrangements as $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{2}{3}$ are common in monocotyledons, as in grasses, sedges and lilies. It has been found in general that, while the number 5 occurs in the phyllotaxis of dicotyledons, 3 is common in that of monocotyledons.

Axillary Buds.—In the axil of previously formed leaves leaf buds arise. These leaf buds contain the rudiments of a shoot, and consist of leaves covering a growing point. The buds of trees of temperate climates, which lie dormant during the winter: are usually protected by scale leaves. These scales or protective appendages of the bud consist either of specialized laminae or of the enlarged petiolary sheath or of stipules, as in the fig and magnolia, or of one or two of these parts combined. These are often of a coarse nature, serving a temporary purpose, and then falling off when the leaf is expanded. They are frequently covered with a resinous matter, as in balsam-poplar and horse chestnut. or by a thick downy covering as in the willow. In plants of warm climates the buds often have no protective apparatus, and are then said to be naked.

The arrangement of the leaves in the bud is termed vernation or prefoliation. The manner in which each individual leaf is folded, and also the arrangement of the leaves in relation to each other, vary in different plants but in each species they follow a regular law. The leaves in the bud are either placed simply in apposition, or they are folded or rolled up longitudinally or laterally, giving rise to different kinds of vernation, the folded or curved lines representing the leaves, the thickened part being the midrib. The leaf taken individually is either folded longitudinally from apex to base, as in the tulip tree. and called reclinate or replicate; or rolled up in a circular manner from apex to base, as in ferns, and called circinate; or folded laterally, conduplicate, as in oak; or it has several folds like a fan, plicate or plaited, as in vine and sycamore, and in leaves with radiating vernation. where the ribs mark the foldings; or it is rolled upon itself. convolute, as in banana and apricot; or its edges are rolled inward, involute, as in violet; or outward, revolute, as in rosemary. The different divisions of a cut leaf may be folded or rolled up separately, as in ferns, while the entire leaf may have either the same or a different kind of vernation.

The leaves have a definite relation to each other in the bud, being either opposite, alternate or verticillate; and thus different kinds of vernation are produced. Sometimes they are nearly in a circle at the same level, remaining flat or only slightly convex externally, and placed so as to touch each other by their edges, thus giving rise to valvate vernation. At other times they are at different levels, and are applied over each other, so as to be imbricated, as in lilac and in the outer scales of sycamore; and occasionally the margin of one leaf overlaps that of another, while it in turn is overlapped by a third, so as to be twisted, spiral or contortive.

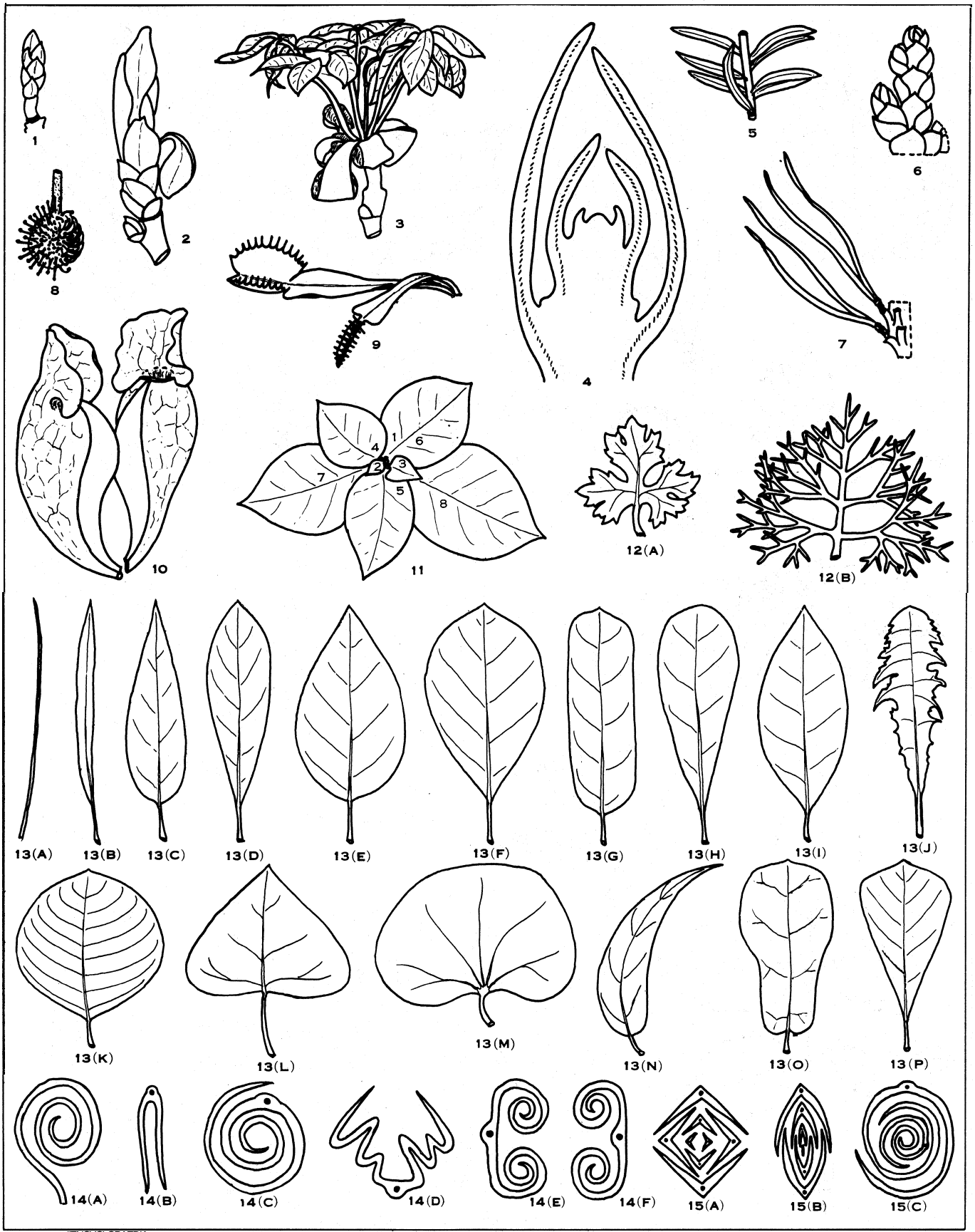
When leaves are applied to each other face to face, without being folded or rolled together, they are appressed. When the leaves are more completely folded, they either touch at their extremities and are accumbent or opposite. or are folded inward by their margin and become induplicate; or a conduplicnte leaf covers another similarly folded, which in turn covers a third, and thus the vernation is equitant. as in privet; or conduplicate leaves are placed so that the half of the one covers the half of another, and thus they become half-equitant, as in sage. When in the case



DRAWN FOR "ENCYCLOPAEDIA BRITANNICA" BY BARBARA PALSER

1. Lilac, a simple leaf with netted venation. 2. Lily of the valley, simple, parallel venation. 3. Maple, simple incised leaf with palmate major veins. 4. Oak, simple lobed leaf with pinnate major veins. 5. Horse chestnut, palmately compound leaf. 6. Honeysuckle twig, leaves oppositely arranged. 7. Bedstraw stem, leaves whorled. 8. Apple twig, leaves alternately arranged. 9. Nasturtium, a peltate leaf. 10. Ginkgo leaf, dichotomous venation. 11. Grass stem with linear, sheathing leaves. 12. Bellwort, a perfoliate leaf. 13. Rose, a pinnately compound leaf with stipules at base of petiole. 14. Types of leaf margins: (A) entire, (B) serrate, (C) dentate, (D) crenate, (E) sinuate, (F) undulate. 15. Types of leaf apices: (A) acuminate, (B) acute, (C) obtuse, (D) truncate, (E) retuse, (F) emarginate, (G) obcordate, (H) cuspidate, (I) mucronate. 16. Types of leaf bases: (A) acuminate, (B) acute, (C) rounded, (D) cordate, (E) oblique, (F) sagittate, (G) hastate, (H) truncate

LEAF



DRAWN FOR "ENCYCLOPAEDIA BRITANNICA" BY BARBARA PALSER

1–3. Hickory buds, in winter, starting to expand in spring, and foliage leaves emerging. 4. Diagram of longisection of bud showing stem apex and origin and development of leaves. 5–7. Conifer leaves: yew, arborvitae, pine. 8–10. Insectivorous leaves: sundew, Venus's-flytrap, pitcher plant. 11. View from above of tobacco plant showing 2/5 phyllotaxy. 12. Leaves of a water plant, crowfoot: (A) aerial, (B) submerged. 13. Types of leaf shapes: (A) acicular, (B) linear, (C) lanceolate, (D) oblanceolate, (E) ovate, (F) obovate, (G) oblong, (H) spatulate, (I) elliptical, (J) runcinate, (K) orbicular, (L) deltoid, (M) reniform, (N) seculate, (O) pandurate, (P) cuneate. 14. Types of vernation: (A) longisection of circinate leaf, (B) cross section of conduplicate leaf, (C) cross section of convolute leaf, (D) cross section of plicate leaf, (E) cross section of involute leaf, (F) cross section of revolute leaf. 15. Cross sections of a bud showing leaf arrangement: (A) accumbent, (B) eauitant, (C) supervolute

of convolute leaves one leaf is rolled up within the other, it is supervolute.

The scales of a bud sometimes exhibit one kind of vernation and the leaves another. The same modes of arrangement occur in the flower buds.

Leaves, aiter periorming their functions for a certain time, wither and die. In doing so they frequently change colour, and hence arise the beautiful and varied tints of the autumnal foliage. Leaves which are articulated with the stem, as in the walnut and horse chestnut, fall and leave a scar, while those which are continuous with it remain attached for some time after they have lost their vitality. Many of the nonconiferous trees of nontropical climates have deciduous leaves, their duration not estending over more than a few months, while in trees of warm climates the leaves often remain for two or more years. In tropical countries, however, many trees lose their leaves in the dry season. The period of defoliation varies in different countries according to the nature oi the climate Trees which are called evergreen, as pines, live oak and citrus, frequently lose a certain number of leaves at intervals, sufficient being left, however, to preserve their green appearance. The fall is sometimes directly accompanied by the formation of a layer of tissue across the base of the leaistalk; the cells of this layer separate from one another; the leaf remains attached only by the fibres of the veins until it becomes detached by wind or irost. Beiore its fall the leaf may become dry because of loss of water; certain of the materials of the leaf pass back into the stem and are available for further growth. The leaf scar is protected by a change of a corky nature (suberization) in the walls of the exposed cells. (A. B. R.; V. H. B.; H. E. HD.)

LEAF-CUTTING BEE, the name applied to solitary bees of the genus *Megachile,* which line their nests with portions of leaves or flower petals. These they cut out with their mandibles and fit together, one within the other, into thimble-shaped cells, each one containing an egg and some pollen and honey paste. There are numerous species on both sides of the Atlantic, often utilizing rose leaves.

See BEE; HYMENOPTERA.

LEAF INSECT, a flat green leaflike phasmid of the family Phylliidae, closely allied to stick insects (*see* ORTHOPTERA), often called walking leaf. The resemblance to leaves involves form as well as colour; the legs and abdomen bear lateral expansions, and the large female tegmina (fore wings), lying edge to edge on the abdomen. forcibly suggest in their veining the midrib and veins of a leaf.



ROSS - HUTCHINS

FEMALE LEAF INSECT, INHABITANT OF THE PHILIPPINES

Females have reduced, functionless hind wings; males have small tegmina and ample nonleaf-like and functional hind wings. Newly hatched young are reddish, but turn green after feeding on leaves a short time. Since leaf insects are phytophagous. or plant-eating, their cryptic colour and form are doubtless purely protective. Their eggs, like those of stick insects. are also probably protected from enemies by their similarity to various seeds. Leaf insects range from India and the Seychelles eastward to the Fiji Islands. Three genera and about 20 species are known. (T. H. HL.)

LEAF MINER, any of a number of insect larvae which live and ieed within the thickness of a leaf. They are chiefly caterpillars (order Lepidoptera). saw-fly larvae (order Hymenoptera ı, beetle and weevil grubs or larvae (order Coleoptera) and maggots of two-winged flies (order Diptera). Most of the burrows or tunnels they make in leaves are either thin, winding whitish trails—characteristic of the columbine and holly leaf miners—or broad. whitish or brownish blotches—typical of the boxwood. burdock and arborvitae'leai miners. Only a few of the many kinds become really injurious. such as the spinach leaf miner. *Pegomya hyoscyami,* a maggot which sometimes ruins spinach, beet and chard leaves; it is often common enough to spoil them for greens. The most feasible method of control on garden plants is to remove and burn infested leaves. Spraying with nicotine solutions or dusting with various insecticides is effective only when the adults are emerging; the mining stage is inaccessible.

See J. G. Needham, S. W. Frost and B. H. Tothill, *Leaf-mining Insects* (1928); Martin Hering, *Biology of the Leaf Miners* (1951).

LEAGUE OF NATIONS. The terrible losses of World War I produced, as years went by and peace seemed no nearer, an ever growing public demand that some method be found to prevent the renewal of the suffering and destruction which were now seen to be an inescapable part of modern war. So great was the force of this demand that within a few weeks after the opening of the peace conference of Paris in Jan. 1919, unanimous agreement had been reached on the text of the covenant of the League of Nations. Although the League was finally unable to fulfill the hopes of its founders, its creation was an event of decisive importance in the history of international relations. The present article offers a brief description of the origins. purposes, functions and structure of the League. together with an outline of its development and of the chief events of its history.

Origins of the Idea.—The central, basic idea of the movement was that aggressive war is a crime not only against the immediate victim but against the whole human community; that accordingly it is the right and duty of all states to join in preventing it; and that ii it is certain that they will so act. no aggression is likely to take place. Such affirmations might be found in the writings of philosophers or moralists. but had never before emerged onto the plane of practical politics. Statesmen and lawyers alike held and acted on the view that there was no natural or supreme law by which the rights of sovereign states, including that of making war as and when they chose, could be judged or limited. Many of the attributes of the League were developed from existing institutions or from time-honoured proposals for the reform of previous diplomatic methods. But the basic conception as defined above. which was given the name of collective security in later discussion. was for practical purposes a new birth engendered by the unprecedented pressures of World War I.

When the peace conference met, it was generally agreed that its task should include the establishment of a League of Nations capable of ensuring future peace. Pres. Woodrow Wilson insisted that this should be among the first questions to be dealt with by the conference; and the work proceeded with far greater speed than that of territorial and military settlement. chiefly because the subject had been exhaustively studied during the war years. Unofficial societies in the United States. Great Britain, France and some neutral countries had drawn up many plans and proposals: and in doing so they in turn had availed themselves of the efforts of earlier thinkers.

Over many years lan-yers had worked out plans for the settlement of disputes between states by legal means or, failing these. by third-party arbitration, and the Hague conferences of 1899 and 1907 had held long debates on these subjects. The results had been unimpressive; the 1907 conference tried in vain to set up an international court. and though many arbitration treaties were signed between individual states. they all contained reservations which precluded their application in the more dangerous disputes. However. though the diplomatists thus kept the free hand as long as possible, the general principle of arbitration—which in popular language included juridical settlement and also settlement through nlediation—had become widely accepted by public opinion and was embodied as a matter of course in the covenant.

Another 19th-century development which had influenced the plan makers was the growth of international bureaus. such as the Universal Postal union. the International Institute of .Agriculture and numerous others. set up to deal with particular fields of work in which international co-operation was plainly essential. They had no political function or influence but n-ithin their very narrow limits they worked efficiently. and it was naturally concluded that wider fields of social and economic life, in which each passing year made international co-operation more and more necessary. might n-ith advantage be entrusted to similar international administrative institutions. Such ideas were strengthened by the fact that. during the war. the joint Allied cornmissions controlling

trade, shipping, raw materials, etc., had gradually developed into powerful and effective administrative bodies. Might not these, admitting first the neutrals and later the enemy states into their councils, become world-wide centres of co-operation in their respective fields?

Yet other lessons of the war concerned the problems of armaments on the one hand and of diplomacy on the other. It was widely believed that the enormous increase in armaments undertaken by the great powers of Europe during the immediate prewar period had been not only a consequence, but also in itself a cause, of tension, hostility and finally war. Equally strong was the belief that "secret diplomacy," *i.e.,* the existence, under secret treaty, of commitments for reciprocal diplomatic or military support, had enabled statesmen and soldiers to run risks which public opinion would never have countenanced. had they been known.

These general propositions — collective security) arbitration, economic and social co-operation, reduction of armaments and open diplomacy — inspired in various degrees the plans drawn up during the war, and it was urged from the first that they could become effective only through the creation of a great international organization charged with the duty of applying them and invested with the powers necessary to that end. Already in the spring of 191j the name "League of Nations" was in general use among the small groups which were discussing the future organization of peace. Their ideas, encouraged by a few statesmen such as former Pres. William H. Taft in the United States and Sir Edward Grey and Lord Robert Cecil in Great Britain, gradually became known and supported. In the United States the League to Enforce Peace and in Britain the League of Nations societies acted as centres of discussion. In the presidential election of 1916 both parties advocated U.S. membership in a future league. A few months later the United States was a belligerent, and Wilson, entering on his second term, became, by right both of his personality and of his position as leader of the greatest world power, the chief spokesman of the Allied coalition. In Jan. 1918, in the historic fourteen points (*q.v.*) in which he summed up U.S. war aims, he called for the formation of "a general association of nations . . . affording mutual guarantees of political independence and territorial integrity to great and small States alike." The fourteen points were in due course accepted by all the Allies as an authentic statement of their war aims also. Thus what had seemed hardly more than a utopian hope was transmuted in a fe months into the formal and official purpose of the soon-to-be-victorious Allies.

Meanwhile, both the British and French governments had appointed special committees to draw up plans for the new organization, and their reports were transmitted to Washington where Wilson and his confidential adviser Col. E. M. House were drafting proposals in their turn. A further contribution of great importance was made by the South African statesman Field Marshal J. C. Smuts,, who published in Dec. 1918 his famous *The League of Nations: a Practical Suggestion,* in which he declared that the League must not be a mere diplomatic defense against war but "a great organ of the ordinary peaceful life of civilisation . . . woven into the very texture of our political system," and that in the long run its power to prevent war would depend upon the extent of its action in peace. This was to most of his contemporaries a new vision of the real nature of an effective League of Nations.

The Covenant. — With the ground thus well prepared, and under Wilson's resolute leadership, the conference was able to draw up, in a few days of intensive committee work, a dpcument to which it gave the name of the "Covenant of the League of Nations." This text was published, as a draft, on Feb. 14, 1919. It was subjected to various criticisms, especially in the United States where Wilson's star was already on the decline, and also by the European neutrals, who had had no official share in the work. But in general it was well received; and though the first great impulse had already weakened and Allied unity had been much impaired, a final amended text was adopted on April 28, 1919, by the unanimous decision of the conference.

The covenant was a short and concise document of 26 articles. The first seven articles established the constitutional basis of the new system. By articie 1, the original members consisted, first, of all the Allied signatories of the peace treaties and, second, of 13 states which had been neutral in the war, if the latter chose to join without reservation. Others could be admitted by a two-thirds majority of the assembly, and any member could withdraw after giving two years' notice.

Articles 2–5 created the directing organs of the League: an assembly composed of representatives of all members; a council composed of representatives of the United States, Great Britain, France, Italy and Japan as permanent members, with four others elected by the assembly. Articles 6 and 7 created a permanent secretariat, provided for the expenses of the League and named Geneva as its headquarters.

Articles 8 and 9 dealt with armaments. All members undertook to reduce their armaments to the lowest possible level, to suppress the evils of private manufacture of arms and to interchange full information as to their existing armaments and their programs for the future. A permanent commission was provided to advise the council on all military, naval and air questions.

Articles 10–17 embodied what may be called the central and basic idea of the League: collective security, together with the various procedures for peaceful settlement of disputes. Each member undertook (art. 10) to respect the integrity and independence of all the others and to join in preserving them against aggression. Article 11 declared that any war or threat of war was a matter of concern to all members, whether directly affected or not; every member had the right to demand that the question be considered by the council, and if necessary to insist on an immediate meeting. By article 12, all bound themselves to submit all serious disputes to peaceful settlement or to inquiry by the council and in no case to resort to war until these procedures had had time to lead to a settlement. And even then, if no settlement were reached, they promised to wait a further three months before going to war. The various methods of settlement — arbitration, legal procedure, or action by the council or the assembly — were then set out in some detail (art. 13–15), and these provisions included the establishment of a permanent international court. Under article 16 all members promised to join in common action against any other which made war in violation of the covenant, this action to take in all cases the form of economic sanctions; *i.e.,* the breaking off of all economic and other intercourse with the covenant-breaking state, and, if this were not enough, of military intervention. This article also empowered the council to expel a member which violated the covenant. And, finally, article 17 extended the system so as to provide protection against, and in certain conditions for, nonmember states.

Article 18 was designed to meet the demand for open diplomacy. It required that all future treaties be registered with, and published by, the secretariat. Article 19 empowered the assembly to propose changes in existing treaties or situations which might be a danger to peace. By article 20 all members agreed that any treaty inconsistent with the covenant was automatically abrogated, and undertook not to enter into any such engagement in the future. Article 21 declared that the covenant did not affect the validity of the Monroe Doctrine (*q.v.*).

Article 22 established the mandates system (*see* MANDATE). Articles 23 and 24 corresponded to the proposals for world-wide economic and social co-operation under the authority of the League; the members undertook to act together in matters concerning transport and communications, commercial relations, health, the drug traffic, etc., and to bring existing international agencies, such as the Universal Postal union, under the direction of the League. They agreed also to set up an International Labour organization (*q.v.*) in order "to secure and maintain fair and humane conditions of labour." Article 25 promised support for the Red Cross (*q.v.*).

Finally, article 26 defined the procedure for amending the covenant; an amendment, to be effective, must be ratified by a majority of the members, including all those represented on the council.

It will be seen from the above summary that the covenant purported to cover each and all of the main proposals which had emerged during the preparatory period — collective security; arbi-

tration and judicial settlement, including the creation of an international court; international co-operation or control in economic and social affairs; disarmament; open diplomacy. It did not satisfy the extreme pacifists, who rejected any use of force. even to resist aggression, or the extreme internationalists. who wished the League to have its own military forces and to impose all its decisions by its own political and military authority. But in the main it fully realized the plans made during the war, and in one essential respect. the creation of efficient working institutions. it went much beyond them.

For the next 20 years the covenant continued to be, in theory. nor only the guide and authority for all the activities of the League. but also the criterion by which liberal opinion in many advanced countries judged the conduct of their own and other governments. In consequence, its text was minutely and repeatedly studied. scrutinized and debated by professors. lawyers and statesmen. This test it bore. on the whole, very successfully. A few minor problems of interpretation were unearthed, chiefly due to the fact that its English and French texts were equally authentic; but in the actual working of the League it never failed to provide both the principles and the methods required by each successive question.

This of course is not to say that its principles were always respected or that its provisions were not capable of improvement. Nevertheless, the covenant system was much more complete and well-planned than might appear from the fact of the various failures and final defeat of the League. For it had received. before it even started to function, a blow so severe that it was never possible to apply the system as its founders had intended.

The covenant was in its nature an entirely separate instrument to which neutral states could accede even if they objected to other parts of the peace. treaties. But it was in form a part of these. so that. though its text was finally settled in April 1919, it could only come into force at the same time as the Versailles treaty as a whole. on Jan. 10. 1920. Meanwhile, in the United States senate, the leaders of the Republican opposition, by then implacably hostile to Woodrow Wilson and all his works, had resolved to return to the policy of isolationism. which two years before seemed to have been abandoned by almost the whole country. They did not formally propose the rejection of the covenant. but they put forward a number of reservations which Wilson was certain to refuse. Not all the Republican senators were isolationists: there was indeed a clear majority for ratification. either without reservation or with such mild reservations as Wilson could have accepted; but this fell short of the two-thirds majority which the U.S. constitution requires for such decisions. In Nov. 1919 and again in March 1920 the proposal to ratify with substantial reservations was defeated, and the hope of U.S. membership disappeared. as it proved, forever.

The effect of this event upon the future of the League was, in one sense. decisive, since it ruled out all possibility of collective security as embodied in the covenant: *i.e.*, the certainty of a complete economic boycott which, it was confidently expected, would suffice to make even the most aggressive government prefer to settle its disputes by negotiation rather than by armed attack. The other component parts of the system could still function, and did in fact function. though with less effectiveness than if the United States had fully participated therein: but the knowledge that the world's greatest economic power would stand aside from sanctions robbed that part of the covenant of its main terrors for the aggressor and destroyed. in consequence, the confidence that other members could place in it.

However, the League was closely interwoven with the fabric of the peace treaties; there was hope that the senate's decision might some day be reversed; and public opinion in many countries would have strongly resisted any proposal to abandon the League. And so, in spite of the absence of the United States, the first meeting of the League council was held immediately after the ratification of the treaty of Versailles, and the League entered on the very active if not always very successful existence which ended in fact with the outbreak of World War II in 1939, though its formal demise did not take place until April 1946.

Members of the League of Nations

Member	Date of entry	Notice of withdrawal (effective after two years)
Afghanistan	Sept. 1934	..
Albania	Dec. 1920	..†
*Argentina	..	..
*Australia	..	..
Austria	Dec. 1920	..‡
*Belgium	..	..
*Bolivia	..	
*Brazil	..	June 1926
Bulgaria	Dec. 1920	..
*Canada	..	
*Chile	..	June 1938
*China		..
*Colombia		
Costa Rica	Dec. 1920	Jan. 1925
*Cuba	..	..
*Czechoslovakia	..	..
*Denmark		..
Dominican Republic	Sept. 1924	..
Ecuador	Sept. 1934	..
Egypt	May 1937	..
*El Salvador		Aug. 1937
Estonia	Sept. 1921	..
Ethiopia	Sept. 1923	..
Finland	Dec. 1920	..
*France		..
Germany	Sept. 1926	Oct. 1933
*Greece	..	
*Guatemala	..	May 1936
*Haiti	..	April 1942
*Honduras	..	July 1936
Hungary	Sept. 1922	April 1939
*India	..	..
Iraq	Oct. 1932	..
Ireland	Sept. 1923	..
*Italy		Dec. 1937
*Japan	..	March 1933
Latvia	Sept. 1921	..
*Liberia		..
Lithuania	Sept. 1921	..
Luvembourg	Dec. 1920	..
Mexico	Sept. 1931	..
*Netherlands		..
*New Zealand	..	..
*Nicaragua	..	June 1936
*Norway	..	..
*Panamá	..	..
*Paraguay	..	Feb. 1935
*Persia	..	
*Peru	..	April 1939
*Poland	..	
*Portugal	..	..
*Rumania	..	July 1940
*Siam	..	..
*Spain	..	May 1939
*Sweden	..	..
*Switzerland	..	..
Turkey	July 1932	..
*Union of South Africa	..	..
Cnion of Soviet Socialist Republics	Sept. 1934	..§
*United Kingdom of Great Britain and Northern Ireland	..	..
*Uruguay	..	..
*Venezuela	..	July 1938
*Yugoslavia	..	..

*Original members. †Annexed by Italy, April 1939. ‡Annexed by Germany, March 1938. §Declared to he no longer a member of the League, by council resolution, Dec. 14, 1939.

Structure of the Organization.— The League quickly became a large and complex structure Of its principal organs and institutions. the assembly and the council, acting either under the direct terms of the covenant or on their own initiative. decided the nature. membership and competence of the rest, directed their work and provided their budget. The assembly consisted of from one to three delegates from each member nation; many states also sent a large body of substitutes and experts. The makers of the covenant had expected that the assembly mould meet perhaps every third or fourth year, but at its first session in 1920 it decided to meet every September. Each session opened with a general discussion on the work done during the past year or planned for the next; this discussion often ranged also over political problems which the speaker considered ought to be dealt with by the League instead of outside it. It then settled down to two or three weeks of committee meetings. Since every delegation was represented on each committee. and these held their meetings in public, the conclusions reached in committee were usually adopted uith no more than a few formal speeches in the plenary assembly. The assembly decisions required unanimity among those who voted. Thus, in theory, any member could veto any decision. In practice, such a contingency was exceedingly rare. It became customary for those who disagreed with the proposals of the majority to vote against them in committee, and having thus put their views on record, to abstain from voting in the assembly.

Except that it usually refrained from discussing political problems that were being dealt with by the council, the assembly's debates covered every part of the activities of the League. By the covenant itself, a few matters such as the admission of new members or the revision of obsolete treaties were specifically reserved to the assembly, and from the beginning it insisted on being the sole authority in regard to the budget. It showed much zeal for disarmament, on which the smaller powers, who could there make their voice effectively heard, were dissatisfied with the policy of the great powers and of the council.

The assembly was, by general consent, the most successful as well as the most original of the many innovations of the League. It was original in its constitutional nature, as a world-wide conference meeting to discuss, not some special question, but any and all questions of international relations, and still more in its spirit, since it gave equal rights and opportunities to be heard to all powers whether great or small, and sought deliberately to follow the open and direct methods of a parliament rather than the formalities of a diplomatic gathering.

The council was originally intended to consist of five great powers—the United States, Great Britain, France, Italy and Japan—as permanent members, together with four others elected by the assembly for limited periods. It was expected that Germany would in due course, and that the U.S.S.R. someday might, become permanent members and that the nonpermanent membership might be correspondingly increased. But the United States seat was never occupied, and the number of elected members was increased to six in 1922 and to nine in 1926, so that the intended majority of great powers was never realized.

After the first year, when it met almost every month, the council held three or four regular sessions a year, though it was not until 1923 that it formally decided to meet at fixed dates in March, June, September and December of each year. It also met in special session when necessary. In the early years, its members were usually represented either by statesmen, who after holding high office had withdrawn from active politics, such as Arthur Balfour or Léon Bourgeois, or by professional diplomatists. In 1925 the European members began to send their foreign ministers to each meeting, a change which greatly enhanced the authority and importance of the council; and this continued to be the normal practice until the last days of the League.

The main business of the council was political. It dealt not only with the major disputes which might endanger peace, but with countless small problems arising out of the peace treaties or submitted to it by the states concerned—problems of frontier adjustment; disputes arising from frontier incidents or accusations of wrongs done to minorities; problems concerning particular areas of constant tension, such as Danzig or the Saar territory, where treaty settlements entrusted administrative or arbitral decisions to the council; reports from committees, such as those dealing with disarmament or with the mandated territories. In any dispute likely to lead to a rupture, the votes of the parties concerned did not count. With this exception, all decisions of substance required unanimity; and all League members concerned in the question under discussion had. for the occasion, the rights of council membership. Actual cases of veto or deadlock were very few; but without doubt the council tended, in consequence, toward compromise or delay rather than clear-cut decisions.

In organizing the secretariat, Sir (James) Eric Drummond, the first secretary-general from 1919 to 1933, struck out on a completely new path when he and his French and U.S. deputies built up a strictly international institution in which it was understood from the first that all officials were to act in independence of their own national authorities. If this ideal was not always realized, it is still true to say that it governed the attitude of the secretariat as a whole and that the latter was rarely if ever accused of partiality on national grounds. As regards its efficiency, the secretariat early reached a high standard and maintained it. In spite of prophecies to the contrary, officials from many different countries were able to work together with zeal and cordiality, and the secretariat was as proud of its corporate spirit as any national service could be. Its work, however, and that of the League in general, was throughout hampered by poverty. At each assembly the League members, especially the richest ones, made devoted efforts to cut down its expenditure to the bone. The average annual budget for the League, the International Labour organization and the permanent court combined was less than $5,500,000. This covered not only running costs but also capital expenditure, including the great Palais des Nations which was completed in 1937. Nevertheless the opponents of the League were able to establish the legend that it was an expensive and extravagant institution.

The assembly, council and secretariat were the central organs of an extensive structure of auxiliary institutions. These fell into two main categories: those of a legal or political character, set up to assist the League in its duty of preventing tension and settling disputes, and those of a social or economic character, whose advice was often sought in connection with political disputes, but whose main function was to organize and extend the habit of international co-operation in social and economic affairs.

The principal organs of the first category were the Permanent Court of International Justice; the Permanent Mandates commission; the minorities committees of the council; and the commissions concerned with military affairs and with the problems of disarmament. Of these, the court and the mandates commission were by general consensus highly efficient bodies which rendered valuable service to the League and to peace. The minorities committees, and indeed all the continuous though mainly secret work of the council for the protection of minorities, were bitterly criticized, on exactly opposite grounds, by the minorities and by the governments concerned. In truth, they redressed not a few injustices, but the council's responsibilities in this field were completely disproportionate to its powers. (For details see INTERNATIONAL COURT OF JUSTICE; MANDATE; MINORITIES; DISARMAMENT.)

In the second category, the most important organs were—besides the International Labour organization, administratively a part of the League but otherwise autonomous—the Economic and Financial organization; the Organization for Communications and Transit; the Health organization; and the Intellectual Co-operation organization. To these must be added those dealing with more strictly humanitarian affairs—the control of the drug traffic, the protection of women, child welfare, the abolition of slavery and the refugee problem. Several of these were in themselves complex organizations, comprising regular conferences. a standing committee and numerous subcommittees for special subjects. It is impossible here to attempt even a summary of the immense mass of work done by these bodies, whether in the form of general agreements and treaties, of expert advice and assistance to particular countries or groups of countries, or of consultation and exchange of ideas and methods.

This work formed a continuous, if often inconspicuous, background to the political action of the League; though often frustrated by political conditions, it represented in total a very great contribution to human welfare. It was done without payment, the members—usually eminent experts in their own fields—receiving nothing beyond their expenses.

POLITICAL HISTORY

The 20 years of the League's active existence fell into four periods: (1) 1920–23, a period of growth, during which the League increased its membership and established its machinery, but had little concern with the chief political problems of the time; (2) 1924–31, from the beginnings of reconciliation in Europe to the Japanese aggression in Manchuria, a period of relative stability; (3) 1931–36, from the Manchurian war to Mussolini's victory in Ethiopia and the formation of the Rome-Berlin axis, a period of conflict, during which, however, as during the preceding period, the League was the main centre of international affairs; (4) 1936–39, a period of defeat for the League, during which the covenant was virtually abandoned.

First Period, 1920–23.—During the first period all the organs described above, which made up the League's working structure, were created. All the neutral states invited to accede to the

covenant had done so. and three of the states defeated in the war, as well as several of those created by the peace treaties, had been admitted. enlarging the membership irom 42 to 54. But while the League was thus establishing itself as a fairly efficient working institution, it was far indeed from exercising the powerful influence on world affairs which its founders had planned. While the United States remained aloof. the so-called Supreme council of the victorious powers clung to the responsibility for dealing with the more serious problems. The only important political achievements of the League in this period were the settlement of the Polish-German frontier in Upper Silesia and the rescue of Austria from financial catastrophe, In each case the council. invited to solve the problem after the Supreme council had tried and failed, did so by what was essentially a new technique in such matters, viz., by an interlocked complex of political and economic dispositions. based on the advice of its technical organizations. The Austrian model nas soon followed by League plans for Hungary, Bulgaria and Greece, and also, in great part, by the Dan-es plan for restoring the collapsed economy of Germany (see REPARATIONS), although this last was not effected by the League.

The climax of discord and disorder in the postwar period was reached in 1923, when the French occupied the Ruhr in order to force the payment of reparations, and Mussolini occupied Coriu in order to force the Greek government to psy compensation for the murder on Greek soil of a group oi Italian officers. The Corfu dispute was expected by many to be fatal to the League. since in this. the first sharp conflict between League members in which the principle of collective security might seem to be involved. Mussolini got his way by methods which plainly violated the covenant. But, under severe pressure in the council and assembly, he was reduced to getting it by a trick and not by continuing to defy the League, and was obliged to evacuate Corfu much sooner than he had intended. The event showed that the League, even if unable to enforce swift decisions. was able to make the way of the aggressor hard and unpleasant.

The Second Period, 1924–31.—The following months produced a notable reversal of the situation. and the League w s now to enter upon the second period of its life. New governments in London and Paris set themaelves to create better relations with Germany and the C.S.S.R.. and both declared that their policy would henceforth be based on the League. The Supreme council had ceased to function; the system of hasty conferences was abandoned; and for the next 12 years Geneva became the main working centre of international affairs. During the first seven of these. the world was free from any serious armed conflict; the minor quarrels with which the council had to deal. though often unpleasant and difficult. usually ended in compromise and did not threaten the siability of the League or the peace of the world.

In the reconstruction of Europe. the question of Germany's admission to the League assumed great importance. It was demanded by Germany as a symbol of its restoration to equality with other great powers. and as enabling it to share in the general management of international affairs, including those arising from the peace treaties. The proposal to admit Germany to the League was supported by the former neutrals and by liberal opinion everywhere as a real beginning of reconciliation, and those who called for reconciliation called also for the execution without further delay of the covensnt provisions for disarmament. In France, Poland and other countries which were neighbours of Germany! these sentiments were not absent. but were accompanied by deep anxiety lest the military ambitions of the German empire might again become uppermost in the Weimar republic, and the attitude of the powerful right-wing parties in Germany gave substance to their fears. They maintained that the security provided by the covenant was inadequate and that disarmament could only he undertaken after they had received guarantees of prompt and effective support in case a new aggression should take place. (German armaments had been drastically cut down by the treaty, but its neighbours believed that it was evading these obligations.)

Many other League members. including those of the British Commonwealth. considered the covenant not as inadequate but as the utmost limit of what they could safely promise. But they believed also that disarmament would ensure peace and prosperity, and that if this were achieved they could afford to reaffirm and even strengthen the League's obligations.

Thus it became accepted League doctrine that increased security was a necessary condition for disarmament and that general disarmament was a necessary condition of security. This double thesis was embodied by the assembly of 1923 in a draft treaty of mutual security, which, however, was promptly rejected by all the principal countries except France.

In rejecting this treaty many governments observed that League action in a crisis might often be retarded through disagreement as to which of the conflicting states was in truth the aggressor and which the victim. The answer seemed to be that the aggressor was evidently that state which refused to submit the dispute to arbitration or other peaceful settlement. When, therefore. the assembly of 1924 resumed the effort to reach the combined goals of disarmament and security. it added arbitration as a third component which should make the whole plan workable and complete. From this formula, and irom the long studies of earlier assemblies and committees, it drew up what was in effect a treaty of arbitration. mutual security' and disarmament. To show that its purpose was not to replace the covenant but to reinforce it, the new plan was called the protocol of Geneva. It constituted, no doubt, on paper. the most complete system of collective security ever devised. It was enthusiastically approved by the assembly. Ten countries, including France: signed it, and others, including Italy and Japan, seemed ready to do so. But a change of government in London, and the natural fears felt by commonwealth countries lest they find themselves in conflict with the United States: led to its rejection by Great Britain.

Further negotiation might well have removed these difficulties; but at this point the German foreign minister. Gustav Stresemann, made a new proposal for calming the reciprocal fears of France and Germany; viz.. that France. Germany, Britain and Italy should jointly guarantee the inviolability of the existing Franco-German frontier and also the demilitarization of the Rhineland. After long negotiation, this plan was elaborated (Oct. 1925) into the group of treaties known as the Locarno pacts (see LOCARNO, PACT OF):

The Locarno pacts were interwoven at every point with the institutions of Geneva. and their entry into force was made conditional on Germany's admission to the League. Stresemann indeed had already been making cautious approaches to the council on the subject, and had received a friendly reply. All members of the League were now strongly in favour of German membership, and a special meeting of the assembly mas held in March 1926 to pass the necessary resolutions. Unexpected difficulties then arose. All agreed that Germany should become a permanent member of the council, and the fellow signatories of Locarno had promised to support this. But now Spain, Brazil and Poland demanded the same privilege, and Stresemann justifiably declared that this was contrary to the spirit of the Locarno agreement. The assembly had to be adjourned. Six months later a compromise was effected. The assembly created only one permanent seat, that of Germany; but it increased the elected members from six to nine, three of which might. at the end of their three-year period, be reelected for further periods. These semipermanent seats were intended to meet the claims of Spain. Poland and Brazil. Brazil, however, preferred to withdraw from the League altogether.

For the next three years the foreign ministers of France: Great Britain and Germany (Aristide Briand. Xusten Chamberlain and Stresrmann) kept a directing hand upon the activities of the League. Their regular participation three or four times a year gave fresh authority to the council's meetings. On the other hand, the smaller powers felt that their interests were treated as of little importance and that the Eocarno group was indifferent, even unfriendly, toward the general development of the League. Still more serious was the council's excessive preoccupation with European problems; the Latin-American and Asian members felt themselves. and in fact were, neglected. The council's authority had never been so high, but its activities had never been so limited.

Two dangerous disputes. the first between Great Britain and Turkey over the question of whether Mosul and its province should

belong to Turkey or to Iraq, the second arising from a frontier fight between Greek and Bulgarian forces, had been settled successfully just before the entry of Germany. Thereafter the council had to cope with nothing more grave than the frequent quarrels between Poles and Germans — quarrels which were bitter enough, but did not seem dangerous until the terrible economic depression which struck the world at the end of 1929. In Germany, from then on, mass poverty and unemployment revived old resentments and gave a new impulsion to the Nazi movement and the demands for rearmament and revenge, while the other powers, each struggling with its own economic difficulties, had little interest to spare for international affairs.

It is necessary here to refer briefly to the laborious efforts made throughout these years at Geneva to reach an effective agreement on disarmament. In approving the protocol, the assembly had expected it to be speedily followed by a world disarmament conference. After Locarno, it seemed once more that the road to disarmament was clear. The council therefore appointed (Dec. 1925) a commission to prepare the way for the conference. Germany, the United States and the U.S.S.R. agreed to send delegates to this preparatory commission, which for the next five years held many long, difficult and sometimes stormy meetings. At first, progress was retarded chiefly by disagreements among the victorious powers. But as the years passed without definite result, the question of German armaments rose more and more into the foreground. The treaty of Versailles stated that the restrictions it imposed on German armaments were "intended to render possible the initiation of a general limitation." Stresemann's own demands, at least in public, were for equality of status based on reduction by the victorious powers; but the alternative — to reach equality by rebuilding Germany's armed forces — made a deep appeal to the German nation. Stresemann's death in 1929 and the spectacular advance of the Nazi party led to a still more complete deadlock. The German demand for rearmament became more threatening. The powers who feared a German attack were the more resolved to keep their superiority in weapons.

When at last the World Disarmament conference did meet, in Feb. 1932, the preparatory work of the commission was neglected and the question of German equality dominated all others. The German delegation was withdrawn in July 1932, and only returned in December after receiving assurances that in the future convention Germany would possess equality of rights with all the other signatories. But in the next months Hitler became master of Germany, and in the atmosphere of fear and mistrust created by this event the conference could make no progress. In Oct. 1933 Hitler, finding that the entente powers proposed to maintain the restrictions of the peace treaty for another four years, seized the occasion to make a spectacular withdrawal from the conference and from the League. From then on Germany was openly rearming and all prospects of disarmament disappeared.

The Third Period, 1931–36. — The third period of League history, the period of conflict, opened with the sudden attack made in Sept. 1931 by the Japanese army on the Chinese authorities in Manchuria. This was clearly an act of war in violation of the covenant, although Japan declared at first that the troops would be withdrawn, and later (Feb. 1932) created a puppet state of Manchoukuo and claimed that this removed any legal ground for League intervention. This was the first major test of the covenant system. No more difficult circumstances could be imagined. Many of the smaller members of the League, and pro-League opinion everywhere. called for the strict application of the covenant; *i.e.*, an economic boycott of Japan. But the chief council members were themselves in the grip of economic crisis; the cooperation of the United States and the C.S.S.R. was certain to be refused; and economic sanctions were never seriously envisaged. After long negotiations, in which the United States did give its support. even permitting a U.S. delegate to sit with the council through one session, a commission of inquiry was appointed, which, reaching Manchuria in April 1932, found the new state of Manchoukuo already established. Nevertheless, the commission drew up a full report, concluding that Manchuria should be returned to Chinese sovereignty, with various safeguards for the rights and needs of Japan. The conclusions of this report were unanimously adopted by the assembly (Feb. 1933). Japan rejected them, and a month later withdrew from the League.

Thus the year 1933 saw the League's failure to protect China against aggression, the breakdown of the disarmament conference and the withdrawal of Japan and Germany. It saw also the failure of another great enterprise, the World Economic conference of June 1933. From the beginning the League had attached high importance to the work of its Economic and Financial organization. Its first big conference on the subject (Brussels, June 1920) had indeed preceded the first assembly. Thereafter it had for several years followed an ascending curve; after taking a great share in restoring some stability to the European currencies, it had turned to the deeper economic problems. The first World Economic conference, held in 1927, ended in a unanimous report describing the need for a freer and fuller flow of international commerce, the obstacles which impeded it and the measures needed to achieve it. And in the next two years much progress was made toward carrying out its recommendations. All this, however, foundered in the economic storm; each country sought to protect its own economy by tariffs, quotas and prohibitions; the plans and conventions drawn up in Geneva, including Briand's plan for a United States of Europe, were swept away. And the World Economic conference of 1933 ended in speedy and almost total failure.

Nevertheless, the normal activities of the League were neither interrupted nor reduced. The United States was now taking part in most of its work. Soviet Russia, which had obstructed and ridiculed the political work of the League, changed its attitude in 1934, through fear of Germany and Japan. Its demand for admission met with some opposition and much misgiving; but the great majority of members refused to throw back into isolation a state which now formally undertook to carry out all the obligations of the covenant. And in truth, the U.S.S.R. did give steady support to the League until shortly before the outbreak of World War II. Meanwhile, the admission of Mexico and Ecuador and the return of Argentina (absent since 1920, though it had not formally withdrawn) completed the Latin-American membership, while that of the Moslem states was extended by the entry of Turkey, Afghanistan and Iraq. In Europe a dangerous crisis following the assassination of King Alexander of Yugoslavia (Oct. 1934) was settled by the good offices of the council. Another critical moment, that of the Saar plebiscite (Jan. 1935), gave rise to the formation, for the first time in history, of a genuine international force — 3,300 men from the armies of Great Britain, Italy, the Netherlands and Sweden — whose presence ensured that the plebiscite would take place without disorder. In South America the council, though it could not settle the war between Bolivia and Paraguay (1932–35), was successful in ending hostilities between Colombia and Peru (1934) and accepted responsibility for administering for a time the disputed territory of Leticia.

But in Oct. 1935 Mussolini invaded Ethiopia, after rejecting all efforts to dissuade him from the aggression which he was openly planning. By the following summer he had occupied and annexed the whole country in spite of the economic sanctions enforced against him in execution of the covenant. From this defeat the League was not destined to recover. The Fascist government was at first surprised by the League's prompt action; under British leadership the members, with only three minor exceptions, agreed to stop the export of arms and of various raw materials and all financial credit to Italy, and also to cease all imports from Italian sources. By December the effect of these measures was beginning to be seriously felt, and the League members were about to consider imposing an embargo on oil, which it seemed would quickly force Mussolini to retreat from Ethiopia.

But Mussolini was saved, and all further sanctions arrested. by the sudden action of the British and French governments, which, without consulting their fellow members, proposed to Italy and Ethiopia a settlement calculated to give the maximum satisfaction to the invader. Though existing sanctions dragged on for several months, they could not prevent the Italian victory. In May 1936 Italy annexed Ethiopia, and in July the assembly put an end to sanctions: though it continued to treat Ethiopia as an independent

member of the League.

Fourth Period, 1936–45.—Meanwhile Hitler had denounced the Locarno pact (March **1936**). A few months later Italy and Germany formed what was known as the Rome-Berlin axis, soon joined by Japan. All three were violently hostile to the League; among its members. only those which. like France. the C.S.S.R. or Czechoslovakia, were looking everywhere for possible support against German aggression continued to affirm their belief in collective security. While in Washington congress was passing the successive Neutrality acts, the majority of League members were declaring that they no longer considered themselves bound by the obligations of the covenant.

Although in this last period of its history the organs of the League continued to meet as before and performed some useful tasks, the main international problems were, as in the first period. dealt with outside Geneva. In the swift succession of crises—the Spanish civil war. Japan's invasion of China, the annexations of Austria. Czechoslovakia and Albania—reference to the League was either a mere formality or else omitted. When World War II broke out in Sept. 1939, no appeal of any sort was made to Geneva. Yet in Dec. 1939 Finland did appeal for help against Soviet aggression. and the assembly decided to organize such help for Finland as it could, while the council declared the exclusion of the U.S.S.R. from the League.

No further meetings of the council or assembly took place during the n-ar. Thanks to U.S. and Canadian hospitality, the economic and social work of the League was continued on a limited scale; but its political activity was at an end.

When, in the last years of war, the Allied leaders began to make plans for the future international organization, they rejected any idea of reviving the covenant; and that instrument was still nominally in force when the United Nations began to function (Oct. 1945). Six months later the assembly met in Geneva for the last time. The powers and functions entrusted to the League by many treaties were transferred to the new organization, which also inherited its material possessions, including the Palais des Nations; and on April **19, 1946,** the existence of the League was formally ended.

If this occasion could not but be a melancholy one to all who had believed in the principles of the covenant, their regrets concerned past mistakes and misfortunes; in regard to the future, they could still hope that the United Nations would pursue the same aims with better success. The provisions of the charter were intended to correct and complete what seemed to be the imperfections of the covenant. Rut it remained true that in its purposes and principles, its institutions and its methods. the new organization followed. in nearly every point, the precedents of the old. (See UNITED NATIONS.)

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LEAGUE OF WOMEN VOTERS (U.S.). An outgrowth of the movement for woman's suffrage, the League of Women Voters of the United States was founded in 1920 after the 19th amendment to the U.S. constitution. giving women the right to vote. was ratified. The organization's purpose is "to promote political responsibility through informed and active participation of all citizens in government." although active membership in the league is limited to women citizens.

Limiting its program to the field of government. the league centred many of its activities on registration, voting and election procedures. Although the organization is nonpartisan in that it does not support or oppose political parties or candidates. it supplies the public with factual information about the candidates through the publication of biographical material. voting records and answers to questionnaires. One of the league's pre-election services is also the dissemination of information on ballot issues.

The league is a political organization, however. in the sense that it takes positions on governmental issues and works to obtain support for the legislative issues on which it takes a stand.

Representatives of local and state leagues meet in biennial conventions to adopt the league's program and to make policy decisions. The members choose a few issues to work on at a time. At the local and state government level, for example. the leagues have worked for improvements in various fields, such as the structure and administration of government, the public schools. taxation. health. welfare and housing.

At the federal level, the league has supported participation in the activities of the United Nations. Other federal measures which it has supported include grants-in-aid for maternal and child welfare, the child labour amendment, improvement and extension of the civil service, the Food, Drug and Cosmetic act, entry of displaced persons, reorganization of congress and civilian control of atomic energy. The League of Women Voters was organized in approximately 1,000 leagues in the U.S. Headquarters of the league were established in the District of Columbia. (Z. D. L.)

LEAHY, WILLIAM DANIEL (1875–1959), U.S. naval officer. was born in Hampton, Ia.. on May **6.** 187 j. He was graduated from the United States Naval academy, Annapolis, Md., in **1897.** and passed midshipman on the battleship "Oregon" when it made its famous run from the Pacific coast of the U.S. to join the U.S. fleet off Cuba in the spring of **1898.** On the "Oregon" he participated in the destruction of Xdm. Pascual Cervera's Spanish fleet off Santiago harbour on July 3, **1898.** The following year he was commissioned an ensign and assigned to the Asiatic station. where he saw active service during the Philippine insurrection and the Boxer uprising in China. Various commands followed on ship and shore and at the beginning of World War I he commanded the navy transport "Princess Matoika," which carried troops to France; for that accomplishment he received the navy cross. He was appointed a rear admiral in 1927, chief of the bureau of navigation in 1933, commander of the battle forces with the rank of admiral in **1936** and chief of naval operations in 1937. Upon his retirement in 1939 he was awarded the distinguished service medal. His retirement was brief. however. Pres. Franklin D. Roosevelt appointed Leahy governor of Puerto Rico in the same year and U.S. ambassador to France in 1940. He was recalled in 1942, partially to demonstrate to the Vichy government the U.S. government's lack of confidence in it. In 1942 Roosevelt named Leahy chief of staff to the commander in chief of the army and navy of the U.S. On Dec. 15, 1944, Leahy was promoted to the five-star rank of admiral of the fleet, a rank retained upon his second retirement at the end of World War II. He died July 20, 1959, in Bethesda, Md. (W. B. CK.)

LEAKE, WILLIAM MARTIN (1777–**1860**). British antiquarian and topographer. was born in London on Jan. 14, 1777. He entered the marine artillery and was lent by the British government to the Turks as an artillery instructor. In 1801, after traveling across the desert with the Turkish army to Egypt. he was, on the expulsion of the French, employed in surveying the valley of the Nile as far as the cataracts; unfortunately he sailed for England on the ship chartered to bring to London the Elgin marbles. and he lost all his maps and observations when the vessel foundered off Cerigo. He was then sent out to survey the coast of Albania and the Morea, with the view of assisting the Turks

against attacks of the French from Italy. There he made a valuable collection of coins and inscriptions. In 1807, war having broken out between Turkey and England, he was a prisoner at Salonika for a short time. He then went on a diplomatic mission to Ali Pasha of Iannina. with whom he remained for more than a year as British representative. In 181 j he retired from the army, in which he held the rank of colonel. Leake died at Brighton on Jan. 6. 1860. The marbles collected by him in Greece were presented to the British museum; his bronzes, vases, gems and coins were purchased by the University of Cambridge after his death, and were preserved in the Fitzwilliam museum.

LEAMINGTON SPA (ROYAL), a municipal borough (1875) in the Warwick and Leamington parliamentary division of Warwickshire, Eng., on both banks of the Leam river, 2 mi. E. of Warwick to which it is united by the intermediate parish of New Milverton. Pop. (1951) 36,345. Area 4.4 sq.mi. Home of the goo-year-old Midland oak traditionally marking the centre of England, it was a village of no importance until about 1786, when baths were first erected at the saline springs.

Leamington Spa is a favourite health and residential centre with the Royal Pump room (rebuilt 1953), baths. an art gallery and museum and pleasure gardens on the right bank of the river; the ornamental Jephson gardens (13 ac.) are illuminated during August and September. The parish church of All Saints and the other churches are modern. Industries include engineering, iron foundries and brickworks. By royal licence granted in 1838 the town became Royal Leamington Spa. To the southeast, on the Fosse way by Chesterton, was a Roman settlement.

LEAP YEAR (otherwise *bissextile),* the name given to the year containing 366 days. The astronomers of Julius Caesar, 46 B C., settled the solar year at 365 days 6 hours. These hours at the end of four years made a day which was added to the fourth year. All years exactly divisible by 4 (except centesimal years which must be exactly divisible by 400) are leap years. The English name for the bissextile year is an allusion to a result of this interposition; for after Feb. 29 a date "leaps over" a day of the week. Of the custom for women to woo during leap year no satisfactory explanation has ever been offered. In 1288 a law was enacted in Scotland that "it is statut and ordaint that during the rein of hir maist blissit Megeste, for ilk yeare knowne as lepe yeare, ilk mayden ladye of bothe highe and lowe estait shall hae liberte to bespeke ye man she likes, albeit he refuses to talk hir to he his lawful wyfe, he shall be mulcted in ye sum ane pundis or less, as his estait may be; except and awis gif he can make it appeare that he is betrothit ane ither woman he then shall be free." A few years later a like law was passed in France, and in the 15th century the custom was legalized in Genoa and Florence.

LEAR, EDWARD (1812–1888), English artist and humorist. was horn in London on May 12, 1812. His earliest drawings were ornithological. When he was 20 years old, he published a brilliantly coloured selection of the rarer Psittacidae. Its power attracted the attention of the 13th earl of Derby, who employed Lear to draw his Knowsley menagerie. He became a permanent favourite with the Stanley family, and Edward, 1 jth earl, was the child for whose amusement the first *Book of Nonsense* was composed. From birds Lear turned to landscape. his earlier efforts in which recall the manner of J. D. Harding; but he quickly acquired a more individual style. About 1837 he set up a studio at Rome, where he lived for ten years, with summer tours in Italy and Sicily, and occasional visits to England. During this period he began to publish his *Illustrated Journals of a Landscape Painter:* charmingly written reminiscences of wandering, which ultimately embraced Calabria, the Abruzzi, Albania, Corsica, etc. From 1848 to 1849 he explored Greece, Constantinople, the Ionian Islands. lower Egypt, the wildest recesses of Albania and the desert of Sinai, He returned to London, but the climate did not suit him. In 1854–55 he wintered on the Nile, and migrated successively to Corfu, Malta and Rome, finally building himself a villa at San Remo. From Corfu Lear visited Mount Athos, Syria. Palestine and Petra; and when over 60, by the assistance of Lord Northbrook, then governor-general, he saw a large area of India.

The last task he set himself was to prepare for popular circulation a set of about 200 drawings, illustrating from his travels the scenic touches of Alfred, Lord Tennyson's poetry; but this he did not live to complete. He died at San Remo on Jan. 30, 1888. Until sobered by age. his conversation was brimful of humorous fun. The paradoxical originality and ostentatiously uneducated draughtsmanship of his numerous nonsense books won him a more universal fame than his serious work. John Ruskin placed the *Book of Nonsense* first in the list of a hundred delectable volumes of contemporary literature.

See *Letters of Edward Lear to Chichester Fovtescue, Lord Curlingford, and Frances, Countess Waldegrave* (1907), edited by Lady Strachey, with an introduction by Henry Strachey; and a *Memoir* by Franklin Lushington, prefixed to Lear's *Illustrations to Tennyson, Nonsense Songs and Stories,* 6th ed. *(1888).*

LEARNING is defined as any relatively permanent change in behaviour resulting from past experience. Similar changes in behaviour are produced by nonlearning processes such as aging, remarkable and relatively predictable alterations in performance capacities being observed between infancy and senescence, but these are independent of experience and are excluded from learning by definition; also with the changes in behaviour which are the symptoms of fatigue. these being impermanent and therefore also excluded by definition. Learning concerns any behavioural change, not merely those changes that are considered desirable or symptomatic of improvement; bad habits seem to be learned in the same general ways and for the same general reasons as good ones. Further, the definition does not restrict learning to occasions of self-conscious practice with intent to learn; conditions conducive to learning often occur without prior arrangement.

The product of learning is called a habit. In spite of its familiar usage, this is a relatively theoretical notion. Technically, a habit is the change itself which the learning process produces. A habit is invisible and exists principally as a tendency or potentiality which does not reveal itself as behaviour until an appropriate occasion arises; eating habits, for example, exist continuously, though we eat only intermittently. The habit is to be distinguished from performance, which is the symptom, directly observable as behaviour, that reveals the existence and strength of the previously acquired underlying habit.

Habits grow under certain conditions and decline under others, and a grasp of these processes and their causes is central to any understanding of an organism's total behaviour. Learning occurs throughout the animal kingdom. accounting for increasing fractions of the total activity as we go up the phylogenetic scale. In human beings, from whom unlearned, instinctive behaviour seems to have vanished, there is almost no activity that has not been created by past experience. William James called habit "the enormous flywheel of society."

Scientific investigation of learning involves exposing an organism to a highly controlled environment and observing the effects of systematic manipulation of this environment upon measurable, quantifiable aspects of ensuing behaviour. Learning is revealed by a correlated systematic and orderly change in the force, immediacy, frequency or resistance to change of the relevant behaviour. Any environmental manipulation which predictably and reproducibly effects any of these changes is established as a determinant of learning. Once the determinants of learning are known, the possibilities for constructive education and re-education are obviously enormous. In addition they constitute a significant increment to understanding of the causes of much ongoing behaviour.

The study of learning is facilitated by the fact that the basic processes are amazingly similar throughout the phylogenetic scale, making, of course, the necessary concessions to different species' differing sensory capacities and potential response repertories. For this reason much of the available information concerning the learning process derives from experiments upon lower animals, particularly the white rat and the dog. The processes, however, can be shown to be quite general.

MODES OF ACQUISITION

There are two generally recognized learning processes, respondent and operant conditioning. Although they share a common

outcome, habit formation, the manipulations required to produce each are different, as are the kinds of behaviour susceptible to change by each procedure.

Respondent Conditioning

Respondent conditioning, also called classical or Pavlovian conditioning, was first fully explored and described by I. P. Pavlov during a series of experiments on the salivation reflex in dogs. He made the casual observation that the dogs in his laboratory routinely salivated at the sights and sounds of their imminent daily feeding. It is a tribute to Pavlov's genius that this commonplace and wholly sensible relation between a recurrent situation and behaviour aroused his curiosity, leading him to wonder whether the mere temporal relation between prefeeding events (stimuli; a stimulus is a part, or a change in a part, of the environment) and the food itself might not fully account for the acquired tendency to salivate before being fed. If so, he could dispense with explanations in terms of such unobservable mental events as ideas, expectations and images, and view the dog as a reagent between observable stimulus input and response output. By careful isolation of the dog in a highly controlled environment into which various stimuli (lights, sounds, even touch) could be introduced by remote control, along with a bit of food to elicit salivation, he was able to show that by maintaining a close temporal relation between intermittent presentations of stimulus pairs, one a "neutral" stimulus (originally inadequate to elicit salivation, such as a bell or a light) and the other an "unconditioned" or "reinforcing" stimulus (originally adequate to elicit salivation, such as food or weak acid), the originally neutral stimulus will acquire the capacity to elicit salivation even when the unconditioned stimulus is withheld. At this point the neutral stimulus is called a conditioned stimulus, and by turning it on and off Pavlov could simultaneously control the dog's salivation.

The process has been demonstrated on other organisms, including human beings, using other unconditioned and conditioned stimuli. It appears to require primarily a temporal contiguity between the occurrence of two stimulus events; their presentation must be approximately simultaneous, although conditioning will proceed optimally if the onset of the conditioned stimulus precedes that of the unconditioned stimulus by a fraction of a second. Corollary to the necessary temporal contiguity is a frequency effect. The magnitude of the response to the conditioned stimulus, measured, for example, as number of drops of saliva elicited, increases with successive pairings of the two stimuli. The increase per trial is very rapid at first, and continues to rise at an increasingly slower rate until a maximum is reached.

Respondent conditioning is a reproducible phenomenon which permits precise control over the relevant behaviour, but the variety of responses susceptible is strictly limited. Only responses initially elicitable by an unconditioned stimulus (that is, only reflexes) can be thus passed from stimulus to stimulus, and in the passing the response changes little, if at all, in form. The repertory is small and fixed, but it does constitute an important fraction of emotional behaviour, such as heart rate, blood pressure, dilation of the pupil. sweating, erection of the hair, and, of course, salivation, and the process is important for that reason. When, for example, fear (an emotion) of an intrinsically harmless situation is acquired, the fear response is old, but the situation is new, and the past history that paired this stimulus with a genuinely dangerous one may be searched for. John B. Watson in the laboratory caused the acquisition of fear in infants by pairing a loud noise, which is an unconditioned stimulus for extensive fear-reflex behaviour. with a small furry animai (white rat), which soon became an object of apparent terror. (This acquired fear was subsequently removed by processes discussed below.) Phobias, or strong irrational fears of specific objects, are sometimes discovered to have been created by one pairing of that object with an intensely fear-provoking situation. By the same process the name of a hateful situation may arouse hate. Not only unpleasant emotions are conditionable, however: pleasure is aroused by a return to a place that formerly held joy-producing experiences. Respondent conditioning has been used to prevent enuresis by conditioning awakening to the stimulus of a full bladder, and to discourage alcoholism by conditioning nausea to the smell of alcohol.

Operant Conditioning

In operant conditioning, also called instrumental or trial-and-error learning, learning is basically a process of selecting, out of initial crude, unlearned behaviour, those responses that are precisely and economically effective in the specific situation. In the white rat's learning successive turns in a maze, the infant's learning to talk and the adult's learning to play golf or drive his car, the responses to be learned cannot be produced on signal at the very onset in the way that the unconditioned stimulus produces the final finished response in respondent conditioning. A different mode of acquisition is required. In these examples, behaviour before learning occurs is highly variable and inadequately related to the demands of the situation.

Motivation. — An important determinant in instrumental conditioning is the prior existence of a problem situation. Technically such a behaviour instigator is called a motive or drive. There are two broad classes. appetites, such as hunger or thirst, which involve deprivations; and aversions, such as discomfort and pain, which involve noxious stimulation. When either of these states prevails, organisms tend to become increasingly and diffusely active. The hungry rat in the maze moves with the restlessness of hunger; the uninformed, worried student with the restlessness of his anxiety. Motives thus account for the arousal and persistence of behaviour at the outset of learning, and without some available behaviour learning would not begin. (See also Motivation.)

Response Selection. — Among the component responses generated by motives there will tend to be some which produce consequences of special relevance to the prevailing motive. such as access to the deprived commodity (food or water) or cessation of the aversive stimulus (pain, the too loud noise, etc.). When this occurs, the response which just preceded the problem solution becomes more likely to recur when the same motive recurs in the future.

It is because of its dependence upon the learner's own behaviour for the solution that this kind of learning is called instrumental or operant (the learner operates upon and thereby changes his environment). These terms are preferred to "trial and error" since trial and error leads to no learning at all, but trial and success does. In addition the term "trial" implies a foresight of the goal that seems unlikely in much learning, as in the case of the hungry rat in the maze.

Reinforcement. — Stimuli which increase the probability of recurrence of the responses which produce or simply precede them, and thus build habits, are called reinforcers. The fundamental determinant of operant conditioning is expressed in the law of reinforcement: If an operant is closely followed by a reinforcing stimulus, its strength is increased. Strength is a general term embracing all the symptoms of habits. Reinforcers are of two general sorts: primary reinforcers are such things as food, water, rest and oxygen, which reduce drives and are unlearned; secondary reinforcers, on the other hand, owe their powers to a history of association with primary reinforcers and, therefore, are said to be learned. Common examples are money and signs of approval or disapproval — intrinsically worthless but of acquired value. Secondary reinforcers are particularly important in human learning; most educational reinforcements are of this derived sort, since commodities seldom change hands in classrooms. They also have been observed in animals, however. Chimpanzees have learned token-rewarded behaviour, where the tokens could be exchanged for grapes; they even hoarded tokens. Rats will pull at a chain if it produces merely the click of a mechanical food magazine from which they have eaten.

Reinforcers are either positive or negative. Positive reinforcers (food, water, money) strengthen behaviour which produces them, negative reinforcers (pain, the sound of the dentist's drill) strengthen behaviour which terminates them. Secondary negative reinforcers produce avoidance behaviour, since if the signs of

danger are effectively responded to the impending disaster may be averted completely. The burned child does not learn to pull his hand out of the fire; he learns not to put his hand into it.

Nearly all the additional determinants of operant learning concern quantitative aspects of the law of reinforcement and are corollary to it. For example, "practice makes perfect" as a recipe for acquiring operant habits is not true. Perfect responses, if reinforced often, become habitual, and in this sense practice. since it permits frequent reinforcement, is necessary. An experiment by E L Thorndike showed that practice in drawing three-inch lines without knowledge of successful approximations produced no improvement whatsoever. and it will be shown below that practice, if not reinforced, is an effective way to destroy habits.

Contiguity — Contiguity affects operant learning in that the shorter the temporal delay between response and reinforcement, the more each reinforcement counts. This generates some curious effects. Often reinforcement depends upon a series of prior responses, such as the several activities required to start a car. The motorist who presses the starter button before he turns the ignition key has been victimized by the contiguity principle; his strongest response is the one closest in time to the reinforcing sound of a running motor, and so sometimes occurs first. Contiguity also accounts for some apparent exceptions to the law of reinforcement. Why do alcoholic habits persist in the face of the hang-over? Because the effect. however awful, is delayed, leaving the immediate more pleasant effects of alcohol in full command. Bribes may be considered as reinforcers, but they do not affect the intended behaviour because they violate the direction of a reinforcer's effect, which is apparently always upon the preceding response.

Quality and Amount. — Reinforcers differ in quality and amount. Water, for example. is a potentially stronger reinforcer than food is. Chimpanzees make fewer mistakes in performing when they are reinforced with bananas than when reinforced with lettuce. according to the observations of O. Tinklepaugh, and J. B. Wolfe and M. D. Kaplon reported that chicks will run faster to four grains of wheat than to one.

Schedule. — Finally, reinforcement may be administered following successive responses according to any arbitrary schedule. If each occurrence of a given response is reinforced, the schedule is said to be continuous. This is the most frequently investigated schedule in experimental studies of learning. It is particularly useful in early stages of learning where reinforceable responses are likely to be few and far between. However, the habits created by extensive continuous reinforcement are remarkable for their instability in the face of a failure of reinforcement. If reinforcement is discontinued, the habit persists briefly, appearing in flurries, and soon vanishes. The discontinuance of reinforcement is called an extinction schedule. The speed and progress of the extinction process are intimately related to the nature of the preceding reinforcement schedule.

Any schedule which involves a less than one-to-one correlation between response and reinforcement is said to be intermittent. These schedules were extensively investigated in the pigeon by B. F. Skinner and Charles Ferster. The results are readily observable when similar schedules are used with human beings. There are four basic programs: (1) Fixed-interval reinforcement schedules involve reinforcing only the first response that occurs after the passage of a given interval of time since the last reinforcement. If the response is free to occur at any time, the ultimate effect of this schedule is such that many responses occur toward the end of the interval, few at the beginning. The schedule resembles working on salary; industrial managers have discovered that it is necessary to introduce additional reinforcers, such as time cards and foremen, to maintain work rates just after payday. Extinction after a fixed-interval schedule shows that the habit persists much longer, reinforcement for reinforcement, than habits formed after a continuous schedule. (2) Fixed-ratio schedules reinforce every nth response; for example, only every 10th or 100th response in a series of similar responses. Again, the rate of response is highest as the end of the ratio is approached, and falls abruptly after the reinforcement. The schedule is like piecework, which labour unions look upon with disfavour because it places extremely high rates of production, which may be injurious to health, at a premium. Extinction after fixed-ratio reinforcement is fairly rapid but may involve hundreds of responses appearing at a very high rate. (3) Variable-interval and (4) variable-ratio schedules space reinforcements randomly with respect to time or serial position of the response. Both schedules generate steady rates of responding, and subsequent extinction is marked by a slow, steady drop in the occurrence of the response.

Reinforcement schedules are obviously important variables in learning. The data may be summarized by saying that the momentary likelihood that a response will occur is governed by the momentary likelihood that it will be reinforced. Persistence and calm in the face of failure can be encouraged in children if continuous or "spoiled child" schedules are avoided in their training. Scheduling helps in understanding the origins and strengths of otherwise curious behaviour: ritualistic superstitions such as telling dice to "come seven" may acquire enormous strength because of the adventitious variable-ratio of reinforced responses; as Skinner showed. a pigeon left hungry before a food magazine that intermittently opens and closes will soon be behaving ritualistically, because of the accidental contingency of some response and the hopper's opening.

Shaping. — A barrier to the application in practical training situations of these operant conditioning principles is the fact that often the desired response is not available at the outset in the learner's repertory. The law of reinforcement requires that the response to be learned must occur before it can be reinforced. How then can a child be trained to say "elephant?" Not simply by waiting for occurrences of it. The good teacher starts out leniently, reinforcing responses that are merely like the desired one. This reduces the variability of random behaviour to instances which are in the right direction. Some variability in the successive forms of reinforced responses will always remain. By slowly becoming increasingly strict in giving reinforcement, the desired response may be successively approximated, eventuating in extremely precise control. This process is called shaping. Trainers of animals are able to condition long and complicated acts, none of whose components, much less their serial arrangement, were originally in the animals' repertories. The process resembles the reinforcing activities of the parent who settles at first for the approximations of baby talk but insists on more adult forms as child and parent grow older.

STIMULUS CONTROL OVER PERFORMANCE

In respondent conditioning the role of stimuli, particularly the conditioned stimulus, in eliciting the conditioned response is obvious. In operant conditioning, although drive conditions are essential to the mechanics of reinforcement, the role of stimuli in evoking and guiding learned responses is also strong, for the reason that most reinforcers are obtainable only in certain environments. The rat in a maze, for example, is guided by the stimulus properties characteristic of each choice point as his maze-running habit is performed. The rat (like human beings) has different food-getting habits. Which one occurs when hunger grows is determined by the environment at the moment. The man starting for his icebox from his living room exhibits quite a different habit from the one he shows when he starts from his bedroom.

Stimulus Generalization. — Even the dog in Pavlov's highly controlled experimental chamber rarely experiences twice, in precisely the same way, the flashing light used as a conditioned stimulus. Differences in the angle of his head. slow changes in the light sensitivity of his eyes and other factors will cause him to experience the "same" stimulus differently on each presentation. Since he conditions, it may be concluded that small differences in the conditioned stimulus do not preclude learning. The tendency for the eliciting power of a conditioned stimulus to spread to other values of the stimulus is called stimulus generalization. It appears to be a phenomenon intrinsic to the process: it normally occurs.

The test for the limits of stimulus generalization is exemplified in this example: a dog is conditioned to salivate to a tone

of certain pitch and loudness. After conditioning has reached full strength (further pairings of food and tone do not increase the number of drops salivated to tone alone) the magnitude of the response to selected tones of both higher and lower pitches is measured. These higher and lower tones have never themselves occurred in temporal contiguity with the food, but they will be discovered to have acquired considerable eliciting strength by stimulus generalization. The magnitude of the generalize3 response is predictable and orderly: it will be less than the amount elicited by the original conditioned stimulus tone, and will diminish in magnitude as the generalized stimulus tone becomes increasingly higher or lower in pitch than the conditioned stimulus. The infant with the conditioned fear of a white rat described earlier was observed to become very uneasy, even frightened. when a woman visitor appeared in the hospital wearing a white fur collar. Possibly stimulus generalization would account for the poet's reaction to Dr. Fell. although he himself could not.

Stimulus generalization in operant learning is less well investigated than that in respondent learning, since in the former persisting, complex situations rather than intermittent, simple stimulus events tend to be the rule. However, when arranged properly, results similar to those of tests upon respondents are observed. For example, Skinner showed that if a pigeon is trained to peck at a key illumineted by a light spot of small diameter, slow increase in the size of the spot progressively weakens the strength of the response. Speech, which is operant behaviour, shows the obvious influence of stimulus generalization. We may call a person by another's name on the basis of some similarity of appearance, behaviour or status they share. Children learning to talk often generalize by calling anything which can be sat upon a chair, and their tendency at an early age to call all men "daddy" is well known.

An interesting if somewhat baffling variant of stimulus generalization can be observed in the human adult. If a response (usually a respondent such as the sweating response elicited by a mild electric shock) is conditioned to a printed word, the same response will subsequently be elicitable by any synonym of that word. For example: if the printed word "style" is paired with shock, the sweating response can be elicited by "style" and also by "fashion." The baffling aspect of this outcome is that the two stimuli have very little physical similarity, which is the usual basis of generalization effects. Because of this, and because the phenomenon obviously depends upon prior learning, it is called mediated stimulus generalization. It has been hypothesized that words susceptible to this effect always evoke a common response appropriate to their common meaning, and that the effective stimulus in both the original and generalized evocations is this common meaning:

Discrimination. — The spread of stimulus generalization is spontaneous, but it can be narrowed by the processes of discrimination. Discrimination involves principally the maintenance of conditioned strength of one stimulus by continuing to pair it with the unconditioned stimulus, while an adjacent stimulus is intermittently presented without the unconditioned stimulus. The effect of the latter procedure is to extinguish the response to the adjacent stimulus. In this fashion the original spread of generalization may be narrowed severely, so that the response remains strong and prompt to the conditioned stimulus but vanishes for other values. There are definite limits to the ultimate fineness of discrimination, however. Two stimuli may be so close together in physical dimensions that any conditioning of one generalizes fully to the other. In this event no amount of discrimination training can cause differential response to the two, and the organism is said to be unable to "tell the difference" between them.

It is upon the basis of application of discrimination procedures to loner animals that statements concerning their sensory acuities may defensibly be made. For example, if a dog's salivation response is conditioned to a red light by pairing it with food, while a green light is intermittently presented but never nith food in time the dog will salivate to red light but not to green. It would appear that the dog "has colour vision"; that is, he behaves differently to different colours, However, if the brightness of the green light is now varied, a brightness will be discovered to which the dog mill salivate. No amount of additional discrimination training on red and green lights of equal brightness will lead to differential response. Hence it is concluded that the dog is colour-blind.

Most human discriminations are verbally reported. The training behind this involves operants, but the reinforcements are casually administered as part of learning to talk and seldom are studied as such. Among the more fascinating complications to be accounted for is how such abstract qualities of situations as beauty, or of acts such as honesty, are discriminative and responded to, verbally, by being called "beautiful" or "honest." These, like many important dimensions of the human world, depend upon the response habits of their viewers for their very existence. In the lower animals even such rudimentary abstractions as colour, length or weight are quite lacking, because no one has trained them in the necessary discriminations.

MODES *OF HABIT BREAKING*

Once a habit is learned the question arises as to its future fate. Habit breaking is a problem of special practical and theoretical importance. Because of unfortunate stimulus contiguities, undesirable emotional responses become attached to situations a person is forced to meet or, as in the case of the phobias. arranges to avoid. Because of carelessly applied reinforcements, a parent may unwittingly create habits of lying, whining, temper tantrums (which may not be emotional at all) or overdependency in his child. If the habit is strong, what can be done to reduce its strength? Several techniques are commonly tried; not all of them are efficient.

Extinction. — The procedures in extinction involve, in the case of respondents, repeated unreinforced elicitation of the response by the conditioned stimulus; the magnitude of the conditioned response will show a progressive decline and finally disappear. If the extinction experiences occur closely together in time, a rest period will lead to the reappearance of the response when the conditioned stimulus is re-presented. This effect is known as spontaneous recovery, spontaneous because the resurgence of strength takes place without a reconditioning experience. It is surely not truly spontaneous, however, but depends, most probably, on the dissipation of fatigue effects generated during the earlier extinction experiences: part of what appeared then to be true loss of the habit was merely a temporary unresponsiveness caused by momentarily overtaxing the response mechanism. The recovered strength may be discouraging to the learner, but it is quickly reduced by additional conditioned stimulus presentations without reinforcement.

Operant habits are extinguished in much the same way. The occasion for the response to occur is arranged, and when the conditioned response appears, the reinforcer is withheld. The strength of the habit will cause additional responses to occur, but the occurrences will become rarer and rarer at a rate determined by the reinforcement schedule that created the habit. As noted above, if the schedule was continuous, there is relatively little resistance to extinction, but the experience is likely to be accompanied by a considerable emotional display, possibly because of its abrupt novelty. Emotional surprise and annoyance occur nhen a cigarette coin machine fails to deliver; the slot-machine player responds with relative calm in the face of a failure of a similar response. If previous schedules have been intermittent, the habit may be very resistant to extinction, though largely unemotional except for discouragement at the apparent lack of progress.

Extraordinary caution needs to be exercised in all forms of extinction to make sure that no occurrences of the response are ever reinforced. Occasional "giving in" merely makes an intermittent reinforcement schedule out of what should be an extinction schedule and increases rather than decreases the persistence of the habit. The parent, for example, may have decided to discourage a child's temper tantrums by ignoring (*i.e.*, not reinforcing) them. If she gives in occasionally because the behaviour is too nerve racking to watch, or in order to avoid a scene before

visitors, she is working directly against the extinction of the habit. William James likened the occasional giving in to dropping a ball of string that has been wound up: the whole process must be started afresh.

Extinction is the opposite of conditioning: it involves withholding the condition necessary for habit building. Like habit building it is an active process, requiring the occurrences of the behaviour involved. In a very real sense, extinction thus shows that one way to break a habit is to practise it, providing that practice never involves reinforcement. One psychologist (Knight Dunlap) cured himself of the habit of typing "hte" for "the" by practising a whole page of "hte." Like habit building, extinction is slow but sure. Many psychologists have concluded on the basis of very carefully controlled observations that extinction procedures are the only effective habit breakers.

Forgetting. — Forgetting appears at first glance to be an indisputably effective method of losing motor skills, people's names and so forth. However, if forgetting means the loss of habits simply as a function of the passage of time, there is reason to doubt that it happens. The passage of time is likely to be populated by aspects of the original habit, during which the stimuli associated mith the old habit occur in new contexts. But these are the conditions of extinction, and it is misleading to speak of mere time as the sole determiner of the loss. If an organism with a habit could be completely isolated from the behavioural context of its occurrence and reinforcement, it appears that its habit would remain relatively undisturbed over long periods of time. A suggestion of this effect over 16 years in the case of a trained pigeon was reported by Skinner. It is commonly claimed that the skills involved in riding a bicycle are never lost, since the stimulus and response components are very distinctive and do not occur in other situations. Speech seems a priori susceptible to this sort of unsuspected extinction, since the component sounds of the unpractised words occur repeatedly in other contexts. Often the attrition of habits over time is more apparent than real. When one tries unsuccessfully to recall a name, he often does so without the stimulus support of the named person himself; the name may become suddenly available when the person is actually seen.

Punishment. — Possibly the most commonly tried method of habit breaking is punishment. The question in evaluating the effects of punishment is whether substituting a negatively reinforcing, painful event for the previous reward causes any more rapid habit loss than would merely discontinuing all reward. Necessarily if a response is punished it is not rewarded, and so some extinction will occur. Under careful investigation (as performed by W. K. Estes) it appears that punishing responses does not hasten their extinction. Punishment does generate some side effects which are both undesirable and misleading to the punisher. Primary among the undesirable effects is the production of sullen, frightened and other emotional behaviours which attach to the punisher (even if he is "doing it for the other's own good"). The misleading aspect comes from the fact that the punishment-generated emotion is likely to inhibit all activity temporarily; thus the punished behaviour appears to have been wakened, but so has all other behaviour. When the emotion subsides, however, the punished response reveals itself in undiminished strength, except for whatever wakening influence the fact. of failure of positive reinforcement may have had.

It has been suggested that the principal positive effect of punishment is that it makes the punisher feel better. It should be noted, however, that some responses cannot be merely extinguished because they cannot possibly be separated from their reinforcing consequences. Masturbation is an example. Leaving aside the desirability of tampering with that habit at all, it would appear that punishment is the only possibility for control. Punishment will reduce the frequency, perhaps to zero, by surrounding the activity with competing emotions, mostly shame and fear. But this is not to say the habit has been broken; its expression is suppressed. This is an instance of a more general case of habit control: a habit may disappear without being broken if some other response is so reinforced that it becomes stronger than, and literally crowds out. the previous response. This effects the same ends but avoids the undesirable consequences of response substitution by punishment.

All the efficient techniques of habit breaking, thus, are variants of the extinction process. In practical control, extinction may be made easier if the procedures involve gradual exposure to the situation which evokes the habit. The fear response of the child who learned to fear the furry animal (white rat) was extinguished by introducing the animal. without the loud noise, in a cage located across the room. This made the child only mildly apprehensive. Every day the cage nas brought a little closer until finally the child was touching the animal. At no time was the full emotion expressed.

THEORETICAL FORMULATIONS OF THE LEARNING PROCESS

Reinforcement Theory. — The foregoing account of the learning process has been given in generally empirical or observational terms. It summarizes the outcomes of a great many experimental analyses of learning instances. The reconstruction of these processes in more general terms is the domain of theory, and theories of the learning process are in considerable dispute. The main bases of contention are generated by a lack of agreement as to what is learned. What are the necessary dimensions in the description of the habit; including some reference to their loci of operation? The most modest departure from a purely descriptive account is found in reinforcement theory, the most elegant and precise versions of which are given by C. L. Huil and B. F. Skinner. According to this view, reinforcement is necessary for learning and determines what is learned. Since reinforcement is itself contingent upon behaviour, the laws of such a theory contain references to the variables affecting performance or the strength of responses. What is learned, then, is simply behaviour, and the criterion of learning is to be found in the alteration of behaviour. The dimensions of learning. in this view, clearly require reference to muscle or gland activity, although since these are controlled from the nervous system, brain and spinal cord are involved. In brief, according to reinforcement theory, learning involves learning to do something.

Gestalt; Insight. — The reactions against early forms of this reconstruction of the learning process were strong and swift. From Germany came the criticisms of the *Gestalt* psychologists *(see* GESTALT PSYCHOLOGY), who urged that what is learned is relations, primarily a perceptual rather than a response matter. They accounted for the reinforcement theorists' failure to grasp this fact by pointing out that the devices commonly used by U.S. psychologists in learning experiments, such as mazes for rats, and puzzle boxes from which cats learn to escape by manipulating latches, never give the learner an opportunity to see all relevant aspects of his situation. In such problem situations "blind" trial and error is about all that is possible. and learning is slow and appears to require many reinforcements because the learner, for example the cat, never does see the relation between what he must do, such as tilting a pole, and the consequent opening of the door which permits escape and access to food. 'The Gestalt psychologists argued, and showed: that if all the details of a problem are visible at the outset: the solution is cot slowly emergent, but may occur suddenly. The true course of learning, according to this view, is characterized by an abrupt leap from failure to success, reflecting insight (sometimes called the Aha! phenomenon) and intelligent assessment of the relations among the elements of the problem. A simple experiment is reported by Wolfgang Köhler in his book *The Mentality* of *Apes.* He placed a banana outside the cage of a hungry chimpanzee. Sultan, and gave him two sticks. each too short to use as a rake for pulling in the food but joinable so as to make a single stick of sufficient length. Sultan alternately tried using each stick, unsuccessfully, and once even used one stick to push the other along so that it touched the banana. This, as the report goes, gave Sultan a lot of pleasure but no banana. Later. after the banana had apparently been given up, Sultan accidentally joined the sticks, observed the result and immediately ran with it to retrieve the

banana, The solution reappeared immediately when the problem was reinstated. This result is ambiguous, however. Many already conditioned responses seem to have been brought to the problem, so that the necessary motor skills were already available once Sultan accidentally rearranged the stimulus properties of the stick. The appearance of the solution was necessarily abrupt because no intermediate steps between failure and success were possible. Insight in human learning is experienced. of course, but, as with Sultan. only in situations where already acquired responses are seen to be applicable when the stimulus properties of the situation are rearranged. Insight mould not occur in learning to play the piano. It occurs frequently in solving mathematical problems.

Expectancy. — Criticism of reinforcement theory was voiced by U.S. psychologists also. Edward C. Tolman early argued in his book *Purposive Behavior in Animals and Men* that reinforcement theorists confused learning with performance. He conceded that organisms do what they have been reinforced for doing, but urged that this is not the whole story. According to reinforcement theory, the rat at the choice point *learns to* turn left; according to Tolman, the rat *learns that* food is down the left alley and so naturally, being hungry, he goes there. He also *learns that* there is nothing down the right alley except a dead end. According to Tolman an organism learns "what leads to what." This knowledge may be acquired by simply experiencing sequences of stimulus events, and no reinforcement is required at all. Tolman prefers the term "expectancy" to "habit" as the product of learning. It is a function of the brain rather than of muscles, and may never show up in behaviour at all. This seems much closer to the common-sense reconstruction: we learn facts.

Reinforcement - Expectancy Controversy. — Curiously enough, although the difference between the reinforcement and expectancy theories seems sharp and significant, it has been very difficult to design an experiment which unequivocally confirms one while refuting the other. One such attempt is the latent learning experiment. If Tolman is right, experience without reinforcement should lead to learning "what leads to nhat" without changing the initial random properties of behaviour. The learning is latent; it doea not show. A hungry rat. for example, is repeatedly run through a maze but never fed at the end. During this period it has an opportunity to learn the pathway but not to use its knowledge. After several experiences of this sort, the goal box is baited with food which the rat discovers and eats. If it has learned during the unreinforced trials, its knowledge of the path should lead it accurately down the alley to food on the next trial.

Variants of this experiment have been tried repeatedly, starting nith Hugh C. Blodgett's experiment in 1929. Blodgett's experiment indicated that learning had indeed taken place in the unreinforced trials; the previously unrewarded rats entered fewer blind alleys after their first discovery of food in the goal box than naive rats would have done. However, the results of similar experiments performed later were equivocal, sometimes shoning latent learning, sometimes not. This literature is reviewed in the book *Modern Learning Theory* (if[r] *K.* Estes *et al.; see* particularly the chapter on Tolman). Most striking is the fact that in experiments in which latent learning does occur, reinforcement theorists have always been able to point to more or less plausible reinforcing events, often secondary, in even the unbaited maze: the rat is at least removed from the narrow confines of the alley and returned to his home cage from the goal box.

In the literature on human learning such designs are called incidental learning studies. A person. for example. can look at a clock and afterward report accurately what time it is. yet be wholly unable to tell whether the numerals were roman or arabic. A typical incidental learning experiment involves asking subjects to learn the content of a printed prose passage and then testing them for details concerning the physical aspects of the print, misspellings, paragraphing and so forth. Such experiments generally shon that it does occur but that it is weak in comparison with motivated learning of the same material.

Relevant to the reinforcement-expectancy controversy are the observations of E. R. Guthrie and G. P. Horton (reported and pictured in their book *Cats in a Puzzle Box),* who photographed cats at the moment they performed a pole-tilting response which permitted them to escape from a puzzle box. The successive escape responses of a given cat were amazingly stereotyped, involving the same musculature, stance and spatial orientation in the box, and they were remarkably different from cat to cat. Some of the postures were very clumsy: for example, one cat always backed into the pole. They argued that if a cat had learned the principle of the pole. his responses should have been more variable. He would have tilted it nith whatever part of him nas closest, and the elaborate and effortful posture should have been replaced by easier ones.

Suggestive evidence comes also from studies of imitation. If learning consists of discovering "what leads to what," watching another, practised organism should increase the skill of a naive observer The only benefit that seems to accrue, however, is that when the observer begins to practise he knows nhat a correct response looks like. although he still has to learn how to effect it. There is evidence that one can learn to imitate as such, but this learning seems to depend upon reinforcement.

In general, the expectancy-reinforcement controversy cannot be said to have been resolved. Most striking. perhaps, has been the reinforcement position's viability, since it appears to have a more restricted scope.

Other Formulations. — Other formulations of the learning process are available. The mathematical learning theorists. principally R. R. Bush and F. Mosteller, and if[r]. K. Estes have adapted stochastic or probability models to the description and prediction of responses, their aim being to predict the probability that a given response will occur on a given trial on the basis of its past frequencies of occurrence. Among the more striking successes of this approach has been the validation of the theoretical prediction that the frequency of choice of an alternative closely matches the frequency with which that choice is reinforced. Thus, if choice *A* is correct 25% of the time and choice *B* 75%, the alternatives are chosen 25% and 75% of the time respectively. This seems reasonable and not at all surprising until one sees that overall correctness is maximized if alternative *B* is consistently chosen. These experiments are performed with human subjects.

Finally, Skinner. although writing in reinforcement terms, argues persuasively (one source is his book *Science and Human Behavior)* that no theories of learning are necessary at all. He urges that when functional dependencies between behaviour and all the variables which affect it are known, theory will be superfluous.

Learning and the Brain

The brain mechanisms involved in learning remain obscure. Theories of central nervous system activity in learning abound; a popular one is that the points of juncture between incoming sensory nerves and outgoing motor nerves undergo a reduction in transmission resistance as impulses aroused by practice repeatedly pass along them. Other evidence (*e.g.,* by K. S. Lashley in his book *Brain Mechanisms and Intelligence*) suggests that this picture of a habit so precisely localized in a part of the brain is unrealistic and that habit formation and retention involve diffuse activity in the nhole brain. However. certain parts of the brain have been discovered which appear to be intimately related to specific aspects of the learning process. For example, if an electrode is planted in the hypothalamic region of a rat's brain, a mild shock delivered there will increase the strength of any response that precedes it. This defines another, rather curious, reinforcer, and is suggestive of the brain's role in the learning process.

Learning and Age

Learning can take place at any age. Human fetuses were conditioned respondently by D. K. Spelt. During about the first month after birth learning is necessarily simple, since during this period the human infant is functionally decerebrate (brainless). During infancy and early adolescence the amount of learning that

takes place is enormous. If adults learn less it is partly because there is less for them to learn. With increasing age the rate of acquisition becomes progressively slower, but the over-all loss in speed is not great for a given individual and even after some decline many older people are still faster than the average child. Some of the apparent decline in speed with age is traceable to the persistence of previously acquired habits which interfere with new responses, rather than to any loss of native capacity. In deteriorated senescence, of course, learning reverts to the low levels of very early age.

In loner animals, such as the fowl, critical ages have been discovered, as reported by N Tinbergen in *The Study of Instincts*, during nhich learning is elaborate, sudden and irreversible. The process is called imprinting. For example, during a short interval occurring soon after hatching, the baby chick or gosling is particularly susceptible to moving objects, including dogs, human beings and so forth. which it responds to henceforth as "mother" following it about and exhibiting sounds of distress at separation *(see* also ANIMAL BEHAVIOUR).

In the human child, the concept of "readiness" reflects observations that certain ages are optimal for acquiring certain skills, such as toilet training, and that attempts to train before that time are pointless and occasionally deleterious.

EFFICIENCY IN LEARNING

Collateral with more academic investigations of learning there has grown an extensive body of experimental literature on the methods of efficient acquisition of skills, both motor and verbal (memorizing). Some generalizations from this literature will be discussed here; there are particularly applicable to human learning situations in which practice with intention to learn is prominent.

Practice.—Few people would hope to learn to swim or play the piano by merely reading a book on the subject; they would know that skill depends upon actual practice of the component responses to be learned. The same requirement holds for the acquisition of "facts" from a text, although it is much less likely to be applied. In a pioneer study A. I. Gates showed that although a given amount of time spent in mere reading of a text will result in some recall as tested later, the same amount of time divided between reading and self-recitation with the book closed will significantly increase the amount recalled later. Up to 80% of total study time may profitably be spent not looking at the book at all, but in self-recitation. This result was repeatedly observed in subsequent analyses. The advantages of self-recitation have been traced to the better motivation generated by being able to observe the fact of one's progress during learning, and to the opportunity which recitation provides to correct errors on the spot and to devote more time to difficult passages; but primarily the advantage seems to depend upon the Iact that in this process the learner is practising recall, and this is the response that he wishes to acquire.

Closely related to this outcome is the question of transfer of training. An earlier educational philosophy, called the "doctrine of formal discipline," was based upon the notion that training in mathematics was conducive to logical thinking, that the study of Latin improved all language skills, and so on through a list of subjects required not for their own contents but for their presumed effectupon other mental powers. The doctrine presupposes that *transfer of training* is strong and positive; that is, that practice on one task will lead to improved performance in another, unpractised task. If transfer occurs, it is not strictly necessary to practise the response to be learned. Nearly all controlled tests for transfer have shown, however, that it is disappointingly weak and it map, in some instances. even be negative. so that training in one skill may interfere with acquisition of a second one. Studying Latin leads to learning Latin, but it has very little beneficial effect upon memory, beyond the fact that certain study habits acquired may be useful in learning another language. Its benefits in increased knowledge of English vocabulary and grammar are weak, and some of its effects upon the subsequent learning of another language may be negative, because of the intrusion of Latin words and constructions.

Transfer is strongest when two tasks have common stimulus or response components. It is usually positive when previously learned responses must be learned to new stimuli; it is usually negative when new responses must be learned to stimuli previously associated with other responses. In general, it is most efficient to practise directly the responses one wishes to acquire.

Massed versus Distributed Practice. — Although no precisely optimal time durations can be specified, it is usually observed that a given amount of time distributed in blocks over several shorter practice sessions, with rest or other activities intervening. leads to more learning than does the same amount of time spent in continuous, uninterrupted practice. The shorter practice sessions should be long enough to overcome an initial period of inefficiency: called the warm-up. The advantages of distributed learning probably depend in part upon the fact that in massed practice repetition tends to favour doing what was done last time, errors and all. The rest period differentially favours the disappearance of errors and retention of correct responses. The rest periods also permit the desired response to recover from the effects of fatigue and maintain a higher level of interest and motivation.

"Cramming" is the colloquial term for intensive massing of practice. It is not true that forgetting after cramming is very rapid; it is true that more learning can be accomplished if the same amount of time is distributed over a longer interval. and in some instances it has been shown that more skill can accrue from less total practice time, if the shorter time is distributed and the longer massed.

Whole versus Part Learning. — In a lengthy assignment to be learned, or speech to be memorized, the learner may divide the task into subparts and learn each one as a separate unit, mastering each one before proceeding to the next. The question arises as to whether this approach is more efficient than learning the material as a whole. Unfortunately no unequivocal answer can be given. It is tempting to conclude from experiments on the subject that the whole method would be more efficient if learners could be persuaded to try it. Whole task learning involves optimal spacing of the subparts, and omits a second step which the part-learner must take: when the subparts are all learned additional practice is required to put them in order. However, most learners are discouraged by the apparent lack of progress made in early stages of whole learning, which vitiates its advantages. Most prescribers of efficient study formulas advocate breaking lengthy. tasks up into fairly long, logically contained subtasks.

Retention. — The most obvious factor favouring long-term retention is the strength of original learning. A task may be learned to perfection as exhibited by one errorless performance: but if the learner stops with this his later retention of the skill will be less than if he practises an additional series of perfect trials. This procedure is called overlearning. Another factor which influences retention, producing difference in amount recalled after the same amount of original learning or overlearning, is found in the nature of the activities immediately following the initial learning. Retention is greatest when the interval between learning and recall is filled with sleep (some experimenters have introduced actual sleep as a laboratory variable, others have for convenience required their subjects to read college humour magazines as the closest approximation to doing nothing that is readily available).

Retention deteriorates as the postlearning activity increasingly resembles the learning task. If the task to be retained involves reciting a list of adjectives, subsequent learning of a list of their synonyms will interfere with recall of the first list. Subsequent practice on a list of digits, on the other hand, will leave the first list relatively intact.

Understanding the Learning Process. — Finally. learning efficiency is increased by a general understanding of the principles of learning. For example. the learner should know that the rate of improvement during practice on a complex task is by no means

steady. It is very rapid at first; the first few trials often account for mastery of a considerable fraction of the total task. Each subsequent trial contributes increasingly less to the total performance, so that, for example, the difference between the skilled marksman and a fairly good shot may involve hundreds of hours of practice. A second characteristic of the rate-of-learning curve which is useful to anticipate is the period of no improvement, called a plateau, that often occurs in complex task learning. Plateaus appear to be caused at stages in the learning process where separate response components begin to merge into continuous, smooth acts. For example, a plateau is commonly found in learning to send Morse code. When the learner's skill in sending letters reaches a high point, he is able to begin to learn to send words as such. The transition is necessary if the skill of the expert is to be acquired, but it involves a period of no apparent increase in skill. However) during the plateau the letter-sending habits are being overlearned to that point of near automaticity which frees the sender's attention enough to read ahead and reduce the interval between each successive letter. The plateau seems unavoidable, but understanding its nature and function reduces the student's discouragement and anxiety while it lasts.

See also CONDITIONING; HABIT; PSYCHOLOGY, COMPARATIVE; PSYCHOLOGY, EXPERIMENTAL.

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LEASE: see LANDLORD AND TENAKT; LAND TENURE: ECONOMIC AND AGRARIAN ASPECTS.

LEAST SQUARES, METHOD OF. The method of least squares, in the simplest case, is a mathematical device for obtaining the best estimate of the true value of some quantity. the apparent value of which has been repeatedly measured under conditions arranged to be as nearly constant as possible. but the individual measures of which inevitably vary at random among themselves. Suppose that several measurements. subject to error, are made of a magnitude y. By the least squares principle the best estimate of y is that for a-hich the sum of the squared differences between it and the observed values is a minimum.

More generally, the dependent variable y may be considered a given function of a number of observable independent variables which contains a number of constants, known or unknown. Measurements greater in number than the quantities to be estimated are made on corresponding sets of the variables. The best estimates of the true values of the unknown constants and of the variables whose measurements are subject to error are those for which the sum of the squared differences (residuals) between observed *y*'s and those calculated by the function is the least possible.

Use of the differential calculus gives a system of normal equations to be solved for the estimates. In many important cases these equations are linear, otherwise their solution may require approximative methods. Theoretical justification for the least squares principle is usually based on the assumption that the residuals obey the normal error law. Curve fitting, the adjustment of observations and statistical correlation theory are examples of important applications.

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LEATHER is animal hide or skin converted by chemical treatment and processing, known as tanning. to a stable and nonputrescible state. The objectives of tanning are to render hides and skins resistant to decomposition or bacterial decay. particularly when wet; to achieve specified physical properties in the tanned hides or skins. such as tensile strength. flexibility, resilience, abrasion resistance; and to impart to the leather chemical properties such as nonsolubility in water at relatively high temperatures. Untanned hide or skin substance becomes soluble in water at approximately 140° F. while many types of leather remain stable at the boiling point of water. All leather possesses a common physical property. water vapour permeability. which is attributable to the internal capillary action of the fibres composing leather and to surface evaporation. The principal hides or skins used in the inanuiacture of leather are cattle hides. calfskins. goat- and kidskins, sheep- and lambskins. These types represent more than 90% of the world production of leather. Other hides and skins used commercially include horse. pig, kangaroo, deer, reptile, seal and walrus. The major raw materials are by-products of meat consumption.

Preservation of Hides and Skins.—Since hides and skins must be accumulated in commercial quantities after slaughter and flaying and prior to tanning. a temporary means of preservation is essential. This is usually known as curing and is effected through two principal methods—salting and drying. Both methods tend to inhibit bacterial action in the raw hide or skin. The best quality cattle hides and calfskins are packed, shortly after flaying. with clean, coarse salt which dissolves in the water of the hide. A saline solution is thereby formed which prevents the putrefactive action of bacteria. Hides and skins treated in this manner are described as wet-salted and can be held for considerable periods without decay under favourable conditions of huinidity and temperature. A similar result is achieved by immersing hides in a brine solution until thoroughly saturated. Where transport presents difficulties, salt may be used for immediate preservation followed by drying, to produce dry-salted stock. Although drying preserves skins against decomposition. it has corollary disadvantages in the quality of the product and later difficulties in tannage. Sun-dried skins are prepared for shipment by drying in the shade. either spread on the ground or suspended from poles. Decay during the process and insect damage are sometimes countered by treatment with an arsenical solution. Most sheep- and lambskins from which the wool has been removed. *e.g.,* pulled, are preserved by pickling in a solution of sulphuric acid and salt and shipped in casks containing the pickling solution.

Sources of Hide and Skin Supply.—Every country possesses some hide and skin supplies. and world production as estimated in the mid-1950s is shown in Table I.

TABLE I.—*World Hide and Skin Production*

Country	Cattle hides		Goat- and kidskins	Sheep- and lambskins
Australia	2,800,000	1,250,000	...	21,000,000
Austria	500,000	650,000	...	200,000
Argentina	8,500,000	...	1,800,000	10,200,000
China	5,000,000	...	13,000,000	6,500,000
Denmark	433,000	670,000	...	38,000
France	3,250,000	5,000,000	300,000	5,000,000
Germany (West)	2,750,000	2,750,000	100,000	700,000
Great Britain	3,000,000	...	...	7,400,000
India	20,000,000	...	36,000,000	...
Italy	1,250,000	2,000,000	5,835,000	3,000,000
New Zealand	800,000	1,300,000	...	18,000,000
Spain	1,260,000	450,000	2,500,000	9,000,000
Switzerland	260,000	530,000	110,000	105,000
Union of South Africa	2,000,000	13,500,000	3,100,000	7,500,000
United States	26,500,000	85,000	200,000	16,000,000
Estimated world slaughter	108,000,000	26,000,000	65,000,000	120,000,000

Between the end of World War II and 1955 a sharp increase occurred in world cattle numbers and slaughter. thereby increasing raw material supplies for leather production. In the United States alone the domestic supply of cattle hides increased from an average of 21,000,000 in 1947–50 to 27,300,000 in 1955.

Histology of **Skin.**—A knowledge of the histology and complex chemical constituents of animal skin is essential to a proper understanding of the intricate reactions taking place in the manufacture of commercial leather. (See SKIN.) The skin may be said to consist of living cells and the products of cell activity: *e.g.*, fibres, dead cells, etc. Skin consists of three well-defined layers. distinct both in structure and origin. These are: (1) a thin outer layer of epithelial cells. the epidermis: (2) a thick layer called the derma: and (3) a subcutaneous layer of adipose tissue known commercially as flesh. The epidermal tissue is completely removed for tanning. The derma is the layer converted into leather. The hair is embedded in a pocket or follicle of epidermis. the hair follicle and hair being penetrated by a projection coming from the derma and knonn as the hair papilla.

Variation of Fibre *Structure.*—The variation of fibre structure determines the tensile strength and pliability of the leather. and the satisfactory preparation of skins for tanning depends upon the separation of these white fibres without damage. The derma consists of connective tissues and fat cells in varied proportions in different skins. determining the general character of the finished product; where large groups of fat cells are interspersed between the collagen fibres the result will be soft. spongy leather because of the empty spaces left when the fat cells have been removed by the preparatory processes to which the skin is subjected. In considering fibre structure from the tanner's standpoint. the presence of connective fibres. which consist of yellow fibres as distinct from the white fibres of the collagen and which are of different chemical composition, being composed of the protein elastin, is of great importance. The presence or absence of these in the finished leather has an important influence on its physical character. particularly as to grain, and also influences stretch and elasticity. These elastins are removed to a predetermined degree in order to effect desired variations of character.

Chemical Composition of Skin.—The following occur naturally in skin—water, proteins. fatty matter. carbohydrates and mineral matter. The proportions vary according to the kind of animal. and. in a given species, according to the age. sex. mode of feeding. climatic conditions. etc.; further. in a given kind of skin they vary from place to place. The composition of the skin as received by the tanner differs from that in the natural state because foreign matter is picked up by the animal while it is alive and is introduced during curing. and also because soluble matter may he washed out during the curing process. The composition is further modified by bacterial and other changes occurring in the interval between flaying and receipt by the tanner. The skin also contains enzymes and bacteria.

Collagen forms about 95% of the protein matter in the derma of calf. steer and cow hides; *i.e.*, the layer which is converted into leather. The fatty matter consists of numerous other substances besides glycerides. The amount in hides is usually small and during the tanning process it is for the most part converted to lime soaps which are removed during scudding. If not properly eliminated it may give rise to greasy leather. The mineral matter naturally present consists of sodium chloride; in addition there are chlorides. sulphates, phosphates. silicates of sodium, potassium, calcium and magnesium. The mineral maiter introduced is removed in the wet work. The chief carbohydrate is glycogen.

PROCESSES PRELIMINARY TO TANNING

Washing and Soaking.—After hides and skins enter the tannery. the first major operation is soaking. This operation has two purposes—first, to wash and remove from the stock water-soluble material that might interfere with later operations: second, to cause the fibres to absorb water so that their normal shape and dimension is restored. In addition to the salt employed in curing, other water-soluble matter in the raw stock removed by soaking includes soluble proteins from blood and lymph. Soaking also softens and facilitates subsequent mechanical removal of dung and any other extraneous material. The removal of soluble proteins is hampered by the epidermis and by layers of fatty tissue on the flesh side of hides and skins. Bacterial control is essential during soaking inasmuch as soluble proteins extracted by water provide ground for potentially enormous multiplication of bacteria with commensurate damage to the stock.

In modern practice. soaking proper of wet-salted stock is often preceded by preliminary washing in revolving drums. using adequate changes of cold water containing antiseptics. The hides or skins may he mechanically agitated in the washing by an arrangement of pegs within the rotating drum so designed as to cause continuous separation and flexing. Following the washing. hides or skins are immersed in vats of from 1,000 to 2,500 gal. capacity. using fresh n-ater at relatively low temperatures. The soaking may be continued for several hours or days until a desired physical condition is achieved. Throughout the operation a compromise is sought betn-een the risk of damage from prolonged washing and the optimum removal of soluble and nonleathermaking material. Special difficulties are met in the treatment of dry hides or skins where washing must restore the normal structure of fibres as well as remove ioreign substance. During drying. fibres tend to change in shape as well as in size. depending on the speed of the process and the temperature used. Adhesion of fibres and films formed by oxidized natural greases retards uniform penetration of water in the soaking. Chemical and mechanical means are utilized to condition the skins properly. An alkaline solution is irequently employed both to separate and to swell the fibres in the soak waters. Soaking is interspersed by milling in rotating drums with the object oi flexing the stock to separate fibres and assist the absorption of water in the soaking vats. Alternate treatment of the hides or skins in vats and drums is continued until a state of adequate flexibility is reached and the water content of the stock has been increased several times. Throughout soaking, the greatest care must be exercised to prevent bacterial growth and excessive swelling of the hides or skins. which might cause lasting deformation of the fibre structure. Extensive chemical research has shown the significant importance of the soaking operation in modern leather manufacture. It is held that control of results in soaking is imperative for successful control of leather properties sought in the following stages of production.

Fleshing.—The purpose in all operations preliminary to tanning is to remove material and portions not desired in the finished leather and to put the hides and skins into proper chemical and physical condition for conversion into leather. Adipose tissue and flesh must be removed after soaking by fleshing machines on which rotating bladed cylinders under pressure cleanse the flesh side of the hide or skin. While there is variation in tannery practice in the sequence of fleshing and other early steps, the procedure is virtually standard in modern plants.

Unhairing.—The next essential preparatory stage is loosening and removing the hair from the grain surface. In this operation the hair must be loosened from the follicles. which represent indentations of the epidermis into the derma, and then removed mechanically. The process can be accomplished by a variety of methods, of which the most important and widely used is liming. Sweating is a historic method now utilized only to a limited extent. and principally for the removal of wool from sheepskins. Enzymatic action and depilation by chemical destruction of hair are also practised to a minor extent. Since animal hair is a valuable by-product in leather production, tanners attempt to remove it from the hide or skin without damage. provided the grain surface of the leather will not be impaired.

Liming.—The results of liming hides and skins are complex. In addition to preparing for unhairing, liming also loosens and dissolves the epidermal layers of cells which do not make leather. The fibrous portions of skin substance belong to the collagen class of proteins whereas hair and the uppermost surface of skin are keratins, which are destroyed by alkalies much more rapidly than collagen. Consequently, in separating keratin from collagen, an alkali solution is used. and the limited solubility of lime serves this purpose efficiently. Control of the degree of liming directly influences ease of hair removal and also determines to some extent the properties of the leather, such as plumpness, stretch and solidity. The method of liming usually practised involves immersion of hides and skins in a mixture of lime and water, using vats with as much as 2,500 gal. capacity.

A quantity of lime is used greatly in excess of the ratio soluble in water so that a saturated solution is always present and the major portion of the lime is suspended in the liquor. During the process of immersion, the raw material is periodically withdrawn from the vat. piled up and allowed to drain. Mechanical agitation through paddle wheels is employed for some types of hides and skins to stir up the undissolved lime in order to maintain the solution at or near saturation. to assist the diffusion of the lime into and among the skins and to prevent skins from packing. Where still vats are used, the lime is also agitated and the solution maintained at full chemical activity in the intervals when the raw stock has been withdrawn to drain.

The time required for easy unhairing through liming is greatly shortened by the use of sharpening agents, of which the principal one is sodium sulphide. The hydrolysis of sodium sulphide in water produces sodium hydrosulphide, which has a specific action on keratin. accelerating the loosening of the hair. Other chemical agents such as dimethylamine are also used to accelerate the liming process. In the treatment of sheepskins, where it is not desirable that the wool come in contact with lime. pulling or fellmongering relies on the application of a heavy paste of lime to the flesh side of the skins. After several hours. diffusion of the hydrosulphide through the skin to the epidermis dissolves the cells holding the wool. Each skin must be painted individually to assure minimum contact of wool and lime.

Systems of dehairing other than liming are employed to a minor extent. Commercial use has been made of enzymes applied to hides and skins previously prepared by soaking in caustic solution. When sodium sulphide is used in very strong solution, hair may be dissolved or sufficiently disintegrated to permit its easy removal. The commercial value of the hair is, of course, lost in this reaction. An older method of dehairing. now virtually obsolete, consists of sweating, which is essentially a controlled putrefaction of cells composing the hair sheaths, induced by temperature and moisture. Sweating was supplanted by the safer and chemically more scientific means of unhairing and is used in modern plants only for lower grades of dry hides and for the removal of wool from some types of sheepskins. The sweating system involves hanging hides and skins in a closed chamber where the air is kept warm and humid. The modern sweat chamber is usually lined with glazed tile or other nonporous material to facilitate the thorough periodic cleansing required to remove microorganisms. Exact means of regulating ternwerature, humiditv and ventilation are imperative to hold the reaction within desired limits.

When hides and skins have been prepared for unhairing, the loosened hair is removed by machines of several types. In principle, the unhairing machine applies dull rotating blades to rub the hair off the grsin surface of the hide or skin without scratching or causing damage to the grain. On some kinds of hides and skins, machine unhairing is followed by hand treatment with dull knives to assure a completely clean grain surface.

Washing and Delimirig.--Several further steps are necessary to prepare the stock ior tanning. Surface lime and some protein decomposition products are removed by washing in running water at temperatures of 60° to 70° F. Extended washing at this stage is avoided to prevent loose grain in the stock. A more complete and controlled removal of rhe lime content is then effected by soaking and paddling in vats with acidified solutions. This both delimes and produces the mildly acid equilibrium desired in hides and skins prior to tanning. Careful regulation of *p*H in the deliming process is governed by the characteristics desired in the finished leather. The dcgrcc of deliming correlates with final softness, pliability and stretch or resilience. In the case of sole, belting and mechanical leathers. the deliming is held to the removal of alkali from the surface. For lighter leathers the process of acidification is maintained until a more uniform *p*H exists through the cross section of the hide or skin. Great reliance must be placed at this stage. as in all modern leather production, upon precise measuring and recording instruments such as electrometric and calorimetric *p*H indicators.

Bating.— During the action of the lime liquors, several physical and chemical changes take place which must be rectified before tanning. Lighter types of leather are subjected to bating to attain a smoother and clearer grain or greater softness and pliability. Bating aids the removal of degradation products of the epidermal system. hydrolyses elastic fibres. controls plumpness, regulates *p*H values and aids in further deliming by the use of enzymes of predetermined. standardized activity which are allowed to act upon the skins in vats. Although the mechanics of bating continued to be studied in the 1950s, its practical application was precisely controlled.

Pickling.— illany types of stock are tanned directly after bating and rinsing, but certain types. particularly- those intended for chrome tanning, are first pickled. This process consists of bringing the stock to a condition of equilibrium in a bath of sulphuric acid and salt of fixed concentration. Drumming in such a solution has the great advantage of bringing the material to a uniform state of acidity, imparting a final cleansing and contributing to softness in the leather.

TANNING

After the preliminary preparation. hides and skins are ready for the chemical conversion to leather. known as tanning. The oldest system of tanning relied on the action of vegetable material containing tannin or tannic acid, but modern technology developed a large range of chemical agents and processes to produce leather. Tanning with chrome compounds came to be the most important method in volume of production, although vegetable tanning remained basic for certain kinds of leather.

Vegetable Tanning.— In this process extracts of infusions derived from tannin-bearing plants, barks or growths are allowed to act on hides and skins.

Tannin-Bearing Plants.—Tannin or tannic acid is abundantly distributed in many diifferent forms of plant life. The tanner originally processed skins exclusively with oak bark, but modern tanners use tannin-containing materials from various sources and of different types. The tannins were formerly classified as belonging to the pyrogallol or catechol class, but this classification was superseded by more scientific groupings; either according to Freudenberg by the chemical groups of (1) hydrolysable tannins and

TABLE II.—*Common Tannins*

Gallotannins		Ellagitannins		Catecholtannins	
Do not produce bloom		Produce bloom		Do not produce bloom	
	Per cent tannin		Per cent tannin		Per cent tannin
Galls (*Quercus infectoria*)	50/60	Myrobalans (*Terminalia chebula*)	33/36	Canaigre (*Rumex hymenosepalum*)	25/30
Sumach (*Rhus coriaria*)	26/30	Divi-divi (*Caesalpinia coriaria*)	39/42	Gambier (*Nauclea gambir*)	35/45
		Valonia (*Quercus aegilops*)	30/40	Hemlock (*Abies canadensis*)	8/20
		Oak bark (*Quercus robur*)	10/12	Larch (*Larix europaea*)	9/10
		hlgarohilla (*Caesalpinia brevifolia*)	60/80	Mimosa or golden wattle (*Acacia pycnantha*)	38/49
				Mallet bark (*Eucalyptus occidentalis*)	20/25
Tanning extracts					
Chestnut wood extract (*Castanea vesca*)	26/30	Myrobalan extract (*Terminalia chebula*)	50/55	Oak wood extract (*Quercus family*)	26/28
				Quebracho extract (*Schinopsis colorado*)	62/68
				Mimosa extract (*Acacia family*)	62/64

(2) condensed tannins; or according to Perkin in three groups: (1) gallotannins; (2) ellagitannins; and (3) phlobatannins or catecholtannins. For the practical tanner the latter grouping is of most interest. Table II shows the most common tannins according to the classification of Perkin; and classified according to their behaviour in the tanning process, as to whether they deposit bloom—a crystalline deposition of ellagic acid—which conduces to firmness in the finished leather but is objectionable when goods are to be subsequently dyed.

Synthetic Tannins.—A number of synthesized products, derived principally from phenols and hydrocarbons, possess characteristic

tanning or leathermaking properties. These products are generally manufactured by mixing phenolsulphuric acids with formaldehyde under exact conditions. Syntans, as such products are known, are not the same as natural vegetable-tanning substances and are rarely used exclusively. However. they are extremely useful as retanning agents in the production of both chrome and vegetable leathers. Improved colour, rapid penetration and other desirable economies are effected through use of syntans, when employed as auxiliary tanning materials.

In a different category from the syntans are the agents of the resin class. While still not in wide use in the 1950s, these products extended the horizons of leather technology by introducing new materials for the conversion of hide substance into stable leather with a great variety of properties.

Vegetable-Tanning Processes.—Processes of vegetable tanning may be conveniently considered in two distinct groups: (1) the tannage of heavy leathers. such as sole, belting, mechanical and upholstery; (2) the tannage of light leathers for shoe uppers, linings, fancy goods, bookbindings. etc.

While similar in principle, the techniques differ by virtue of the great variation in weight or substance of raw stock and the solidity or flexibility sought in the finished leather. Throughout the vegetable-tanning process, the strength of tanning liquors is accurately controlled by instruments recording the specific gravity and the acidity of the solutions.

Tannage of Sole Lenther.—In the United States and most other countries, hides to be tanned for sole leather are processed in sides, the hide being divided into two portions by cutting down the line of the backbone. After tanning the finished sides are customarily divided into three main parts, the bend accounting for 50% of the area, the belly and shoulder each representing approximately 25% of the side area. In Great Britain the cutting or rounding is usually accomplished prior to tanning.

The tannage of sole leather usually consists of three group operations: (1) colouring. by suspending the goods in a series of weak liquors of gradually increasing strength—rocker vats are used in this first stage; (2) laying the material in a series of strong liquors. increasing in strength as the tannage proceeds. the operation being called handling and the series of vats described as handlers or layaway vats; (3) placing the goods for comparatively long periods in a strong liquor after they have been dusted between each piece of leather (in layer pits, called dusters) with a small quantity of solid tanning material. The suspender tannage is accomplished in a series of vats containing weak liquors that have been used previously.

The sides are usually moved daily into solutions of gradually increasing strength and their position in the same vat is also changed once or twice daily. The length of time and the number of vats used varies in different tanneries.

The goods are moved from the strongest suspender vats to the layaway vats or floaters. There they are handled daily by being drawn up on the side of the vat, allowed to drain and then transferred. in a horizontal position, to vats of gradually increasing strength of tannin. Handling becomes less necessary as the tannage proceeds. In the latest stages of the handler round, it is customary in Great Britain to sprinkle the goods with a little solid material, mimosa bark. ground myrobalans or valonia. as a preliminary to the layers or dusters. At the end of the handler round, the goods are usually almost completely tanned and are then transferred to the layers, which contain very strong liquor obtained from the leaches of previously unused tannin or by the addition of chestnut or oak wood extract.

In the layers the goods may be allowed to remain for long periods without change, being lifted and transferred into increasing strength solutions every one or two weeks. This treatment permits the deposition of bloom and is conducive to the production of firmer; harder, heavier and better wearing leather. To complete the process. the goods are removed, drained and then scoured to remove the deposited bloom from the grain.

Tannage of *Calfskins*.—One of the essential differences in the manufacture of calf leather by the vegetable process is in the preparation before tanning. After liming, unhairing, fleshing and scudding, the goods are commonly either bated or thoroughly delimed. The goods are sometimes pickled after bating; however, this operation may be omitted.

Usually the tannage is begun by suspending the skins in non-astringent, used liquors originally prepared from a mixture of two or more of the following materials: mimosa bark, myrobalans, gambier. quebracho, chestnut or oak wood extract. After the skins have been suspended for a period varying from two to seven days, the tannage may be completed in a handler round, the skins being finally given a retannage to lighten the colour by drumming, paddling or suspending in a warm sumac infusion. Alternatively, the tannage is sometimes done entirely in paddles using gambier in the earlier stages and gradually strengthening the tannin content of the solution by adding quebracho-myrobalan extract, chestnut extract, etc. Because calfskins are dyed in the majority of cases, the usual custom is to avoid bloom-giving tanning materials. the irregular deposition of bloom on the surface of the leather detracting from a level dyed result.

Tannage of *Skivers*.—Skivers are the grain portions of sheepskins which have been split in the limed condition. One of the materials most widely used in their manufacture is sumac (*Rhus* coriaria); this material readily produces a white leather capable of being dyed in any colour. The material, as removed from the splitting machine in limed condition, must be washed, delimed and thoroughly bated, after which it is commonly pickled and then tanned in a paddle wheel. The goods are placed in the paddle wheel with the sumac in the ground leaf form and preferably after having been infused with water for a few minutes at a temperature of 140° F.; the tannage is usually begun at a temperature of about 90° F. The goods are usually completely tanned within 12 hours; then they may be removed, drained, rinsed in water and hung up to dry into the crust condition.

Vegetable *Retannage*.—Sometimes certain properties of vegetable tanning are added to leather produced by the chrome process, for retanning with vegetable extracts produces combination tanned leather with physical characteristics of both types. In the case of cattle-hide upper leather, for example, vegetable retanning produces greater plumpness than chrome tanning alone. Combination tannages are also employed for specialized types of sole leather in order to give. them both the abrasion resistance of chrome leather and the greater thickness of vegetable leather.

Mineral Tannage.—As mentioned previously. tanning with mineral salts: primarily sodium or potassium bichromate, replaced the use of vegetable extracts for the bulk of all light hides and skins. Most shoe upper leather, for example, is produced by chrome tanning. The oldest process of tanning with mineral salts is the alum process, still used in the manufacture of most glove leather. The proportions of the materials used vary, but the following may be taken as an example: 8 lb. alum. 8 lb. salt, 3 to 5 lb. flour and 2 to 4 lb. egg yolk for 100 lb. of prepared skins. It is customary to add all of the ingredients at the beginning of the tanning and to prolong the drumming for about two hours until the leathering process is completed. The goods are then removed, drained and dried.

Chrome Tanning by tlze *Double-Bath Method*.—This method is commercially applied chiefly in the tanning of goatskins for the manufacture of *glacé* kid; it is also'used in the tannage of calfskins for willow calf and for mechanical leathers.

The prepared pelt is first treated with a comparatively weak solution of potassium or sodium bichromate acidified with hydrochloric or sulphuric acid. After this solution has been absorbed by the skins. they are transferred to a solution of sodium thiosulphate (hypo), to which hydrochloric or sulphuric acid is added as the reduction process proceeds. The free sulphurous acid produced reduces the chromic acid: resulting from the action of the acid on the bichromate solution. into a basic chromium chloride or a basic chromium sulphate salt, the thiosulphate during the reduction process undergoing oxidation to sodium tetrathionate-and sodium sulphate. At the same time. sulphur is liberated and deposited in the interstices between the fibres as well as in and on the fibres of the skins. The sulphur deposit is one of the principal features which distinguish leather tanned by the two-bath process from that pro-

duced by the one-bath method.

The modern commercial method is first to pickle the skins mith sulphuric acid and common salt, and then drum in a solution of sodium bichromate and acid. The more complete the absorption of chromic acid resulting from the chemical action the better, as this has an important influence on the finished leather.

After the goods have been thoroughly impregnated, they should be of a bright orange-yellow colour. They are then removed from the solution and carefully drained for a minimum period of 24 hours. after which they are passed through a striking-out machine for the purpose of laying the grain of the skin perfectly flat and removing any wrinkles that may have appeared.

The reducing operation is done in the drum or paddle wheel, but in the case of heavy goods it may be done in pits. The following is probably the best procedure: the necessary quantity of sodium thiosulphate is dissolved and placed in the paddle. About one-third of the acid required, after dilution, is added to the solution of sodium thiosulphate. The mixture should be well stirred either by mechanical paddling or by hand. mith a wooden stirrer; after a few minutes the solution will become slightly cloudy as a result of precipitation of finely divided sulphur. showing that the reaction has begun. A further one-third of the diluted acid is added, and after about one hour the remainder.

Generally, the reduction takes place in fairly well-defined stages indicated by the colour of the goods. In the early stages there is a change from the original yellowish orange to a darker yellow and then to a lightly brownish yellow. Later the colour becomes a greenish olive, and finally a pale bluish green.

The following are suggested quantities for the two solutions:

first bath		second bath	
6%	hichromate of soda	1	sodium thiosulphate
4½%	hydrochloric acid	7½%	hydrochloric acid
	or		or
1¾%	sulphuric acid	3%	sulphuric acid

Chrome Tanning by the Single-Bath *Method*.—The single-bath method is more largely practised than is the two-bath process, particularly in the case of calfskins intended for box and willow or suede finish; hides for side leathers; and sheep for gloving. upper leather. linings and fancy purposes.

The single-bath process is simpler and less liable to produce irregular results. The essential difference is that! whereas in the double-bath process the basic salt of chromium is formed on the fibres. in the single-bath method the basic chromium salt is applied directly to the skins in solutions of gradually increasing strength.

One of the simplest methods of preparing a single-bath chrome liquor consists of neutralizing the acid of chromium sulphate or chrome alum by adding sodium carbonate. The following proportions of sodium carbonate and chrome alum should be used to produce the salt. $Cr(OH)SO_4$. which is most generally suitable: For each 1,000 lb. of pelt to be tanned, dissolve 1 jo lb. chrome alum in 50 gal. water. at a temperature of about 85° to 95° C. When the whole of the chrome alum has gone into solution, cautiously add a solution prepared by dissolving 16 lb. soda ash or 60 lb. washing soda crystals in 25 gal. hot water. When all of the sodium carbonate has been added. the solution should be thoroughly stirred. The usual procedure is to mix together carefully in a suitable lead-lined tank equal parts of sodium bichromate and concentrated sulphuric acid after dissolving the bichromate in a small quantity of water. The reducing agent is then cautiously added until the colour of the solution is changed from the original orange-yellow colour to a bright bottle-green shade.

The following quantities produce a liquor which is considered of a satisfactory chemical composition: 200 lb. bichromate; 200 Ib. sulphuric acid (95%); 50 Ib. glucose; 100 gal. water. The tannage is carried out on lines more or less identical with those of vegetable leathers. the processing being done either in the drum or paddle wheel for the lighter classes of leather. and by suspension in vats for chrome sole leather, hydraulic and similar leathers. Starting with a weak solution, the strength is increased until complete penetration has been effected.

In contrast with vegetable production, leather may be made by the chrome process in hours and days instead of weeks, and greater precision is thereby afforded tanners in controlling the nature of their output. Chrome-tanned leather has exceptionally good wearing properties, high tensile strength and resistance to chemical reagents and it will stand high temperatures in wet or dry condition without detrimental effect.

Compounds of iron. zirconium and titanium have been employed to produce leather of basically sound characteristics. although such salts were not in commercial use in the latter 1950s.

Oil *Tannage*.—One of the earliest processes for converting pelt into leather was the application of oil and fatty substances. The modern method of manufacturing chamois leather (made from the flesh split of a sheepskin), deer. antelope and similar skins consists in impregnation with an oxidizable fish oil of the goods when in a weakly alkaline condition, and subsequent processing to effect further oxidation of the oil on the fibres.

The goods as they leave the splitting machine are relimed to effect a further swelling of the fibres and decomposition of the fat cells with a view to subsequent removal of the natural grease. Having been relimed sufficiently, they are then frizzed on the split side. This operation is somewhat similar to that of hand fleshing but consists of the removal of the coarse fibred surface or ground from the split side nearest to the grain: by cutting this away with a sharp two-handled knife on a frizzing beam.

The goods are now delimed either by employing a fermented infusion of bran or other flour offal; or by the use of a suitable acid. The object to be attained by oil tanning is the substitution of a suitable fish oil for the moisture in the fibres. The goods are first drained and then pressed in some hydraulic or other press to express from them as much moisture as possible. They are then hung up to partially dry. This requires careful supervision to prevent the goods' becoming too dry, and the fibres in consequence becoming repellent to the subsequent absorption of the oil and becoming stuck to each other. After as much moisture has been eliminated as practicable, the goods are placed in a machine called the stocks. This consists of two heavy hammers working in a semicylindrical vessel in which the goods are subjected to a hammering or beating action; at the same time the goods are continuously turned over by reason of the shape of the vessel. They are sprinkled with a fish oil. usually cod-liver oil. during the process of stocking or kneading, and are processed until they become sufficiently saturated. They are then further dried, resprinkled with oil and restocked. These operations are repeated until the goods are fully saturated and practically all moisture has been replaced by fish oil. The oil is then decomposed on the fibres by the application of heat.

Solvent *Tanning*.—Considerable attention has been given to tanning with solvents, such as acetone, in place of aqueous solutions of the tanning agents themselves. Intensely rapid penetration of hide and skin fibres is accomplished with solvent media, thereby expediting the tanning process enormously and enabling prompt changes to be made in types of leather produced. It was believed that the commercial introduction of solvent tannage would alter leather technology as radically as the perfection of chrome tanning at the end of the 19th century. Systems under investigation in the 1950s called for initial dehydration of hides and skins. after preparatory steps such as those followed in the conventional methods, and subsequent saturation in a solution of solvent and tanning agent.

PROCESSES FOLLOWING TANNING

Upon leaving either the vegetable tanyard or the chrome tanning drums. leather is in a condition described as rough tanned and must be subjected to a series of finishing steps. These operations give the product necessary solidity or flexibility. lubricate the fibres by replacing the natural oils of the hide and skin lost in tanning, dye or colour the stock and give the surface one of the various finishes associated with the conventional textures of leather.

Drying.—An important stage in the final manufacture of leather is drying of the hides and skins after tanning. Humidity and temperature control are imperative in the drying process in order to maintain proper hydroscopic balance, to avoid deformation of surface and fibres by nonuniform evaporation of moisture and to condition the leather for subsequent stages of manufacture.

Heavy leathers, such as sole, are still dried by hanging in a ventilated dry loft. The leather is suspended from hooks on a series of horizontal rods so placed that the current of air through the loft moves uniformly against the leather. A light coating of oil is usually applied to the wet leather before hanging in the dry loft to act as a protective film against the excessive drying of the grain surface and to ensure that evaporation of moisture from the flesh side is uniform. Evenness of colour and temper in the finished leather is largely dependent on the rate of evaporation during the drying process. Heavy leather must be dried more slowly than lightweight or thin leather in ratio to moisture content. Vegetable-tanned leather is also dried at a slower rate than chrome-tanned leather, which can be brought to a proper state of dehumidification at comparatively high temperatures.

Radical changes in drying techniques have been perfected. Tunnel drying, in which hides and skins move continuously through an enclosed tunnel under controlled heat and humidity, came to be almost universally employed. Uniform rates of evaporation are thereby achieved with the final condition of the leather predetermined. Suspension of the hides and skins during progress through the drying tunnels is carried out by several methods. In the modern method termed pasting. skins or sides of leather are affixed with suitable pastes or mountants to clean glass or metal plates which then move automatically through the drying tunnels, suspended from overhead rails. Another innovation in drying procedure was the use of infra-red lamps in banks over conveyors on which skins and sides are carried. Infra-red-ray drying also may be combined with the automatic operation of pressure finish sprayers on the same conveyor belts.

Fat-Liquoring. — After leather has been tanned and dried. it is generally hard and stiff. lacking in pliability, mellowness and fullness. Blended oils and greases incorporated into the leather give it the required softness, add to its wearability and strength and also increase resistance to cracking. Older methods of applying oils and greases, chiefly by surface deposition on wet or dry leather, were generally supplanted by the modern process of fat-liquoring. Emulsions of oil in water are utilized to secure uniform penetration and coating of leather fibres. Since oils are generally insoluble in water, soaps are used to produce stable emulsions. When wet leather is drummed with such emulsions, the tiny globules of oil penetrate the leather and combine with the fibres. Many different kinds of oils are used in fat-liquoring leather, and the choice for any given type of product depends upon the characteristics desired in the finished leather, as well as the adaptability of the oil to the specific process followed in tanning and finishing.

Currying and Stuffing. — In the production of some kinds of leather a higher grease or oil content is desired than that which can be obtained by the use of fat-liquors. The process formerly used to impregnate any kind of leather with greases was that of currying. but in modern practice that operation is usually reserved for heavy leathers such as belting, harness and mechanical types. Lighter leathers, such as upper leather intended for hunting boots or work shoes, may be "stuffed" with microcrystalline greases to secure maximum pliability and water resistance.

The old-time currier was a skilled craftsman capable of undertaking all of the processes from the crust-tanned condition to the finished commercial product, when the leather required was of a greasy type.

The goods after tanning and drying are split or shaved, and then scoured either by hand or machine until the grain surface is thoroughly cleansed from bloom and excess tannins. The leather may then be retanned to obtain a better colour! after which it is ready for grease impregnation.

Grease impregnation may be done in three different ways: (1) hand stuffipg; (2) drum stuffing; and (3) dipping. Hand stuffing consists in applying to the previously moistened leather a thick layer of dubbing prepared by mixing together about equal parts of beef tallow and cod-liver oil. The application is made, usually to the flesh side of the leather, with a brush and the leather is afterward slowly dried. As drying proceeds by evaporation the more oily portions of the dubbing are absorbed by capillarity and become thoroughly distributed and absorbed by the fibres. Drum stuffing consists in drumming the leather, which has been previously put into an equable condition of moisture by damping, in a drum heated either by live steam or by hot air circulating through the vessel.

Dipping is chiefly practised upon heavy leathers, for example, harness backs and strapping, and consists of immersing the leather, which has been previously well dried, in a tank filled with molten grease (usually paraffin wax). The dried leather offers little resistance to the penetration of the molten wax and complete permeation is effected in a few minutes. This impregnation is not as satisfactory as drum or hand stuffing because of the nonoxidizable and slight lubricating properties of the wax.

Dyeing. — Colour is imparted to leather either by dyeing with one of the modern classes of dyes or by applying pigment in a suitable medium to the surface. Leather is sometimes base dyed for uniformity of the surface prior to treatment with pigment finishes. Aniline dyes are frequently used to impart depth of colour and enhance the natural-grain texture of the leather. The most widely employed methods of dyeing are: (1) brush dyeing or staining; (2) dipping; (3) drum dyeing; and (4) spraying. Drum dyeing and spraying are the most important methods for dyeing and colouring various kinds of leather. In the drumming operation. skins are tumbled in revolving drums containing the necessary dye compounds. with provision for maintenance of required temperatures. The use of acid or basic dyes is dictated by the colour standards desired or by tanning procedures and subsequent finishing steps. In the spray method the dyes are applied to the leather in an atomized state through pressure spray guns. Spraying booths or automatic sprayers geared to the movement of a conveyor belt may be used. Spraying is also employed to deposit additional colour in the form of insoluble pigments which are suspended in water or lacquer mediums. Pigment compounds may be blended with binding agents such as casein, shellac or one of the modern types of lacquers. Pigment coats aid the tanner in securing uniformity of colour and even depth of hue.

Brush dyeing can be utilized in colouring heavy types of leather such as upholstery hides. luggage and strap sides, and various specialty leathers. A weak solution of the dye is brushed on the surface of suitably prepared leather and usually two or three applications are given to obtain regularity of colour. A similar method is sometimes used in the colouring of glove leathers, particularly when colour is desired only on the surface which will make the exterior of the glove.

Advanced developments in dye chemistry are employed by the tanning industry to produce colours which are relatively fast to light and very resistant to repeated wettings and temperature extremes. Leathers for gloves, garments and similar products have been perfected which are washable in soap or other detergents or can be cleaned by normal commercial processes. In the production of such leather it is essential that the fat-liquors not be affected by water or solvents so that inherent pliability and softness, as well as colour, be retained after washing or dry-cleaning.

Finishing Leather. — A major series of final operations in the tannery can be broadly described as finishing. This term ranges in meaning from the rolling and polishing of sole leather to the buffing which produces the fine. napped surface of suede. Finishing may be said to compare in importance with the basic tanning operation. Methods, procedures and materials used in finishing vary with the kind of texture, surface, gloss and appearance required in the final product. The following are the principles followed in finishing several major categories of leather.

Sole Leather. — To obtain the requisite degree of firmness and solidity for satisfactory wearing qualities and ease of shoe manufacturing, sole leather must he compressed before leaving the tannery. This is done mechanically either by rolling or hammering under considerable pressure. In the United States and Great Britain, sole leather is commonly rolled, initially in a slightly damp condition and afterward in the dry state, on a pendulum type of heavy rolling machine which produces heavy pressure and heat at the moment of impact against the leather. In a later development in the United States, pneumatic machinery was employed to compact sole leather automatically. In the United States finish-

ing of sole leather was guided by the increasing trend toward greater flexibility in shoes. whereas in Great Britain firmer sole leather continued to be preferred.

Upper *Leather.*—Complex systems of upper leather finishing are demanded by the contemporary diversity of upper leather for shoes. The first step for almost all upper leather is the staking operation. This consists essentially of mechanical manipulation of hides and skins to loosen fibres and to impart a required degree of softness. The flexing action of the machinery used for this purpose is regulated in accordance with the denseness or firmness of the leather. After staking. leather is buffed on the flesh side by a buffing machine. in which a rapidly rotating cylinder covered with abrasive material gives a uniform nap to the flesh side. In many instances the grain side is lightly buffed as well to remove surface defects.

When cattle hides are to be tanned or used in less than the full thickness. *e.g.,* for shoe uppers, they are split in cross section by machines with finely adjusted band knives. The upper or grain layer of the hide is the principal product and is described as grain side leather. The flesh cut is known as a split and may be tanned or finished separately. Cattle hides are also split for use in luggage, upholstery. garments and fancy leathers.

Leather which is to have a smooth, polished or lustrous finish is subjected to a series of related processing steps. These are intended to create a surface which is integral with the leather itself. resistant to abrasion, capable of withstanding wetting and temperature variations and does not impair the ability of leather to transpire moisture. To achieve these ends, several coats of prepared finish, in which dye or pigment may be included, are applied in succession to the leather. Materials ranging from casein. albumin and wax to complex resins and lacquers. are embodied in the finish formulas. These are applied by machines through sprays or rollers as well as by hand. When a highly polished surface is to be produced, leather is glazed on a machine which rapidly moves a solid glass cylinder against the leather under considerable pressure. With each stroke of the "glazing jack." heat and friction are created which plasticize the finish and impart high lustre to the leather.

A grained effect is achieved through boarding by hand or machine. The skin is doubled, grain surface inside. and pressure is appiied to the doubled portions in the required direction either by hand or with a cork-covered board. or by rotating cork-covered cylinders. The natural grain of leather is thereby enhanced and brought into sharper definition. Following boarding, the leather may be smoothed by placing the grain surface under heavy pressure mith a flat polished steel plate. Grain leather of considerably more texture is produced by a combination of tanning and finishing variations.

Pressure embossing machines of great weight are sometimes used to produce distinctive grain textures or printed effects. In this process. prior to or during finishing the grain surface of the leather is brought into contact mith an engraved plate carrying the required pattern or design. Under a combinatiop of heat and high pressure, the pattern embossed or printed on the leather becomes permanent.

In manufacturing suede leathers, a fine uniform nap is desired. This is achieved by applying to the flesh side of the skin a rapidly rotating cylinder covered with emery or carborundum abrasives. Pressure is carefully adjusted and regulated to abrade fibres sufficiently so that an even velvety surface is produced. Mechanical or air-brushing machinery is employed to remove the fine leather dust resulting from the buffing action.

Variations in the finishing process are identified with special types of leather. Morocco is goatskin leather which has been grained by hand after glazing on a special type of glazing machine. The natural grain is raised and accentuated by working the skin while wet in five or more directions with a cork-covered graining tool. Drying the skin at a high temperature fixes the grain permanently. Patent leather bears a finish produced by successive coats of compounds incorporating linseed oil. each coat being dried before application of the next. A final stage of the finishing procedure for many leathers involves ironing on special low-temperature machines to correct any loss of smoothness.

IMITATION LEATHER

Artificial leather or. more properly, imitation leather was the term originally applied to coated fabrics with a surface simulating genuine leather. There was no true artificial leather as of the latter 1950s since the fibre structure characteristic of the natural product had not been synthesized.

Moreover. the courts of both Great Britain and the United States, as well as administrative agencies such as the Federal Trade commission, frown upon the use of the word "leather" except for the genuine material. In correct commercial nomenclature emphasis is given to identification of materials imitating leather by brand name or by basic type; *e.g.,* vinyl plastic, rubber-coated fabric, pyroxalin fabric. etc.

The first feasible imitation leathers were based on patents issued in the United Kingdom in 1851. These covered the application of cellulose nitrate compositions to various cotton fabrics. forming a waterproof coating of sufficient substance to be given surface texture. Earlier attempts at producing imitation leather sought to form a film upon a fabric base through the oxidation of drying oils. While still used for certain purposes. such coated products lack the substance and strength of pyroxalin-coated fabrics. The latter are made in various weights or gauges and may be printed or embossed to simulate typical leather grains.

The fabric or backing on which the pyroxalin composition is flowed may be one of the standard cotton constructions. either in gray goods or dyed. Weight of the base fabric ranges from 2 to 14 oz. according to the tensile strength desired and the thickness of the coating to be used. Standard weaves, such as sateen. twills or drills, are employed. Heavier fabrics are often brushed or napped on the uncoated side to achieve greater pliability and softness. The pyroxalin coating is prepared by adding cellulose nitrate to a suitable organic solvent such as acetone. butyl acetate or an alcohol derivative. Pigments and a softening agent or plasticizer are incorporated in the mixture. Agents such as oxidized vegetable oils, dibutyl phthalate. triphenyl phosphate. etc.. are utilized for softening and plasticizing the mixture. The fabric is coated mechanically on a conveyor where the flow of the coating mixture is controlled and synchronized with the movement of cloth across the rolls. A drying chamber or infra-red lamp then volatilizes the solvent, leaving a dry film or coated fabric. In a subsequent printing or embossing operation, texture may be given to the smooth surface, including imitations of natural leather grains.

Development of the plastics industry greatly increased the number of products described as imitation leather. The most important of these, polyvinylchloride and its adaptations, outstripped pyroxalin in commercial importance following 1946 Sold under various names, it is best known as vinyl or vinyl plastic. The base plastic, polyvinylchloride. is coloured, treated with plasticizers and finally produced in continuous sheets or rolls of specified gauge or thickness.

Calendering machines finish the surface to a smooth, glasslike appearance. to a mat or semigloss polish. or emboss texture in imitations of boarded or grained leather. In certain applications vinyl films are used unbacked but for many others they must be bonded to fabrics. Low stitch-tear strength and poor puncture resistance necessitates such backing.

Other plastics or intermediates in synthetic rubber processes are used for unsupported or backed films and marketed as imitation leather. Principles of manufacture or treatment parallel the vinyl process with rollers used for extrusion of films which are uniform in thickness. In general the plastics are distinguished from the older pyroxalin compounds by greater chemical resistance and more precisely controlled physical characteristics. Lack of fibre structure in such extruded films is associated with low resistance to penetration by sharp objects and by moderate stitch-tear strength. Electronic or heat sealing was developed to overcome the latter disadvantage.

Pyroxalin-covered cloth was originally produced as a low-cost substitute or imitation of leather. Plastic films, however. are a distinct class of product with value in many applications which

are in no sense competitive with leather. They can be and are finished to simulate leather for purposes such as low-cost automobile and furniture upholstery, popular-priced luggage. handbags, notebook covers. mall coverings, belts and in the decorative arts. Properly described or identified to avoid misrepresentation, these materials are used for many consumers' goods and industrial products.

CARE OF LEATHER

Articles made of modern leathers, in which the basic tannage and finish contribute to maximum wear, need comparatively little maintenance. A few simple and easily followed rules of care will enhance the appearance and service of leather in the innumerable products for which it is used. In general. the principles to be observed for almost all leathers are as follows: (1) Wet leather articles should be dried slowly at moderate temperatures. Avoid excessive heat; if a hot radiator, for example, is used to dry wet shoes or gloves. leather fibres will be distorted and the potential wear impaired. (2) Solvents such as benzine. carbon tetrachloride or naphtha should be used only with the greatest care in removing soil or dirt spots. Some new modern leathers. however. are made with fibre lubricants which resist solvents and such leathers can be readily dry-cleaned with commercial solvents. (3) Smooth leathers are best cleaned with neutral soap to remove surface soil. Any good grade of toilet or castile soap will serve. although specially compounded saddle soaps both clean and help lubricate leather. (4) Leather should be periodically polished with a compound of waxes and oils both to protect and enhance the surface and to aid in lubricating the fibres.

With respect to care and maintenance! the leather in most consumer products can be divided into two categories, smooth or polished leathers and suede or napped leathers.

Smooth or Polished Leathers.— Shoes, luggage, upholstery, handbags and other goods made of leathers which carry a polish or lustre may be given the same basic care. Surface dirt should be removed by brushing or wiping with a damp cloth. If the article is only superficially soiled, the application of polish and wax will be sufficient to restore the finish. A touch of energy in buffing or brushing the polish helps considerably in restoring lustre. In the event the soil is more firmly attached, a soap and water treatment is recommended. A damp. not wet. cloth should be applied to soap and then to leather. With moderate rubbing, this treatment should suffice for all but the most intractable cases of soil. Stains and spots which do not yield to soap and water may be susceptible to cleaning solvents. However. these should be handled with the greatest care, always using the minimum possible quantity to avoid cleaning rings and stains. After applying the soap and water, the shoes or other articles should be wiped with a clean. damp cloth and allowed to dry slowly. One or two light coats of polish and buffing are again the final step.

Suede Leathem— Napped,sueded or brushed leathers are best cleaned with a stiff brush. Fine wire brushes remove dirt readily and also raise the nap, thereby restoring the suede texture. Light soil on suede leather shoes or garments can often be removed by rubbing with a soft rubber eraser or even a viscose sponge. Grease spots and stains can be eliminated by lightly rubbing the soiled area with a cleaning solvent. If the nap of suede leather has been compacted or compressed from wear, fine sandpaper provides an easy way of restoring the nap. Brushing will then remove both dirt and grit, leaving the original suede surface. A type of suede leather for garments was introduced in the U.S. which proved readily dry-cleanable. Handling an entire garment is best done professionally. but spots can be removed from such leather with standard cleaning solvents.

White **Leathers.**—White leather should have its oil content maintained for the best possible service. A good white cleaner contains oils which replace the oils lost through washing and wear. Smooth white leather shoes, such as those of calf or kid, should be lightly treated with soap and water before application of a white shoe dressing. In cleaning with soap only a damp cloth need be used and excessive wetting should be ayoided. The shoe should be dried immediately with a clean cloth, then a thin film of white cleaner or dressing applied. At no time should a thick coat, of white dressing be used since this is unnecessary and adversely affects the oils in the leather. White suede leather or buckskin leather can be brushed with a soft wire brush to remove soil. Following the brushing a white leather dressing should be lightly applied and then the leather brushed again to restore its nap. Where soil is not excessive. simple cleaning measures are successful. A fine grade of sandpaper will both remove soil and improve the nap. Frequently the use of a soft Artgum eraser will suffice to remove superficial soil. Commercial or proprietary white shoe cleaning preparations are primarily emulsions of titanium dioxide, soap and leather lubricants. These should always be applied in moderation and in thin coats for best results.

Oiled Leather for Work Shoes or Hunting Boots.— This is a class of leather specially treated with oils and waterproofing compounds for use in heavy duty footwear. It is designed to repel water and to retain maximum softness after wetting. In general the care of such leather requires the simple measures of cleaning with mild soap and water and subsequent lubrication.

For the latter purpose commercially available preparations may be used. although it will be found that applying a 10% to 20% solution of sulphonated castor, neats-foot or cod oil will suffice. The number of applications, at intervals of at least one day, can be readily judged by the degree of flexibility and dryness desired in the leather.

Upholstery **Leather.**—Modern upholstery leather finishes require minimum cleaning treatment. Waxes or polishes should rarely if ever be applied, and only in light coats. Upholstery leather is best cleaned by washing with mild soap and a minimum of water. The soap film applied should then be removed with a clean damp cloth so that the leather can dry free of any soap residue. In cases where leather has been subjected to hard usage and is excessively dry, a very light application of sulphonated oil to the clean grain surface will aid in rejuvenating the leather.

Mildew or Mould.— Mould on leather can be prevented by two simple methods. First. because no moulds can live in the absence of moisture, leather or leather articles should be kept dry and free of excessive humidity. Leather articles should not be stored in a humid atmosphere. particularly where ventilation is poor and temperature high. If this precaution is not feasible, special fungicide compounds may be used to inhibit moulding. Preparations containing paranitrophenol, for example, in concentrations sufficient to represent .3 to .5 of 1% of the weight of leather. will effectively prevent mould growth.

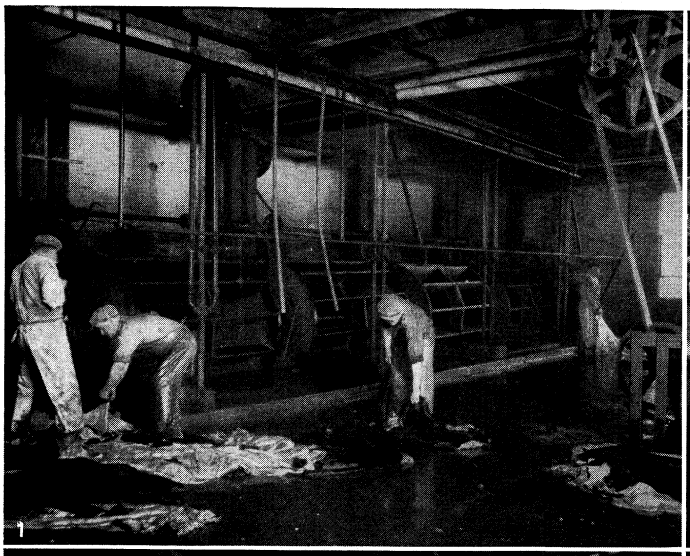
Industrial and Harness Leathers.— The two requisites for the care of industrial leathers, such as transmission belting, and harness or saddlery leathers are proper cleaning with mild soap and water and the application of dressings for fibre lubrication. In the case of transmission belting, it is important to avoid any excessive oiling which would impair friction coefficient or cause the belt to change in dimension. Dressings used for transmission belting contain sulphonated oils or greases, compounded to keep fibres lubricated without affecting pulley tension. Harness and saddlery require regular cleaning with soap and water to remove soil and perspiration, and the use of saddle soaps or sulphonated oils for conditioning the leather.

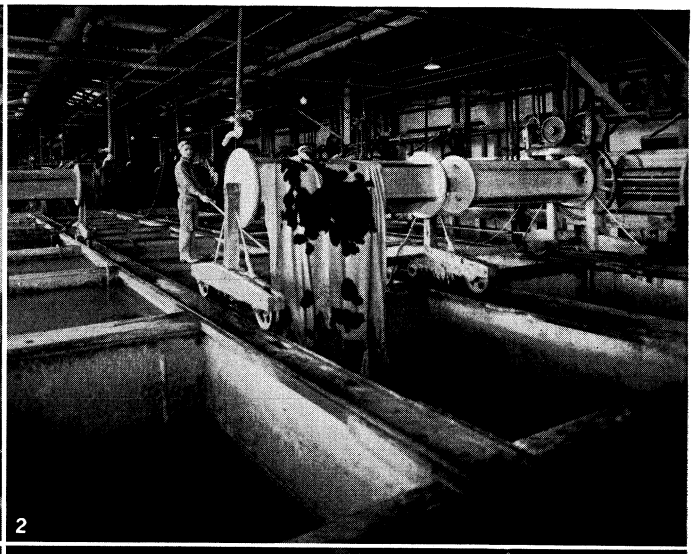
MAJOR TYPES OF LEATHER

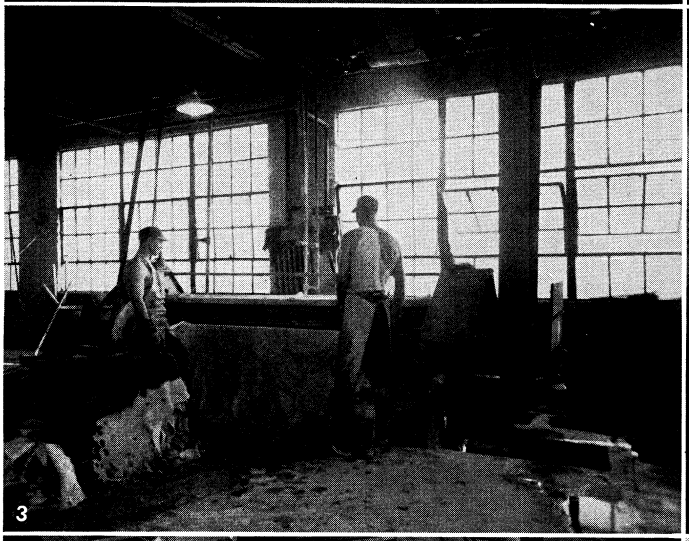
The variety of leathers produced in the United States and throughout the vorld covers hundreds of applications. The following classification (from Tanners' Council of America, *Dictionary of Leather Terminology,* 4th ed., 1946) lists the most important types produced:

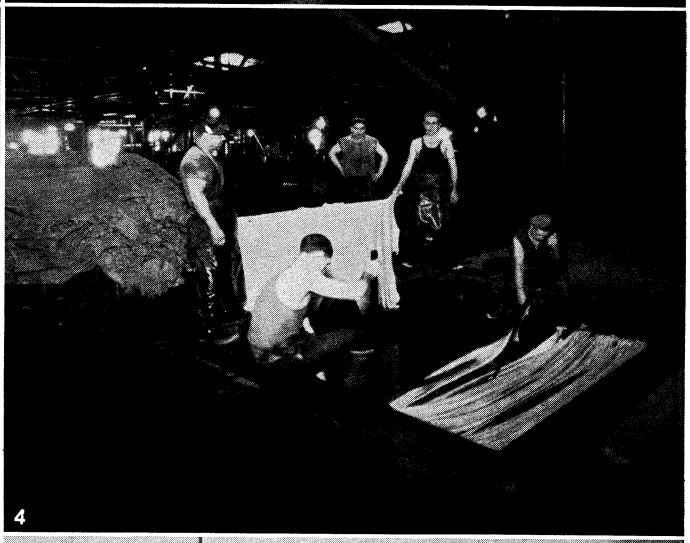
Raw Materials of Tanning Industry and Leather Produced Therefrom

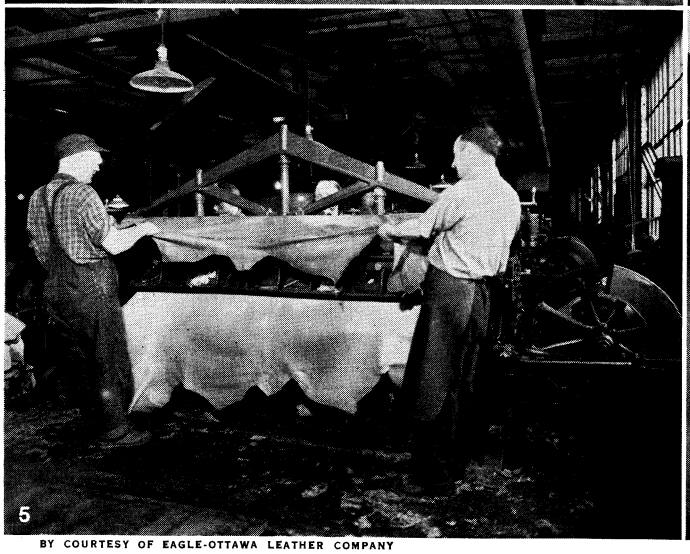
1. Cattle group
   Steer, cow and bull hides, producing leather for:
   - Shoe soles, heels, counters, melting, inner soles, etc.
   - Boot and shoe uppers
   - Harness, saddles, skirting (for saddles), horse collars, etc.
   - Travelling bags, suitcases, briefcases, straps, etc.
   - Gloves and garments

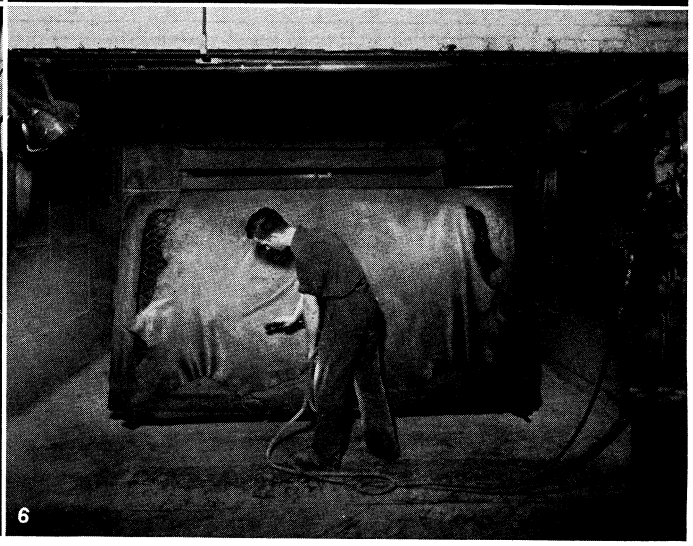












BY COURTESY OF EAGLE-OTTAWA LEATHER COMPANY

OPERATIONS IN TANNING UPHOLSTERY LEATHER

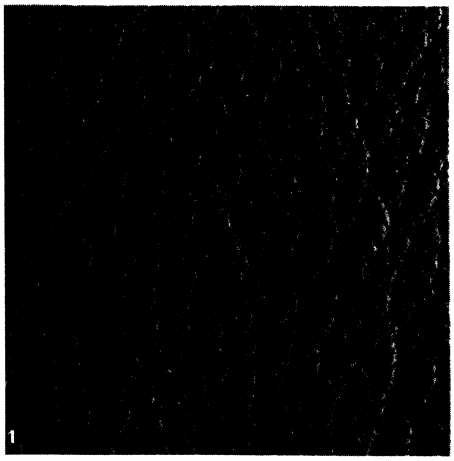
1. Washing hides in vats with revolving paddle wheels and cold running water
2. Reeling hides in large vats of hydrated lime and sodium sulphide. The hair roots are destroyed in this process, which requires four or five days
3. Scraping the hairs off by means of a dull-bladed machine. The hides at this stage are swelled by lime and must be treated with bate, an organic compound which neutralizes the lime and makes the hides soft and pliable, ready for the tanyard
4. A tanyard. After bating, the hides are subject to decomposition and must be tanned to prevent rotting. They are placed in vegetable tanning liquor of progressively increasing strength
5. Splitting machine with belt knife which operates horizontally and splits leather to the required thickness
6. Finishing leather. Airbrushes are used to apply the colour and finishing material



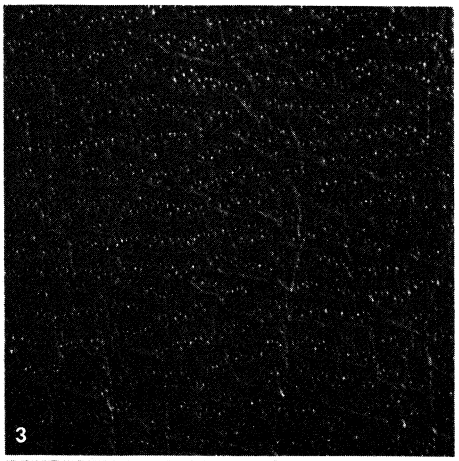
FENN-PIX; BY COURTESY OF TANNERS' COUNCIL OF AMERICA

MICROSCOPIC ENLARGEMENTS IN COLOUR OF VARIOUS KINDS OF LEATHER

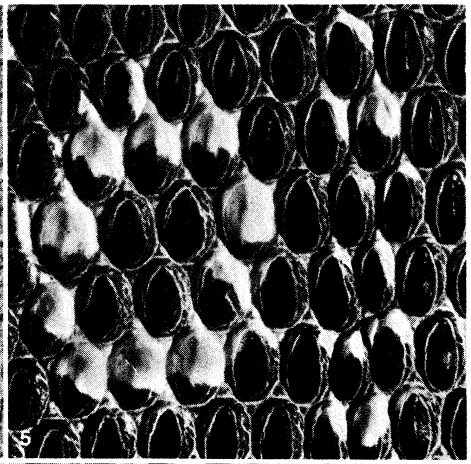
1. Crushed kid. 2. Sheepskin. 3. Horsehide. 4. Kid. 5. Java ring lizard. 6. Calf suede. 7. Cowhide. 8. Watersnake. 9. Pigskin. 10. Alligator. 11. Ostrich. The magnification is approximately four linear diameters

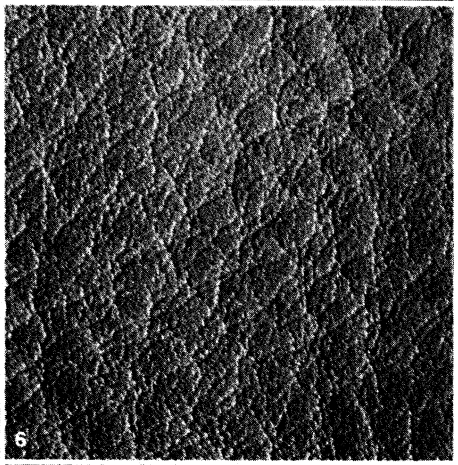


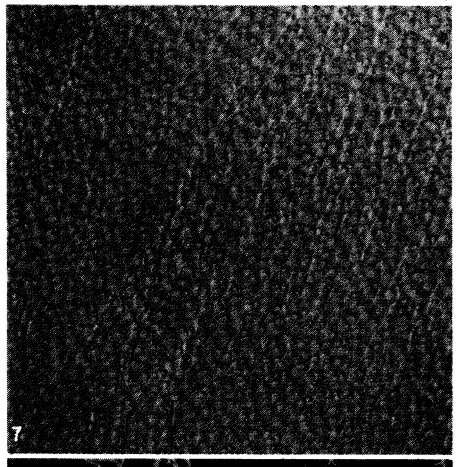


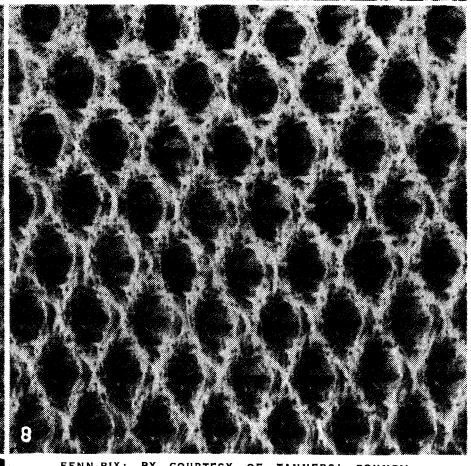


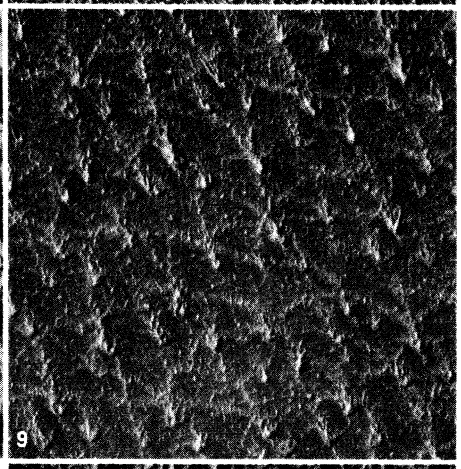




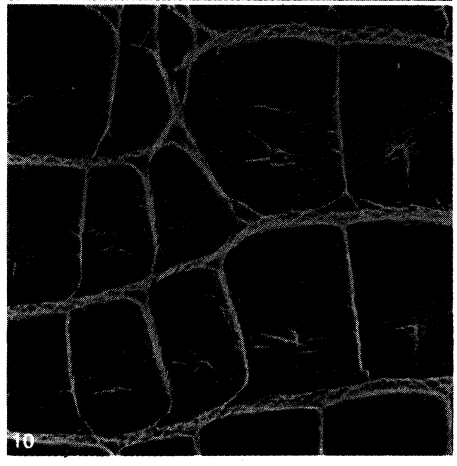






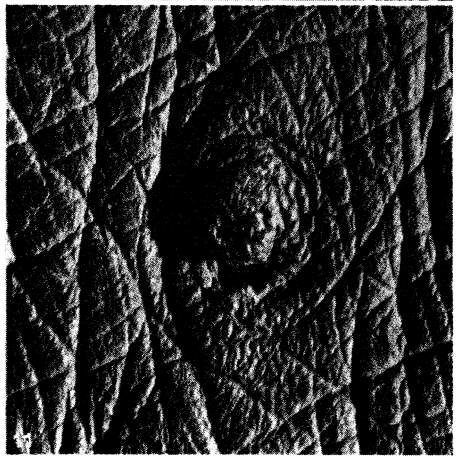


FENN-PIX; BY COURTESY OF TANNERS' COUNCIL OF AMERICA



MICROSCOPIC ENLARGEMENTS IN COLOUR OF VARIOUS KINDS OF LEATHER

1. Crushed kid. 2. Sheepskin. 3. Horsehide. 4. Kid. 5. Java ring lizard. 6. Calf suede. 7. Cowhide. 8. Watersnake. 9. Pigskin. 10. Alligator. 11. Ostrich. The magnification is approximately four linear diameters



Machinery belting
Upholstery for automobiles, furniture, aeroplanes and decorative purposes
Fancy leather goods, handbags, belts, etc.
Bookbindings
Aprons
Buffing wheels
Aprons, carders, combers and pickers on textile machinery
Hydraulic packings and washers
Laces for belting, etc.
Lithographic purposes
Footballs and sporting goods
Razor straps
Suspenders
Scabbards
Rawhide

Kipskins (from large calves or undersized or small breeds of cattle), producing leather for:
Shoe uppers
Fancy leather goods and handbags
Gloves and garments
Shoe lining

Calfskins, producing leather for:
Boot and shoe uppers
Fancy leather goods and handbags
Gloves and garments
Sweatbands for hats
Rawhide and parchment
Military helmets and gas masks
Fine shoe linings
Bookbindings
Grips for golf clubs
Handicrafts

2. Sheep and lamb groups

Woolled skins, haired skins (cabrettas), etc., producing leather for:
Shoe linings and uppers, slippers and play shoes
Gloves
Bookbindings
Leather goods and handbags
Aprons
Chamois
Coats and other articles of clothing
Aviators' clothing
Sweatbands for hats
Meters
Parchment
Piano actions
Rollers on textile machinery
Military helmets
Millinery and caps
Sporting goods (balls, gloves, etc.)

3. Goat and kid group

Skins used for producing leather for:
Shoe uppers
Fancy leather goods and handbags
Globes and garments
Aviators' clothing
Bookbindings
Upholstery

4. Equine group

Horse, colt, ass, mule and zebra hides, producing leather for:
Shoes
Gloves and garments
Aviators' clothing
Sporting goods (baseball covers and mitts, etc.)
Puttees
Luggage
Razor straps
Belts

5. Buffalo

Domesticated land and water buffalo (not American bison, whose hide is not tanned for leather), producing leather for:
Shoe soles and uppers
Buffing wheels
Luggage
Handbags

6. Pig and hog group

Pig, hog, boar, peccary and carpincho (a Brazilian rodent) skins, producing leather for:
Fancy leather goods and luggage
Gloves
Inner soles, counters, etc.
Saddlery and harness
Shoe uppers

7. Deer group

Fallow deer, reindeer, antelope, gazelle (dik-dik), elk and caribou skins, producing leather for:
Shoe uppers
Gloves
Clothing
Fancy leather goods
Piano actions
Mukluks

8. Kangaroo and wallaby group

Skins producing leather for:
Shoe uppers

9. Aquatic group

Seal, sea lion and walrus skins, producing leather for:
Luggage, fancy leather goods and huffing wheels

Shark, whale, blackfish, dolphin, porpoise, etc., producing leather for:
Fancy leather goods, luggage and shoe uppers

Alligator, producing leather for:
Shoes, handbags, luggage and fancy leather goods

10. Minor classes

Ostrich skins for:
Fancy leather goods and luggage

Camel, llama, alpaca and yak:
Tanned in producing countries usually for local consumption

Lizard, snake, frog and similar skins:
Shoe uppers and fancy leather goods

(I. R. G.)

LEATHERHEAD, an urban district in Surrey, Eng., 20 mi. S.S.W. of St. Paul's cathedral, London. Pop. (1961) 35,554. It lies at the foot of the North Downs in the valley of the Mole, there crossed by a 14-arch bridge (1782), and in London's "green belt." The parish church of SS. Mary and Nicholas was built about 1320.

The district is largely residential and includes Ashtead, Fetcham and the Bookhams. It contains a Celtic field system, several tumuli and ample evidence of Roman and Saxon occupation. St. John's school was founded in 1851.

LEATHERJACKET, larvae of several kinds of crane flies or daddy longlegs (Tipulidae) which feed on the roots of grasses and other crops. *Tipula oleraceae* is the chief offender in Europe, while *Nephrotoma ferruginea* and others cause damage in North America. They are controlled by use of poisons and rotation of crops. They are distinguished from wireworms (Elateridae, *see* BEETLE), which they closely resemble, by the absence of legs. Larvae of most crane flies are aquatic or semiaquatic. See DIPTERA. (C. H. CN.)

LEAVENWORTH, a city of northeastern Kansas, U.S., the seat of Leavenworth county and the oldest city in the state. Ft. Leavenworth was built by Col. Henry Leavenworth (1783–1834) in 1827 as a part of the defense of the Santa Fe trail (*q.v.*). Settlement on the present site of the city stems from the efforts of proslavery Missourians who first settled there in 1854. For a few years beginning in 1859 the Central Overland California and Pike's Peak Express company operated westward from Leavenworth. The city was incorporated in 1854 and secured a new charter in 1881.

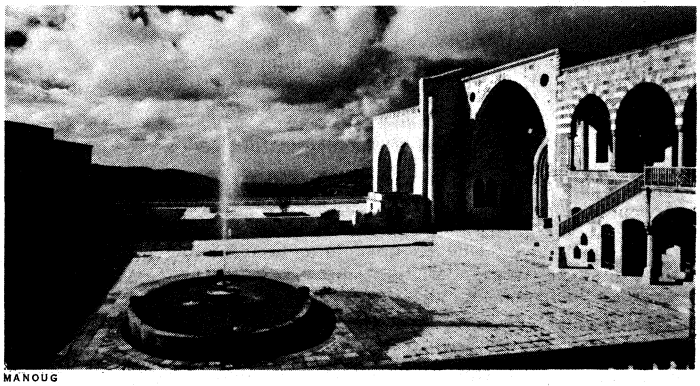
Ft. Leavenworth, north of the city, is the location of the U.S. army's Command and General Staff college for advanced training of field-grade officers The U.S. military prison has been at Ft. Leavenworth from 1908. The federal penitentiary at Leavenworth was opened in 1895. At Lansing, near Leavenworth, is the Kansas state penitentiary and the state industrial farm for women. Leavenworth produces furniture, automobile and tractor batteries, millwork, greeting cards, steel fabrications, farm implements and uniforms. It is also a centre for handling and processing dairy, meat and other farm products.

Xavier, near Leavenworth, is the site of St. Mary's college, a Roman Catholic college for women, founded in 1860. There are two newspapers, the *Leavenworth Times* (daily) and the *Leavenworth Chronicle* (weekly). For comparative population figures *see* table in KANSAS: *Population.* (D. P. G.)

LEBANON, a country situated at the eastern end of the Mediterranean sea, bordered on the north and east by Syria and on the south by Israel. Its physical geography is inseparable from that of Syria (*q.v.*). The state came into existence under the French mandate after World War I (1920) by the expansion of the autonomous Turkish sanjak of Beirut to include the whole littoral from the frontier of Palestine (now Israel) to Tripoli with four districts inland.

History. — Though the inhabitants of Lebanon have played a minor part in history, commercial, religious and strategical causes have frequently linked their fortunes with those of more powerful

near eastern and Mediterranean communities. Almost at the beginning of history Lebanon appears in the character, which it preserves until the days of the Byzantine empire, of the well-wooded background of the Phoenician coast towns which exploit its forests.



MANOUG

PALACE OF AMIR BASHIR II AT BEIT ED DIN, LEBANON. COMPLETED IN THE 19TH CENTURY

In the 6th century Monothelite sectaries fleeing from orthodox Byzantine persecution in north Syria colonized the Mountain and apparently Christianized it after their fashion. In the next century they appear first as the allies of Justinian II against the caliph and then as rebels, hence called Mardaites, against his authority. The next four centuries were marked by the infiltration into southern Lebanon of the heretics of Islam, who finally coalesced into the Druse community, but the early history of the Druses and of their Christian Maronite rivals is most obscure. The latter are certainly the descendants of the Monothelites. with whom they were ranked by Abulfaraj at the end of the 13th century; the status of their church as a body affiliated to the Church of Rome was not definitely fixed until 1736. By giving protection to the Lebanese Catholics in the 18th century, France sowed the seeds of the feud between Maronites (*q.v.*) and Druses (Druzes; *q.v.*). The Turkish sultanate encouraged the Druses in the 19th century against an infidel community which looked to the west for countenance; the feudal organization of both communities broke down between 1840 and 1860. The Druses disclaimed their Shehab amirs, and the Maronites in 1858 revolted from the Khazin family. Civil war led to European intervention which brought the constitution of the Lebanon as an autonomous province.

The Lebanon sanjak (province) was governed from 1864 until 1914 by a Christian military governor (*mushir*) assisted by a council (*majlis*) of 12 elected representatives of the three religions of the Mountain and their sects. Order was preserved by a local militia and Turkish troops were not quartered in the province. The system worked well and Lebanon enjoyed peace and a relative prosperity. (P. GR.; X.)

The French Mandate.—After the end of World War I the history of Lebanon was closely linked with that of Syria. To strengthen their position against the Syrian (Moslem) nationalists, the French increased the area of the former Lebanon sanjak, with its predominantly Christian population, by incorporating into it Moslem coastal and inland districts of Syria proper. (*See* also SYRIA.)

A Franco-Lebanese treaty of Nov. 13, 1936, providing for recognition of Lebanon as an independent state within three years, was not ratified by France. When World War II broke out the French suspended the constitution and placed Lebanon under military rule. There was little reaction, but the capitulation of June 1940 was an immense blow to France's prestige. By the end of the month the French military authorities ordered a cessation of hostilities and adhered to the Vichy government. In June 1941 the British and Free French were forced to reconquer Lebanon and Syria. Gen. Georges Catroux, the French commander, issued a proclamation (June 8) promising the termination of the mandate system and the proclamation of independence. After the capitulation of Vichy forces, while the British and Gen. Charles de Gaulle mere exchanging views about the future of the Lebanon (and that of Syria), the local nationalists refused to admit that their independence was conditional upon a treaty with France. They demanded rapid implementation of the Catroux proclamation. On Nov. 26, 1941, the French officially announced the independence of Lebanon. but for more than a year this declaration remained an empty gesture.

Independence *Achieved.*—A temporary government was appointed on March 19, 1943, to prepare for elections. The elections were completed in Aug. 1943; they were won by anti-French Constitutionalists led by Bishara Khalil el-Khuri (1890–). a Maronite, who on Sept. 21 nas elected president of the republic; four days later he asked Riyadh es-Solh, veteran leader of the Moslem community, to form a government. Acting on the thesis that Lebanon was now a sovereign state, the government would not recognize any special French rights on its territory. On Nov. 11, 1943, on orders from De Gaulle. Jean Helleu, the French delegate general. arrested the president and most of the cabinet and dissolved the chamber of deputies. Under U.S.-British pressure Helleu was recalled and el-Khuri resumed office.

With the end of World War II, France began to send troops to the Levant. The arrival of the first contingent in Beirut on May 17. 1945, lit the fuse which led to the explosion in Syria when the French bombarded Damascus on May 29–30. The British intervened two days later and fighting stopped. After June 1 began the transfer of French troops and civilians from Syria to Lebanon. By the end of Aug. 1946 the last British and French troops left Beirut and Lebanon was free.

El-Khuri remained president of Lebanon until Sept. 18, 1952, when he had to resign. Five days later Camille Shamun (1899–), a prominent democratic leader of a younger generation, was elected president of the republic. The country is an original member of the Arab league (*q.v.*) but it took little part in the 1948–49 Arab-Israeli war. On June 17, 1950, Lebanon signed the somewhat loosely worded Arab collective security treaty, but joined neither the closer Syro-Egyptian alliance signed on Oct. 20, 1955, nor the five-power middle east defense (Baghdad) treaty which became effective in Nov. 1955. In 1957 Lebanon accepted the Eisenhower doctrine, the only Arab country to do so, and received help from the U.S in the form of money and arms.

In 1958 armed rebels friendly to Pres. Gamal Abdel Nasser's United Arab Republic threatened the Shamun government. Following a revolt in Iraq during July in which King Faisal was killed, Shamun requested U.S. help, and on July 14 U.S. troops landed in Lebanon. During an emergency session of the UN general assembly, the Arab countries introduced a resolution calling for nonintervention in each other's internal affairs and for the UN secretary-general to facilitate the early withdrawal of U.S. troops; it was unanimously approved. Elections were held in Lebanon and Gen. Fuad Shehab, army chief of staff, was named president. He took office on Sept. 28. The last U.S. troops were withdrawn on Oct. 25, 1958. (X.)

Area and Population.—Lebanon has an area of 4,015 sq.mi.

TABLE I.—*Distribution of the Population by Religion*

Religion	1932	1944	1954
Christian churches:			
Roman Catholic	283,274	411,605	518,600
Rites Maronite	226,378	327,846	403,200
Rites Greek	45,999	64,280	88,200
Rites Armenian	5,694	10,048	
Rites Syriac	2,675	4,984	27,200
Rites Latin	2,000	3,117	
Rites Chaldaean	528	1,330	
Orthodox	76,522	109,883	138,300
Armenian (Gregorian)	25,462	59,749	69,100
Syriac (Jacobite)	2,574	3,753	4,200
Chaldaean (Nestorian)	800	1,200	illegible
Protestant (all denominations)	6,712	10,440	13,800
	395,345	596,630	745,400
Moslems:			
Sunnis	175,925	illegible	illegible
Shi'as (Metawila)	154,208	209,338	248,940
Druses	53,047	74,314	illegible
	383,180	519,244	626,500
Jews	3,518	5,666	5,000
Others	3,501	5,061	illegible
Total	785,543	1,126,601	1,383,000

(10,400 sq.km.). It is divided into five provinces (*muhafazat*): Beirut, Northern Lebanon, Mount Lebanon, Southern Lebanon and the Bekaa (the eastern valley).

The Lebanese are of mixed origin, though the majority regard themselves as Arabs, and they are Arabic speaking. About 6% of the population is Armenian speaking. Lebanon is the most densely populated country of the middle east (about 361 inhabitants per square mile in 1956). Between 1932 and 1956 the population increased from 785.543 to 1,450,000. The principal towns are (pop., 1956 est.): Beirut (cap.) 400,000; Tripoli (Tarabulus) 80,000; Zahle 20,000; Saida (Sidon) 20,000.

Religion.—Christians have a small numerical majority. They were 53.9% in 1954, with Maronites predominating; Moslems were 45.3%, being divided into Sunnis, Shi'as and Druses. (See Table I.) Lebanon enjoys religious freedom, including freedom of conversion, and all citizens are equal before the law in right and in fact, whatever their religious allegiance.

Education.—Lebanon has a very fully developed system of education. In addition to the secular state schools there are many private schools, Lebanese and foreign. (See Table II.)

TABLE II.—*Schools in Lebanon, 1954–55*

	State		Private		Foreign		Total	
	Schools	Pupils	Schools	Pupils	Schools	Pupils	Schools	Pupils
Primary	1,005	83,951	684	52,554	86	18,792	1,775	155,297
Higher primary	69	6,362	142	8,356	53	6,724	264	21,442
Vocational	9	806	16	317	8	273	33	1,396
Secondary	3	242	58	2,074	31	2,256	92	4,572
High education	1	266	2	70	8	3,910	11	4,246

There are three universities. The Catholic (Jesuit) University of St. Joseph was founded in Beirut in 1881; in the mid-1950s it had five departments (theology. oriental letters, law, medicine and engineering). The American University of Beirut was founded in 1866 as the Protestant college; it became a university in 1920 with two departments (arts and sciences, medicine). The Lebanese (State) university opened in 1951.

Government.— The head of state is a president elected by a two-thirds majority of the chamber of deputies for a period of six years. He appoints the members of the cabinet and nominates one of them as premier. The single-chamber legislature is elected by universal suffrage. In 1952 the number of seats was reduced from 77 to 44, multimember constituencies being replaced by single or two-member constituencies, and for the first time women had the vote.

Defense.—Lebanon has small armed forces totaling about 10,000, including 2,300 of gendarmerie.

Agriculture.— Although there was a large urban population engaged in trade and industry, agriculture was the occupation of about half of the people and accounted, according to estimates at mid-century, for about one-fifth of the national income. Compared with many Mediterranean countries Lebanon has an abundant water supply from rivers, springs, wells and rain but the mountainous character of most of the land limits the extent of irrigation and would render very expensive the reclamation of much of the unused land believed to be cultivable. Of a total area of 2,565,000 ac., 675,000 ac. are under cultivation and an additional 284,000 ac. might be cultivable. On the coastal plain and in the Bekaa about 118.000 ac. were irrigated at mid-century and plans to double this area were made which would bring the acreage under irrigation up to about 30% of the whole cultivated area. Cultivation is intensive as a result of both natural conditions and the pressure of the agricultural population on the land. (See Table III.)

Wheat accounts for about one-half and barley for about one-quarter of the cereal crop. Fruits include citrus, grapes, apples, pears and bananas; industrial crops, olives, sugar beet and tobacco. There is a substantial surplus of fruits and vegetables for export.

Livestock (1955 est.) numbered 30,000 cattle, 60,000 sheep, 500,000 goats, 6.000 horses, 22.000 asses and 5,000 mules.

TABLE *111.—Acreage and Production of Crops in 1953*

Product	Area in acre	Production in metric to
Cereals	108,000	101,800
Pulses	17,300	31,700
Vegetables	16,000	207,800
Fruits	19,800	240,500
Industrial crops	51,500	77,200

Source: United Nations, *Economic Developments in the Middle East 1945–54* (New York, 1955).

Industry.— Industry in Lebanon is on a small scale, partly because of the lack of raw materials and partly because of the restricted market. In 1950 many industries were severely hit by the ending of the customs union with Syria, but various factors combined to revive them later. Industrial machinery and most raw materials enter duty free and protection of local manufactures is provided by a duty of 25%–30% on competing imports. The main products are processed foods (preserves, sweetmeats, dough products and biscuits), beet sugar, alcoholic beverages (arrack, beer and wine), soft drinks, oils and fats, tobacco and cigarettes, matches, eau de cologne, soap, leather, cotton yarn and textiles and cement. The oil refineries of the Iraq Petroleum company at Tripoli (opened 1940) and of the Trans-Arabia pipeline at Saida (opened 1955) were important employers of labour. In 1956 the Tripoli refinery produced 177,005 metric tons of petrol (gasoline), 94,854 tons of paraffin, 208,500 tons of gas oil and 455,397 tons of fuel oil.

Finance.— The currency is the Lebanese pound (£L.), divided into 100 piastres. The average free exchange rate varied between 1951 and 1957 from FL. 3.80 to FL. 3.18 per the U.S. dollar and from FL. 9.41 to FL. 8.90 per £1 sterling. Currency circulation rose from £L. 188,080,000 in 1948 to FL. 337,866,000 in Dec. 1956. During the same period gold holdings rose from U.S. $1,710,000 to U.S. $77,200,000, while foreign exchange holdings decreased from U.S. $72,410,000 to U.S. $10,500,000. Budget revenue and expenditure are given in Table IV.

TABLE IV.—*Budget*
(in EL. 000,000)

Item	1939	1952	1953*	1954*	1955*	1956*
Revenue	7.20	124.76	112.76	123.40	137.5	151.5
Expenditure	6.37	88.51	112.84	123.40	133.8	151.5

*Estimates.

Foreign Trade.— The customs union between Syria and Lebanon came to an end on March 13, 1950 (decree published on March 11). Before that date the statistics published by the directorate-general of the Syro-Lebanese customs represented the total trade of the two countries. Table V gives the value of the trade of Lebanon for the years 1951–57.

TABLE V.—*Foreign Trade*
(in £L. 000, including trade in gold)

Year	Imports	Exports	Re-exports*	Transit†
1951	320,772	97,655	8,201	1,136,794
1952	347,049	77,430	19,491	1,038,601
1953	361,680	87,710	12,209	1,062,043
1954	484,402	105,582	13,935	1,034,014
1955	527,319	120,528	16,375	1,148,400
1956	561,083	145,795	14,521	1,100,300
1957	626,991	152,179	25,608	1,244,828

*Re-exports include goods withdrawn from storage which are actually re-exported and goods of foreign origin re-exported with drawback rights. †Crude oil transitting Lebanon is included.

Both imports and the import surplus tended to increase after the ending of the customs union with Syria. Principal imports were vegetable products, textiles and manufactured textile articles, precious stones and metals. cereals, minerals, chemical and pharmaceutical products, machinery and electrical appliances, motor vehicles, metals and metal goods, live animals and food products. Exports are equally diversified—much more so. indeed, than was the case in other countries of the middle east—and included vegetable products. textiles and textile articles, precious stones and metals. common metals and manufactured articles, leather and leather goods, food products, machinery and electrical appliances. In 1956 the chief sources of imports were Syria, the Cnited Kingdom, the United States and France, while the chief destinations of exports were Syria, Saudi Arabia and France.

The tourist trade formed an important item in the economy of Lebanon; the number of visitors rose from 67,000 in 1950 to 285,000 in 1953.

Transport and Communications.— The Aleppo-Damascus-Amman railway line crosses eastern Lebanon. Beirut is linked with it at Riyaq and Tripoli at Homs. The Lebano-Syrian railway system is operated by a single concessionary company. There are gocd metaled roads between the principal centres. There is a modern airport near Beirut.

The oil pipeline from Iraq terminates at Tripoli; that from the Saudi-Arabian field of Dhahran at Saida.

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LEBANON, a town of Connecticut, U.S., about 27 mi. E.S.E. of Hartford. It was settled in 1695 and incorporated as a town in 1700; the name is from the biblical Lebanon.

In colonial times the town mas situated on the most direct road between New York and Boston. It was the home of Jonathan Trumbull, governor of Connecticut during the American Revolution, and came to be the site of the war office (1727) which served as the governor's headquarters and the centre from which the military and naval activities of Connecticut were directed during the revolution. The war office has been restored as a museum.

By 1790 the population of Lebanon had increased to 4,166 from 3,960 in 1774. Like many New England towns, however: the population began to decline in the early 19th century when the opening of the Erie canal and greater accessibility of farm products from the middle west made farming in New England unprofitable. By 1920 the population had declined to 1,343. In the meantime, immigrant families, mostly from eastern Europe, began moving in to replace some of the older Yankee stock. Agriculture gradually shifted to poultry and dairy farming for the markets in the growing cities.

In the latter part of the 20th century the population was about 2,500, including some nho nere urban commuters. Lebanon also attracts a number of summer visitors. (N. L. W.)

LEBANON, a city of Pennsylvania, U.S., 86 mi. N.W. of Philadelphia; the seat of Lebanon county. Primarily an iron and steel centre, Lebanon also manufactures textiles, electrical machinery and other products.

Germans settled in the region in the 1720s, but it was not until about 1750 that George Steitz laid out the tonn, at first called Steitztown. It became a borough in 1821 and a city in 1885, remaining a predominantly Pennsylvania Dutch community. Located in the fertile Lebanon valley near the famous Cornwall ore mines and other mineral deposits, it became an iron centre before the American Revolution. Its growth was stimulated by the building of the Union canal (1827) and the Lebanon Valley railroad (1857). For comparative population figures *see* table in PENNSYLVANIA: *Population.* (S. W. HM.)

LEBEDEV, PËTR NIKOLAEVICH (1866–1912). Russian physicist who succeeded in proving experimentally the existence of the extremely small pressure which light exercises on bodies, was born on March 8 (new style; Feb. 24, old style), 1866, in Moscow. In 1887 he went to study physics under A. Kundt in Strasbourg. He took his doctor's degree in 1891 and published his first research on the Mossotti-Clausius theory of dielectrics. In the same year he was appointed assistant in physics at the University of Moscow and in 1892 professor. In 1901 appeared his classical work. *Experimental Research on Light Pressure.* In 1910 (*Annalen der Physik)* he succeeded in measuring this pressure. theoretically determined by James C. Xlaxwell. In 1911 Lebedev started a private laboratory. His further work was mainly on the origin of the earth's magnetism, but his death in Moscow on March 14 (N.S.; 1, O.S.), 1912, stopped his experiments. He founded in Moscow the Lebedev Physical society. In 1913 his *Collected Researches* mere published in Russian under the auspices of this society.

LE BEL, JEAN (d. 1370), Belgian chronicler, was born near the end of the 13th century. His father, Gilles le Beal des Changes. was an alderman of Likge. Jean entered the church and became a canon of the cathedral church, but he and his brother Henri followed Jean de Beaumont to England in 1327, and took part in the border warfare against the Scots. His will is dated 1369, and his epitaph gives the date of his death as 1370. Jacques de Hemricourt, author of the *Miroir des nobles de Hesbaye,* has left a eulogy of his character, and a description of the magnificence of his attire, his retinue and his hospitality. Hemricourt asserts that he was 80 years old or more when he died. For a long time Jean le Bel (or Lebel) was only known as a chronicler through a reference by Froissart, who quotes him in the prologue of his first book as one of his authorities. A fragment of his work, in the manuscript of Jean d'Outremeuse's *Mireur des istores,* was discovered in 1847; and the whole chronicle, preserved in the library of Châlons-sur-Marne, mas edited in 1863 by L. Polain. This chronicle covers the period from 1326 to 1361. Jean le Bel gives as his reason for writing a desire to replace a certain rhymed chronicle that had dealt inaccurately with the history of Edward III prior to the beginning of the Hundred Years' War. His chief merit is his refusal to narrate events unless either he himself or his informant had witnessed them. Writing for the public of chivalry, he preserved no general notion of a campaign, which resolves itself in his narrative into a series of exploits on the part of his heroes. Jean Froissart was indebted to him, and seems to have borrowed from him some of his best-known episodes, such as the death of Robert the Bruce, Edward III and the countess of Salisbury.

LE BEL, JOSEPH ACHILLE (1847–1930), French chemist whose hypothesis concerning the asymmetric carbon atom contributed to the development of stereochemistry, was born at Péchelbronn, Bas-Rhin, on Jan. 21, 1847. He studied at the Polytechnique in Paris, and then became *préparateur* at the University of Strasbourg. Later he was assistant to Antoine J. Balard, the discoverer of bromine, and then to Charles A. Wurtz (*q.v.*). Le Bel's family owned petroleum workings at Péchelbronn, and when he inherited these lucrative properties he retired from academic work and fitted up a private laboratory.

Le Bel is remembered chiefly for his theory of the asymmetric carbon atom in optically active compounds *(see* STEREOCHEMISTRY). He and Jacobus Hendricus van't Hoff (*q.v.*) independently and almost simultaneously published their ideas in 1874 Van't Hoff seems to have been influenced more by Friedrich A. Kekulé von Stradonitz (*q.v.*) while Le Bel followed Louis Pasteur (*q.v.*). He believed the tetrahedral carbon atom represented only the simplest solution of the problem, which probably had other more general solutions. He argued that the four univalent radicals attached to a carbon atom should be considered as a problem in equilibrium. He was the first to separate an optically active component from a synthetic mixture of the two mirror-image components of a compound containing an asymmetric carbon atom. He used mostly the selective destructive action of lower organisms on the dextro and levo isomerides. He was also the first to demonstrate that the optical activity disappears when the asymmetric carbon of the type CWXYZ is changed to CX_2YZ. He predicted that other asymmetric elements would give rise to optical activity. In 1899 William J. Pope, using advanced techniques not available to Le Bel, accomplished the resolution of these optical isomers. Le Bel died in Paris on Aug. 6, 1930.

See W. J. Pope, J. *Chem. Soc.* (1930); *E.* Wedekind, *Zeitschrift fur angewandte Chemie* (1930). (R. E. O.; X.)

LEBESGUE, HENRI LÉON (1875–1941), French mathematician whose chief claim to fame is in integration, a field he largely remade, was born at Beauvais. Oise, on June 28, 1875, and educated at the École Normale Supérieure and the University of Paris. His doctoral thesis (1902) was titled *Integral, Length, and Area.* He was *maître des conferences* at Rennes until 1906, when he went to Poitier, first as *chargé de cours* of the faculty of sciences and later as professor. About six years later he was called to Paris as *maître dcs conferences,* and afterward he became professor at the Collkge de France. In 1917 he was awarded the Prix Saintour, and in 1922 he was elected to the Paris Academy of Sciences. He was made an honorary member of the London Mathematical society in 1924 and a foreign member of the Royal society in 1930. He died in Paris on July 26. 1941.

One of the greatest mathematicians of his day, Lebesgue was a

pronounced specialist. He made one important contribution to topology in the "pavement theorem" and did some work on Fourier series and potential theory, but his main work was in integration.

Toward the close of the 19th century mathematical analysis was limited effectively to continuous functions, and artificial restrictions were necessary to keep out the growing number of exceptions. Under the classical Cauchy-Riemann definition of the integral, the operations of differentiation and integration were mutually inverse only for continuous or well-behaved functions. Influenced by the work of Émile Borel. Camille Jordan and others on theories of measure and content, Lebesgue formulated, in brilliant memoirs of 1901 and 1902, a new definition of the definite integral. The consequence of this notion of the integral is that any bounded summable function is the derivative of its indefinite integral, except perhaps for an ensemble of points of measure zero. This "Lebesgue integral" is one of the great achievements of modern real analysis.

Besides about 50 papers, a bibliography of which is given in the Journal of the London Mathematical Society, xix, 56–64 (1944), Lebesgue wrote two classic books: *Leçons sur l'integration et la recherche des fonctions primitives* (1904, 1928); and *Leçons sur les séries trigonome'triques* (1906). (C. B. BR.)

LE BLANC, a town of central France, capital of an *arrondissement,* in the *département* of Indre, 44 mi. W.S.W. of Châteauroux on the Orléans railway between Argenton and Poitiers. Pop. (1954) 4,925. Le Blanc, which is identified with the Roman Oblincum, was in the middle ages a lordship belonging to the house of Naillac and a frontier fortress of the province of Berry. The Creuse divides it into a lower and an upper town. The church of St. Génitour dates from the 12th, 13th and 15th centuries, and there is an old castle restored in modern times. It is the seat of a subprefect, and has a tribunal of first instance. Wool spinning, and the manufacture of linen goods and edge tools are among the industries. There is trade in horses and in the agricultural and other products of the surrounding region.

LE BLON (LE BLOND), **JACQUES CHRISTOPHE** (JACOB CHRISTOPH) (1667–1741), German engraver, the first to make use of several metal plates (each for an individual colour) for printing a single impression, was born in Frankfurt am Main, May 5, 1667. He lived in Rome, Amsterdam, London and Paris. In London he was granted a patent for his discovery and formed a company that became bankrupt. Le Blon then went to Paris where he spent the rest of his life. About 50 of his plates are known, many of them reproductions of works of the old masters, and although they were printed in very large editions they are extremely rare today. He died in Paris on May 16, 1741.

See C. Dodgson, *Old French Colour-Prints* (1924). (H. Es.)

LEBOEUF, EDMOND (1809–1888), marshal of France, was born at Paris on Nov. 5, 1809, passed through the École Polytechnique and the school of Metz. He served in Algeria, in the Crimean War, and in the Italian War of 1859, when his action at Solferino materially assisted in achieving the victory. In Sept. 1866, having in the meantime become aide-de-camp to Napoleon III, he was despatched to Venetia to hand over that province to Victor Emmanuel. In 1869 Leboeuf became minister of war, and reorganized the war office and the civil departments of the service. In the spring of 1870 he received the marshal's baton. On the declaration of war with Germany Leboeuf delivered himself in the Corps Législatif of the historic saying, "So ready are we, that if the war lasts two years, not a gaiter button would be found wanting." Leboeuf took part in the Lorraine campaign, at first as chief of staff (major general) of the army of the Rhine, and afterwards, when Bazaine became commander in chief, as chief of the 3rd corps, which he led in the battles around Metz. Shut up with Bazaine in Metz, on its fall he was a prisoner in Germany. On the conclusion of peace he returned to France and gave evidence before the commission of inquiry into the surrender of Metz, when he strongly denounced Bazaine. He died at the Château du Moncel near Argentan on June 7, 1888.

LE BON, JOSEPH (1765–1795), French politician, born at Arras on Sept. 29, 1765, was curé of a constitutional church in the Pas-de-Calais, and was elected to the Convention on July 2, 1793. His severities against counterrevolutionaries during his missions (1793–94) to the *départements* of Somme and Pas-de-Calais led to his arrest on July 10, 1795, on a charge of abuse of power. He was tried before the Somme tribunal, and executed at Amiens on Oct. 10, 1795. Whatever his offences may have been, he saved Cambrai from falling into the hands of the Austrians, and his condemnation was probably mainly due to political enmities.

LE BRAZ, ANATOLE (1859–1926), Breton scholar, was born on April 2, 1859 at Duault, Côtes-du-Nord, and educated at the Lycée St. Louis, and at the Faculté des Lettres at Paris. He held posts as professor of philosophy at the college of Etampes (1884–86) and the Lycée of Quimper (1886–1900); as professor of French literature at the University of Rennes (1901–1924) and as lecturer at Harvard university (1906).

His publications include *Soniou Breiz-Izel* (1890); *La Chanson de la Bretagne* (1892); *Piques d'Islande* (1897); *La Terre du Passé* (1901); *Au Pays des Pardons* (1894); *La Le'gende de la mort chez les Bretons-armoricains* (1893, later ed., 1922); *Vieilles Histoires du pays Breton* (1897); *Au Pays d'exil de Chateaubriand* (1909); *Ames d'Occident* (1906).

LEBRIJA or LEBRIXA, a town of southern Spain, in the province of Seville, near the left bank of the Guadalquivir. Pop. (1950) mun., 16,386. Lebrija is 44 mi. S. by W. of Seville, on the Seville-Cadiz railway. Lebrija is the Nabrissa or Nebrissa, surnamed Veneria, of the Romans; by Silius Italicus (iii, 393), who connects it with the worship of Dionysus, the name is derived from the Greek *nebris* (a "fawn-skin," associated with Dionysiac ritual). Nebrishah was a strong and populous place during the period of Moorish domination (from 711); it was finally recovered in 1264. Its chief buildings are a ruined Moorish castle and the parish church, containing some early specimens of the carving of Alonzo Cano (*q.v.*).

LEBRUN, ALBERT (1871–1950), French statesman, was born on Aug. 29, 1871. At first he devoted himself to engineering, but turned to politics about 1900. He was minister of the colonies, 1911–13 and 1913–14; minister of war, 1913; and minister of blockade and liberated regions, 1917–19. He became a senator in 1920, was president of the senate, 1931–32, and of the French republic, 1932–40. He died in Paris on March 6, 1950.

LE BRUN (LEBRUN), **CHARLES** (1619–1690), French painter, elevated by Louis XIV to direct the artistic production of his reign, was born in Paris on Feb. 24, 1619. A protégé of the chancellor Pierre Séguier, he studied first with Guillaume Perrier, then with Simon Vouet, under whose tuition he developed a style of considerable impact ("Hercules and Diomedes," Nottingham). In 1642 he went to Rome with Nicolas Poussin and during the four years he spent there absorbed much from Poussin and from contemporary baroque painting. On his return to Paris in 1646 he was given large decorative and religious commissions; his work for the Hôtel Lambert and for Nicolas Fouquet at Vaux-le-Vicomte in the 1650s made his reputation secure. His first commission from Louis XIV dates from 1661, when he painted the first of a series of subjects from the history of Alexander. "The Tent of Darius" delighted Louis, who liked to think of himself as a latter-day Alexander. Le Brun was made first painter, given an enormous salary and until his death occupied a position of paramount importance in the artistic life of France not equaled until the advent of J. L. David at the end of the 18th century.

Colbert was quick to recognize and to further Le Brun's organizing capacities. In 1663 Le Brun was appointed director of the Gobelins, which, from being a small tapestry manufacture, expanded into a sort of universal factory supplying all the royal houses. From the 1660s, commissions for decoration of the royal palaces, notably Versailles, were given automatically to Le Brun and his assistants. In 1663, the Academy of Painting and Sculpture was reorganized, with Le Brun as director; its satellite, the Academy of France at Rome, was created in 1666. These institutions gave French art its characteristic homogeneity.

Le Brun's style, a more dramatic and earth-bound version of that of Poussin (*see* "Horatius Holding the Bridge," Dulwich) became dulled and generalized when applied to large surfaces. As a portrait painter, however, he was consistently distinguished ("The Banker Jabach and His Family," Berlin). His dictatorship lasted until the marquis de Louvois replaced Colbert on the latter's

death in 1683. For the last seven years of his life Le Brun continued to receive the king's support, but his position declined radically in importance. He died at Paris on Feb. 22, 1690. *See* also PAINTING: *France: Royal Patronage.*

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LEBRUN, CHARLES FRANÇOIS, duc de Plaisance (1739–1824), French statesman, was born at St.-Sauveur-Lendelin (Manche) on March 19, 1739. He was an adviser of the chancellor Maupeou and shared in his downfall in 1774. After the revolution he professed liberal views, in the Constituent Assembly, and proposed various financial laws. After the *coup d'état* of the 18th Brumaire in the year VIII. (Nov. 9, 1799), Lebrun was made third consul and he took an active part in the reorganization of finance and of the administration of the departments of France. In 1804 he was appointed arch-treasurer of the empire, and in 1805–1806 as governor-general of Liguria effected its annexation to France. In 1808 he reluctantly accepted the title of duc de Plaisance (Piacenza). He was governor-general of the departments formed in Holland from 1811 to 1813. He accepted the *fait accompli* of the Restoration in April 1814, and Louis XVIII. made him a peer of France; but during the Hundred Days he accepted from Napoleon the post of grand master of the university. On the return of the Bourbons in 1815 he was suspended from the House of Peers, but was recalled in 1819. He died at St. Mesmes (Seine-et-Oise) on June 16, 1824.

See M. de Caumont la Force, *L'Architrésorier Lebrun* (1907); *M.* Marie du Mesnil, *Mémoire sur le prince Le Brun, duc de Plaisance* (1828); *Opinions, rapports et choix d'tcrits politiques de C. F. Lebrun* (1829), ed. with a biographical notice, by his son Anne-Charles Lebrun.

LECAN, an independent linguistic stock of South American Indians, so called from the Lecas, its most important tribe. The Lecas lived in north-western Bolivia, just east of Lake Titicaca, on the eastern slope of the Andes. Their original home is said to have been on the Tipuani river and its tributaries, but they later moved east and north-east to the Mapiri and Beni rivers in the provinces of Larecaja and Caupolican, where, in the vicinity of Aten, their modern descendants live.

See A. F. Chamberlain, "Sur quelques familles linguistiques . . . de l'Amérique du Sud," *J. Soc. Americanistes de Paris* (n.s.), vol. vii., pp. 179–202.

LE CARON, HENRI (whose real name was THOMAS MILLER BEACH) (1841–1894), British secret service agent, was born at Colchester, on Sept. 26, 1841. At nineteen he went to Paris, where he found employment in business connected with America. He crossed the Atlantic in 1861 and enlisted in the Northern army, taking the name of Henri Le Caron. In 1864 he married a young lady who had helped him to escape from some Confederate marauders; and by the end of the war he rose to be major. In 1865, through a companion in arms named O'Neill, he was brought into contact with Fenianism, and having learnt of the Fenian plot against Canada, he mentioned the designs when writing home to his father. Le Caron, from that time till 1889, acted for the British government as a paid military spy. He remained for years on intimate terms with the most extreme men in the Fenian organization. His services enabled the British government to take measures which led to the fiasco of the Canadian invasion of 1870 and Riel's surrender in 1871, and he supplied full details concerning the various Irish-American associations, in which he himself was a prominent member. He was in the secrets of the "new departure" in 1879–1881, and in 1882 had an interview with Parnell at the House of Commons, when the Irish leader spoke sympathetically of an armed revolution in Ireland. For 25 years he lived at Detroit and other places in America, paying occasional visits to Europe, and all the time carrying his life in his hand. The Parnell commission of 1889 put an end to this. Le Caron was subpoenaed by *The Times,* and in the witness-box the whole story came out. He published the story of his life, *Twenty-five Years in the Secret Service.* He died on April 1, 1894. The report of the Parnell commission is his monument.

See references under PARNELL, CHARLES STEWART.

LE CATEAU, a town of northern France, in the *département* of Nord, on the Selle, 15 mi. E.S.E. of Cambrai by road. Pop. (1954) 8,001. Formed by the union of the two villages of Péronne and Vendelgies, Le Cateau became the seat of an abbey in the 11th century. In the 15th it was frequently taken and retaken, and in 1556 it was burned by the French. It was finally ceded to France by the peace of Nijmwegen in 1678. Le Cateau suffered much damage during World War I. It was the scene of the battle of Le Cateau in Aug. 1914 and in Oct. 1918 was bombarded after the British entered it. It has a board of trade arbitration. It manufactures cloths, etc.

LE CATEAU, BATTLE OF, 1914. This was the battle which Gen. Smith-Dorrien's II Corps, the left wing of the British Expeditionary Force, as also of the Franco-British line of armies, fought during the retreat from Mons (*q.v.*). It thus formed a pendant to the Battles of the Frontier. (*See* FRONTIER, BATTLES OF THE.) Too closely pressed by the advancing German I. Army (Kluck) to continue its retreat safely, the II. Corps paused to fight, on the initiative of its commander, and against the intentions of the British commander-in-chief. By its resolute resistance, at serious cost to itself, it averted a disaster to the British Expeditionary Force and contributed to the secure retreat of the Allied armies.

LECCE, town and archiepiscopal see of Puglia region, Italy (anc. *Lupiae*), capital of the province of Lecce, 24 mi. S.E. of Brindisi by rail. Pop. (1951) 56,937. The town is rich in buildings of the 17th century, in rococo style. They are built in the light yellow stone of the district. which closely resembles that of Malta. Among them are the cathedral of S. Oronzo. the churches of S. Croce, S. Angelo, S. Irene, S. Matteo, etc., and the Prefettura (containing a museum). There are remains of a Roman amphitheatre, and the church of SS. Nicola e Cataldo. built by Tancred in 1180, may be noted, as well as the massive castle of 1539 and the walls and bastions of the same period. Lecce is the centre of a fertile agricultural district and is a very clean and prosperous town. It makes statues of papier-mâché. The small harbour of S. Cataldo is 7½ mi. E and is reached by electric tramway. Lecce occupies the site of a Messapian city of unknown name. Hardly a mile west was Rudiae, the birthplace of the poet Ennius. The name Lycea, or Lycia, begins to appear in the 6th century. The city was for some time held by counts of Norman blocd, including Bohemund, son of Robert Guiscard. Its remoteness from the larger centres has given it a life of its own, and it has produced so many men of letters that it has been called the Athens or the Florence of Apulia. Allied planes bombed Lecce in World War II.

See M. S. Briggs, *In the Heel of Italy* (London, 1910); G. Gigli, *Il Tallone d'Italia I. Lecce e Dintorni* (Bergamo, 1911).

LECCO, town of Lombardia region, province of Como, 32 mi. by rail N. by E. of Milan, 673 ft. above sea-level. Pop. (1951) 41,684. It is near the south end of the eastern branch of the Lake of Como, which is frequently distinguished as the Lake of Lecco. From Lecco the line to Colico was one of the earliest in Europe to be run by electricity (overhead wires). Branches run to Chiavenna and Sondrio; and another line runs to Bergamo. To the south the Adda is crossed by a fine bridge originally constructed in 1336–38 by Azzone Visconti and rebuilt in 1609 by Fuentes Almost the only old building is the castle, of which a part remains. Besides iron works, there are copper works, brass-foundries, olive oil mills and a manufacture of wax candles; and silk-spinning, cotton-spinning and wood carving.

In the 11th century Lecco, previously seat of a marquisate, was presented to the bishops of Como by Otto II; but in the 12th century it passed to the archbishops of Milan During the 13th century it was struggling with the metropolitan city. In 1283 the Visconti drove its inhabitants across the lake to Valmadrera. But in a few years the people returned and Azzone Visconti made Lecco a strong fortress During the 15th and 16th centuries the citadel of Lecco was an object of endless contention In 1647 the town with its territory was made a countship. Morone, Charles V's Italian chancellor, was born in Lecco.

LECH (*Licus*), a river of Bavaria, 104 mi. long, with a drainage basin of 1,067 sq miles. It rises in the Vorarlberg Alps, winds out of the gloomy limestone mountains, flows north-northeast and enters the plains at Fiissen (2,580 ft.). Here it forms rapids, and a fall, then pursues a northerly course past Augsburg, where it receives the Wertach, and joins the Danube from the right just

below Donauwörth (1,330 ft.). It is not navigable. *See* DANUBE.

LE CHAPELIER, ISAAC RENÉ GUY (1754–1794), French politician, was born at Rennes on June 12, 1754. He studied law and in 1789 was elected to the States-General. He adopted advanced opinions, and was one of the founders of the Breton club. He was elected president of the Constituent assembly and presided during the important period following Aug. 3, 1789. He was a leading member of the committee which drew up the new constitution; he further presented a report on the liberty of theatres and on literary copyright. He also opposed Robespierre's proposal to exclude members of the Constituent assembly from the new assembly. After the flight of the king to Varennes (June 20, 1792), his opinions became more moderate, and on Sept. 29 he brought forward a motion to restrict the action of the clubs. This, together with a visit which he paid to England in 1792 made him suspect, and he was denounced on his return. He was executed at Paris on April 22, 1794.

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LE CHÂTELIER, HENRY LOUIS (1850–1936), French inorganic chemist, is best known for the "Le Châtelier principle" (1888), which states that if a system is in stable equilibrium and one of the conditions is changed then the equilibrium will shift in such a way as to tend to restore the original condition. This principle is invaluable for predicting the optimum conditions for achieving a reaction, either in the laboratory or industrially. Born in Paris, Oct. 8, 1850, Le Châtelier graduated from the École des Mines in 1875, spent two years as a mining engineer and then returned (1877) to the École des Mines as professor of chemistry. He succeeded Henri Moissan (*q.v.*) at the University of Paris in 1908. He died at Miribel-les-Échelles, Isère, on Sept. 17, 1936.

In the course of his long career. Le Châtelier became an authority on metallurgy, on cements, glasses, fuels and explosives. He investigated the physical properties of alloys, the processes of annealing and tempering. the calcining and the setting of cements, the fusion, firing and annealing of ceramic and glassware, the combustion of fuels and the phenomenon of allotropy.

His work yielded not only many new facts, but also a wealth of theoretical principles and experimental methods. His interest in the calcining of cements led him to develop the platinum-rhodium thermocouple for measuring high temperatures and to introduce the use of the melting points of sulfur and gold to calibrate the thermocouples. He made improvements in optical pyrometry, introduced the differential dilatometer for high temperature work, worked out new methods of preparing abrasives for polishing metallographic sections and devised an improved microscope for examining such sections.

Le Châtelier was a great teacher, stressing precise measurement and scientific reasoning, and introducing facts only to illustrate general principles. He wrote prolifically, producing books on alloys, ceramics, steels, silicates, the combustion of fuels and the relationship of science to industry. He founded the *Revue de Métallurgie*, and was its editor from 1904 to 1914.

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LECKY, WILLIAM EDWARD HARTPOLE (1838–1903), Irish historian and essayist, was born at Newtown Park, near Dublin, on March 26, 1838, being the son of John Hartpole Lecky and his first wife, Mary Anne Tallents. Lecky was educated at Kingstown, Armagh, Cheltenham and Trinity college, Dublin, from which he graduated B.A. in 1859 and M.A. in 1863. An early interest in theology led to the publication of *Religious Tendencies of the Age*, in 1860; but this, together with a book of poems and *Leaders of Public Opinion in Ireland* (1861), met with little success. In 1863 he made his fourth venture as an author with the *Declining Sense of the Miraculous*, subsequently incorporated in the *History of Rationalism* (1865). In spite of its length and discursiveness the book, which is indicative throughout of wide knowledge, clear thought and sound judgment, achieved an instantaneous success. His reputation was enhanced by the appearance of the *History of European Morals* (1869). Both books are, in a sense, an attempt to explain the same set of facts from a different standpoint, or, in his own words, both "are an attempt to examine the merits of certain theological opinions according to the historical method. . . . The 'Morals' is a history of the imposition of those opinions upon the world and attempts to show how far their success may be accounted for by natural causes. . . . The 'Rationalism' is a history of the decay of those opinions."

Lecky's marriage in 1871 with Elizabeth van Deden involved him in a multiplicity of social duties, but he did not allow these to interrupt his work. In the same year he brought out a revised edition of *Leaders of Public Opinion*, but it still failed to please, and Lecky returned to his magnum opus, *The History of England in the 18th Century*. This work, which occupied him for 19 years, was published in 12 volumes. each of which was received with acclamation. The book is distinguished by its lucidity, reliability and scrupulous impartiality, qualities which are most conspicuous in the section dealing with Ireland, a subject in which Lecky was intensely interested.

In 1895, he was elected member of parliament for Dublin university as a Liberal Unionist and on taking his seat in the House he became a keen advocate of reform in Ireland. He supported the extension of educational facilities for Roman Catholics and upheld Plunkett's agricultural policy, but he continued to oppose the granting of Home Rule. Lecky was the recipient of many honours. In 1897 he was made a privy councilor, in 1902 he became one of the first members of the British Academy founded in that year, and soon after he received the Order of Merit. He died on Oct. 22, 1903, in London.

Apart from the works mentioned, Lecky wrote: *Democracy and Liberty* (1896, revised ed., 1899); *The Map of Life* (1899); and in 1903 he published a third and finally revised edition of *Leaders of Public Opinion*. He contributed to several periodicals and two of his lectures, *The Political Value of History* and *The Empire, Its Value and Its Growth*, were published in 1892 and 1893 respectively. A collection of essays and biographical sketches was published posthumously in 1908 by Mrs. Lecky, under the title of *Historical and Political Essays*.

LECLANCHE CELL, an electrolytic cell formerly used for purposes such as ringing electric bells, where only an intermittent current is required. *See* BATTERY: *Primary Electric Cells*.

LE CLERC (LECLERC), **JEAN** (JOHANNES CLERICUS) (1657–1736), French Protestant theologian, was born on March 19, 1657, at Geneva, where his father was professor of Greek. In 1679 were published *Liberii de Sancto Amore Epistolae Theologicae* (Irenopoli: Typis Philalethianis), usually attributed to Le Clerc; they deal with the doctrine of the Trinity, the hypostatic union of two natures in Christ, original sin and the like. At Amsterdam he met John Locke and Philip v. Limborch, professor at the Remonstrant college; the acquaintance with Limborch soon ripened into a close friendship, which strengthened his preference for Remonstrant theology. In 1684 he finally settled at Amsterdam, first as a moderately successful preacher, and aftenvards as professor of philosophy, belleslettres and Hebrew in the Remonstrant seminary. He died on Jan. 8, 1736.

His publications are listed with biographical material, in E. and E. Haag's *France Protestante* and J. G. de Chauffepie's *Dictionnaire*. His series of Biblical commentaries appeared between 1693–1731; the portion relating to the New Testament included the paraphrase and notes of Henry Hammond (1605–60). Le Clerc's commentary had a great influence in showing the necessity for a more scientific inquiry into the origin and meaning of the biblical books, but it was on all sides hotly attacked. His *Ars Critica* appeared in 1696 and, in continuation, *Epistolae Criticae et Ecclesiasticae* in 1700. Le Clerc's new edition of the *Apostolic Fathers* of Johann Cotelerius (d. 1686), published in 1698, marked an advance in the critical study of these documents. But the greatest influence of Le Clerc was exerdised by means of the journals he edited. These were *Bibliothbque universelle et historique*, 25 vol. (1686–93), begun with J. C. de la Croze; *Bibliothbque choisie*, 28 vol. (1703–13); and *Bibliothkque ancienne* et *moderne*, 29 vol.

(1714–26).

See Le Clerc's *Parrhasiana ou pensées sur des matières de critique, d'kistoire, de morale, et de politique: avec la défense de divers ouvrages de M. L. C. par The'odore Parrhase* (1699) and *Vita et opera ad annum MDCCXI., amici ejus opusculum, philosophicis Clerici operibus subjiciendum,* also attributed to himself. The supplement to Hammond's notes was translated into English in 1699; *Parrhasiana, or Thoughts on Several Subjects* in 1700; the *Harmony of the Gospels* in 1701; and *Twelve Dissertations out of M. Le Clerc's Genesis* in 1696.

LECOCQ, (ALEXANDRE) CHARLES (1832–1918), one of the principal French composers of operettas after Offenbach and known for *La Fille de Madame Angot*. Born a cripple, June 3, 1832, in Paris, he studied harmony at the Conservatoire under François Bazin, composition under Fromental Halévy and the organ under François Benoit. Though he became proficient at the organ, he was prevented from continuing his studies on this instrument by his diseased hip. His first operetta was *Le Docteur Miracle* (1857), written for a competition organized by Offenbach, which shared the prize with a setting of the same libretto by Bizet. Between 1859 and 1867 he produced six one-act operettas, but it was not until the production of his three-act *Fleur de the'* (1868) that he achieved success. Nine of Lecocq's operettas were produced during the next four years, and following the success in Brussels of *Les Cent Vierges* (1872), *La Fille de Madame Angot,* on a libretto by Clairville, P. Siraudin and V. Koning, mas given there in December of the same year. Acclaimed as his masterpiece, three months later it mas performed in Paris, where it ran for 411 nights. Within a year it was performed in 103 provincial towns in France, and thereafter was frequently revived in most European countries and in the United States. In 1947 some of the music was arranged by Gordon Jacob as a ballet and given as *Mam'zelle Angot*. From 1874, when *Girofle-Girofla* was produced in Brussels, to 1911, Lecocq continued to write operettas, chiefly produced in Paris, of which the most successful was *Le Petit Duc* (1878). His single attempt at *opéra-comique, Plutus* (1886), was a failure. He also wrote polkas, mazurkas, schottisches and other dances, and five volumes of songs. Lecocq kept alive the spirit of Offenbach in the French operetta, adapting it to the more sober view of light opera that came into fashion after the Franco-German War. He died in Paris on Oct. 24, 1918.

See Charles Lecocq, "Mcs Cauchemars," in *La Gazette Parisienne* (1895–97); L. Schneider, *Hervé et Lecocq* (1924). (E. LR.)

LECONTE DE LISLE, CHARLES MARIE RENÉ (1818–1894), French poet, was born in the island of Réunion on Oct. 22, 1818. His father, an army surgeon, who brought him up with great severity, sent him to travel in the East Indies with a view to preparing him for a commercial life. After this voyage 'he went to Rennes to complete his education, studying especially Greek, Italian and history. He returned once or twice to Rkunion, but in 1846 settled definitely in Paris. His first volume, *La Vénus de Milo,* attracted to him a number of friends many of whom were passionately devoted to classical literature. In 1873 he was made assistant librarian at the Luxembourg; in 1886 he was elected to the Academy in succession to Victor Hugo. His *Poèmes antiques* appeared in 1852; *Poèmes et poésies* in 1854; *Le Chemin de la croix* in 1859; the *Poèmes barbares,* in their first form in 1862; *Les Erinnyes,* a tragedy after the Greek model in 1872; for which occasional music was provided by Jules Massenet; the *Poèmes tragiques* in 1884; *L'Apollonide,* another classical tragedy, in 1888; and two posthumous volumes, *Derniers poèmes* in 1899 and *Premières poésies et lettres intimes* in 1902. In addition to his original work in verse, he published a series of admirable prose translations of Theocritus, Homer, Hesiod, Aeschylus, Sophocles, Euripides and Horace. He died at Voisins near Louveciennes (Seine-et-Oise) on July 18, 1894.

In Leconte de Lisle the Parnassian movement seems to crystallize. His verse is clear, sonorous, dignified, deliberate in movement: classically correct in rhythm, full of exotic local colour, of savage names, of realistic rhetoric. It has its own kind of romance, in its "legend of the ages," so different from Hugo's, so much fuller of scholarship and the historic sense, yet with far less of human pity. Coldness cultivated as a kind of artistic distinction seems to turn all his poetry to marble, in spite of the fire at its heart. Most of Leconte de Lisle's poems are little chill epics, in which legend is fossilized. They have the lofty monotony of a single conception of life and of the universe. He sees the world as what Byron called it, "a glorious blunder," and desires only to stand a little apart from the throng, meditating scornfully. His only prayer is to Death, "divine Death," that it may gather its children to its breast. (A. SY.)

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LE CORBUSIER (CHARLES EDOUARD JEANNERET) (1887–), a revolutionary figure in modern architecture, was born on Oct. 6, 1887, in La Chaux-de-Fonds, Switz. Also known as a city planner, painter, sculptor and author, Corbusier made his greatest contributions in the field of civic and domestic architecture. At the age of 14 he was admitted to the art school of his native city, where his talent was recognized by one of the teachers, the painter Charles L'Eplattenier. He built his first house at the age of 18, but his career as an architect began only around 1920. In 1908 he made his first long stay in Paris and worked 15 months in the atelier of Auguste Perret, a pioneer in reinforced concrete construction; in 1910 he worked for five months in the atelier of the factory designer Peter Behrens in Berlin. He finally settled in Paris in 1917. Although Swiss by birth, he is considered French by training. Modern painting then absorbed his interests *(see* PAINTING: *Nonobjective Painting: Purism).* Together with A. Ozenfant and Dermée he founded the avant-garde magazine *L'Esprit Nouveau* in Oct. 1920. He began to build at that time, associating himself with his cousin, Pierre Jeanneret. The year 1923 marked the appearance of *Towards an Architecture* (Eng. trans., 1928), in which his earlier articles for *L'Esprit Nouveau* reappeared. with an appreciable influence on the architectural world. At the International Exhibition of Decorative Arts in Paris (1925) he exhibited a two-story apartment unit precursing his later residential blocks in his Pavilion de L'Esprit Nouveau, which was financed mainly by Voisin, the automobile manufacturer, whose name is also associated with Le Corbusier's model for a "contemporary city of 3,000,000 inhabitants" (Paris).

Endless ingenious methods of construction were employed by Le Corbusier. The flat roof with roof garden, which he advocated, is not merely a tribute from architecture to health, but the thick concrete flags laid on sand, with open, grass-sown joints, insulate the house beneath and lessen the considerable reaction of a concrete structure to varying weather conditions. In 1927 he won first prize in the international competition for the design for the Palace of the League of Nations in Geneva, but his plan was not used. In 1925–29 his Centrosoyus (Ministry of Central Economic Planning) nas built in Moscow; 1932 marked the erection of his Swiss dormitory at the Cité Universitaire, Paris. In Brazil he planned the Ministry of Health and Education building in Rio de Janeiro (1936). Among his many city-planning schemes were those for Algiers (starting in 1930), São Paulo, Rio de Janeiro, Buenos Aires. Barcelona (1933), Geneva, Stockholm, Anvers and Nemours (1934), and his plan for the Palace of the Soviets in Moscow (1931). His scheme for a museum in 1929 was realized, to a certain extent, in Tokyo in 1956. His most extensive book on urbanism, *La Ville Radieuse,* appeared in 1933. In 1940, after the outbreak of war, he moved to the south of France. There his studies of proportion centred in the *Modulor,* which greatly awakened architectural interest in the conception of a building with coherent proportions. He was able to return to his Paris atelier in 1944. In 1946 he went to New York to co-operate on the preparation of plans for the United Nations buildings, and was a member of the board of consultants for the design of the Secretariat building (1950).

Le Corbusier's genius finally received recognition. Through the efforts of the French minister of reconstruction, Claudius Petit, he realized the Unité d'Habitation at Marseille, 1947–52. A con-

tinuous line of thought runs from the Plan Voisin (1922) to the towers of Meaux (1957), his Unit6 at Nantes-Rezé (1956) and the Unité at the International Architectural exhibition in Berlin, containing 400 apartments (1957).

His project for the civic centre of St. Dié in the Vosges mountains (1945) envisaged an integrated community life previously equaled only by the Greek agora. In 1950 Corbusier began building Chandigarh, the capital city of Punjab. In addition to the overall plan for the city he also designed the High Court of Justice (1956), the Secretariat (1957), the House of Parliament and Governor's palace (the last two begun in 1957)—all in reinforced concrete. His daring chapel at Ronchamp (1955) points toward a new conception of spatial and plastic imagination. Le Corbusier received a great number of distinctive honours. including honorary degrees from the University of Zürich and the Swiss Institute of Technology in Zürich; the French Legion of Honour; and a gold medal for distinguished service from Queen Elizabeth II.

Le Corbusier's Oeuvre *complète* was published in six volumes (1929 et *seq.*); other works include *When* the Cathedrals *Were White* (1937; Eng. trans, 1947) and *New* World of Space (1948). See S. Papdaki (ed.), Le Corbusier, Architect, Painter, Writer (1948); S. Giedion, Space, Time and Architecture, pp. 509–540 (1954). (S. GN.)

LECOUVREUR, ADRIENNE (1692–1730), French actress, was born on April 5, 1692, at Damery, Marne, the daughter of a hatter, Robert Couvreur. She showed a natural talent for declamation and was instructed by La Grand, *sociétaire* of the Comédie Française. After a long apprenticeship, she made her Paris debut in 1717, as Électre, in Crébillon's tragedy of that name, and Angélique in Molière's *Georges Dandin*. She was immediately received into the Comédie Française, and for 13 years she was the queen of tragedy there, attaining a popularity never before accorded an actress. She is said to have played no fewer than 1.184 times in 100 roles, of which she created 22. Adrienne Lecouvreur abandoned the stilted style of elocution of her predecessors for a naturalness of delivery and a touching simplicity of pathos that delighted and moved her public. In M. Baron, who returned to the stage at the age of 67, she had an able and powerful coadjutor in changing the stage traditions of generations. The jealousy she aroused mas partly due to her social success; she was on visiting and dining terms with half the court, and her *salon* was frequented by Voltaire and all the other notables and men of letters. She was the mistress of Maurice de Saxe from 1721, and sold her plate and jewels to supply him with funds for his ill-starred adventure as duke of Courland. Adrienne Lecouvreur died on March 30, 1730, and it was believed that she was poisoned by a jealous rival mistress of De Saxe. She was denied the last rites of the church. and her remains were refused burial in consecrated ground. Voltaire, in a fine poem on her death, expressed his indignation at the barbarous treatment accorded to the woman whose "friend, admirer, lover" he was.

Her life formed the subject of the tragedy (1849), by Eugène Scribe and Ernest Legouvé. See Lettres *d'Adrienne* Lecouvreur, edited by G. Monval (1892); A. Bourgeois, Adrienne Lecouvreur (1895); G. Rivollet, Adrienne Le Couvreur (1925).

LE CREUSOT, a town of France in the *département* of Saône-et-Loire, 55 mi. S.W. of Dijon on the Paris-Lyon railway. Pop. (1954) 27,304. Le Creusot is situated in a district rich in coal and iron and it has the most extensive ironworks in France. The coal bed of Le Creusot was discovered in the 13th century; but it was not till 1774 that the first workshops were founded there. The royal crystal works were transferred from Sèvres to Le Creusot in 1787, but this industry came to an end in 1831. Meanwhile several enterprises for the manufacture of metal had ended in failure. It was only in 1836 that the foundation of ironworks by Adolphe and Eugène Schneider definitely inaugurated the industrial prosperity of the place. They supplied war material at first, but later they enlarged their production and manufactured steel, armourplate, guns, locomotives, electrical machinery, etc. In 1897 the ordnance manufacture of the Société des Forges et Chantiers de la Méditerranée at Le Havre was acquired by the company, which also has branches at Chalon-sur-Saône, where shipbuilding and bridge construction is carried on, and at Sète.

LECTERN, a reading desk, usually restricted to ecclesiastical use. In the early church the ambo (*q.v.*) served as a reading desk, but by the 15th century the use of special stands for the large books then in vogue became common. On the continent, especially in Italy, there are many beautiful examples of the Renaissance period in carved wood, usually with heavily scrolled, spreading, triangular base, and a support of generally baluster type. In the Anglican Church, where the lectern is usually reserved for the reading of the lessons, a type has become traditional in which the book rest is supported on the wings of an eagle or a pelican. In many cases these are of metal.

LECTION, LECTIONARY. A lection, or lesson. is a reading from Scripture, patristic homilies or lives of saints in the Roman Catholic Church. The custom of reading extracts from the Pentateuch and prophetic books (cf. Luke iv, 16–20. xvi, 29) in synagogues on the Sabbath was taken over with others into the Christian divine service, additions being made from the writings of the apostles and evangelists. Traces of such additions are found in the New Testament itself in such passages as Col. iv, 16.

There are traces of fixed lessons coming into existence in the 3rd century: Origen refers to the book of Job being read in Holy Week (Commentaries on Job, lib. i.). Allusions of a similar kind in the 4th century are frequent. John Cassian (c. 380) states that throughout Egypt the Psalms were divided into groups of twelve, and that after each group there followed two lessons, one from the Old, one from the New Testament (De *caenob. inst.* ii. 4), implying but not absolutely stating that there was a fixed order of such lessons just as there was of the Psalms. St. Basil the Great mentions fixed lessons on certain occasions taken from Isaiah, Proverbs, St. Matthew and Acts (Hom. xiii. *De* bapt.). It is learned from Chrysostom (Hom. lxiii. in *Act.*, etc.), and Augustine (Tract. vi. in *Joann.*, etc.) that Genesis was read in Lent, Job and Jonah in Passion Week, the Acts of the Apostles in Eastertide, lessons on the Passion on Good Friday and on the Resurrection on Easter Day. Nothing in the shape of a lectionary is extant older than the 8th century, though there is evidence that Claudianus Mamertus made one for the church at Vienne about 450 The council of Carthage in 397 forbade anything but Holy Scripture to be read in church; this rule has been adhered to so far as the liturgical epistle and gospel, and occasional additional lessons in the Roman missal are concerned, but in the divine office, on feasts when nine lessons are read at matins, only the first three lessons are taken from Holy Scripture, the next three being taken from the sermons of ecclesiastical writers, and the last three from expositions of the day's gospel; but sometimes the lives or Passions of the saints, or of some particular saints, were substituted for any or all of these breviary lessons.

LECTISTERNIUM, a rite of Greek origin, but common in Rome from 399 B.C. onward. The term is derived from Lat. *lectum* sternere, "to spread a couch." It consisted of a meal offered to gods and goddesses, represented by their busts or statues, perhaps originally by symbols. These symbols were laid upon a couch (*lectus*) or *pulvinar* (from *pulvinus,* "cushion") in the attitude of reclining. In front of the couch, which was placed in the open street, a meal was set out on a table.

On the first occasion couches were prepared for three pairs of gods—Apollo and Latona, Hercules and Diana, Mercury and Neptune. The feast, which on that occasion lasted for eight (or seven) days, was also celebrated by private individuals; the citizens kept open house, quarrels were forgotten, debtors and prisoners were released and everything done to banish sorrow. Similar honours were paid to other divinities in subsequent times, always after consultation of the Sibylline books and as a propitiatory ceremony. The gods being grouped in Greek fashion and being frequently of Greek origin, it is plain that the rite is Greek, presumably Cumaean, since the Sibylline books came from Cumae; but in this form it does not seem to be found in Greece. In addition, lectisternia were held annually, or oftener (for the greater part of the year in some shrines) at temples of gods originally Greek, as Ceres. This largely replaced the old Roman *epulum* or *daps*, in which a table was spread for the god, who was not visibly represented. This is not to be confused with the *sellisternium*, most reasonably explained (by L. R. Taylor) as the setting of a

chair for some deity to look on at a festival. In Christian times the word was used for a feast in memory of the dead.

LECTOR or READER, a minor office-bearer in the Christian church. From an early period men have been set apart, under the title of *anagnostae, lectores* or readers, for the purpose of reading Holy Scripture in church. It is not known what the custom of the church was in the first two centuries, the earliest reference to readers, as an order, occurring in the writings of Tertullian *(De praescript. haeret.* cap. 41); there are frequent allusions to them in the writings of St. Cyprian and afterward. Cornelius, bishop of Rome in A.D. 251–252, in a well-known letter mentions readers among the various church orders then existing at Rome. The custom has not fallen out of use, but the precise duties and method of appointment vary greatly.

LEDA (parentage variously given), in Greek legend, was wife of Tyndareus and either was loved by Zeus in the form of a swan, and laid an egg, or eggs, from which came Helen and one or both of the Dioscuri (*cf.* CASTOR AND POLLUX), or hatched out a similar egg laid by Nemesis. Clytemnestra was her daughter by Tyndareus.

See Roscher's *Lexikon der Mythologie,* art. "Leda."

LE DAIM (or LE DAIN), **OLIVIER** (d. 1484), favourite of Louis XI of France, was born at Thielt, Flanders. He became court barber and valet to Louis XI and was ennobled under the title Le Daim in 1474 and made comte de Meulan in 1477. In the latter year he was sent to Burgundy to influence the young heiress of Charles the Bold, but he was ridiculed and compelled to leave Ghent. He thereupon seized and held Tournai for the French. Le Daim amassed a fortune by intrigue and violence and was named gentleman-in-waiting, captain of Loches and governor of Saint-Quentin. After the death of Louis XI he was arrested, tried before the parlement of Paris and on May 21, 1484, hanged at Montfaucon without the knowledge of Charles VIII. Le Daim's property was given to the duke of Orleans.

BIBLIOGRAPHY.—*See* memoirs of the time, especially those of Ph de Commines; Robt. Gaguin, *Compendium de origine el gestis Francorum* (1586)—it was Gaguin who made the celebrated epigram concerning Le Daim: "Eras judex, lector, et exitium"; Baron de Reiffenberg, *Olivier le Dain* (1829); G. Picot, "Procès d'Olivier le Dain," in the *Comptes rendus de l'Académie des sciences morales et politiques,* vol viii, pp. 485–537 (1877); J. S. C. Bridge, *A History of France from the Death of Louis XI,* vol. i, pp. 41–46 (1921).

LEDERBERG, JOSHUA (1925–), U.S. geneticist, co-winner of the 1958 Nobel prize in medicine for his discoveries in bacterial heredity, was born May 23, 1925, in Montclair, N.J. While a student at Columbia university medical school, he took a leave of absence to work at Yale university with E. L. Tatum (*q.v.*) on bacterial genetics. The experiments were immediately successful, and Lederberg never returned to his medical class. He joined the department of genetics at the University of Wisconsin in 1947, transferring in 1959 to Stanford university medical school, where he became chairman of the department of genetics.

The experiments of Lederberg and Tatum demonstrated that, contrary to what had previously been widely believed, sexual reproduction occurs in bacteria. This and Lederberg's later experiments showed the hereditary mechanism to be similar to that in higher organisms and laid the groundwork for the study of bacterial genetics. Along with a student, N. D. Zinder, Lederberg demonstrated the phenomenon of "transduction," whereby a fragment of the chromosome is transferred from one bacterial cell to another by an infecting virus. (J. F. Cw.)

LEDOCHOWSKI, MIECZYSLAW HALKA, COUNT (1822–1902), Polish Roman Catholic cardinal and archbishop, was born on Oct. 29, 1822, in Gorki, Russian Soviet Federated Socialist republic. As archbishop of Poznan, he resisted the "May laws," during Bismarck's *Kulturkampf* against the Roman Catholic Church *(see* GERMANY: *History)* and was imprisoned in 1874. Though made a cardinal shortly thereafter, he was not released until Feb. 1876. He went to Cracow, where his presence was made the pretext for anti-Prussian demonstrations. He thereupon went to Rome. from which, in spite of having been deposed by the civil government, he continued to direct the affairs of his diocese, not resigning till 1885. Cardinal Ledochowski died at Rome on July 22, 1902.

His nephew, WLODZIMIERZ LEDOCHOWSKI (1866–1942), was general of the Jesuit order, 1914 to 1942.

LEDOUX, CLAUDE NICOLAS (1736–1806), French architect, was born at Dormans-sur-Marne, March 21, 1736. While executed in the baroque and neoclassical styles of the time, his works also exhibit efforts to break away from traditionalism. His unexecuted projects for spherical, cylindrical and pyramidal houses have no parallel in architectural history. He won early fame building the residences of Madame du Barry, the dancer Marie Madeleine Guimard and several aristocrats. From 1775 to 1779 he erected the factory buildings and workmen's houses of the royal saltworks (Salines de Chaux) at Arc-et-Senans in Franche-Comté. Between 1775 and 1784 he carried out the theatre of Besançon and in 1783 the office building of the Ferme Générale. Four of his Parisian tollhouses have survived. After his imprisonment in 1793 as a suspect royalist, he devoted himself to the composition of his *L'Architecture* (1804), in which he presented his advanced designs for an ideal city. He died in Paris, Nov. 19, 1806.

See Emil Kaufmann, *Three Revolutionary Architects: Boullée, Ledoux and Lequeu,* American Philosophical Society, *Transactions,* **vol.** xlii, part 3, with complete bibliography (1952), *Architecture in the Age of Reason* (1955). (*E.* KN.)

LEDRU-ROLLIN, ALEXANDRE AUGUSTE (1807–1874), French lawyer politician, was the grandson of Nicolas Philippe Ledru, the celebrated quack doctor known as "Comus" under Louis XIV., and was born in a house that was once Scarron's, at Fontenay-aux-Roses (Seine), on Feb. 2, 1807. He was called to the bar, and was retained for the Republican defence in most of the great political trials of the years 1830–40. He was elected deputy for Le Mans in 1841 with hardly a dissentient voice; but for the violence of his electoral speeches he was tried at Angers and sentenced to four months' imprisonment and a fine, against which he appealed successfully on a technical point. He made a rich and romantic marriage in 1843, and in 1846 disposed of his charge at the Court of Cassation to give his time entirely to politics. He was now the recognized leader of the workingmen of France. He had more authority in the country than in the Chamber, where the violence of his oratory diminished its effect. He asserted that the fortifications of Paris were directed against liberty, not against foreign invasion, and he stigmatized the law of regency (1842) as an audacious usurpation. He founded La *Réforme* in which to advance his propaganda. Between Ledru-Rollin and Odilon Barrot with the other chiefs of the "dynastic Left" there were acute differences, hardly dissimulated even during the temporary alliance which produced the campaign of the banquets in 1848. Ledru-Rollin and Lamartine then held the tribune in the Chamber of Deputies until the Parisian populace stopped serious discussion by invading the Chamber. He was minister of the interior in the provisional government, and was also a member of the executive committee appointed by the Constituent Assembly, from which Louis Blanc and the extremists were excluded. At the crisis of May 15 he definitely sided with Lamartine and the party of order against the proletariat.

After this he never regained his influence with the working classes, who considered they had been betrayed. At the presidential election in December he secured only 370,000 votes. His opposition to the policy of Louis Napoleon, especially his Roman policy, led to his moving the impeachment of the president and his ministers. The motion was defeated, and next day (June 13, 1849) he headed what he called a peaceful demonstration, and his enemies armed insurrection. He himself escaped to London where he joined the executive of the revolutionary committee of Europe, with Kossuth and Mazzini among his colleagues. He was accused of complicity in an obscure attempt (1857) against the life of Napoleon III., and condemned in his absence to deportation. Émile Ollivier removed the exceptions from the general amnesty in 1870, and Ledru-Rollin returned to France after twenty years of exile. Though elected in 1871 in three departments he refused to sit in the National Assembly, and took no serious part in politics until 1874, when he was returned to the Assembly as member for Vaucluse. He died on

Dec. 31, 1874.

Under Louis Philippe he made large contributions to French jurisprudence, editing the *Journal du palais, 1791–1837* (27 vols., 1837), and *1837–1847* (17 vols.), with a commentary *Répertoire général de la jurisprudence française* (8 vols., 1843–48), the introduction to which was written by himself. His later writings were political in character. See *Ledru-Rollin, ses discours et ses écrits politiques* (2 vols., Paris, 1879), edited by his widow; A. R. Calman, *Ledru-Rollin and the Second French Republic* (New York, 1922); A. R. Calman, *Ledru-Rollin après 1848 et les proscrits français en Angleterre* (1921).

LEE, ANN (1736–1784), English religious visionary, was born in Manchester, where she was first a factory hand and afterwards a cook. She is remembered by her connection with the sect known as Shakers (*q.v.*). She died at Watervliet, near Albany, New York.

LEE, ARTHUR (1740–1792), American diplomat, brother of Richard Henry Lee, was born at Stratford, Westmoreland county, Virginia, on Dec. 20, 1740. He was educated at Eton, and studied and practised medicine and law in Virginia and in England. In 1770–75 he served as London agent for Massachusetts At that time he had shown great ability as a pamphleteer, having published in London *The Monitor* (1768), seven essays previously printed in Virginia, as well as various political tracts. In Dec. 1775 the committee of secret correspondence chose him as its European agent for the purpose of ascertaining the views of European countries regarding the war between the colonies and Great Britain. In Oct. 1776 he was appointed on the commission with Franklin and Silas Deane to negotiate a treaty of alliance, amity and commerce with France, and to negotiate with other European governments. His letters to Congress resulted in Deane's recall; and other letters impaired the confidence of Congress in Franklin, of whom Lee was especially jealous. Early in 1777 he went to Spain as American commissioner, but receiving no official recognition, accomplished nothing; until the appointment of Jay, however, he continued to act as commissioner to Spain, held conferences with the Spanish minister in Paris, and in Jan. 1778 secured a promise of a loan of 3,000,000 livres, only a small part of which (some 170,000 livres) was paid. In June 1777 hc went to Berlin, but was not officially recognized. With Franklin and Deane in Feb. 1778 he signed the treaties between the United States and France. Lee was recalled in 1779, and returned to the United States in Sept. 1780. He was a member of the Virginia house of delegates in 1781 and a delegate to the Continental Congress in 1782–85. With Oliver Wolcott and Richard Butler he negotiated a treaty with the Six Nations, Oct. 22, 1784, and with George Clark and Richard Butler a treaty with the Wyandot, Delaware, Chippewa and Ottawa Indians, Jan. 21, 1785. He was a member of the treasury board in 1784–89. After the adoption of the constitution which he opposed, he retired to his estate at Urbana, Va., where he died on Dec. 12, 1792.

BIBLIOGRAPHY.—See R. H. Lee, *Life* of *Arthur Lee* (1829), and C. H. Lee, *A Vindication of Arthur Lee* (1894); both partisan. Eight vols. of Lee's mss. in the Harvard university library are described and listed in *Library* of *Harvard University, Bibliographical Contributions* No. 8 (1882). Much of Lee's correspondence is to be found in Wharton's *Revolutionary Diplomatic Correspondence* (1889); *American Historical Review,* xxx, p. 280, and xxxi, pp. 33–39.

LEE, FITZHUGH (1835–1905), U.S. cavalry general, mas born at Clermont, in Fairfax county. Virginia, on Nov. 19, 1835. He was the grandson of "Light Horse Harry" Lee. and the nephew of Robert E. Lee (*q.v.*). Graduating from West Point in 1856, he became a cavalry subaltern. On the secession of Virginia he joined the Confederate army and served with distinction through the Civil War. He was made brigadier general in 1862. and major general in 1863. commanding cavalry divisions under Stuart, Hampton and Lee. On April 9, 1865, at Farmville, Va., he led the last charge of the Confederates.

After the war he was conspicuous in his efforts to reconcile the south to the issue of the war. From 1836 to 1890 he was governor of Virginia. In 1596 he was appointed by Pres. Grover Cleveland consul general at Havana. In that post (in which he was retained by Pres. William McKinley) lie was from the first called upon to deal with a situation of great difficulty, which culminated with the destruction of the "Maine" (*see* SPANISH-AMERICAN WAR OF 1898). Upon the declaration of war with Spain he reentered the army. He was one of the three ex-Confederate general officers who were made major generals of U.S. volunteers. He was military governor of Havana and Pinar del Rio in 1899, and retired as a brigadier general. U.S. army, in 1901. He died in Washington, D.C., on April 28, 1905. He wrote *General Lee* (1894) and *Cuba's Struggle Against Spain* (1899).

LEE, FRANCIS LIGHTFOOT (1734–1797), G.S. Revolutionary statesman. was a signer of the Declaration of Independence. Born in Westmoreland county. Va.. on Oct. 14, 1734, he was educated privately. He served in the Virginia house of burgesses and later in the state senate and in the continental congress (1775–79). He was an ardent supporter of the revolution. His brothers included Arthur. Richard Henry (*qq.v.*) and William Lee. Francis Lee died on Jan. 11, 1797.

LEE, HENRY (1756–1818), American general. called "Light Horse Harry." was born near Dumfries (Va.), on Jan. 29, 1756. His father was first cousin to Richard Henry Lee. He graduated (1773) at Princeton. and on the outbreak of the War of Independence. became an officer in the patriot forces. He served with distinction under Washington. and in 1778 was promoted major and given the command of a small irregular corps. with which he won a great reputation'as a leader of light troops, and the soubriquet of "Light Horse Harry."

His greatest exploit was the brilliant surprise of Paulus Hook (N.J.), on Aug. 19, 1779. He was promoted lieutenant-colonel 1780, and sent with a picked corps of dragoons to the southern theatre of war. Here he rendered valuable services: notably at Guildford Court House, Camden and Eutaw Springs. From 1786–88 he was a delegate to the Confederation Congress, and in the Virginia Convention of 1788 he favoured the adoption of the Federal Constitution.

From 1789–91 he served in the general assembly, and from 1791–94 was governor of Virginia. In 1794 Washington sent him to help in the suppression of the "Whisky Iilsurrection" in western Pennsylvania. He was a major-general in 1798–1800. From 1799–1801 he served in Congress. He delivered the address on the death of Washington which contained the famous phrase. "first in war. first in peace, and first in the hearts of his countrymen." Soon after the outbreak of the War of 1812, Lee. while helping to resist an attack on his friend. A. C. Hanson, editor of the Baltimore *Federal Republican,* received injuries, from which he never recovered. He was the father of Gen. Robert E. Lee. He died on Cumberland Island. on March 25, 1818.

Lee wrote valuable *Memoirs of the War in the Southern Departnzent* (1812; 3rd ed. with memoir by Robert E. Lee, 1869).

LEE, NATHANIEL (*c.* 1653–1692). English dramatist, son of Dr. Richard Lee, a Presbyterian divine. was born probably in 1653. Lee was educated at Westminster school, and at Trinity college, Cambridge. taking his B.A. degree in 1668. Coming to London under the patronage, it is said, of the duke of Buckingham, he tried to earn his living as an actor. but his acute stage fright made acting impossible. His earliest play. *Nero, Emperor of Rome,* was acted in 16;j at Drurp Lane. Lee made his reputation in 1677 with a blank verse tragedy, *The Rival Queens, or the Death of Alexander the Great,* which remained a favourite on the English stage down to the days of Edmund Kean. *Mithridates, King of Pontus* (acted 1678), *Theodosius, or the Force of Love* (acted 1680). *Caesar Borgia* (acted 1680)—an imitation of the worst blood and thunder Elizabethan tragedies—*Lucius Junius Brutus, Father of His Country* (acted 1681). and *Constantine the Great* (acted 1684) followed. *The Princess of Cleve* (1681) is a gross adaptation of Madame de La Fayette's exquisite novel of that name. *The Massacre of Paris* (published 1690) was written about this time. Lee had given offence at court by his *Lucius Junius Brutus;* he sought rehabilitation by collaborating with Dryden in *The Duke of Guise* (1683), a play which directly advocated the Tory point of view. In it part of the *Massacre of Paris* was incorporated. In 1684 his mind became completely unhinged. He recovered his health but died in a drunken fit in 1692. and was buried in St. Clement Danes, Strand. on May 6.

Lee's *Dramatic Works* were published in 1784. In spite of their

extravagance, they contain many passages of great beauty.

LEE, RICHARD HENRY (1732–1794), American statesman and orator, was born at Stratford, Westmoreland county (Va.), on Jan. 20, 1732, one of the six distinguished sons of Thomas Lee (d. 1750), a descendant of an old Cavalier family. Richard Henry Lee received an academic education in England, travelled, and returned to Virginia in 1752, having inherited a fine property from his father, and applied himself to varied studies. When 25 he was appointed justice of the peace of Westmoreland county, and in the same year was chosen a member of the Virginia house of burgesses, in which he served from 1758 to 1775. His first speech was in strong opposition to slavery, which he proposed eventually to abolish by imposing a heavy tax on all further importations. He early allied himself with the Whig element in Virginia, and in the years immediately preceding the War of Independence was a conspicuous opponent of the arbitrary measures of the British ministry. In 1768, in a letter to John Dickinson of Pennsylvania, he suggested a private correspondence among the friends of liberty in the different colonies, and in 1773 he became a member of the Virginia committee of correspondence.

Lee was a delegate to the First Continental Congress in Philadelphia in 1774, and prepared the address to the people of British America, and the second address to the people of Great Britain. He introduced in Congress on June 7, 1776, the famous resolutions: (1) "that these united Colonies are, and of right ought to be, free and independent States, that they are absolved from all allegiance to the British Crown, and that all political connection between them and the State of Great Britain is, and ought to be, totally dissolved"; (2) "that it is expedient to take the most effectual measures for forming foreign alliances"; and (3) "that a plan of confederation be prepared and transmitted to the respective Colonies for their consideration and approbation." His first resolution was adopted on July 2, and the Declaration of Independence was adopted two days later. Lee was in Congress from 1774 to 1780; a member of the Virginia house of delegates in 1777, 1780–84 and 1786–87; was in Congress again from 1784–87, having been president in 1784–86; and was one of the first U.S. senators chosen from Virginia. Though opposed to the Constitution because of what he regarded as its infringements upon the independent power of the States, he accepted the place of senator in hope of bringing about amendments, and proposed the Tenth Amendment in substantially the form in which it was adopted. He retired from public life in 1792, and died at Chantilly, in Westmoreland county, on June 19, 1794.

See the ***Life*** (1825), by his grandson, R H. Lee; and *Letters* (1910), edited *by* J. C. Ballagh.

His brother, WILLIAM LEE (1739–1795), accompanied another brother, Arthur Lee (*q.v.*), to England in 1766 to engage in mercantile pursuits, joined the Wilkes faction, and in 1775 was elected an alderman of London. In April 1777, however, he received notice of his appointment by the committee of secret correspondence in America to act as a commercial agent at Nantes. He went to Paris and became involved in his brother's opposition tc Franklin and Deane. In May 1777 Congress chose him commissioner to the courts of Vienna and Berlin, but he gained recognition at neither. In Sept. 1778, at Aix-la-Chapelle, he negotiated a plan of a treaty with Jan de Neufville, who represented Van Berckel, pensionary of Amsterdam. A copy of this proposed treaty, falling into the hands of the British on the capture of Henry Laurens (*q.v.*), led to Great Britain's declaration of war against the Netherlands in Dec. 1780. Lee was recalled from his mission to Vienna and Berlin in June 1779. He resigned his post as an alderman of London in Jan. 1780, and returned to Virginia about 1784.

See *Letters* of ***William Lee***, edited by W. C. Ford (1891).

LEE, ROBERT EDWARD (1807–1870), American general, was born at Stratford, Va., on Jan. 19, 1807. He came of a family with a great record of public service. His father, Henry Lee, was governor of Virginia and in the Revolutionary War made himself famous as a leader of Washington's cavalry, earning the sobriquet of "Light Horse Harry." Two Lees (Richard and Francis) signed the Declaration of Independence. A forbear, Thomas Lee, became president and commander-in-chief of Virginia, while the founder of the American branch of the family, Richard Lee, who migrated to Virginia in the reign of Charles I., became secretary of State and a member of the privy council of Virginia, and helped to hold the colony for Charles II.

Robert, the fourth son in Henry's second family, entered the United States military academy at West Point, where he graduated with great distinction, and was in 1829 commissioned as 2nd lieutenant in the Corps of Engineers. Two years later he married Mary Custis, great granddaughter of Martha Washington, heiress to the Arlington estate in the Virginian hills which overlook Washington, and of the White House on the Pamunkey. Thus by birth and marriage Robert was connected with the leading families of Virginia. In 1846, when war broke out between the United States and Mexico, Lee, then a captain, was already distinguished in the service for his ability, and was chosen by Gen. Scott to join the headquarters staff. He returned from this war with a reputation established at the age of 42, and was chosen successively to be superintendent of West Point, and to be colonel of cavalry, in which capacity he was employed for some years in the country of the Comanche Indians. In 1859 he was at his wife's home, Arlington, when John Brown's raid on Harper's Ferry took place, and he was employed in the unpleasant task of capturing the raiders. From this duty he returned to the Texas border to be summoned to Washington in February, 1861, to meet the crisis of his life.

Lee was no politician, but he had followed with an intelligent interest the development of the crisis which culminated in the Civil War. He regarded slavery as an evil, and in common with many of the landowners of Virginia, had liberated his slaves, but he considered that it would be a greater evil to attempt to eradicate slavery by force. He believed firmly in the advantages of the Union, but still more firmly that the authority of the Federal Government was conferred on it freely by the several States, which had the right to secede if they wished. His political creed may be summed up in the words which he wrote on the eve of the crisis:—"I can anticipate no greater calamity for the country than the dissolution of the Union. . . . Still a union that can only be maintained by swords and bayonets, and in which strife and civil war are to take the place of brotherly love and kindness, has no charms for me. If the Union is dissolved and the Government dispersed I shall return to my native State and share the miseries of my people and, save in defence, will draw my sword no more."

At the time when war became certain Lee's military reputation was so high that Scott advised Abraham Lincoln to offer him the command of the Federal forces in the field. That brilliant offer Lee declined with a heavy heart. He resigned his commission in the United States army and went to Richmond to place his services at the disposal of Virginia.

AS MILITARY ADVISER

In the first months of the war Lee was engaged in organizing the troops of his State. He was then for a time military adviser to the Confederate president, Jefferson Davis, and in that capacity watched the defeat of the first Federal invasion of Virginia at Bull Run. During part of that year, 1861, he was sent to command in western Virginia, where the Federals under the leadership of McClellan had won conspicuous successes. With untrained troops and inexperienced officers, in difficult mountainous country, his campaign there was a failure, and he returned to Richmond with his reputation under a cloud to be sent by Davis to organize the coast defences of the Carolinas. He was engaged on this work when he was again summoned, in March 1862, to Richmond to be military adviser to the President.

The Federals had then assembled armies for the invasion of Virginia numbering 180,000 men, to which the Confederates could immediately oppose 80,000, a number which might eventually be brought up to 100.000. McClellan, with the main Federal army, was preparing to disembark on the Yorktown peninsula and to advance on Richmond from the coast, while other Federal forces converged on Richmond from the north and west. How

in these circumstances was Richmond to be defended? J. E. Johnston, who commanded the Confederate main army in Virginia, proposed to concentrate all available troops about Richmond and to fight it out there. Lee saw that this was a counsel of despair, and that the one chance for the Confederates was to utilize their central position and to compensate by skilful manoeuvre for inferior numbers. He therefore persuaded the President to send Johnston, against the latter's wish, to oppose McClellan in the Yorktomn peninsula, so that time might be gained. He turned to "Stonewall Jackson" (see JACKSON, THOMAS JONATHAN), whom he asked to unite some of the remaining detachments of the Confederates in Virginia, in order to attack the Federals in the Shenandoah valley, and so create alarm for the safety of Washington. This task Jackson brilliantly accomplished in his famous Valley campaign. The Federal forces intended to aid McClellan in his attack on Richmond were diverted or dispersed. In the meantime Johnston had fallen back on lines prepared around Richmond, and in the battle of Seven Pines attacked McClellan. The result was indecisive and Johnston fell wounded, Lee succeeding to the command of the army of northern Virginia.

Lee now proceeded to consummate his plan. McClellan, expecting reinforcements to his right flank, had advanced on Richmond with his forces divided by the Chickahominy. Jackson had prevented the arrival of these reinforcements and kept them in expectation of attack. Lee thereupon brought Jackson by rail and road towards Richmond, and on his arrival had 87,000 men opposed to McClellan's 109,000. Further he skilfully utilized the defences of Richmond to outbalance McClellan's superior numbers, leaving in them 28,000 men to hold 75,000 of McClellan's army scuth of the Chickahominy, while with 59,000 he attacked at the beginning of the battles of the "Seven Days" the 34,000 Federals on the north of the river. With his right overwhelmed McClellan was forced to retreat and fell back to the James river, eventually embarking his troops and returning to the Potomac. Generalship had neutralized superior numbers and the danger to Richmond was removed

When McClellan's retreat was ended, Lee sent Jackson to the Rapidan to check the Federal force which, recovering from the latter's blows, was uniting under the command of Pope. As soon as McClellan's intention to evacuate the Yorktown peninsula was clear Lee joined Jackson with the main body of the army of northern Virginia. Before them Pope fell back behind the Rappahannock, and Lee, whose intention was to manoeuvre Pope out of Virginia, divided his forces, sending Jackson with half his force by a flank march to come down on Pope's rear, while he himself followed with the remainder under Longstreet. Jackson reached Manassas Junction and destroyed Pope's depots, and then fell back a short distance so as to cover the passes of the Blue Ridge and be in a position to unite with Longstreet. While so placed a Federal column, ignorant of his presence, marched across his front. Jackson, unable to resist the temptation. attacked and so brought on the second battle of Bull Run (Aug. 29–30), in which, Longstreet arriving in the nick of time on the field, Pope was completely defeated. Lee then decided to cross the Potomac and invade Maryland, not with the object of conquering any portion of Northern territory, but to keep the Federal forces out of Virginia by forcing them to defend Washington, and to strengthen the peace party in the North.

After crossing the Potomac Lee detached Jackson with half his force to reduce Harper's Ferry, which, held by a garrison of 11,000 Federals, interrupted his communications with Virginia. Jackson speedily accomplished his task, but nhile he was engaged in it, an order by Lee which disclosed the division of his forces fell into the hands of McClellan, who advanced and attacked the Confederates in position behind the Antietam (Sept. 17). Jackson arrived on the field in time to enable Lee to repulse McClellan's attacks, but this done the Confederates were compelled to retire into Virginia. It is more than doubtful whether Lee was justified in accepting this battle. He could have avoided it and returned to Virginia with the defeat of Pope and the surrender of Harper's Ferry to his credit and have avoided the heavy losses which the Confederates could ill afford. It would appear that at this time he was disposed to underrate unduly the fighting power of the Northern troops.

A long pause followed the battle of the Antietam, and it was not until Dec. 1862 that Burnside, who had displaced McClellan in command of the Army of the Potomac, attempted to meet Lee in the field. Lee's army was then disposed along the Rappahannock, and his service of information being admirable, he was able to concentrate in time to meet Burnside's attack upon his position at Fredericksburg. This attack, which was purely frontal against a strong position, was repulsed with great ease on Dec. 13. Lee had been criticized for not undertaking an immediate pursuit, but his justification is that he expected the Federals to renew the attack, and did not wish to expose his infantry to the fire of the superior Federal artillery on the opposite heights.

The experiences of a winter campaign in Virginia caused the Federals to await the spring to renew their efforts, and the two armies matched each other on the Rappahannock until towards the end of April 1863. Hooker, who had taken Burnside's place, then had 120,000 men opposed to Lee's 60,000, and he planned, while leaving part of his army on the river, to occupy Lee's front, to march the remainder round the Confederate left and come down on their rear through the woods of Chancellorsville. Lee was once more well informed of his opponents' movements Leaving a detachment on the river he marched with the bulk of his troops. including Jackson's corps, towards Chancellorsville. On the outskirts of the wilderness of Chancellorsville Lee and Jackson made their plans on the night of May 1–2. Lee, with an understanding of the delaying power of entrenchments which no other soldier of his day possessed, proposed to repeat the manoeuvre which had opened the battles of the "Seven Days." Keeping only 10,000 men with himself entrenched opposite Hooker's front. he sent Jackson, under cover of the woods, round Hooker's right, which on the evening of May 2 was surprised and routed. Jackson fell mortally wounded, but Hooker was driven back over the Rappahannock.

Lee followed this victory by another invasion of Northern territory. He had been joined by Longstreet's corps, which brought his strength to 73,000 men, and early in June he began a brilliant series of manoeuvres across Hooker's front, which brought his army in the third week of that month into the northern end of the Shenandoah valley. There he detached Stuart with his cavalry to delay Hooker's crossing of the Potomac. It was Lee's intention that Stuart should return to cover his right flank, but by an unfortunate misunderstanding Stuart, who had made himself famous by a number of raids round the Federal army, crossed the Potomac to the east of the mountains and was separated from Lee for several days. Thus the Confederates entered Pennsylvania by way of the Cumberland valley deprived of their eyes, and in ignorance of the Federal movernents. Hooker had crossed the Potomac to cover Washington, but Lincoln, realizing that he had been outmanoeuvred by Lee, replaced him by Meade.

It was not until June 29 that Lee learned that the Federal army was across the Potomac, and he at once began to concentrate his forces. The next day his flank guard came into collision with Federal cavalry near Gettysburg. and on July 1 both armies mere converging on that place. That evening and on the morning of the 2nd the advantage was with the Confederates, for the Federal forces were arriving piecemeal, and there is little doubt but that if Longstreet had attacked on the morning of the 2nd, as Lee wished him to do, the Confederates would have been victorious. But Longstreet, though a fine tactician, was an obstinate subordinate, and found excuses for delay. By noon on July 2 the opportunity had passed, and Lee's attacks both on that day and on the 3rd were heavily repulsed Lee thereupon skilfully retreated, and on July 14 was back in Virginia.

After Gettysburg both armies needed rest, and when Meade was once more ready to advance Lee had prepared strong defences along the Rapidan, which the Federals found too formidable for attack. So the minter passed with the two armies waiting for better weather to resume manoeuvre.

The result of Gettysburg was to change Lee's military policy.

Up to that battle he had hoped to force the North to make peace by winning a resounding victory in Northern territory. After Gettysburg he understood that the South's resources would no longer justify that policy, and his plan became to exhaust by delay the patience of the North. In March 1864 Lincoln took the decisive step of appointing Grant, the hero of Vicksburg, to the supreme command of the Federal armies Grant, realizing that Lee and his army were the chief obstacle to the fulfilment of Federal aims and the superiority of the resources of the North, proposed to fasten on to Lee and compel him to fight on every possible occasion. By the beginning of May Grant had an army of 130,000 ready in northern Virginia, and on the night of May 3-4 he began to cross the Rappahannock near Fredericksburg, hoping to force Lee to leave his lines on the Rapidan in order to cover Richmond. Lee waited until Grant was across the river, and then attacked, with 60,000 men, Grant's flank as he was moving through the forest of the Wilderness. The forest country neutralized the effect of the superior Federal artillery, the Southerners were better acquainted with the intricate country and the advantage was with the Confederates. But Grant would not acknowledge defeat, and knowing that his army was much stronger than that of Lee, he, instead of retreating as Hooker had done, broke off the battle and continued to advance towards Richmond.

Lee at once divined Grant's intention, and when the Federal advance guard reached Spotsylvania Court House on May 8 it found its way barred by entrenchments. There followed a 13 days' battle of trench warfare, in which the Federal assaults were heavily repulsed. Grant then abandoned his efforts to force Lee's front, and once more marched past his flank, only to find, on May 23, Lee once more barring his way behind the North Anna. Again Grant marched past Lee's flank, and again on June 1 found Lee in position at Cold Harbor. Grant, apparently losing patience, on June 3 made a frontal attack on Lee's lines which failed with heavy loss.

Despite this rebuff Grant's determination was not shaken. He continued his previous manoeuvre and crossing the James river compelled Lee to follow him towards Richmond, and began on June 16 the long siege of Petersburg. During his advance from the Rappahannock to Petersburg Grant had under him 180.000 men, including reinforcements. Lee commanded 80,000. It had taken the Federals a month of strenuous fighting to advance 70 miles. and their casualties had numbered close to 55,000. Confidence in the North was shaken, but both Lincoln and Grant remained firm, and as long as that was so the end was sure. Grant by confining Lee to the immediate defence of Richmond had deprived him of the one weapon which could compensate for his inferior numbers. his skill in manoeuvre.

The siege of Petersburg dragged on through the winter of 1864 and into the spring of the following year, Grant continually extending his lines and compelling Lee to stretch his exiguous resources until the breaking point was reached. On April 2, he abandoned his lines around Richmond in the hope of being able to unite with Johnston in North Carolina. This Grant prevented by a prompt and masterly pursuit, and Lee surrendered with his army at Appomattox Court House on April 9. in an interview made noteworthy alike by Grant's noble generosity and by Lee's calm dignity in disaster.

After the war Lee set himself to heal the wounds of his people. Determined to take no part in any of the numerous controversies which the war aroused, he, though in financial straits like most Southerners, refused firmly to write his account of the great events in which he had taken a leading part. He was offered and accepted the post of president of Washington college (afterwards Washington and Lee university) and there he spent his last years teaching, by example and precept. the youth of Virginia to be good Americans. He died on Oct. 12, 1870.

As a general Lee's chief characteristics were his rapid grasp of the possibilities of a military situation, his skilful use of interior lines of communication, his capacity for guessing what was in the minds of his opponents, and his understanding of their weaknesses. Few commanders have excelled him in the power of arousing devotion in his men, Almost his only weakness was a tendency to trust his subordinates too much, and an unwillingness to force his decisions on them. It was this characteristic which made so grievous the loss of Jackson, who at once grasped what was in Lee's mind and devoted himself wholly and loyally to execute his chief's intentions.

Beyond and above all this, Lee's great contribution to the art of war was his understanding of the part field defences could play in aiding manoeuvre. In this he was years ahead of his time, and it was not until the beginning of the 20th century that his methods were really understood and applied by the military world. His high character, his moral courage, his noble nature, and his mastery of the art of war, made him a notable figure in history.

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LEE, SIR SIDNEY (1859–1926), English Shakespearian scholar and second editor of the *Dictionary of National Biography,* was born of Jewish parents in London, Dec. 5, 1859. Educated at the City of London school and Balliol college, Oxford, he worked for Sir Leslie Stephen on the *Dictionary* until he succeeded him as editor in 1891. He contributed 820 articles, mainly on the Elizabethans. His biographical aims and methods are described in his lecture, *The Principles of Biography* (1911), in which he emphasizes the importance of candour and of brevity.

Before the *Dictionary's* completion (1902–03), Lee had expanded his article on Shakespeare into a *Life* (1898), and in 1902 produced the facsimile edition of the first folio of Shakespeare's *Comedies, Histories and Tragedies.* In 1906 he edited Shakespeare's *Works.* In *Elizabethan and Other Essays* (publ. 1929), he drew attention for the first time to the influence of the discovery of America upon Elizabethan writers. *The French Renaissance in England* (1909) shows his interest in comparative literature, and when, after being knighted (1911) he became (1913) professor of English at East London college (later Queen Mary college), he stressed its value in promoting international understanding. He helped to found the English association (1918). Lee's other works include a *Life of Queen Victoria* (1902) and of *King Edward VII* (1925–27), on the second volume of which he was still working when he died, in London, March 3, 1926.

See A. F. Pollard, "Sir Sidney Lee and the D.N.B.," *Bulletin of the Institute of Historical Research,* vol. iv (1926–27); Charles Firth, "Sir Sidney Lee," *Proceedings of the British Academy,* vol. 15 (1929).

LEE, STEPHEN DILL (1833–1908), Confederate general in the American Civil War, was born at Charleston, S.C., on Sept. 12, 1833, of a distinguished South Carolina family. Graduating from West Point in 1854, he served in the U.S. army until 1861, resigning on the secession of South Carolina. He was aide-de-camp to General Beauregard in the attack on Ft. Sumter, and captain of a light battery in General Johnston's army later in the year 1861.

Because of distinguished conduct on the fields of battle, he rose to the rank of brigadier general in Nov. 1862, and took command of defenses at Vicksburg. Until its surrender to General Grant in July, 1863, he served with great credit, and on becoming a prisoner of war, was immediately exchanged, promoted major general, and assigned to command the cavalry troops of that arm in the southwestern theatre of war. After harassing the advance of Sherman's column on Meridian he took General Polk's place as commander of the department of Mississippi. In June 1864, on John Bell Hood's promotion to command the army of Tennessee, he was made a lieutenant general and assigned to command Hood's old corps in that army.

He fought at Atlanta and Jonesboro, accompanied Hood in the bold advance to Nashville, and fought in the battles of Franklin and Nashville, after which, in the rout of the Confederate army, he kept his troops closed up, and for three consecutive days formed the fighting rearguard of the otherwise disintegrated army. Lee was himself wounded, but did not give up the command until an organized rearguard took over the post of danger. On recovery he joined Gen. Joseph E. Johnston in North Carolina, and he sur-

rendered with Johnston in April 1865. After the war he settled in Mississippi and devoted himself to planting. He died at Vicksburg on May 28, 1908.

LEE, TSUNG-DAO (1926–), Chinese theoretical physicist who, together with C. N. Yang (*q.v.*), received the Nobel prize in physics in 1957.

Lee was born in Shanghai, China, on Nov. 25, 1926. He was educated at the National Chekiang university (Hankow) and the Southwest Associated (Kunming) university and received the Ph.D. degree at The University of Chicago in 1950. After serving briefly as research associate in astronomy there and in the physics department of the University of California, he was a member of the Institute for Advanced Studies at Princeton, N.J. (1951–53); in 1953 he became professor of physics at Columbia university in New York city.

Lee and Yang were instrumental in the discovery of violations of the principle of parity conservation (the principle of space reflection symmetry), a principle previously considered generally valid. They demonstrated that for certain processes it had in fact not been established, and to test the principle pointed out specific experiments. The experiments, performed by C. N. Wu and others, proved the violation of the principle. The discovery rapidly led to substantial advances in the physics of elementary particles. Lee also made other major contributions to the fields of elementary particles, and to statistical mechanics, field theory, astrophysics and turbulence. (JK. S.)

LEE, VERNON (pseudonym of VIOLET PAGET) (1856–1935), English essayist and novelist whose interpretations of Italian art and letters did much to stimulate understanding of Italy, was born at Boulogne-sur-mer, France, Oct. 14, 1856. Her parents were cosmopolitan intellectuals who finally settled in Florence. There she collected materials for *Studies in the Eighteenth Century in Italy* (1880), which brought to life for English readers the hitherto unexplored world of Metastasio and Goldoni. Her collections of essays, *Belcaro* (1881) and *Euphorion* (1884), reveal her scholarship, always enlivened by wit and imagination. After her first visit to England in 1881, she caricatured its aesthetic coteries in her novel, *Miss Brown,* 3 vol. (1884). She wrote more than 30 books, including a play, *Adriadne in Mantua* (1903), *Pope Jacynth and other Fantastic Tales* (1905) and *Vital Lies* (1912), which shows her an independent critic of social conditions. Her powerful allegorical drama, *Satan the Waster* (1920), reveals her ardent pacificism. She died at San Gervasio, Italy, Feb. 13, 1935.

See M. Baring, *Lost Lectures* (1932).

LEECH, JOHN (1817–1864), English caricaturist notable for his contributions to *Punch* magazine, was born in London on Aug. 29, 1817, the son of the Irish proprietor of the London Coffee House, Ludgate Hill. He was educated at Charterhouse where he met W. M. Thackeray, his lifelong friend. He then began to study medicine, but soon drifted into the artistic profession and in 1835 published *Etchings and Sketchings by A. Pen, Esq.,* comic character studies from the London streets. His first big success was a parody on W. Mulready's postal envelope, on ahich appeared his device of a leech in a bottle. In 1840 Leech began contributing to magazines with a series of etchings in *Bentley's Miscellany;* he also collaborated nith George Cruikshank, whose work his own resembled both in style and subject. Later, however, he excluded the horrific and satirical elements of the Gillray-Rowlandson tradition and developed a comfortable, warmly humorous middle-class urbanity. in which character is underlined by emphatic contrasts of stock types. These qualities emerge from the four etchings illustrating Dickens' *Christmas Carol* (1844). the *Comic History of England* (1847–48) and the woodcuts for the *Comic History* of *Rome* (1852). These were followed by numerous etchings and woodcuts of sporting scenes in R. S. Surtees' novels. His lithograph illustrations include *Portraits of Children of the Mobility* (1841), a parody illustrating the mingled pathos and humour of London street urchins; and a later, more accomplished series *Fly Leaves.*

Leech's first contribution to *Prmch* appeared in the issue of Aug. 7, 1841, the beginning of a fruitful connection cut short only by his death in London on Oct. 29, 1864. At first mainly social themes occupied him, but later he began his political cartoons of the careers of Lord Brougham, Lord Palmerston, Disraeli and Lord John Russell, and of the Crimean War—notably the *General Février turned Traitor* (1855). He lacked the sharp sting of Sir John Tenniel in this field, however, and afterward concentrated on social caricature, as in *Pictures of Life and Character from the Collection of Mr. Punch* (1862). He also contributed to *Punch* almanacks and pocket-books, to *Once a Week* and to the *Illustrated London News,* as well as to numerous novels and miscellaneous volumes. Of these, *A Little Tour in Ireland* (1859) is noteworthy for his sensitive treatment of pure landscape.

See W. P. Frith, *John Leech, His Life and Work,* 2 vol. (1891); June Rose, *The Drawings of John Leech,* with bibliography (1950). (D. L. FR.)

LEECH. Of the three classes of segmented worms (Annelida; *q.v.*), leeches or bloodsuckers, class Hirudinea, are the most specialized, chiefly because of their parasitic or predatory habits. They are slimy worms, from less than an inch to several inches long, having a terminal sucker at each end of a cylindrical or flattened body; in the tropics larger and more brightly coloured kinds occur. Leeches are primarily aquatic, and their dependence on moisture largely determines their distribution: most of them inhabit quiet fresh waters, but many are marine, and some are amphibious or terrestrial.

General Structure **and** Function.—A typical leech is broader in outline at the posterior end, where the larger sucker occurs; at the narrower, or anterior, end is a smaller sucker and the mouth. Unlike other annelids, leeches lack parapodia and setae (bristles). Some are admirably equipped for a parasitic life: the terminal suckers serve for attachment, feeding and locomotion; and the greatly expanded crop-stomach permits a considerable store of food. Most leeches possess a powerful musculature—they can readily extend and contract their bodies—which enables them to swim with strong, undulating motions, or to crawl along a solid surface like an inch worm by using the terminal suckers. Both sexes are present in a single leech (hermaphrodite; *q.v.*). For detailed information on anatomy, physiology and classification of leeches *see* ANNELIDA: *Class Hirudinea.*

Aquatic Leeches.—Marine species abound in all seas as external parasites of fishes, turtles and crustaceans. They are tenacious hangers-on, rarely leaving their hosts.

The majority of aquatic leeches are the gray-brown or olive suckers (though some have colourful markings) that are found in fresh-water lakes, ponds and muddy swimming holes throughout temperate areas to a height of 12,000 ft. (Lake Titicaca). These are chiefly free agents ahich attach themselves to hosts only long enough to fill the crop-stomach with blood (facultative parasitism). The medicinal leech, stock in trade of the medieval physician, is one of these types (see *Importance,* below).

Typical of the fresh-water leeches of the family Hirudidae are those belonging to the genus *Macrobdella.* They live in shallow, still waters attached to plants and to the undersides of stones and logs, often a little above the water line. These are the pests that are attracted to bathing beaches and floats by the disturbance of the water and by chemical sense. Since their bite is painless, they often attach themselves to a bather, fill with blood and drop off unnoticed. After being well-nourished by full meals taken in the spring. the leeches become sexually mature; since they are hermaphroditic, copulation leads to mutual impregnation. The fertilized eggs are deposited in a mass of thick foam secreted by an anterior band (clitellum). This foamy mass, forming a complete girdle about the leech, soon becomes stiff enough for the leech to slip out. The egg cocoon thus formed is an ellipsoidal capsule with firm, somewhat horny walls and an internal chamber containing the eggs in a nutritive albumen. The cocoon is either buried in the soil or placed under a stone or log at the water's edge. Other leeches *(Erpobdella,* etc.) deposit their eggs in blister-shaped capsules attached to plants. stones. etc.

Some related leeches such as *Philobdella* leave the water regularly to feed on earthworms and, in spring, to gorge on frogs'

eggs. Another group (*Haemopis*), ill-adapted for bloodsucking, feed mainly on earthworms, insect larvae and other small animals and sometimes even on the organic ooze on the pond floor.

Proboscis leeches, which rarely swim but travel on solid surfaces with a looping motion, are mostly small, flat forms which are external facultative parasites on fresh-water salamanders. frogs and turtles. Many attack and feed on snails. They do copulate but accomplish insemination by attaching bundles of mature spermatozoa (spermatophores) to the backs of their mates, and receiving similar packets (hypodermic implantation). The active sperm eventually penetrate the body tissue and reach the egg sac. The fertilized eggs are then usually attached to the ventral surface of the parent and are carried about until they hatch, the young remaining near the parents until they are able to fare for themselves. The best known are the rather large, leaf-shaped Placobdella *picta* and P. rugosa, often found in large numbers clinging to the soft skin at the base of the legs of snapping turtles. These leeches often bear as many as 200 actively squirming young, which the parent protects by bending over the thin edges of its body. An African species has a permanent internal brood sac.

Another group of common fresh-water leeches, the worm leeches. Erpobdellidae. active, long, slender types that occur in large numbers at the borders of ponds or creek pools. Only at night do they become active swimmers or crawlers in search of small worms, other leeches, insect larvae, etc. Having no jaws or "teeth," they cannot bite but will attach to freshly bleeding cuts and bruises, and they may gather on freshly killed and bleeding animals.

Land Leeches.—The predaceous land leeches, distinguished from the true land leeches, are most numerous in South America, where they feed largely on earthworms. The true sanguivorous land leeches—those completely unable to swim—Haemadipsa and related genera, are widely distributed in tropical Asia and the islands of the Pacific and Indian oceans. These bloodsuckers are among the most feared of all leeches: although they usually drop off the host after a feeding, they may enter the air passages, and sometimes even the sinuses, from which they cannot escape once they have fed and become distended with blood.

In the rain forests of India and Ceylon are found voracious land leeches, especially along trails and about cattle yards, on the ground, and in bushes and trees. These bloodthirsty types are easily aroused, and they congregate quickly to attack any passing man or beast. Prey is detected by a combination of odour. light, temperature and mechanical sensations, of which the first is probably the most important. The bites of all except the brightly coloured "stinging leeches" are painless; however, there are many cases recorded of persons injured or lost in the jungle lying helpless while myriads of leeches drained their blood.

Importance.—In human relations leeches are both useful and harmful. Early in the 19th century, when phlebotomy was most widely practised, many millions of the medicinal leech, Hirudo medicinalis, largely raised on leech farms, were used in Europe and America. Beneficently, the practice of bleeding with leeches has almost ceased, and only a few leeches find use in minor operations, and those mostly in the orient. Hirudin, an anticoagulant extracted from leech salivary glands, has been used to prevent blood clotting during surgical operations; in modern medicine, however, it has been supplanted by other anticoagulants. In the northern U.S. leeches are thought to be of considerable aid in the control of the snail population in lakes and ponds, thus indirectly lowering the incidence of swimmers' itch, a dermatitis caused by certain larval stages of some snails. Leeches are also excellent fish bait, especially for yellow perch and lake trout. The more colourful varieties of the medicinal leech had unusual patterns, many of which were copied into textile designs by early 19th century weavers.

As harmful agents, sanguivorous leeches affect both men and domestic and game animals. In many cases they are merely annoying and, to some persons, loathsome pests, and the slight trifid cuts they leave usually heal quickly. But in the old world tropics leeches are still a serious problem. The young of the horse leech, *Limnatis nilotica*, live in springs and wells and may enter the mouth or nostrils of any drinker, crawl into the air or food passages, grow rapidly and cause bleeding and obstruction, sometimes even the death of the host. In India the cattle leech, Dinobdella ferox, has similar habits and is responsible for the death of many domestic animals.

No leeches are poisonous nor are any definitely known to be intermediate hosts of human parasites, but their habits make them potential carriers of infective agents. There is evidence that the common buffalo leech, Hirudinaria *manillensis*, may transmit the rinderpest of cattle in the Philippines, and other leeches are known to be the hosts of parasites such as trypanosomes of fishes, salamanders and turtles. Species of Theromyzon attack both wild and domestic ducks and geese, and these and Glossiphonia *complanata* are commonly present in the air passages of wild ducks dying of botulism. The externally parasitic leeches mentioned earlier also cause heavy mortality among fishes.

Control.—Little has been done to control leeches. In areas infested with land leeches, fires and various repellants have been partially effective as deterrents. Land and fresh-water leeches are sensitive to common salt, lime and other water-absorbent substances; these compounds thrown into water around bathing beaches or floats will dispel them. Leeches inhabiting lakes controlled by dams may be killed by freezing: before the leeches have gone into winter quarters, and when a sudden drop of temperature is imminent, the water level may be rapidly lowered, leaving the bloodsuckers exposed to severe cold.

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LEEDS, THOMAS OSBORNE, 1ST DUKE OF (1632–1712), English statesman. was born on Feb. 20, 1632. and succeeded his father, Sir Edward, as and baronet, on Sept. 9, 1647. Too young to take any part in the Great Rebellion, in which his father was prominent on the royalist side, he spent most of his youth and early manhood on the family estates at Kiveton and Thorpe Salvin. Yorkshire, and in spite of a short period of travel in France and Italy received little training for the active political life he was later going to pursue. On May 1, 1653, he confirmed his political outlook and greatly improved his material prospects by marrying Bridget, daughter of the royalist leader Montague Bertie, 2nd earl of Lindsey, and granddaughter of Robert, the 1st earl. who had commanded the royalist forces and had been slain at Edgehill.

His actual introduction to politics, however, did not take place until the Restoration, and was mainly due to the influence of George Villiers, 2nd duke of Buckingham, to whom, like many other young Yorkshiremen, he attached himself. Appointed successively deputy lieutenant, colonel of a foot regiment of militia and justice of the peace in the West Riding, he was in Nov. 1661 advanced to be high sheriff of Yorkshire for the ensuing year, and on Jan. 16, 1665, was returned to parliament at a by-election for York city. There he continued his support of Buckingham, taking a leading part in the attack on Lord Chancellor Clarendon, the duke of Ormonde and their associates, and sharing in the spoils when these statesmen were dismissed from office. On Nov. j, 1668, he was appointed joint treasurer, and on Sept. 20, 1671, sole treasurer, of the navy; on May 3, 1672, he was admitted to the privy council; on Feb. 2, 1673, he was raised to the Scottish peerage as Viscount Osborne of Dunblane; and on June 19 of the same year he was created lord high treasurer of England.

Meanwhile his attitude to Buckingham had been gradually changing. He had accepted Buckingham as leader of the younger generation against Clarendon and the elderly men who monopolized office after 1660; but he had no real objection to Clarendon's geaeral policy and as Buckingham deviated further and further from that policy, supporting toleration of dissenters, alliance with France and war with the Dutch, he became increasingly doubtful of the value of any association with him. His appointment as treasurer encouraged him to develop a policy of his own, and his success in that office enabled him to do so with effect. He was not a great financier, but he had a clear head, invincible determination and

a self-confidence which gained him an unusual degree of influence with the king. Within a few months oi his elevation he had so far improved the financial position of the government as to be rewarded on Aug. 1S, 1673, with the English titles of Baron Osborne of Kiveton and Viscount Latimer, and on June 27, 1674. with the further title of earl of Danby, by which he is most generally known. On Feb. 12, 1674, he took Buckingham's place as lord lieutenant of the West Riding and shortly afterward friendly relations between them were broken off altogether.

Danby's policy, as it unfolded itself during the years 1675–78, was one of steady support for the Cavalier and Anglican interest at home and of uncompromising hostility to France abroad. In the domestic aspect of that policy he was on the whole successiul, discountenancing Catholicism and dissent alike, and, in spite of the failure of his nonresisting test bill, maintaining the authority of the king and the stability of the existing regime. His success was marked by the award of the Garter on April 19, 1677; and on Sept. 19, 1678, he reached the seeming height of his power and iavour with the marriage pi his third daughter, Bridget, to one of the king's illegitimate children, Charles Fitzcharles, earl of Plymouth. But in foreign affairs, with which his acquaintance at best was superficial, he was less fortunate. Parliament's early confidence in the king had been shattered by the policy embodied in the secret treaty of Dover, and it refused to grant the supplies necessary for a real breach with France until it was convinced that such a breach mas seriously intended, while the king declined to renounce the subsidies he had for some time been drawing from France until he was confident of parliamentary support instead.

Danby's solution of the problem thus presented was to reassure parliament by engineering a marriage between Princess Mary, elder daughter of the duke of York, and William of Orange, the chiei opponent of France on the continent, while at the same time conniving, though with the greatest reluctance, at the king's secret negotiations with France; but the almost inevitable result mas his own downfall. During the excitement roused by the discovery of the so-called Popish plot the former English ambassador at Paris, Ralph Montagu, revealed to the house oi commons that while raising money on the pretext of a coming war with France Danby had also negotiated for a subsidy from France in the event of peace being declared; his plea that he had done so only by the king's command was brushed aside and he was immediately impeached. To save himself and protect the king, who was anxious to avoid inconvenient inquiries, he came to terms with the opposition leaders, promising a dissolution of the Cavalier parliament and a general election in return for the dropping of the prosecution; but the new parliament, when elected, proved even more bitter against him than its predecessor had been, and could not be induced to observe the agreement. 'On April 16, 1679, he was committed to the Tower, to remain there untried until his release, Feb. 12, 1684.

For the last year of the reign of Charles and the greater part of the reign of James, Danby remained in retirement. James would willingly have restored him to office had Danby been prepared to support the repeal of the Test and Habeas Corpus acts, but this he declined to do and as the policy of the king advanced from one extreme to another his attitude to the government became more and more hostile. He took an active part in the conspiracy which led to the Revolution, was one of the seven signatories of the famous invitation to William of Orange, raised the north of England in support of William after his landing, and in the Convention of 1689 was instrumental in securing the throne jointly for William and Mary. On Feb. 14, 1689, he was appointed lord president of the council; on March 12 he was restored to his old post of lord lieutenant of the West Riding; on April 20 he was created marquess of Carmarthen; and by the spring of 1690 he had practically re-established himself as chief minister of the crown.

His second period of power, however, differed from his first in that he had no longer any important department of state under his own control and had to depend for the maintenance of his position almost entirely on the skill in party organization and parliamentary management which he had developed and employed with great success under Charles II. For four years he contrived to maintain an uneasy balance among the contending iactions at William's court, endeavouring on the whole to enlist the moderate men of all parties in support of the Revolution settlement. In recognition of his services he was given his final step in the peerage and created duke of Leeds on May 4, 1694. But he had many enemies on both sides and in the following year these were able to carry an impeachment against him for corruption in connection with the affairs of the East India company. No trial followed; but there was little doubt of the substantial justice of the charge and his influence thereafter greatly declined. In 1699. as a result of a reconstruction of the ministry. he mas deprived oi all his offices and although he recovered iavour under Anne, and even entertained some hope of a real restoration to power after the Tory triumph of 1710, he never again filled any important post. He died at Easton Neston, Northamptonshire, on July 26, 1712.

Leeds was a clear and effective but not a prolific writer, and published little beyond some pamphlets in his own defense. He was, however, methodical in dealing with his correspondence and other papers, the bulk oi which have survived and found their way by devious routes to the British Museum. While in the hands of different owners, sections of these papers mere examined by the royal commission on historical manuscripts, and have been partially printed or calendared in its *Reports*—*9th* report, app. ii (Morrison mss.); 11th report, app. vii (Leeds rnss.); 14th report, app. ix (Lindsey mss.); 15th report, app. ii (Hodgkin rnss.); and the *Supplementary Report on the Lindsey Mss.* Toward the close of his life, when he was hoping for a restoration to high office, Leeds gathered together some of the most important of his pamphlets and other papers in *Memoirs Rrlating to the Impeachment of Thomas Earl of Danby (now Duke of Leeds) in the year 1678* (1710), and edited, with many errors and omissions, *Copies and Extracts of some Letters written to and from the Earl of Danby (now Duke of Leeds) in the years 1676, 1677 and 1678, with particular Remarks upon some of them* (1710). A more accurate and complete version of the latter publication is included in the second volume of Andrew Browning's *Thomas Osborne, Earl of Danby and Duke of Leeds* (3 vol., Glasgom, 1944–51), the first full account of the duke's life. (A. Bc.)

LEEDS, a city and county borough in the West Riding of Yorkshire, Eng., 24 mi. S.W. of York by road. Pop. (1961) 510,597. Leeds lies almost at the centre of the West Riding. on the river Aire above the marshy lowland which is liable to flooding in winter. It early became a local market centre, attracting routes from all directions. To the northwest the Aire valley leads to the Craven gaps in the Pennine highland—the lowest ways through the Pennines in the whole length from Tyne to Trent. Southwest of Leeds lie the shortest ways through the highland, for there the Pennines are at their narrowest. Both road and rail routes have taken advantage of these physical conditions, with the result that Leeds has become an important nodal town occupying a central railway position with two principal railway stations. It also connects with Liverpool by the Leeds-Liverpool canal and with Goole and the Humber by the Aire and Calder navigation. It is the centre of a coal and iron district and is regarded as the capital of the great manufacturing district of the West Riding, clothing being its staple industry. East and north the country is agricultural; west and south lie the manufacturing towns of the woolen area.

History.—Leeds belonged to the kingdom or principality of Elmete, and was ruled by British chieftains until Edwin conquered Northumbria in the 7th century. At the time of the Norman conquest the township consisted of seven estates, each held by a thane, but by 1086 these had been united into a single manorial estate. Throughout the middle ages it retained its rural character long after it became commercially important. In 1207, the lord of the manor, Maurice Paganel, granted a charter to the inhabitants and in 1626 it was created a municipal borough by Charles I. The object of the charter was the regulation and protection of the woollen trade by local authority. During the Commonwealth, Leeds gained, temporarily, parliamentary representation, and a new charter was issued in 1661, giving Leeds its first mayor. This was superseded in 1684 by a charter which placed the corporation under the absolute power of the crown in certain contingencies, but the charter of 1661 was restored by William III and this still forms the basis oi municipal constitution. The town became a county borough in 1889 and a city in 1893. The title of lord mayor was conierred on the chief magistrate in 1897. In 1918 the borough mas divided into six constituencies; the number was increased to seven in 1948 and reduced to six in 1955.

The original city of Leeds contained no historical buildings. The Cistercian abbey of Kirkstall, founded in 1152 by Henry de Lacy, was presented to Leeds in 1889, and the 12th-century parish church of Adel is also included within the city boundary. The corporation also acquired the Tudor-Jacobean mansion and park (93j ac.) of Temple Newsam, once the property of the Knights Templars and the birthplace of Lord Darnley, in 1922. New municipal offices, called the civic hall, were opened by King George V in 1933. There were 3.987 ac. of open spaces in the borough in 1956 apart from common lands.

Industries.—Leeds lies in the "soft water" area oi the Pennines and this was a factor in the introduction of woollen manufacture in the 14th century. The industry became established in the Aire and Calder valleys, but it was not until the middle of the 16th century that Leeds was able to challenge the supremacy of York and Beverley. Even in the 17th century, cloth was made in the neiphbouring villages to the east and was only finished and sold in the town. With the industrial revolution the woollen industry of Leeds yielded pride of place to engineering and in the 18th and 19th centuries the city was concerned mainly with industrial and agricultural equipment, and transport services; parts for seaplanes and aeroplanes are produced at Leeds for assembly at Brough. During the second hali of the 19th century engineering was displaced by the wholesale clothing industry, which was really an outgrowth of the woollen and worsted manufactures. It was introduced in 1855 and is now the largest single industry in the town. About one-third of the ready-made clothes are exported. A later development was the establishment in Leeds of the Research Association for Woollen and Worsted Industries (incorporated 1918). During the second hali of the 18th century, Leeds was iamed for its pottery, but the industry lapsed in the 19th century and the

potteries closed down in 1878. The linen trade arrived in 1788 and was soon prosperous but because of competition with Belfast and Dundee the mills were closed. Only two or three firms remain. Today, the most important industries besides wholesale clothing are engineering, woollen and worsted manufactures, printing, coal mining, leather industries and furniture trades. Leeds has a reputation ior colour printing and some of the most complicated and efficient printing machinery is produced.

The development of transport has been an important factor in the concentration of industries. In 1659 the Aire was made navigable to Leeds, and in 1760 was linked with the Calder, forming the Aire and Calder navigation. The Leeds and Liverpool canal was begun in 1770, but was not completed until 1816. By 1848 Leeds was connected by rail with all important neighbouring towns.

Education.—The University oi Leeds originated with the foundation of the medical school in 1831. In 1874, the Yorkshire College of Science was established to supply instruction in the arts and sciences which are applicable to the manufactures, engineering. mining and agriculture of the county. In 1884, the college was amalgamated with the medical school and in 1887 it became one of the constituent colleges of Victoria university, and so remained until its separate incorporation in 1904. In 1928 the foundation stone was laid of an extensive scheme of new buildings to meet growing requirements. Other educational establishments include a grammar school (founded in 1552), .technical colleges, a Wesleyan Methodist theological college and the lecture hall and museum iormerly owned by the Leeds Philosophical and Literary society and later acquired by the corporation. Besides many public libraries the city has a civic theatre, opened in 1949. In the mid 1950s there were eight evening institutes, and colleges of art, commerce and housecraft and a teachers' training college in addition to primary and secondary schools.

Leeds is the seat of a Roman Catholic bishop with a procathedral dedicated to St. Anne.

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LEEK, a market town and urban district in the Leek parliamentary division of Staffordshire. Eng., 24 mi, N. of Stafford by road. Pop. (1951) 19.356. Area 6.7 sq.mi. It lies near the river, Churnet, 640 ft. high in the southwestern Pennines, with the parish church of St. Edward the Confessor at its highest point. The Nicholson institute contains the public library, arts centre and museum. About 1½ mi. N. of Leek are ruins of the Cistercian abbey of Dieulacresse, erected in 1214 by Ralph. earl of Chester. It was he who gave to Leek a charter in which it is called a borough.

Before the Dissolution Leek was an estate of Dieulacresse abbey and was later garrisoned for parliament during the civil war. Prisoners of the Napoleonic wars were housed in a group of cottages known today as Petty France. In 1842 Leek townsmen demonstrated for the Chartist movement. The chief manufactures are sewing silks and textiles.

LEEK, a vigorous, hardy biennial related to the onion, belonging to the family Liliaceae. In the first season of growth leaves arise from a compressed stem or stem plate; the thick leaf bases overlap and are arranged concentrically in a nearly cylindrical bulb. The leaf blades are long, linear, solid and keeled. The base of the bulb is little if any larger than the neck. Profuse, fibrous, shallow roots grow in a tuft from the base of the stem plate. In the second season a tall solid stalk arises, bearing leaves and a large, globular, simple, terminal umbel with very numerous, regular, perfect flowers. The seeds are small, black, irregular and somewhat angular. The thick, blanched, succulent cylinder of leaf bases (the bulb) is used in the same way as green onions; the leaves may be used for flavouring.

Leek (*Alium* porrum) is native to lands of the eastern Mediterranean and near east where it was commonly cultivated and eaten in ancient times. It has been a common vegetable all over Europe and the British Isles for as long as there are records of food plants there. The Romans probably distributed it over much of Europe and introduced it to the British Isles. It is still commonly grown in all those lands but is little grown in America. The leek is the national badge of the Welsh who wear it in their hats on St. David's day.

In regions of mild winters leek seed can be sown during autumn or winter for spring harvest; in colder regions it is sown one to two months before the average date of the last spring frost. Seeds are sown shallowly in a rich, friable soil in rows about 15 in. apart for hand culture, and up to 30 in. apart for machine culture. Plants should stand two to three inches apart in the row. As the plants develop, soil is ridged up to them to blanch the leaf bases. High ridging in warm weather may induce decay.

The plants may be harvested either before or after autumn frosts and mild freezing, but must be protected from hard freezing. After removal from the soil they must be used rather promptly, just as green onions must be. They cannot be stored for long periods because of severe wilting and susceptibility to spoilage organisms. (V. R. B.)

LEE OF FAREHAM, ARTHUR HAMILTON LEE, 1ST VISCOUNT, cr. 1922 (1868–1947), British politician, was born at Bridport, Dorsetshire on Nov. 8, 1868. Educated at Cheltenham and Woolwich, he entered the royal artillery in 1888, retiring with the rank of brevet-major in 1900. From 1893 until 1900 he was professor of strategy and tactics at the Royal Military College in Canada, during which period he organized the military survey of the frontier. In 1900 he entered the House of Commons as Conservative member for the Fareham division of Hampshire, which he represented for 18 years. He was civil lord of the admiralty from Oct. 1903 until the resignation of the Balfour ministry in 1905. In 1912 he carried through parliament an act aimed at the white slave traffic. On the outbreak of World War I he rejoined the army, and served as a colonel on the staff. In 191j–16 he was personal military secretary to the secretary for war (Lloyd George) and in 1917–18 director general of food supplies. He was created baron in 1918, and was sworn of the privy council in 1919. He joined Lloyd George's administration in 1919, first as minister of agriculture and then as first lord of the admiralty (Feb. 1921–Nov. 1922). He was a member of the Imperial cabinet in 1921, a delegate to the Washington Conference, Nov. 1921–Feb. 1922; and in 1923–24 chairman of the royal commission on the public services of India, for which he was created G.C.S.I. in 1925. In 1921 he presented to the nation, as a residence for the prime minister, the house and estate of Chequers. He was created G.C.B. in 1929. He died July 21, 1947.

LEER, a town and river port in Lower Saxony, Germany, on the right bank of the Leda near its confluence with the Ems, and at the junction of railways to Bremen, Emden and Munster. Pop. (1950) 20,643. Leer is a very old place, although it obtained municipal privileges only in 1823. Woollen fabrics, cigars, soap and earthenware are manufactured, and there are iron-foundries, distilleries and shipbuilding yards.

LEEUWARDEN, the capital of the province of Friesland, Netherlands, on the canal between Harlingen and Groningen, 33 mi. by rail W. of Groningen; the seat of a superior court and a court of common appeals. Pop. (1957 est.) 81,458 (mun.). Leeuwarden grew up round the court of the Frisian stadtholders; and it is a very clean town. The Prince's Garden, laid out by William Frederick of Nassau in 1648, was given to the town by King William I in 1819. The royal palace, seat of the Frisian court from 1603 to 1747, is now the residence of the royal commissioner for Friesland. The Kanselary was begun in 1502 as a residence for the chancellor of George of Saxony (1539), governor of Friesland, but was only completed in 1571 and served as a court house until 1811. It was restored at the end of the 19th century to contain the provincial library and national archives.

Other noteworthy buildings are the weigh-house (1595), the town hall (1715), and the great church of St. Jacob, once the church of the Jacobins, and the largest monastic church in the Netherlands. The unfinished tower of Oldehove dates from 1529–32. The museum of the Frisian Society contains a collection of provincial antiquities, including two rooms from Hindeloopen, an ancient village of Friesland, some Frisian works in silver of the 17th and 18th centuries, and a collection of porcelain and faience.

Leeuwarden is easily accessible from all parts of the province by road. rail and canal. The chief business is in stock of every

kind, dairy and agricultural produce and freshwater fish, a large quantity of which is exported. The industries include boatbuilding and timber yards, iron foundries, copper and lead works, furniture, organ, tobacco and other factories, and the manufacture of gold and silver wares. The town is first mentioned in documents of the 13th century.

LEEUWENHOEK (LEUWENHOEK), **ANTON VAN** (1632–1723), Dutch microscopist, was born at Delft on Oct. 24, 1632, and died there on Aug. 26, 1723. For a time he was in a merchant's office in Amsterdam, but soon turned to the manufacture of microscopes and to the study of the minute structure of organized bodies by their aid.

Leeuwenhoek found that single lenses of very short focus mere preferable to the compound microscopes then in use, and though his researches were not conducted on any definite scientific plan. his powers of careful observation enabled him to make many interesting discoveries. He extended M. Malpighi's demonstration of the blood capillaries in 1668, and six years later gave the first accurate description of the red blood corpuscles.

In 1677 he described and illustrated the spermatozoa in dogs and other animals, though in this discovery Stephen Hamm had anticipated him by a few months; and he investigated the structures of the teeth. crystalline lens, muscle, etc. In 1680 he noticed that yeast consists of minute globular particles. and he described the different structure of the stem in monocotyledonous and dicotyledonous plants. His discoveries were for the most part made public in the *Philosophical Transactions* of the Royal society, of which he was elected a fellow in 1680. The first representation of bacteria is to be found in a drawing by Leeuwenhoek in that publication in 1683.

His researches on the life histories of various low forms of animal life were in opposition to the doctrine that they could be produced spontaneously, or bred from corruption. Thus he showed that the weevils of granaries, in his time commonly supposed to be bred from wheat as well as in it, are really grubs hatched from eggs deposited by winged insects. His chapter on the flea, in which he not only described its structure but traced out the whole history of its metamorphoses. beginning with its first emergence from the egg, is of great interest. not so much for the exactness of his observations as for the incidental revelation of the extraordinary ignorance then prevalent in regard to the origin and propagation of "this minute and despised creature." Some asserted that the flea was produced from sand, others from dust, etc., but Leeuwenhoek showed it to be "endowed with as great perfection in its kind as any large animal," and proved that it bred in the regular way of winged insects.

Leeuwenhoek also carefully studied the history of the ant and was the first to show that what had been commonly reputed to be ant's eggs were really their pupae, containing the perfect insect nearly ready for emersion, and that the true eggs were much smaller and gave origin to maggots or larvae. He argued that the sea mussel and other shellfish were not generated out of sand found at the seashore or mud in the beds of rivers at low water, but from spawn, by the regular course of generation. He maintained the same to be true of the fresh-water mussel, nhose ova he examined so carefully that he saw the rotation of the embryo, a phenomenon supposed to have been first discovered long afterward. In the same spirit he investigated the generation of eels, which were at that time supposed to be produced from dew nithout the ordinary process of generation.

"We can now easily conceive," Leeuwenhoek remarked in connection with his observations on Rotifera, "that in all rain water which is collected from gutters in cisterns, and in all waters exposed to the air, animalcules may be found; for they may be carried thither by the particles of dust blown about by the winds."

Leeuwenhoek's contributions to the *Philosophical Transactions* amounted to 375, and those to the *Memoirs of the Paris Academy of Sciences* to 27. Two collections of his works appeared during his life, one in Dutch (1685–1718), and the other in Latin (1715–22); a selection was translated by S. Hoole (1798).

See C. Dobell, ***Antcny van Leeuwenhoek and His Little Animals*** (1932); ***B.*** Cohen, "On Leeuwenhoek's Method of Seeing Bacteria," ***J. Bact.,*** 34:343 (1937) and ***The Leeuwenhoek Letters*** (1937).

LEEWARD ISLANDS, a group in the West Indies. They take their name from their position farther down the trade wind than the adjacent Windward Islands. The most northerly of the Lesser Antilles, they form a curved chain stretching southwest between Puerto Rico and Martinique. They comprise the British Leeward Islands colony and Dominica (from 1940 a separate colony within the Windward Islands colony); the U.S. Virgin Islands territory; the French overseas *département* of Guadeloupe with its dependencies of Marie Galante, Désirade, Les Saintes, St. Bartholomew (St. Barthélemy) and the northern part of St. Martin; and the Netherlands Antilles territories of St. Eustatius. Saba and the southern part of St. Martin. The Leeward Islands (pop., 1960 census. 130,875) consists of four colonies: Antigua (*q.v.;* with Barbuda and Redonda); St. Christopher-Nevis-Anguilla; Montserrat (*q.v.*); and the British Virgin Islands (*see* ST. KITTS: VIRGIN ISLANDS). The lighthouse island of Sombrero, 30 mi. N.W. of Anguilla, became part of the colony in 1904 and is now attached to St. Christopher-Nevis. The seat of the colony's governor and executive and general legislative councils is at St. John's, Antigua. In 1940 the judiciary of the Leewards and Windwards was unified. In 1958 Antigua. St. Christopher-Nevis-Anguilla and Montserrat became members of the West Indies federation.

Leeward Islands is the alternative name of: (1) the fles sous le Vent in the French Pacific islands; and (2) the Lava Rock Islets, the 1,250-mi.-long western chain of the Hawaiian Islands which includes the Midway Islands (*q.v.*).

LE FANU, JOSEPH SHERIDAN (1814–73), Irish journalist and author, was born of an old Huguenot family at Dublin, Aug. 28. 1814. He entered Trinity college, Dublin. in 1833. He was actively engaged in Irish journalism, both as editor and proprietor, 1839–58. In 1858 his wife died, and from that time he lived in retirement. He died in Dublin on Feb. 7, 1873 His best-known works are *The House by the Churchyard* (1863), *Uncle Silas, a Tale of Bartram Haugh* (1864) and *In a Glass Darkly* (1872). *The Purcell Papers,* Irish stories dating from his college days, were edited with a memoir of the author by A. P. Graves in 1880.

LEFEBVRE, PIERRE FRANÇOIS JOSEPH (1755–1820), DUC DE DANTZICK from 1808, marshal of France, was born at Rouffach in Alsace on Oct. 20, 1755.

He led the van division under J. B. Jourdan in 1794 at Fleurus and from 1795 on the Rhine. A wound at Stockach (March 1799) led to his being given command of the troops in Paris (August). This was a key position on 18 Brumaire, and his support of Napoleon was magnificently rewarded: senator marshal in 1804, commander of the imperial guard in 1806 and duke of Dantzick (he had been detached in 1807, mainly with Germans and Poles, to capture Danzig) in 1808. the first of h'apoleon's dukes. He failed in his corps command in Spain (Dec. 1808) but led the Bavarians efficiently in 1809 at Eckmiihl and against the Tirolese. He was nith the guard again in Russia; he lost his only son and was so exhausted that he could not serve in 1813; but he gallantly accompanied the emperor in the campaign of 1814. Louis XVIII made him a peer of France. He died at Paris on Sept. 14, 1820.

(I. D. E.)

LEFEBVRE, TANNEGUY, or TANAQUILLUS FABER (1615–1672), French classical scholar, a-as born at Caen in 1615 and died at Saumur on Sept. 12. 1672. For nearly 20 years he was professor at Saumur. His daughter Anne became the famous Madame Dacier. In spite of eccentricities he was a highly cultivated man and a thorough classical scholar. He brought out editions of Greek and Latin authors, including Longinus. Anacreon and Sappho. Dionysius Periegetes. Agathemerus, Apollodorus and Aelian; and Virgil, Horace. Lucretius. Terence, Florus, Phaedrus and Eutropius and Aurelius Victor. His most important original works are: *Les Vies des poètes grecs* (1665); *Méthode pour commencer les humanités grecques et latines* (new ed., 1731), of which several English adaptations have appeared; and *Epistolae* (1659–65; 1674).

See F. Graverol, *Mémoires* ***pour la vie de Tanaquil Lefèvre*** (1686); ***and*** the article ***sub*** *nomine* in ***Nouvelle biographie générale*** (1859).

LEFT-HANDEDNESS: *see* HANDEDNESS.

LEG, the general name for those limbs in animals that support and move the body; in man, the lower limbs. Specifically, the lower limb of man is subdivided into the thigh, from the pelvis to the knee; the leg, from the knee to the ankle; and the foot. *See* MUSCLE AND MUSCULAR SYSTEM; SKELETON, VERTEBRATE.

LEGACY, in common law, some particular bequest given or left by a testator in his will. The word is primarily applicable to gifts of personalty or gifts charged upon real estate. Legacies may be either specific, general or demonstrative. A specific legacy is "something which a testator, identifying it by a sufficient description and manifesting an intention that it should be enjoyed in the state and condition indicated by that description, separates in favour of a particular legatee from the general mass of his personal estate"; *e.g.,* a gift of "my portrait by X," naming the artist. A general legacy is a gift not so distinguished from the general mass of the personal estate; *e.g.,* a gift of £100 or of a gold ring. A demonstrative legacy partakes of the nature of both the preceding kinds of legacies; *e.g.,* a gift of £100 payable out of a named fund is a specific legacy so far as the fund named is available to pay the legacy; after the fund is exhausted the balance of the legacy is a general legacy and recourse must be had to the general estate to satisfy such balance. Sometimes a testator bequeaths two or more legacies to the same person; in such a case it is a question whether the later legacies are in substitution for, or in addition to, the earlier ones. In the latter case they are known as cumulative.

If the estate of the testator is insufficient to satisfy all the legacies these must abate, *i.e.,* be reduced rateably; as to this it should be noticed that specific and demonstrative legacies have a prior claim to be paid in full out of the specific fund before general legacies, and that general legacies abate rateably *inter se* in the absence of any provision to the contrary by the testator.

As a general rule, legacies given to persons who predecease the testator do not take effect; they are said to lapse; but by the Wills act, 1837, gifts to a child or other issue of the testator will not lapse if any issue of the legatee survive the testator.

In the absence of any indication to the contrary a legacy becomes due on the day of the death of the testator, though for the convenience of the executor it is not payable till a year after that date. It frequently happens, however, that a legacy is given payable at a future date; in such a case, if the legatee dies after the testator but prior to the date when the legacy is payable it is necessary to discover whether the legacy was vested or contingent, as in the former case it becomes payable to the legatee's representative; in the latter, it lapses.

In this, as in other cases, the test is the intention of the testator as expressed in the will; generally it may be said that a gift "payable" or "to be paid" at a certain fixed time confers a vested interest on the legatee, while a gift to A "at" a fixed time, *e.g.,* 21 years of age, only confers on **A** an interest contingent on his attaining the age of 21.

United States.—The common-law doctrines applicable to the nature of legacies and the order in which they are to be paid are generally in force in the United States. Courts are averse from construing legacies to be specific unless it is clear that the testator so intended.

Statutes have commonly modified the rigid common-law rule that a legacy lapsed by the death of the legatee during the lifetime of the testator and the share of the estate thus bequeathed went to the residuary legatee or those next of kin of the testator who were entitled to take under the intestate laws. They usually provide that the benefit of a lapsed legacy shall descend to the issue of the legatee, but commonly limit this rule to legatees who are descendants of the testator or the close collaterals. Such legislation is based upon the theory that it approximates more closely to the testator's intention than the common-law doctrine.

Legislation has also enabled legatees more readily to bring suit for their legacies.

LEGACY DUTY AND SUCCESSION DUTY. In the British fiscal system the "acquisition duties" of legacy duty and succession duty were levied on gratuitous acquisitions of property on the occasion of death. The amount of the tax was a percentage of the value of the acquisition; determined by the degree of relationship (if any) between the beneficiary and the benefactor. The two duties were complementary; they were not both exigible on the same property on the same death. They had a long history; legacy duty lasted from 1780 to 1949 and succession duty from 1853 to 1949. By the Finance act, 1949, both were abolished and neither is exigible in connection with any death occurring after July 29, 1949. (*See* ESTATE AND INHERITANCE TAXES.)

LEGAL AID is a phrase which has acquired by usage and court decision the specific meaning of giving to persons of limited means gratis or for nominal fees legal advice, or counsel to represent them in court in civil and criminal matters.

UNITED STATES

Organized legal aid work in the United States began in 1876 when a group of citizens of German origin in New York city formed an office intended chiefly to assist German immigrants in the protection of their legal rights. By the time this organization had broadened the scope of its activities to serve all members of the community unable to pay lawyers' fees, a similar service was organized in 1886 in Chicago which undertook to give legal assistance to all persons without means regardless of nationality, race or sex. From that time forward, the movement to establish legal aid offices in the larger cities gradually expanded; and by 1916 there were 41 organizations providing service in 37 cities.

The continuing rise in population and its concentration in urban centres accentuated the need for legal aid service. Moreover, a steady and significant growth in the number and complexity of laws which go beyond affairs of business and deal with the everyday relationships of individual citizens contributed to a more widespread need for expert legal counseling among persons of small means.

As a result, by 1952, there were 123 legal aid offices and 53 volunteer legal aid committees of bar associations providing service in civil cases. In addition, there were 38 defender offices providing the services of lawyers to indigent persons accused of crime. In 1951 these organizations handled 350,000 cases at a cost just under $2,000,000. From the beginning of the movement to 1952, legal aid organizations handled 6,767,800 civil cases and 1,503,700 criminal cases at a total gross operating cost of $24,428,000.

A further means of providing the service is afforded by law school clinics of which there are two basic types: (1) those operated by or directly affiliated with a law school and providing direct services to clients; and (2) those which are conducted as a co-operative activity by the school and a separately established legal aid office. In either case, selected students under the supervision of a faculty or staff lawyer render as much of the service as their training qualifies them for. There are 11 clinics of the first type and more than 20 of the second, each varying considerably in the degree to which the experience is made an integrated part of the educational process.

Despite this accelerating expansion, there remained a substantial need to extend and strengthen the service for both civil and criminal cases in the United States. Legal aid embraces both assistance in court and such out-of-court services as advice, negotiation, drafting legal documents and settling disputes without litigation. It is carried on, for the most part, by charitable societies which obtain their major support from community chests and other private sources. In some cities, it is provided by a public bureau or by a bar association. For the country as a whole, the support of legal aid in civil matters in the early 1950s came 60% from community chests, 9.5% from tax funds, 8.5% from clients and 14% from other contributed funds.

A comprehensive study of the availability of lawyers' services for persons unable to pay fees was completed in 1951 as a part of a survey of the legal profession sponsored by the American Bar association. This study revealed an average use of established legal aid facilities in civil matters of approximately 7½ cases per 1,000 of population and a substantially higher actual and potential need.

It also disclosed an inadequate system in a number of states for assigning counsel to poor persons charged with criminal offenses. The extent of the unmet need having thus been assayed, the American Bar association and a growing number of state and local bar associations accepted increasing responsibility for providing the movement with leadership and initiative.

The national body which co-ordinates and guides the existing service and spearheads its extension is the National Legal Aid association, the direct successor of two preceding national organizations the first of which was formed in 1911. Incorporated in 1949, the purpose of this central body was stated in its certificate of incorporation thus: "To encourage the formation of new legal aid organizations wherever they may be needed, whose purpose shall be to render legal aid without charge, if necessary, to all who may appear to be entitled thereto, and who are unable to procure such assistance elsewhere, and to promote measures for their protection, to provide a central body with defined duties and powers for the guidance of legal aid work, and to co-operate with the judiciary, the bar and all organizations interested in the administration of justice."

Its basic membership consists of autonomous local legal aid organizations but also includes bar organizations as associate members and interested individual lawyers as professional members. For its membership, it conducts an annual legal aid conference and publishes a bimonthly periodical, a directory of legal aid facilities and an annual volume of committee reports and proceedings.

On the equally important front of developing new facilities where needed, it serves as the vehicle by which the legal profession and the social welfare agencies of the country may pool their efforts effectively to improve the administration of justice for persons of little means. (See also LEGAL EDUCATION.)

(E. A. BL.)

GREAT BRITAIN

England and Wales.—In former days legal aid was rendered for the most part by charitable persons, but as early as the days of Henry VII a statute was passed establishing in *forma pauperis* ("as a poor man") procedure by which the poor should have their writs for nothing and have counsel assigned to represent them. This act was repealed, but the lord chancellor may by regulation provide for those who have been admitted in *forma pauperis*.

In 1914 rules of court gave a certain amount of relief to needy litigants by excusing them from payment of court fees; but in 1949 the Legal Aid and Advice act provided for legal aid and advice in England and Wales. Part i of this act related to legal aid in civil matters. No provision had been made for mere advice by the late 1950s.

Legal aid consists of the representation by a solicitor and, if it is necessary, by counsel in all civil proceedings subject to certain exceptions. It is not given to anyone unless he shows that he has reasonable grounds for taking, defending or being a party thereto, and it may be refused if it would be unreasonable in that particular case, or only a trivial advantage would be gained, or if, because of the simple nature of the proceedings, a solicitor would not normally be employed. It is available for any person whose income is not more than £420; but a person with disposable capital of more than £500 may be refused.

Expenses in connection with legal aid proceedings are paid in the first instance out of what is called the legal aid fund to which the aided person may have to make a contribution.

The proceedings in which legal aid is available include proceedings in the supreme court and the county court. But they do not include proceedings for defamation, breach of promise of marriage, loss of service consequent upon seduction or the inducement of one spouse to leave or remain apart from the other.

Legal aid is obtained by applying for a certificate to a local committee which consists of practising lawyers (barristers and solicitors) appointed by the Law society. Having decided that a certificate shall issue, the committee notifies the applicant of the amount (if any) he must contribute toward the costs. In most cases the applicant may choose his solicitor from among those who have their names on a panel as willing to act in .these matters.

If a certificate is refused, the applicant may in certain cases appeal to an "area committee" which also consists of practising lawyers. A decision of an area committee is final. A certificate may be revoked if the applicant has failed to comply with the regulations or has given false information. Where it appears to an assisted person's solicitor that the proper conduct of the proceedings requires counsel, such counsel are selected from the appropriate panel. Fees payable to solicitor and counsel are paid out of the legal aid fund, but they are less than can normally be exacted in litigation.

If the proceedings are successful and the other side has to pay costs, they are paid into the legal aid fund, and the assisted person may be entitled to the refund of all or part of what he has paid toward costs. If the proceedings are unsuccessful, the assisted person is not liable to more than the amount of his contribution. If the other side is awarded costs, they can only amount to such sum as the court thinks reasonable in all the circumstances and having regard to the means of all parties. If the assisted person has no means, the opposite party—who may have been plaintiff or defendant—is left to pay his own costs.

The act also provides for legal aid in matters not involving litigation, and for the giving of legal advice generally, on payment of a small fee; but these parts of the act had not been brought into operation by the late 1950s.

Legal aid is also provided in criminal cases under the Poor Prisoners Defence act, 1930, and the regulations made thereunder (S.R.O. 1930/1066); the Summary Jurisdiction (Appeals) act, 1933; the Criminal Appeal act, 1907, and Appeal Rules, 1908 S.R.O. 1908/227; and the Costs in Criminal Cases act, 1908. The acts of 1907 and 1930 were modified by part ii of the Legal hid act, 1949, but that part was not in operation by the late 1950s. Legal aid is to all intents administered by the Law society.

Scotland.—Legal aid in Scotland is regulated by the Legal Aid and Solicitors (Scotland) act, 1949, part i. This is to all intents equivalent to the English act of 1949 referred to above. The Scots act provides for legal aid in civil actions in the court of session and the sheriff courts. It is administered by the Law Society of Scotland. Legal aid in all criminal courts in Scotland in matters not involving litigation (under s. 5) and legal advice (under s. 7) were not available in the 1950s. Until legal aid is introduced in criminal courts, what is called the poor's roll system continues to operate in the high court of justiciary and in criminal cases in the sheriff courts. A person admitted to the poor's roll is exempted from paying the usual costs, and the court assigns him a counsel from a list prepared by the faculty of advocates.

By the mid-20th century, no other European or commonwealth country had developed a legal aid system as comprehensive as that in Great Britain.

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LEGAL ARTICLES. All aspects of legal practice receive individual treatment and should be sought under their own headings.

Such subjects as ADMIRALTY; ADMIRALTY, HIGH COURT OF; JURISDICTION, are given detailed treatment by experts; this is apparent also in APPEAL; ARREST; BANKRUPTCY; COMMONS; COMPANY; CONFLICT OF LAWS; CONTRACT; COPYRIGHT; CORPORATION; CRIMINAL LAW; DEPORTATION AKD EXILE; DIVORCE; ENGLISH LAW; EVIDENCE; HOMICIDE; INDIAN LAW; INSANITY; INTERKATIONAL COURT OF JUSTICE; INTERNATIONAL LAW, PUBLIC; JURISPRCDENCE. COMPARATIVE; JUVENILE DELINQUENCY; LAW OF SUCCESSIOT; LEGITIMACY AND LEGITIMATION; LIBEL AND SLANDER; LIQUOR LAWS AND LIQUOR CONTROL; MAKDATE; MARTIAL LAW; MEDICAL JURISPRUDENCE; OATH AND AFFIDAVIT; PARLIAMENT; PARTNERSHIP; PATENT; PEACE, INTERNATIONAL; PEERAGE; POLICE; POST AND POSTAL SERVICES; PRACTICE AND PROCEDURE; PRISON; PRIVILEGE; PROHIBITION; PROXY; REAL PROPERTY AND CONVEYANCING, LAWS OF; RECEIVER; REPRE-

SENTATION; ROMAN LAW; SENATE; SOVEREIGNTY; STATUTE LAW; TORTURE; TREASON; TREATY; TRUST; ELECTORAL SYSTEMS; WILL.

Many shorter articles define law terms or outline procedure and references to these will be found in the key articles.

LEGAL EDUCATION. The subject of this article is education in the law as administered in U.S. and English courts of justice.

THE UNITED STATES

At the time of the American Revolution legal education in the United States was of the apprenticeship type in the offices of practitioners. It continued to be almost wholly so for over half a century. Some of the practitioners' offices became schools. the most famous of which was that of Judge Tapping Reeve, established at Litchfield, Conn., about 1784.

Legal education in the universities developed slowly. The first professorship of law was founded at the College of William and Mary in 1779. In a few colleges lectures on law were given. The best-known lectures were those of Chancellor James Kent in Columbia college which, like Sir William Blackstone's in England, were published (*Commentaries on American Law).* The Harvard Law school, the oldest existing law school, was established in 1817, and several other universities soon followed suit. The method of instruction then employed, dominant in most law schools until the end of the 1800s, was a combination in varying measure of lectures, textbooks and comments or quizzes, the textbooks often growing out of the law-school lectures as. for example, the notable series by Justice Joseph Story at Harvard.

In 1870 the case system was initiated at Harvard by C. C. Langdell. Its principal characteristic was the study of reported court cases, instead of texts or lectures. An accompanying characteristic, developed by Langdell's colleague. J. B. Xmes, was active class discussion by student and teacher, beginning with a close analysis of a specific case and ranging widely over hypothetical situations. The cases were not employed as illustrations of general principles announced by lecture or text but as the staple of class study. By World War I the case system was in use in all the leading law schools.

In the 1920s several factors combined to bring into question the adequacy of the case method by itself and to cause it to be varied and supplemented. One was the growing importance of public law, evidenced by the expansion of legislation and administrative law, and by new fields of law of great importance, such as taxation. Another was the growth of the social sciences and the desire to employ their findings in law. Still another was the increasing interest in jurisprudence and comparative law. It was accompanied by the development of new conceptions of the nature of law, particularly sociological jurisprudence with its functional approach to legal problems. connected with the name of Roscoe Pound, and somewhat later "legal realism."

The result was that in the 1920s and 1930s there was a reexamination of curriculum and teaching methods. Enriched curriculums were developed, with the courses stimulated by questions of philosophy and social science, if not guided by their findings, and with many courses reorganized to achieve greater coherence. The casebooks were no longer collections of cases alone but contained as well some text and nonlegal material. At the same time there were changes in teaching methods. From the beginning there had been variety in the case method of instruction, with some lecturing employed and with variation in the extent and thoroughness of class discussion. Then changes became more deliberate. Increased attention was given to practical skills, such as counseling, drafting and advocacy. with emphasis laid on the affirmative aspects as well as on the analytical and critical. At times a problem method was employed which called for the consideration of new problems and for the formulation of a course of action. Though the prevailing system of instruction was still the case method and large classes, undergraduate seminars and small-group work came into use and moot courts were found everywhere. The most distinctive form of independent student work was the law review. In the U.S. the learned journals in law are published by the law schools and their editors are drawn from the student body.

World War II almost halted developments, at first because the faculties and the student bodies were depleted by the demands of the war, and later because the returning veterans overcrowded the schools. But by 1950 this condition had been righted, and the law faculties resumed their self-examination. much stimulated by the experience of many teachers in the armed and government services.

From the earliest days. U.S. law teachers contributed to legal writing and consequently to the systematization of the law. After World War I there was increasing recognition of research as a major function of law faculties. The field of research came to be extended beyond court decisions and statutes to comprehend the operations of courts and of government as well as the social factors on which law rests. For the most part research was carried on by faculty members individually. In some law schools, research institutes were founded to foster the work.

In most states study in law school is the only training in law necessary to stand the bar examination and to be admitted to practice. and no period of apprenticeship is required. A few states, notably Pennsylvania and New Jersey, require a brief period of work in a law office. In some schools there have been efforts, through legal aid clinics and in other ways, to bridge the gap between law school and practice. *(See* LEGAL AID: *United States.)* Study under a practitioner as a method of preparation for admission to the bar has almost disappeared. In its place appeared a system of part-time study in law school, offered in the afternoon or evening for those who must earn their living while studying law. The period of study for part-time students is ordinarily four years, instead of three years for the full-time student. To return to the subject of apprenticeship, while it is rarely required for admission to the bar, an informal apprenticeship or association with older lawyers by those just admitted to the bar is common practice.

After the three years required for the first degree in law, graduate instruction leading to the master's degree or to the doctorate in law is available. The work is undertaken by those who wish to specialize in selected fields and, more particularly, by those who desire to pursue scholarly work in law.

The increasing complexity of the law, the rise of new subjects and the rapid changes effected by the legislatures and the administrative commissions created a need for continuing legal education for practitioners. Consequently. a new type of postgraduate training, intended for practising lawyers, arose. The program offers concentrated work for a very short time on selected areas. This training is principally under the guidance of the bar associations rather than the law schools.

Two unofficial bodies have been influential on law-school standards. The Association of American Law Schools, organized in 1901, prescribes standards for membership, and its annual meetings facilitate the exchange of ideas on legal education. Its yearbook reflects in the committee reports the changing views and stresses in legal education, and its quarterly *Journal of Legal Education* is the best source of discussion in its field. The American Bar association, through its section of legal education and admission to the bar. maintains a list of schools bearing its approval. The standards for approval, similar to those of the Association of American Law Schools, have been steadily raised. In 1952 they included the requirement of three years of college work for admission and three years of full-time law school or its equivalent in part-time work for the first professional degree in law; or, two years of college and four years of law school.

In 1952 there were 124 law schools on the approved list of the American Bar association. with an enrollment of 35,634 students. The approved schools had 86% of the total number of students in all law schools which gave reports on enrollment to the association. Of the students in the approved schools, 71% were in the full-time classes.

A major characteristic of legal education in the U.S. is its spirit of inquiry and initiative, with consequent variety and experimentation in objectives and methods. These qualities are possible because the universities in the United States have a great measure of freedom in legal education. They are controlled neither by the

organized profession nor by the government. The various states exercise some indirect control by prescribing the minimum period of study in college and law school and through the requirement of a state-controlled examination in specified legal subjects for admission to the bar. The bar examiners, by specifying the subjects for examination, tend to standardize the law-school curriculum. Since there is a natural inclination to retain old subjects in the bar examinations and to refuse to include newer or less professional ones, change and development in the law schools may thus be discouraged.

Another characteristic is the isolation of the law school from the other schools of the university. The liberal arts college developed its distinctive and independent form before the law school appeared as part of the university, and law-school work was made to follow the completion of the student's work in college. When the social sciences developed, they were not welcomed into the law school because of the strictly professional, rather than academic, background of study in the common law. This was true even of studies in government and economics, which are close to much of the lawyer's work. Therefore, they found their place outside the law faculty, instead of inside it, as in many other countries. To an increasing degree the separation is being lessened. In a few universities there are professors of philosophy and the social sciences on the law faculty, teaching their subjects with emphasis on legal aspects; in others, the law-school period has been expanded one year at the expense of the undergraduate college, and broader subjects are introduced into the law-school years; in still others seminars are offered jointly by two or more university departments dealing with problems of common concern. Generally, however, the ordinary law courses are given with some infusion of the problems and ideas from other fields.

After World War II there were two distinct but complementary movements. One urged increased stress on the skills of the lawyer, with more precise identification of these various skills and improved methods of teaching them. The other was based on a broadened conception of the function and opportunities of the lawyer, and on clearer recognition of the importance of his perspective and values and of his professional and social responsibility. The second movement sought to broaden correspondingly the curriculum of the law school and also the prelaw work of the student. These movements were not new, but they gained strength from the increased role of government, the opportunities of lawyers in the public service and the magnitude and urgency of postwar problems. They were not intended to lessen the precision and accuracy traditional in a lawyer's training and work. U.S. legal education remains dominantly professional in outlook and content. *(See* also JUDICIAL REFORM: *20th Century Reforms;* LEGAL PROFESSION.)

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ENGLAND

In England, legal education falls under four main heads: (1) education for a university degree; (2) education for the barristers' and solicitors' examinations; (3) education in professional skills; and (4) subsidiary legal education. After a brief historical survey, each of these heads will be considered in turn.

History. — In the reign of Stephen (1135–54) the universities began to teach canon and civil law, and confer degrees of bachelor and doctor in these subjects. Vacarius, who began to teach at Oxford in about 1145, seems to have been the first teacher of civil law. In 1540 Henry VIII founded regius professorships of civil law at Oxford and Cambridge, but still no English law was taught there. When toward the end of the 16th century "Doctors' Commons" (*q.v.*) was set up in London for those doctors of law who practised in the ecclesiastical and admiralty courts, the study of any kind of law at the universities languished.

Education in English law was thus left for the inns of court and chancery (*q.v.*), as befitted the strongly procedural content of the subject. The process of education was basically a communal form of apprenticeship for seven years on a residential and collegiate basis. Students learned their law by attendance in court and at readings and moots conducted in the halls of the inns. The system reached its zenith in the reign of Henry VIII, and thereafter declined, mainly because of the appearance of printed lawbooks and because of the increasing reluctance of practitioners to devote the required time to preparing readings and of students to attend them. By the end of the 17th century there was little or no organized teaching of law, and not until toward the end of the 18th century did the modern system of a student becoming "pupil" to a particular barrister for a year or so become general. Apart from sporadic efforts by individual inns of courts for some years before and after the end of the 18th century, there was no organized teaching for the bar until in 1852 the four inns of court joined in forming the Council of Legal Education, which then started the present system of lectures; and at last in 1872 examinations (which for 20 years had merely been an alternative to attending lectures) were made compulsory for call to the bar.

Meanwhile, the apprenticeship system had become well established for attorneys and solicitors. Mere *de facto* service as a clerk for periods of five years or more ceased to suffice when a statute of 1729 required service for five years under articles of clerkship. The Law society (founded in 1825) instituted lectures in 1833 and compulsory examinations in 1836. The universities, too, had begun to teach English law. Oxford led the way with William Blackstone's lectures in 1753 and his inauguration as first Vinerian professor in 1758; and Cambridge followed with the Downing professorship in 1800. Examinations for degrees in law were instituted at Oxford in 1852 and at Cambridge in 1858.

University Education. — Under modem conditions all English universities had come to provide instruction and examinations in English law, as well as in certain other branches of law. There were many variations, but in general the principal course in law was a three-year residential course leading to the degree of B.A. or LL.B., though London conducted an LL.B. examination for external students; and higher degrees were awarded for postgraduate work of various kinds, which at London was fostered by the Institute of Advanced Legal Studies, founded in 1947. There were considerable variations between different universities, both in the subjects taught and in the style of instruction. Oxford and Cambridge, with their continued attachment to Roman law and their emphasis on the cultural aspects of law, provided a contrast with London and most provincial universities, which were rather more practical and professional in tone. Despite these variations, constitutional law, the English legal system, legal history, jurisprudence, public international law, crime, contract, tort, and real and personal property were to be found in most courses, together in some cases with a number of other subjects such as Roman law, equity, trusts, conveyancing, conflict of laws, evidence and administrative law.

Professional Education. — For the bar examinations, the principal form of organized instruction had come to be courses of lectures delivered in London each year from early October until late July by part-time readers and lecturers appointed by the Council of Legal Education, partly from the university teaching staffs and partly from practising members of the bar. The council also appointed a number of practising barristers as part-time tutors to give instruction to small groups of students in chambers on most of the subjects of the bar final examination. The bar examinations were conducted by a board of examiners, appointed by the council, which included all the readers as well as many of the lecturers and a number of others. The examinations, which were held three times a year, were divided into part i and the final, each comprising five papers. In part i, each paper could be taken at a separate examination, and university graduates who had obtained a sufficient standard in the corresponding subject in their university examinations could claim exemption. The subjects were Roman law; English and commonwealth constitutional law and English legal history; contract and tort; real property (or Hindu and Mohammedan law, or Roman-Dutch law); and criminal law. In the final examination, all the papers had to be taken at the same examination, and there were no exemptions. The subjects, some

of which appeared in only part of a paper. or in more papers than one, were. criminal procedure; common law; construction of documents; equity; company law; conveyancing, or divorce, or international law. or a special subject in Hindu, Mohammedan or Roman-Dutch law; evidence; civil procedure; and conflict of laws.

The corresponding position for the solicitors' profession was as follows. Courses of instruction for the solicitors' examinations were provided in London by the Law society's school of law. staffed mainly by ahole-time lecturers, and at many of the main provincial centres by the universities and certain other bodies. For those who lacked a university degree in law, a year's attendance at such a course was obligatory. The examinations, held three times a year by independent examiners appointed by the Law society, consisted of the intermediate and the final. The intermediate comprised a law portion (three papers—on real property, contract and tort, and public law) and a paper on bookkeeping and trust accounts; a university degree in law provided exemption from the law portion, and each portion could be taken separately. The final consisted of seven papers covering a wide range of subjects. These were: real and personal property (especially conveyancing); contract and tort; wills, intestacy, probate and equity; income tax, death duties and stamp duties; companies and partnership; magisterial practice. or conflict of laws and divorce: or local government, or patents, copyright, designs and trademarks; and practice, or special subjects in common law, or admiralty, carriage of goods by sea and marine insurance. or town and country planning, compulsory acquisition and rating. There was also an optional honours examination with five papers (conveyancing; equity; common law; evidence and crime. or succession; and conflict of laws, or local government). (*See* also LEGAL PROFESSION.)

Although many candidates for the bar and solicitors' examinations attended the courses of instruction already mentioned. many did not. and instead attended private tutorial establishments or took correspondence courses; and some worked on their own. though for the final examinations (at which sometimes over two-thirds failed the bar final and about half the solicitors' final) this was a perilous course.

Education in Professional Skills.—Most teaching of professional skills in England was still in 1958 much as it had been for over a century. For solicitors, the apprenticeship system remained in force. Service under articles of clerkship to a solicitor for five years (reduced in certain cases: *e.g.*, to three years for university graduates) was a prerequisite to admission as a solicitor. The bar also in the main relied on a system of apprenticeship; most of those who intended to practise "read in chambers" with a practising barrister for 6 or 12 months, or sometimes more. usually after passing the final. though there was nothing to make this obligatory. The pupil studied his master's papers, drafted his pleadings and opinions and accompanied him to court. However, after July 1951 the Council of Legal Education successfully held practical courses of over three months' duration after each examination. and these supplemented or replaced reading in chambers for many, especially overseas students. The courses gave organized instruction in drafting pleadings and opinions, and in advocacy, conduct in court and professional etiquette. They were severely practical, and represented England's first sustained effort in organized group instruction in the professional techniques of the law. In addition. contests in advocacy were organized by the Inns of Court Students' union, and a number of moots for students and recently called barristers were held by the inns.

Subsidiary Legal Education.— The majority of students who made law their principal subject did so for the purposes of ultimate qualification as a barrister or solicitor. But many (perhaps, indeed, the majority) of those who studied law did so for other purposes. Some other professional examinations (*e.g.*, for accountants) included a strong element of law; and many who engaged in commerce or industry attended courses of instruction in those branches of law most likely to prove of value. Many establishments such as technical colleges. evening institutes and correspondence schools throughout England provided courses of instruction to serve these needs. In addition, some university students included certain sections of law in their general education; and, often in the guise of "civics." a little elementary law was taught in the senior forms of some schools. Nevertheless, despite a wide public interest in law, especially in its more dramatic forms, it could not be said that law had established its claim to form part of a liberal and civilized education of the modern citizen. See also LEGAL PROFESSION.

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LEGAL PROCEDURE: see PRACTICE AND PROCEDURE.

LEGAL PROFESSION. The legal profession is the vocation based on expertness in the law and its application. The two main divisions are the judges (the bench) and the practising lawyers. This article deals first with the functions and standards of the proiession generally; then with the practice of law in the United States, in England and Wales and, very briefly, in other countries.

FUNCTION AND STANDARDS

The primary function of the profession is to apply and utilize the law in specific cases—in short, to individualize the law. This function is manifest in the work of the advocates and the judge in the courtroom where cases are tried and decided. A lawyer will investigate the facts and the evidence by conferring with his client, interviewing witnesses and reviewing documents; and he will prepare and file the pleadings in court. He may seek a summary judgment because the opponent evidently has no case, or through discovery proceedings he may force the other side to reveal more fully the issues and the facts on which it relies. At the trial he will introduce evidence and object to improper evidence from the other side, and he will argue questions of law and of fact. If he loses, he may seek a new trial or relief in an appellate court.

Even in controversy, lawyers do more than press their cases to the end before the court. Negotiation, reconciliation, compromise—in all of which lawyers have a large part—bring about the settlement of most cases without trial.

In office work, too, the profession applies and utilizes the law. The lawyer may advise the client on the law and halt an illegal plan. In conference with the client and through negotiations with others he map aid in developing a wise plan to be embodied in a document. The law gives to private persons the power to arrange and determine their legal rights in many matters and in various ways, as through wills, contracts or corporate bylaws. In aiding these arrangements the lawyer is helping to particularize the legal rights of the parties.

Another field of work, which developed rapidly in mid-20th century, is the representation of clients before administrative commissions and legislative committees. The development was a result of the increase of government regulation of economic life.

Ordinarily the lawyer is retained by one side only, even in office matters, and is a partisan. The method for settling unresolved controversies is a competitive one—the adversary system of administration of law under which the lawyers zealously represent their respective sides. The method involves a formidable paradox—the use of partisan representatives to bring out the truth and to achieve equal justice under law. So partisan representation must be enlightened if the method is to attain its ends.

A lawyer, like other men, has several loyalties in his work. They include loyalty to his client, to the administration of justice, to the community. to his associates in practice and to himself—whether to his reasonable economic interests or to his ethical standards as a man. These diverse and at times competing loyalties must be reconciled with wisdom. It is the purpose of the standards of the profession to effect the reconciliation. For instance, the lawyer's loyalty to his client keeps him from repre-

senting another person with conflicting interests. In the trial of a case he must be zealous yet fair. The duty of fairness and candor is especially incumbent on the government's lawyer in criminal prosecutions. Of this duty the supreme court of the United States has said: "The United States Attorney is the representative not of an ordinary party to a controversy, but of a sovereignty whose obligation to govern impartially is as compelling as its obligation to govern at all; and whose interest, therefore, in a criminal prosecution is not that it shall win a case, but that justice be done" (Berger v. United States, 295 U.S. 78, 88 [1935]). The standard most troubling to laymen permits the defense of anyone accused of crime. As a canon of the American Bar association provides: "It is the right of the lawyer to undertake the defense of a person accused of crime, regardless of his personal opinion as to the guilt of the accused." The reason given is, "Otherwise innocent persons, victims only of suspicious circumstances, might be denied proper defense."

UNITED STATES OF AMERICA

History. — The history of the American legal profession goes back to England and to the profession which there developed the common law, although in the United States there was never a formal separation of barrister and solicitor as in England (see below). In the simple life of the early Colonies the need for lamyers was not obvious. As life and law became more complex their work increased. Always there was concern with the affairs of the family and with the enforcement of the criminal law. With the development of the nation. other fields of practice became important. Land, commerce, industry and finance, taxation and government regulation — each in turn came to form a major share. The most pervasive change was the decline in advocacy and the increase in office work, which now makes up the bulk of practice.

In the work of the lawyer in the 20th century there is need for the consideration of factors reaching far beyond the rules of law. "The modern lawyer almost invariably advises his client upon not only what is permissible but also what is desirable. . . . His duty to society as well as to his client involves many relevant social, economic, political and philosophical considerations" (*United* States v. United *Shoe* Machinery *Corp.*, 89 F. Supp. 357, 359 [D. Mass. 1950]).

Public Role. — Leadership in public affairs has always been an actual role of U.S lawyers. It is appropriately so, for lawyers are experts in law and in the adjustment of human relations, and law is the instrument through which government maintains stability in society and establishes justice among its citizens. In legislative as well as executive office. lawyers have been outstanding. making up in the 85th congress (1957–59), for example, 66% of the senate and 56% of the house of representatives. In public life outside public office, they have also been conspicuously useful. Even in their daily work of applying the law to concrete cases, they aid in the development of the law. In maintaining the rights of the citizens lawyers are indispensable to the enforcement of the Bill of Rights and are thus essential to the constitutional system.

In the 20th century, however, there was a decline in the number of leaders of the bar, especially corporation lamyers, in elective office. The decline has been ascribed to the engrossing character of corporate practice. It may be due. too. to the opposition of the electorate to men identified in their minds with a single type of client. These lamyers have continued to render service in appointive office and through the guidance of institutions which are public though not political, such as universities, schools, charities, churches and cultural institutions.

Standards. — The profession's ideal of achievement is inscribed over the building of the supreme court of the Cnited States: "Equal Justice Under Law." The basic authority over the bar (a term which in the United States includes all lawyers) rests in the courts, which have power to censure, suspend or disbar lawyers for misconduct. The Canons of Professional Ethics, approved by the American Bar association in 1908 and later amended, have been adopted by the bar associations of many states and enacted by the legislatures of a few. A short, eloquent statement on professional responsibility was adopted in 1958 by a joint committee of the Association of American Law Schools and the American Bar association.

Unlike the English barrister, the individual American lawyer has no professional duty to take every case tendered to him, but the American Bar association has reaffirmed the duty of the bar to provide the assistance of counsel for even the most unpopular defendants.

Bar Organizations. — The existing bar associations arose in the 1870s or later, though there were some in the nation's early days. For the most part the associations are voluntary, with no legal control over their members, and are territorial in scope, extending to city or state or nation. Some have a particular field or a special purpose, such as administrative law or law reform, as the basis of membership and activity. Examples are the American Law institute and American Judicature society.

The American Bar association, national in scope though not governmental in nature, was organized in 1878. The membership in 1959 was more than 90,000 out of a total of about 220,000 U.S. lawyers. Its principal work is done by committees and sections devoted to special fields of practice, such as insurance law or labour relations, or to subjects of concern to the bar and the public, such as judicial administration and the Bill of Rights In the 1940s the association sponsored the survey of the legal profession. The findings of more than 400 survey participants were summarized in The American Lawyer (see Bibliography).

The state bar associations were all voluntary organizations until the 1920s when the self-governing or incorporated bar was initiated. Under this system, which in the early 1960s had been established in more than half the states, the association includes all practising lawyers within a state in its membership and has considerable control over the standards of its members.

Privilege to Practise Law. — Each state grants the privilege to practise law within its borders. The requirements for admission call for a bar examination preceded by specified periods of general and legal education. They may include approval of an applicant by a committee on character and fitness. To practise in a federal court a lawyer needs a grant of the privilege from that court, based primarily on previous admission to the bar of a state.

The exclusive character of the lawyer's privilege to practise law raises questions on what matters are nithin the privilege. The questions became urgent in the second quarter of the 20th century with the rise of new experts who claimed to offer a kind of expertness the lawyer did not possess. at least in the same measure, and of organizations which provided services with seemingly greater efficiency and economy. The accountant in tax matters, the title company in sales of land, the trust company in estate work are illustrations. Bar committees on unauthorized practice of law have as their announced guide the protection of the public against persons lacking the intellectual qualifications and professional standards essential in legal work. At times the committees brought suit against unauthorized practitioners; and at other times they reached agreement with representatives of such rival groups as accountants and trust companies. As late as the 1950s, however, the bar associations had given little attention to how the new specialized expertness as well as the lawyer's traditional skills mere to be made available economically to clients who had need of both of them.

Methods of Providing Legal Services. — The traditional method of providing legal services is for the individual lawyer to be retained by and to represent the individual client, and in the early 1950s more than two-thirds of the lawyers still practised individually. However, the development of partnerships of lawyers has been stimulated by the groning complexity of the law. There were some very large partnerships. with 10 to 25 partners and 50 to 75 other salaried lawyers. The profession had not developed an adequate system of referral or consultation by which the general practitioner could procure the aid of the expert when needed.

Large industrial corporations increasingly employ salaried lawyers who give full time to this work. Honever, a corporation cannot practice law by representing others in legal matters, even though the work is done by lawyers on its staff. The prohibition against the corporate practice of law has been applied rigidly, even

to nonprofit corporations organized to provide legal services to their members.

Several methods are used to provide services to the poor. The oldest is the system of assigned counsel in criminal cases. with the court designating a lawyer to represent the accused. Another method is the public defender employed and compensated by the state, county or city to represent indigent defendants. A third method is that of the legal aid societies (see LEGAL AID) These organizations give representation in civil as well as criminal cases and are supported primarily by private donations. In 1954 there were 161 legal aid offices in the United States and Canada in addition to 72 committees of lawyers doing legal aid work.

The lanyer reference service is for those who are able to pay a fee but do not know whom they should consult. The office of the service gives the inquirer a list of lawyers competent in his case. The lawyer will confer with the inquirer for a specified small fee and determine with him whether the case merits further attention and nhat the additional fee shall be.

The federal government as well as the states and the counties and cities have their legal representatives. The chief law officer of the United States is the attorney general. As the head of the department of justice he is a member of the cabinet. The United States attorneys who represent the government in the district courts are under his general direction.

ENGLAND AND WALES

In England and Wales practising lawyers are divided into two branches, barristers and solicitors. Trial of cases is the characteristic activity of a barrister, office work that of a solicitor. No one may be both barrister and solicitor at the same time, though it is possible to withdraw from one branch and become a member of the other after satisfying its requirements for admission.

Barristers-at-Law. — The barristers, known also as counsel and. collectively, as the bar. have the exclusive right to appear as advocates in the superior courts and concurrent right with the solicitors in the inferior courts. Barristers also do some advisory work. as they may be asked by solicitors to give opinions or to draft documents. The more important judicial appointments are made from their ranks.

To be a barrister it is necessary to become a member of one of the four Inns of Court; that is, Lincoln's Inn, the Inner Temple, the Middle Temple and Gray's Inn (ree INNS OF COURT AND CHANCERY). The privilege of the inns to determine who may go to the bar rests not on statute but on custom going back to the middle ages. The benchers of each inn are its governing body with disciplinary power over its members.

The general council of the bar derives its authority from the bar. The council acts in matters of general concern to the profession, and its opinions and rulings help to set the standards for barristers. For example, a barrister is bound to accept any case tendered at a proper professional fee regardless of his personal feelings, except in such special circumstances as conflicting interests of clients. This requirement. illustrated by Thomas Erskine's defense of Thomas Paine during the French Revolution, is deemed essential to the protection of liberty under law. There may be no partnership of barristers or of barrister and solicitor; and a practising barrister may not carry on any other profession or business.

The inns formerly provided a comprehensive form of legal education and apprenticeship. Their educational activities have been taken over by the Council of Legal Education established by the four inns. A student must keep the necessary terms for three years. A term is "kept" by dining at least six times (three for a university student) in the hall of the inn along with the members — a practice regarded as helping to initiate the student into the traditions of his profession. The inns still stress the apprenticeship system whereby a student or a young barrister enters the chambers of a practising barrister and, for a fee (for example, 100 guineas a year), is guided through various phases of a barrister's work.

From 1948–49 to 1956–57 the number called to the bar by the four inns was about 500 each year, one-third to one-half of whom were from overseas. The number actually practising in 1957 was only 1,958, for the majority of those admitted withdraw from practice and engage in other activities.

Serjeant-at-law was originally the highest rank of barrister but the order became obsolete. The distinguishing mark of the rank was a close-fitting cap known as a coif. Queen's (king's) counsel, nho constitute the leaders of the bar, hold a higher rank with somewhat different rights and obligations.

The two principal law officers of the crown are the attorney general and the solicitor general. The various government departments also have legal advisers. There is, however, no general system of public prosecutors. Except for the rare cases where the attorney general or the solicitor general appears, the crown retains private counsel to prosecute particular cases.

In general a barrister undertakes no work except through a solicitor. The client goes first to a solicitor who prepares and delivers his instructions to a barrister. The instructions, containing an outline of the case, are known as a brief — a term which in the United States means a written argument submitted to a court.

Solicitors. — The solicitors carry on most of the office work in law. They confer with clients, give advice. draft documents. conduct negotiations, prepare cases for trial and retain barristers for advice on special matters or for advocacy before the higher courts. They have a right to practise in all the courts as the agents for litigation or representatives of their clients, and they are deemed officers of the court, but they may appear as advocates only in the lower courts. Since the kinds of activities they engage in make up the greater part of the work of lawyers, solicitors are ten times as numerous as barristers in active practice, numbering in 1957 over 20.000. Solicitors may practise in partnership with one another.

The term solicitor, in earlier days confined to the chancery courts. has supplanted the designations attorney and proctor, the former having been used in the common law courts and the latter in the ecclesiastical and admiralty courts. The inns of chancery and similar societies with which these lawyers were formerly associated have disappeared. The Law society is now the solicitors' organization, incorporated by parliament and entrusted with extensive duties. Its membership includes most but not all of those in practice.

The education required of a solicitor includes a law school course. A most important feature is a period of apprenticeship, under articles of clerkship, with a practising solicitor. The term of the articles is five years, reduced for university graduates, and there is usually, though not invariably, a fee paid to the principal. A woman may be a solicitor or a barrister. Only a British subject may be a solicitor, though there is no such requirement for the barrister.

The Law society has extensive authority in setting and enforcing standards for solicitors. Its rules prescribe how monies held for a client or in trust are to be kept and to be shown on books of account; and compliance with the rules by each solicitor must be certified to annually by a chartered accountant or may be inquired into by inspection of the solicitor's books. The society maintains a client compensation fund to reduce or relieve losses sustained from dishonesty by a solicitor. A solicitor, unlike a barrister, may sue for his fees.

A most important part of the society's duties is the administration of the legal aid (*q.v.*) provided by parliament. The system, largely state-financed, is administered by this professional organization, thus securing the direct relationship of lawyer and client without interference by an outside intermediary.

OTHER COUNTRIES

Scotland. — The Scottish legal profession is separate from that of England and Wales, though there is a similar division into two branches — advocates and solicitors (formerly law agents). The Faculty of Advocates, headed by the dean of the faculty, is the governing body of the first branch; and the Law Society of Scotland is the governing body of the solicitors. There are several ancient legal societies with picturesque titles to which a Scottish solicitor may belong, such as, in Edinburgh, the Society of Writers to Her

Majesty's Signet.

Commonwealth of Nations. — The nations formerly a part of the British empire, as well as the British colonial territories: have their own distinct legal professions. In the federal nations like India, Australia and Canada, each component part of the federation, such as a state or province, has its separate profession, admission to which is prerequisite to practice in that part of the nation. Some maintain the separation of barristers and solicitors. Others have fused the two branches into one! as the provinces of Canada and some of the Australian states have done.

Civil Law Countries. — The legal profession in the numerous and important countries of the civil law—the countries of continental Europe and Central and South America, for example—distinguished though it is, varies too widely in history and organization for discussion here. Only two matters will be mentioned.

In some countries the judiciary is a separate branch. A law graduate will decide whether he will make his career in the judicial branch or as a practising lawyer. The judges are appointed and promoted by the state and are essentially a part of the civil service.

In many countries the notaries, limited in number and wholly unlike the notary public in the United States, are persons trained in law. They have exclusive privileges in connection with some office work, such as marriage settlements and wills. *(See* also CIVIL LAW.)

Communist Countries. — In communist countries the legal profession necessarily has functions different from those in noncommunist countries because of differences in the role of the state and the party and the rights of individuals. The lawyer is widely used as adviser to government bureaus but has far less scope in representing individuals. Even in criminal cases the lawyer for the defense has been reported to have the advancement of the state's interest as his major responsibility rather than the defense of his client against the state.

International Tribunals. — There is no separate bar with the exclusive privilege to appear before international tribunals. There are organizations of persons interested in international law, some international in membership, as the International Law association; others national in membership, as the American Society of International Law. The International Court of Justice ("the world court") requires that an agent be designated by each nation in a case before it, and it permits the appearance of other persons as advocates to argue the case. The advocate is usually a citizen of the nation he represents, but this is not essential; and at times an expert international lawyer from another nation is retained to present the case.

See also LEGAL EDUCATION.

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LEGAL PSYCHOLOGY: *see* PSYCHOLOGY, APPLIED: *Forensic Psychology.*

LEGAL TENDER, a tender or offer. particularly of money, in satisfaction of a liability or debt and in accord with the proper legal requirements *See* PAYMENT.

LEGARÉ, HUGH SWINTON (1797–1843), U.S. lawyer and diplomatic official, attorney general under Pres. John Tyler and a leader in southern intellectual and literary life, was horn in Charleston, S.C.. Jan. 2, 1797. He studied at Moses Waddel's acndemy and graduated from South Carolina college in 1814. An unusually able classical scholar, who aspired to the life of the scholarly gentleman, LegarC spent the period 1814–1817 in a concentrated study of law and in 1818 went to Europe, where he studied law and languages. He served in the state legislature in 1820–22 and 1824–30. He and a number of other Charlestonians, including the botanist and scholar, Stephen Elliott, Sr., established the *Southern Review* (1828–32), a literary journal of considerable distinction. LegarC was a principal contributor to and, at times, editor of the *Review;* his articles show critical ability and an erudition probably not surpassed by any contemporary American scholar.

LegarC was a conservative who feared democracy, but he opposed John C. Calhoun and the nullification group. In 1830 he was appointed attorney general of the state, and in 1832 he was made chargé d'affaires to Belgium. He returned to Charleston in 1836 and was elected to congress as a Union Democrat. During the heated controversies of the period he lost support and was defeated in the election of 1838. As a Whig, he supported Benjamin Harrison and John Tyler in 1840, and Tyler made him attorney general in 1841. His profound knowledge of civil and international law made him an especially valuable cabinet member. When Secretary of State Daniel Webster resigned in May, 1843, LegarC became secretary ad interim. He died in Boston, June 20, 1843.

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LEGASPI, Luzon, P I *see* ALBAY.

LEGATE, BARTHOLOMEW *(c.* 157j–1612), English fanatic, nas born in Essex and became a dealer in cloth. About the beginning of the 17th century he became a preacher among a sect called the "Seekers." and appears to have held unorthodox opinions about the divinity of Jesus Christ. Together with his brother Thomas he was put in prison for heresy in 1611. Thomas died in Newgate gaol, London, but Bartholomew's imprisonment was not a rigorous one. Janies I argued with him. and on several occasions he was brought before the Consistory Court of London. but nithout any definite result. Eventually Legate was tried before a full Consistory court in Feb 1612, and found guilty of heresy. He was burned to death at Smithfield on March 18, 1612. Legate was the last person burned in London for his religious opinions.

See T Fuller, *Church History of Britain* (1655); and S. R. Gardiner, *History of England,* vol ii (1904).

LEGATE, a title now generally confined to the highest class of diplomatic representatives of the pope, though still occasionally used, in its original Latin sense, of any ambassador or diplomatic agent. According to the *Nova Compilatio Decretalium* of Gregory *IX.*, under the title "De officio legati" the canon law recognizes tno sorts of legate, the *legatus natus* and the *legatus datus* or *missus.* The *legatus datus* (*missus*) may be either (1) *delegatus,* or (2) *nuncius apostolicus,* or (3$ *legatus a latere (lateralis, collateralis).* The rights of the *legatus natus* formerly included concurrent jurisdiction with that of all the bishops within his province. The commission of the *legatus delegatus* (generally a member of the local clergy) is of a limited nature, and relates only to some definite piece of work. The *legatus a lafere* (almost invariably a cardinal though the power can be conferred on other prelates) is in the fullest sense the plenipotentiary representative of the pope. He has the power of suspending all the bishops in his province, and no judicial cases are reserved from his judgment. Without special mandate, honever, he cannot depose bishops or unite or separate bishoprics. At present *legati a latere* are not sent by the holy see, but diplomatic relations, nhere they exist. are maintained by means of nuncios, internuncios and other agents.

The history of the office of papal legate is closely involved with that of the papacy itself. If it were proved that papal legates exercised the prerogatives of the primacy in the early councils, it would be one of the strongest points of the Roman Catholic view of the papal history. Thus it is claimed that Hosius of Cordova presided over the council of Nicaea (325) in the name of the pope. But the claim rests on slender evidence, it is even open to dispute whether Hosius was president at Nicaea, and though he certainly presided over the council of Sardica in 343, it was probably as representative of the emperors Constans and Con-

stantius, who had summoned the council. Instances of delegation of the papal authority in various degrees become numerous in the 5th century, especially during the pontificate of Leo I. Vicarial or legatine powers had been conferred in 418 by Zosimus upon Patroclus, bishop of Arles. In 449 Leo was represented at the "Robber Synod," from which his legates hardly escaped with life; at Chalcedon, in 451, they were treated with singular honour, though the imperial commissioners presided. Another sort of delegation is exemplified in Leo's letter to the African bishops (*Ep.* 12), in which he sends Potentius, with instructions to inquire in his name, and to report. Augustine of Canterbury is sometimes spoken of as legate, but it does not appear that in his case this title was used in any strictly technical sense, although the archbishop of Canterbury afterwards attained the permanent dignity of a *legatus natus*. Boniface, the apostle of Germany, was in like manner constituted, according to Hincmar (*Ep.* 30), a legate of the apostolic see by Popes Gregory II. and Gregory III. According to Hefele (*Conc.* iv. 239), Rodoald of Porto and Zecharias of Anagni, who were sent by Pope Nicholas to Constantinople in 860, were the first actually called *legati a latere*. The policy of Gregory VII. naturally led to a great development of the legatine as distinguished from the ordinary episcopal function. From the creation of the mediaeval papal monarchy until the close of the middle ages, the papal legate played a most important rôle in national as well as church history. The further definition of his powers proceeded throughout the 12th and 13th centuries. From the 16th century legates a *latere* give way almost entirely to nuncios (*q.v.*).

LEGATION, a diplomatic mission of the second rank. The term is also applied to the minister's residence and its precincts. *See* AMBASSADOR; DIPLOMACY.

LEGATO, a musical term signifying smoothness or evenness of performance, a passage so marked being intended to be played or sung in as connected a manner as possible.

LEGENDRE, ADRIEN MARIE (1752–1833), French mathematician distinguished for his work on elliptic integrals, the theory of numbers, the attractions of ellipsoids and the method of least squares, was born in Paris on Sept. 18, 1752. He was educated at the Collège Mazarin, and was appointed professor of mathematics in the École Militaire at an early age, but resigned in 1780. In 1795 he was elected professor in the École Normale. Although he was, from time to time, appointed to several minor government positions, he was never offered offices commensurate with his ability because his colleague Laplace disliked him. He died in Paris on Jan. 10, 1833.

Legendre's researches on elliptic integrals (*see* ELLIPTIC FUNCTIONS) extended over more than 40 years. He took up the subject in 1786 where L. Euler, J. Landen and J. L. Lagrange had left it, and for some time was the only mathematician to cultivate this new branch of analysis. The results of his labours were almost entirely neglected by his contemporaries, but his *Traité des fonctions elliptiques* had scarcely appeared in 1827 when the discoveries which were independently made by the two young and as yet unknown mathematicians N. H. Abel and C. G. J. Jacobi placed the subject on a new basis and revolutionized it completely. Nevertheless, Legendre contributed much that was of value and it was he who discovered the three canonical forms of integral. Moreover, the readiness with which, at the age of 76, he welcomed researches that quite overshadowed his own does the highest honour to him.

To Legendre is due the theorem known as the law of quadratic reciprocity, the most important general result in the science of numbers discovered since the time of Pierre de Fermat, and called by K. Gauss the "gem of arithmetic." Legendre published his own researches and those of his predecessors in the theory of numbers in a systematic form in two large volumes under the title *Théorie des Nombres* (1830). (*See* NUMBERS, THEORY OF: *Quadratic Residues.*)

One of the problems he studied at an early age was the attraction of spheroids. In the first of his four great memoirs on this subject, published in 1783, he introduced the celebrated function which has been named after him. In 1806 appeared Legendre's *Nouvelles Méthodes pour la détermination des orbites des comètes* which is significant as containing the first published suggestion of the method of least squares. Legendre also made important contributions to geodesy and was widely known for his *Eléments de géométrie*, a modern rival to Euclid. In it he gave a simple proof that π is irrational, and forecast that it was not the root of any algebraic equation of finite degree with rational coefficients. *See* also FERMAT'S LAST THEOREM; POLYNOMIAL.

See Élie de Beaumont, "Memoir de Legendre," trans. by C. **A. Alexander** in *Smithsonian Report* (1874). (G. J. Ww.)

LEGENDRE, LOUIS (1752–1797), French revolutionary, was born at Versailles on May 22, 1752. He kept a butcher's shop in Paris. He was an ardent supporter of the Revolution, a member of the Jacobin club, and one of the founders of the club of the Cordeliers. Though of uneducated speech, he was gifted with a genuine eloquence. He was prominent in the taking of the Bastille (July 14, 1789), the massacre of the Champ de Mars (July 1791) and the attack on the Tuileries (Aug. 10, 1792). In the convention, he voted for the death of Louis XVI, and was sent on a mission to Lyons (Feb. 27, 1793) before the revolt of that town. He was a member of the *Comité de Sûreté Générale*, and contributed to the downfall of the Girondists. When Danton was arrested, Legendre at first defended him, but was intimidated by Robespierre. After the fall of Robespierre, Legendre took part in the reactionary movement, undertook the closing of the Jacobin club, was elected president of the convention, and helped to bring about the impeachment of J. B. Carrier, the perpetrator of the *noyades* of Nantes. He was subsequently elected a member of the Council of Ancients. Legendre died on Dec. 13, 1797.

LEGENDRE COEFFICIENT AND FUNCTION: *see* SPHERICAL HARMONICS.

LEGER, FERNAND (1881–1955), French painter identified with "machine art," was born in Argentan, Normandy, on Feb. 4, 1881. He was first trained as an architect. Moving to Paris, he turned to painting and by 1910 began to show the influence of Cubism, as in his abstract "Nudes in the Forest." Sometimes called a Tubist rather than a Cubist because mechanistic tubes appeared frequently in his work, Léger had already painted some of his best-known masterpieces by 1919. Chief among these were "The Disks" and "The City."

As a rule Léger painted in series, developing his final composition after numerous variations on a theme. He tended to mechanize the human being, as he glorified modern machinery. Repudiating all romanticism, he said, "For me the human figure . . . has no more importance than keys or bicycles." He also said, "I have used the machine as others have used the nude or still life. . . ."

Though Léger was deeply influenced by the machine age and mass production, his work was also affected by Byzantine mosaics and the paintings of Poussin. David, Cézanne and the Douanier Rousseau. Using brilliant flat colour he concentrated on familiar objects, often magnified, usually isolated and monumental. For him disciplined order was combined with boldness of vision. Both painter and ceramist, he was also a teacher and designer of stained-glass windows, mosaics and theatrical scenery.

The United States, where he lived during World War II, interested Léger immensely. He loved Negro jazz and the excitement of American city life. In describing the country's "unbelievable vitality," he claimed he had painted better in America than ever before.

Léger died on Aug. 17, 1955, at Gif-sur-Yvette. *See* also PAINTING: *Cubism.*

See Katherine Kuh, *Léger* (1953); André Verdet, *Ferdinand Léger,* with bibliography (1955). (K. W. KH.)

LEGERDEMAIN: *see* CONJURING.

LEGGE (afterward BILSON-LEGGE), **HENRY** (1708–1764), English statesman, son of William Legge, 1st earl of Dartmouth (1672–1750), was born on May 29, 1708. He became private secretary to Sir Robert Walpole, and in 1739 was appointed secretary of Ireland, and subsequently held other offices. Although his conduct as envoy extraordinary to Frederick the Great (1748) earned the king's displeasure; he was made treasurer of the navy on his return to England, and in 1754 he became chancellor of the ex-

chequer in the Newcastle ministry. His adherence to Pitt's policy secured his dismissal in Nov. 1756, but 12 months later he returned to his post, which he held until April 1757. On Pitt's return to office in the following July, Legge again became chancellor of the exchequer, in which position he imposed new taxes on houses and windows.

Legge was dismissed in March 1761 but continued to take part in parliamentary debates until his death on Aug. 23, 1764.

See John Butler, Bishop of Hereford, *Some account of the character of the late Rt. Hon. H. Bilson Legge* (1785).

LEGGE, JAMES (1815–1897), British Chinese scholar. was born at Huntly, Aberdeenshire. in 181j. and educated at King's college. Aberdeen. and at Highbury Theological college. London. In 1839 he started for China. where he was to undertake missionary work, but, as the country was not yet open to Europeans. he remained for three years teaching in the Anglo-Chinese college at Malacca, until it was removed to Hong Kong. There he lived for 30 years. and began his monumental edition of the *Chinese Classics* with translation, prolegomena and notes (1861–86; new ed., 1893). In 1876 a chair of Chinese languages and literature was constituted at Oxford for his occupation. He died at Oxford on Nov. 29, 1897.

Among his other works were *The Life and Teaching of Confucius* (1867); *The Life and Teaching of Mencius* (187j); and *The Religions of China* (1880).

LEGHORN, city of Toscana region, Italy (Ital. LIVORNO, Fr. LIVOURNE), chief town of the province of Livorno, which consists of the commune of Leghorn and the islands of Elba and Gorgona.

The town is the seat of a bishopric and of a large naval academy—the only one in Italy—and the third largest commercial port in the republic, situated on the west coast, 12 mi. S.W. of Pisa by rail, 10 ft. above sea level. Pop. (1957 commune est.) 155,305. It is built along the seashore upon a healthy and fertile tract of land, an oasis in a zone of Maremma. Behind is a range of hills, the most conspicuous of which, the Monte Nero, is crowned by a frequented pilgrimage church and also by villas and hotels, to which a funicular railway runs.

The town itself is almost entirely modem (an extension of the older pentagonal town, entirely surrounded by canals). The Fortezza Vecchia (1521–34), guarding the harbour, is picturesque. Incorporated in it is a massive round tower, attributed to Matilda of Tuscany (q **v.),** but by some thought to be of the 9th or 10th century. The Fortezza Nuova (1590) on the east side of the old town was erected under Ferdinand I, whose fine bronze statue. with four barbarian slaves round the pedestal, stands near the old harbour. The lofty Torre del Rlarzocco, erected in 1421 by the Florentines, is fine. The façade of the cathedral was designed by Inigo Jones. The old Protestant cemetery contains the tombs of Tobias Smollett (d. 1771) and Francis Horner (d. 1817), and a large number of other British graves, the trading community having formerly been of considerable importance: but the "factory" was closed in 1825. At the Villa Valsovano, Shelley wrote the greater part of the *Cenci* in 1819. There is also a large synagogue founded in 1581.

The exchange, the chamber of commerce and the clearinghouse (one of the oldest in the world, dating from 1764) are united under one roof in the Palazzo del Commercio, opened in 1907. Many streets have been widened, and the road along the shore has been transformed into a shady promenade. Leghorn is the principal sea-bathing resort in that part of Italy, the season lasting from the end of June to the end of August. A spa for the use of the saline waters known as Xcque della Salute has been constructed. Leghorn is on the main line from Pisa to Rome; a branch line runs to Colle Salvetti. The harbour is protected by a breakwater nearly $\frac{3}{4}$ mi. long.

The imports consist principally of machinery, coal, grain, dried Esh, tobacco, wool and hides. and the exports of hemp, hides, olive oil. soap, coral, candied fruit. nine, straw hats, boracic acid, mercury and marble and alabaster.

The older shipyards have been extended, and shipbuilding is carried on, especially by the Orlando yard which builds large ships for the Italian navy, while new industries—namely, glass-making and copper and brass founding, electric power works, a cement factory, soap works, porcelain factories, flour mills, oil mills, a cotton-yam spinning factory, electric plant works, a ship-breaking yard, a motorboat yard, etc.—have been established. Other important firms, Tuscan winegrowers, oil growers, timber traders, colour manufacturers, etc.. have head offices and stores at Leghorn. with a view to export. Coral is also worked there.

The earliest mention of Leghorn occurs in a document of 891, relating to the first church there; in 1017 it was called a castle. In the 13th century the Pisans tried to attract a population to the spot and built the lighthouse (1303–05); in the 14th century Leghorn became a rival of Porto Pisano at the mouth of the Arno, which it uas destined ultimately to supplant. Crban V and Gregory XI landed at Leghorn on their return from Avignon. Charles VI of France sold it for 26,000 ducats to the Genoese (1407) from whom the Florentines purchased it in 1421. In 1496 the city made a successful defense against Maximilian and his allies, but was still small; in 1551 there were only 749 inhabitants. With the rise of the Medici came a rapid increase of prosperity; Cosmo, Francis and Ferdinand erected fortifications and harbour works, narehouses and churches with equal liberality, and the last especially gave a stimulus to trade by inviting "men of the East and the West, Spaniards and Portuguese, Greeks, Germans, Italians. Hebrens, Turks, Moors, Armenians, Persians and others," to settle and traffic in the city, as it became in 1606. Declared free and neutral in 1691, Leghorn was permanently invested with these privileges by the quadruple alliance in 1718; but in 1796 Napoleon seized all the hostile vessels in its port. It ceased to be a free city by the law of 1868.

After the Axis defeat in north Africa in June 1943, Leghorn was subjected to heavy Allied air raids. (T. A.; X.)

See Pietro Vigo, *Livorno.*

LEGIEN, KARL (1861–1920), German labour leader, was born on Dec. 1. 1861, in Marienburg, West Prussia. A turner by trade, he became in 1887 president of the turners' trade-union, and from 1891 onward was chairman of the general committee of the German federation of trade-unions and editor of their *Korrespondenzblatt.* He took a prominent part in 1901 at the Copenhagen congress which led to the foundation of the International Federation of Trade Unions. Be was secretary of that body from 1903 until 1919. He nas a strong supporter of the German government during World War I, and after the war, in conjunction with Theodor Leipart, aided in founding the Arbeitsgemeinschaft, an organization intended to rebuild German industry in co-operation nith employers. He died in Berlin on Dec. 26. 1920. Legien wrote many works on trade-union questions, including *Die deutsche Gewerkschaftsbewegung* (1911).

LEGION, in early Rome, the levy of citizens marching out en masse to war (Lat. *legio).* like the citizen-army of any other primitive state. As Rome came to need more than one army at once and narfare greu more complex, *legio* came to denote a unit of 4.000 to 6,000 heavy infantry supported by a cavalry contingent and light infantry armed with darts, slings and other missile weapons. In a broader sense, however, the term "legion' came to denote the military system that enabled Rome to conquer and rule the ancient world. *(See* ARMY; INFANTRY; ROMAN ARMY; TACTICS: *Tactics of the Ancient World.)*

Under the Republic the legion aas distinguished for its tactical flexibility as compared with the phalanxes of Greece and Macedonia or the massed formations of Persian and Egyptian arms. Roman citizens and auxiliaries from conquered Italian states were organized into separate legions. The object lessons taught by Hannibal led to an increase of cavalry and missile neapons, and during the civil nars the legionary became a professional soldier rather than a citizen-soldier. Citizens and auxiliaries now mingled in the ranks. both being attracted less by patriotism than by the expectations of donatives. land grants and other material rewards. Each legion had its own proud traditions, and the 10th Legion won renonn as the favourite unit of Julius Caesar.

The 28 legions during the early years of the Empire were increased in response to the growing menace of mounted barbarian incursions along the frontier, and the proportion of cavalry to

heavy infantry rose. More emphasis was placed upon missile weapons, and by the 4th century A.D., according to Vegetius, each legion had an "artillery" arm equipped with engines of war (*q.v.*).

Machiavelli advocated the revival of a legion adapted to weapons of gunpowder during the Renaissance, and in the 18th century Marshal Saxe adopted a modern legionary formation which became the tactical ancestor of the modern division. During the American Revolution the term "legion" was applied to several flying columns of mixed infantry and dragoons supported by light artillery, such as those commanded on the British side by Lieut. Col. Banastre Tarleton and on the American side by Count Casimir Pulaski.

In modern times the term has been employed for organizations of an unusual or exceptional character, such as a corps of foreign volunteers or mercenaries. Perhaps the earliest examples of this were the Provincial Legions formed in France by Francis I. Napoleon, in accordance with this precedent, employed the word to designate the second-line formations which he maintained in France and which supplied the Grande Armée with drafts. The term "foreign legion" is often used for irregular volunteer corps of foreign sympathizers raised by states at war, often by smaller states fighting for independence.

Unlike most foreign legions the "British Legion" raised in Great Britain and commanded by Sir George de Lacy Evans (*q.v.*) was a regularly enlisted and paid force.

The most famous example in the 20th century of the term "legion" as applied to a special branch of the military service is found in France's *Légion Étrangère,* made up of foreign volunteers commanded by French officers. The presence of a few men of title or fugitives from justice in the ranks created an aura of romance, but in actual fact most of the Legionnaires were simply motivated by a fondness for military life. They saw action in France's colonial wars, and their reputation as fighters was upheld in World War II. Rallying to De Gaulle, they gave a good account of themselves in Africa, Italy, France and Germany. Their organization and traditions continued almost unchanged after 1945 Indeed, many of the regiments retained their pre-war designations while fighting guerrilla campaigns in Indo-China and Algeria.

The term has also served to denote peacetime organizations such as the American Legion, composed of veterans of wars in which U.S. land, naval and air forces have participated. (LN. MS.)

LEGISLATION. The term legislation means the preparing and enacting of laws, but for the purposes of this article it refers only to acts of state legislatures or of the congress of the United States; in other contexts it is sometimes used to apply to municipal ordinances and to the rules and regulations of administrative agencies passed in the exercise of delegated legislative functions. (For an account of legislation in Great Britain, see STATUTE LAW.) Legislation involves not only action by a legislative body, however, but also participation by the executive. Concurrence by the executive is required to make legislation effective except where his exercise of the veto power is overridden by a sufficient majority of each house of the legislature. Moreover, the role of the executive involves far more than mere acquiescence or dissent. As the principal officer of state and as a political leader he participates extensively in the formulation of governmental policy and often in the actual preparation of legislation.

In the Cnited States the subject of legislation is complicated by the federal character of the nation. Each state possesses lawmaking power effective within its boundaries. The national government, within the scope of its constitutional powers. may pass legislation effective throughout the nation. Thus, conflicts may arise between a state and the national government. These conflicts are resolved by the courts. The constitution, treaties and laws of the United States are the supreme law of the land: and state statutes passed in contravention of them are unenforceable. Both state and federal courts are obliged to refuse to enforce a state statute contravening federal constitutional or statutory law. Furthermore, the supreme court of the United States may review state legislation and decide whether or not it conflicts with the constitution of the United States or with legislation passed by congress. The supreme court of the United States is the final arbiter with respect to federal legislation and as to state laws insofar as their conflict with federal power is concerned. State legislation also must comply uith the provisions of state constitutions. Final decision with respect to such compliance is vested in the state courts. (*See* CONSTITUTION AND CONSTITUTIOSAL LAW.)

The courts have the power not only to determine the constitutionality of legislation but also to decide what legislation means and how it fits into the whole structure of the law. Law in the United States, as in all nations sharing the Anglo-U.S. legal tradition. is derived largely from judicial precedents established in earlier cases. The body of precedents is known as the common law (*q.v.*). Legislation in the states sometimes changes the common-law rules. Through the interpretation of such legislation. the courts often may either restrict or extend its application. Thus in a very real sense the courts may be regarded as a part of the legislative process.

The relation of courts to legislation is involved also in another peculiar American problem. This relates to the extent to which courts will take "judicial notice" of statute law. When such notice is taken, it is unnecessary for a litigant to prove what the law is. All courts must take judicial notice of the federal laws and the statutes of the state in ahich suit is brought. However, there are different rules regarding the extent to which the courts will take notice of the legislation of other states. In some states statutes require the courts to take notice of such laws, while in others they must be specially pleaded or proved or else the courts will assume that the law of the other state is identical with either the decisional or statutory law of the state where the trial takes place. After 1936, honever, most states solved the problem by adopting the Uniform Judicial Notice of Foreign Law act. This law requires courts to take judicial notice of the common and statute law of other states but not of other countries.

The Legislative Process.—The process by which statutes are enacted is an important aspect of the study of legislation. In the states this process is controlled largely by constitutional provisions. Aside from restrictions on the subject matter of legislation, such as those forbidding the enactment of laws depriving any person of life, liberty or property without due process of law, there are constitutional limitations on the form and effect of legislation. These vary somewhat from state to state. Typical provisions are those limiting the authority of the legislature to pass local or special laws, requiring a single bill to be confined to one subject expressed in its title and providing that, except in an emergency, no law shall be effective until a specified number of days after its enactment.

In some states by constitutional provision and in others by statute or resolution, procedural requirements governing the passage of legislation are prescribed. In the main these are designed to prevent hasty and secret legislation. Examples of such provisions are the requirement that bills be read three times in each house, that the vote on final passage be entered in the journal, and that the enrolled bill be signed by the presiding officer of each house before presentation to the governor. The effect of noncompliance with these provisions varies among the states depending on the attitude of the courts as to hom noncompliance may be shown. In some states and in the case of the federal government, it is held that the existence of a properly executed enrolled bill is conclusive evidence of compliance with all procedural requirements. In others, the journals of the respective houses may be consulted, and in still others the courts may receive testimony regarding the method of passage. Where noncompliance can be shown it renders the bill void.

No discussion of legislative procedure would be complete without reference to the committee system. Both in congress and in the state legislatures, procedural rules require that proposed legislation be referred to a committee for study and recommendation. It is generally recognized that the most important work of a modern legislative body is done in committee. This is true partly because the sheer bulk of legislation prevents individual members from considering each measure at length and partly because much legislation is highly complex and technical in nature and thus requires consideration by experts. Membership on an influential

committee is highly prized by legislators in view of the importance of the function performed by committees. In order to promote efficiency and to make committee membership more meaningful, there has been a tendency to reduce the number of standing committees in state legislatures. This has also been the case in congress. In 1946 the number of standing committees in the house was reduced from 48 to 19 and in the senate from 33 to 15. Another development is the creation of technical staffs to serve the committees by collecting information, performing research and preparing legislation.

The Legislative Product. — Legislation is expressed in different forms. Usually legislative measures are referred to as acts or joint or concurrent resolutions of both houses of the legislature. As has been pointed out. no matter what these measures are called; they must be approved by the executive or passed over his veto in order to have legal effect. In some instances: one house or both may pass resolutions that may have some significance even though not submitted to the executive. Ordinarily, these measures involve the internal management of the legislature. such as the creation of committees. providing for legislative employees or instituting an investigation. Treaties of the national government have the force of statutes and stand on a parity with them. States may not make treaties. but with the consent of congress (and, where no national interest is involved, without it) may enter into compacts that have the effect of statutes. Compacts have been used to deal with problems requiring regional treatment but not nation-wide control.

The province of legislation in what was originally at least a common-law legal system is worthy of consideration. Legislation is useful in providing a framework for governmental action in fields that are either entirely new or that were not considered by the common law to be within the province of governmental action. The control of atomic energy is an example of the first area and the social security program of the second. Another field of legislative activity is found in connection with instances where it has become necessary to cope with situations with which the common law did not deal successfully. Perhaps the most obvious example has to do with workmen's compensation. The old law of master and servant developed by the English courts prior to the industrial revolution did not effectively solve the problems created by industrialization. It became necessary to enact legislation that in effect removed the defenses previously available to the employer and substituted the principle of liability without fault. These, of course, are but a few examples of the exceedingly broad area occupied by legislation in a complex society.

The wide scope of legislative activity and the fact that there are so many legislative bodies in the Cnited States created an immense mass of legislation. In the more populous states and in the federal congress, thousands of bills are introduced during each legislative session. Adequate consideration of the measures is hampered by the fact that most states have biennial rather than annual legislative sessions, and in many the length of the session is limited by the constitution. Special sessions may be called by the executive. but this device has not been very effective. In 1954 the Committee on American Legislatures of the Xmerican Political Science association recommended the substitution of regular annual legislative sessions for states with large populations. It also recommended the elimination of limitations on the length of legislative sessions.

The vast bulk of legislation has created difficulties in terms of keeping abreast of legislative developments. In the case of congress. and to some extent in the states, private agencies have supplied their clients with periodic reports on the status of legislation in particular areas. In New York the Legislative *Annual* has collected and preserved primary source material dealing with the legislation of that state. An index to state legislation was originated in 1928 by the Library of Congress. Occasional revisions of the laws are made by each state and by the federal government, but not in accordance with any definite schedule. In spite of these sources of information, there remains a heavy burden on anyone wishing to find all the legislation dealing with a particular topic.

Aids to Legislation. — The complexity of federal and state legislation has focused attention on the development of means to improve the quality of statutory law. Since legislative drafting requires special qualifications, the federal and many of the state governments provide specially trained counsel to prepare measures. Recognizing the need for such training. law schools offer courses that includk legislative drafting and, in some instances, provide drafting services for public and private groups. In addition to technical problems of drafting, the substantive aspects of legislation are matters of concern. For example, under the Legislative Reorganization act of 1946, important committees of congress were provided with professional staffs to do research. In other instances, commissions aided by experts have prepared particular statutes such as codes of procedure. workmen's compensation laws and tax measures. Continuity of legislative policy has sometimes been attained through the device of the legislative council. In recognition of the need for constant scrutiny of legislation to keep the law abreast of current problems. the state of New York created a law revision commission in 1934, charged with the duty of continually revising the statutes. North Carolina is another state in which continuous statutory revision has been undertaken.

Uniform Laws. — Since each state as well as the national government has lawmaking power, it is not surprising that in many instances state and federal laws on the same subject have contained different and conflicting provisions. This has been especially undesirable in regard to commercial matters. Accordingly, there have been numerous attempts to secure uniform legislation. A movement to attain this end was initiated by the organization of the Commissioners on Uniform State Laws in 1892. Commissioners appointed by each state meet annually to frame legislation on subjects upon which uniformity is believed to be desirable and to recommend its enactment by state legislatures. As might be expected, their most successful achievements have been in the field of commercial law, although many other subjects have been dealt with. The Council of State Governments prepares legislation in areas of general interest, not necessarily for enactment in uniform style but for the purpose of suggesting models to guide particular state legislatures. Other efforts to promote uniformity have been made by private interest groups and public welfare organizations. The American Law institute has engaged in the preparation of model legislation in the fields of taxation and criminal law. The American Bar foundation, organized under the auspices of the Xmerican Bar association, has instituted research programs leading to the preparation of model legislation. Interpretation statutes on the British model were also enacted in some states, although they have been of doubtful value.

Codification. — On the European continent a movement toward the codification of all law gained considerable strength during the 19th century. In England the principal advocate of codification was Jeremy Bentham (*q.v.*), who regarded it as a remedy for what he considered to be the evils of the common law. Although his efforts gained little support in England, his views were supported to some extent in the United States. David Dudley Field (*q.v.*) of New York was perhaps the leading exponent of codification in the United States. In 1848 the so-called Field code was adopted in New York. This code attempted to recognize and simplify procedural law. A proposed codification of substantive law was not enacted. Perhaps due to the failure of New York to accept the latter code, the general codification movement was limited in the United States, although procedural codes were adopted in many other states. Even where codes were adopted, however, they did not produce the hoped-for results of simplification and clarity. This may have been due to the unwillingness of judges, trained in the common law and accustomed to relying primarily on earlier decisions, to treat codes as ultimate sources of law, as is done in countries that have adopted the civilian legal system. On the other hand, limited attempts to codify certain segments of the law met with more success. The restatements of the law by the American Law institute were somewhat analogous to codes and were undertaken for similar purposes but were not adopted as statutes.

Interpretation. — The culmination of the legislative process is found in the interpretation of legislation by the courts, since,

unless compliance with the legislative will is automatic, it is at this point that legislation is given meaning and effect. Interpretation may be regarded as the process of attaching meaning to words. Although scholars have attempted to draw a distinction between interpretation and construction, the terms ordinarily are used interchangeably. The subject of statutory interpretation is extremely technical and is more properly discussed in a legal treatise. However, consideration of the way in which courts handle legislation is essential to a general understanding of the field.

The goal of statutory interpretation is ostensibly to discover and give effect to the intention of the legislature. Although there has been controversy over whether or not legislative intention actually exists, it is useful to suppose that legislation represents the collective will of the lawmaking body and that this will can be discovered by the courts. It then becomes important to consider the tools and materials used by judges in discovering what the intention of the legislature, in this sense, is. In this connection, one may distinguish between what may be called intrinsic guides and extrinsic aids to interpretation. The former involve the consideration of the statute itself, together with certain rules developed by the courts to assist them in the process of interpretation. Some are essentially rules of grammar such as would be used in discovering the meaning of any document. Others are rules or canons of construction that the courts have used in arriving at satisfactory results. For example, it is often said that the enumeration of a number of circumstances to which the statute applies indicates an intention to exclude all circumstances not enumerated. (*Expressio* unius est exclusio *alterius.*) Another instance is the rule of ejusdem generis, which, briefly stated. is that where specific language is used (such as inn. restaurant, barber shop) followed by a general phrase (such as other place of accommodation), the general phrase will be interpreted to include only matters of the same kind. Thus, in the instance stated. the phrase would not include the office of a dentist. Still other canons are essentially statements of policy, such as "statutes in derogation of the common law are to be strictly construed," or "remedial statutes are to be liberally construed."

Extrinsic aids involve matters not found in the statute itself. The meaning of a statute may be determined from related laws. Particularly in the federal courts such materials as the historical background of the statute, committee reports, successive drafts of bills during the process of enactment, and, to some extent, legislative debates may be considered.

These aids and guides, however, are simply devices to assist the courts. Frequently the underlying consideration may be some economic. philosophical or social objective.

Occasionally courts will depart completely from the literal wording of a statute in order to avoid what appears to be an absurd or unjust result. They may exclude a particular situation from a statute that plainly includes it. On rare occasions, courts have also applied statutes to persons or situations that were not included in the law in order to supply an inadvertent omission. Strictly speaking, the court does not interpret the statute in either situation, but establishes its own rule on the basis of policy.

See also AMERICAN LAW; COMMON LAW; STATUTE LAW; and the many related articles.

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Upon their introduction in congress, bills are numbered serially, by chamber of origin and by type (bill or simple, joint or concurrent resolution) and issued in printed form. The Library of Congress Legislative Reference service prepares a *Digest of Public General Bills* currently before congress. Upon passage, new public laws are separately printed New public and private laws subsequently appear in the *United States Statutes at Large,* a cumulative, annotated edition of all U.S statutes since the first congress. Much of U.S. public law has been codified in the *United States Code.* In the field of state legislation, the Library of Congress issues cumulative digests of new state laws.

(C. B. N.)

LEGISLATURE, the name given to that portion of the government of a country or state which is charged with the making, modification or repealing of the laws and with the raising and appropriation of the revenues. In many modern states the bicameral system (*q.v.*) has been adopted. The legislature bears different names in different countries: parliament, congress, legislature, diet, etc. The commonest name for the upper house is senate; in most countries other than the English-speaking countries the lower house is a chamber of deputies. In most of the legislatures of the various states in the United States, the lower branch of the house is known as the house of representatives, in a few it is styled the assembly and in three the house of delegates. The upper house is officially termed the senate for all of the states. In about two-thirds of the states the term of office for senators is four years; in most of the others it is two years. One state (Nebraska) had at mid-20th century a unicameral legislature.

Legislatures are a product of the modern era. Before the primitive beginnings of early legislative bodies (estates) in Europe in the medieval period, it was not generally recognized that governments might make law. Law was regarded as pre-existing and exemplified by custom (*q.v.*); basic legal principles might be discovered or applied, but law itself could not be created. Before there could be legislatures it was necessary that men change their concept of how law comes into existence. A need had to be felt for man-made legislation to meet specific human requirements.

Bicameral System.—In a bicameral legislative system, power is shared by two more or less co-ordinate legislative bodies. (See BICAMERAL SYSTEM.) Generally speaking, the lower house is most directly representative of the people. being elected on a wide franchise; the upper house, second chamber or senate is either elected on a restricted or derivative franchise or may contain nominated or hereditary elements or direct representatives of certain classes, interests or geographical divisions of the nation, as in the United States. The two houses may or may not be of equal authority. The power of initiating legislation usually belongs to both chambers but may, as in the case of the British parliament (*q.v.*), be restricted by confining the right of bringing forward financial measures to the lower house. The house of representatives in the United States congress initiates revenue bills, but the senate may amend them as it sees fit. (See CONGRESS, UNITED STATES.)

The general adoption of a second chamber in addition to the popular chamber is due to the belief that it is desirable to have a body, less directly controlled by popular opinion, which may exercise supervisory and delaying functions. Various devices have been adopted for securing an issue from possible deadlock between the two houses of a legislature, for example. joint sessions and the limitation of the delaying action of an upper house to a given period. The U.S. senate has unusual powers with regard to the ratification of treaties! the ratification of appointments to office and trial for impeachment. In general, the legislatures of the different American states are similar to the national congress. (See UNITED STATES [OF AMERICA]: Administration and Social Conditions.) Great Britain is the only country which retains a hereditary upper house, the house of lords, though even in this case its hereditary character is modified by the creation of life peerages. The hereditary element in the parliaments of central Europe was swept away by World War I. Even in elective upper houses the qualifications for members are usually more stringent than for members of the lower house, and the duration of their appointment is generally longer.

Legislative Representation: State Legislatures in the United States.—In theory pure representation calls for legislatures established on the basis of direct and equal representation for all voters, so that every voter has the same electoral influence over legislative action. In practice this condition is by no means realized. For mechanical reasons no representation can be exact because men are born and die and move about faster than the election system can keep track of them, but even aside from this, representation can show major distortion or unbalance as a result of three factors, all of which can be found in the election of U.S. state legislators.

Constitutional Requirements.—A number of state constitutions require representation of area regardless of population, just as

the constitution of the United States establishes equal representation in the senate for all states no matter how populous. Some state constitutions allow each county, large or small, one seat in the upper house, or require that every town, no matter how tiny, have at least one seat in the lower house. Other constitutional provisions may introduce bias into representation through special formulas or requirements, such as setting maximum limits of representation for populous counties or cities.

Legislative Requirements.—Since constitutions often allow considerable leeway on the matter, the legislatures themselves usually draw the boundaries of districts. This power has often been used to gerrymander (*q.v.*) districts, legislative parties or factions drawing boundaries in such a way as to maximize their own representation in the legislature and minimize the opposition's. The usual technique is to draw boundaries so that one's own party enjoys a close but safe margin of support in many districts. while the opposition's votes are concentrated heavily in a few districts and hence wasted.

Failure to Redistrict.— Imbalance also results from reluctance of state legislatures to adjust district boundaries and representation to the movement of voters across such boundaries. This gerrymandering by default produces serious inequalities in a nation of heavy internal migration, such as the U.S. Since the chief migration has been from country to city, the result has been underrepresentation of urban areas in state legislative chambers.

All three factors cause a decided rural bias in the great majority of both upper and lower houses in U.S. state legislatures. The arrangement is defended by rural interests on the basis of expediency, tradition and the Jeffersonian notion of the superior virtues of country life and country people. It is attacked as a contradiction of the democratic ideal of political equality and as giving an unfair advantage to farmers and other rural groups.

Legislative Powers.— The powers of legislatures vary widely. Historically. the growth of legislative authority accompanied great periods of popular ferment and revolution and the broadening of popular control of government. Legislatures came to be regarded as the people's branch of government against kings, nobles, judges and clerics. Following the mid-19th century, however, legislatures lost many of their powers, although usually retaining their symbolic roles as the seats of popular sovereignty, while the real power tended to shift into the hands of executive leaders with mass followings. The principal causes of the decline in legislative power were threefold: (1) the inability of legislatures. with their many factions, often divided leadership and cumbersome parliamentary procedures, to meet the need for quick; drastic and sustained action in the face of domestic or foreign crisis (especially war); (2) the necessity of delegating huge grants of power to executive leaders and bureaucrats as governments took on enormously complex and exacting social, economic and military tasks; and (3j the shift in popular attention. stimulated by press. radio and other mass mediums, from locally elected representatives in legislatures to the national executive and party chiefs. The culmination of this trend occurred in various 20th-century fascist and communist regimes. where the legislatures became hardly more than gatherings of carefully selected representatives hearing and applauding the pronouncements of dictatorial leaders. In western democracies, however, the legislatures retained some powers of importance. The British parliament could question cabinet members. debate and revise measures brought in by ministers and cause the fall of cabinets by refusing assent to bills (although it almost never exercised this last function). The U.S. congress retained its basic lawmaking and investigating powers, though its main role lay in its veto on the president. except when the latter found it possible to dominate the members through party and political influence. Such parliamentary systems as the French and Italian remained at mid-20th century the active seat of authority. but their principal function was the negative one of limiting executive leadership and power rather than the positive one of enacting programs on their own. In Asian and African nations the legislatures symbolized and institutionalized post-World War II popular control over government, just as western legislatures did in the 19th century, and hence many legislatures in those two continents enjoyed considerable power and prestige.

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(J. MACG. B.; X.)

LEGITIMACY AND LEGITIMATION. Children born in wedlock are legitimate. A child that is the issue of a father and mother who were lawfully married at the time of the birth of the child is legitimate. Moreover there is a very strong presumption that at whatever time after the marriage a child is born, that child is to be regarded as lawfully begotten by the husband. This rule. however. may be rebutted by evidence to the effect that the husband did not have access to the wife at any time when in the course of nature the child could have been begotten. Those born out of lawful wedlock are bastards or illegitimate.

Great Britain.— The common law of England provided that a child once illegitimate could not be legitimated by the subsequent marriage of its parents. This was in contrast to most systems of law. including Roman law, Scottish law and indeed the law of the church.

The Legitimacy act of 1926 ended a controversy between church and state by providing that when the parents of an illegitimate person marry, the marriage shall render that person legitimate from the date of the marriage. There is an exception, however, in the case of a person whose father or mother was married to a third person when the illegitimate person was born.

As regards property. the legitimation does not, except as expressly provided by the act, give the legitimated person any rights and does not affect the succession to any dignity. title or honour. The difference between the rights of a legitimate and an illegitimate child are confined principally to the inheritance of titles and of property upon an intestacy.

There is, however, a most important disability from which an illegitimate child suffers. Since registration of births is required by law, the entry in the register makes it apparent at a glance whether a child is legitimate or not. These registers are open to public inspection, and therefore anyone can discover that a child is illegitimate. Indeed there are many bodies and persons which require the production of a certified copy of an entry of birth for various purposes. This fact brings to the fore a burning controversy. There are those who wish to preserve this state of affairs in order that the disgrace of profligacy may be brought home. On the other hand there are those who consider that, since the illegitimate child was not the profligate. it should not be made to suffer. Reforms have been suggested whereby no person shall be entitled to inspect or obtain copies of an original entry in the register unless it be for the purpose of litigation in which it is necessary to establish who were the parents of a child. The reformers contend that birth certificates should be in an abbreviated form showing only the date and place of birth and the nationality of the child.

The father of a legitimate child is liable to maintain it in a manner suitable to the station in life of the parents. This becomes most important when the parents separate or are divorced. An illegitimate child, on the other hand, is entitled only to the very limited maintenance provided by the Bastardy acts. The mother is primarily liable for its maintenance. but may obtain an order against the father for the payment of maintenance not exceeding £1.10.0 per week. Reformers feel that this amount should be increased. They also consider that the distinction between the legitimate and the illegitimate child should be abolished as far as possible. They further consider that much juvenile delinquency results from the fact that the distinction is kept alive. (P. E. L.)

United States.— To the English common law rule that legitimacy is the status only of children whose parents were lawfully married there are notable exceptions in U.S. law. At least 25 states followed the early lead of Virginia, which passed a statute

drafted by Thomas Jefferson in 1785 making legitimate the offspring of any marriage. whether valid or not. In other states, such as Indiana and Wisconsin. the children of bigamous marriages are legitimate if one or both of the marital parties did not know of the illegal nature of their marriage. However, in Michigan and Nebraska. the children are legitimate only in relation to that parent, in the bigamous union, who was legally capable of contracting marriage.

Subsequent marriage of the parents of children born out of wedlock is generally recognized as legitimating such issue. However, some states, such as Arkansas and Kentucky, require an acknowledgment by the father in addition to the subsequent marriage in order to remove the legal stigma of illegitimacy. There are also other methods by which the status of legitimacy may be attained. For example, Tennessee and North Carolina authorize legitimation by judicial decree, in Michigan it can be effected by a written instrument recorded like a deed, in Louisiana by a notarial act and in Alabama by a declaration attested by two witnesses. In California and Oklahoma, public acknowledgment by the father of an illegitimate child as his own and receiving it into his family (with the consent of his wife if he is married) establishes the child as legitimate. Another method of legitimating is through the process of legal adoption of the illegitimate child. Arizona and North Dakota seem to have the most liberal approach of all, however, in declaring any child to be the legitimate issue of its natural parents (whether married or not), with full rights of support and inheritance.

At English common law, illegitimate children had no legal claim to support or inheritance. Several states, therefore give, without express legitimation, rights of inheritance to such children in case of acknowledgment by the father. Kansas so provides when the father's acknowledgment has been general and widely known, or in writing. New Mexico has the same provision. Other states permit inheritance where the paternity of the father has been proved during his lifetime.

While legitimacy and inheritance are separate and distinct from legal procedures aimed merely at establishing support and maintenance for children born out of wedlock, there was a growing body of U.S. legislation in the 1950s which enlarged the father's duties and responsibilities in the care and upbringing of his illegitimate offspring. The law in Minnesota, for example, provides that upon a legal adjudication of paternity the father is subject to all the obligations for the care, maintenance and education of the child and to all the penalties for failure to discharge those obligations which would be imposed upon him if the child were his legitimate offspring. The Minnesota statute further provides extensive administrative aids in enforcement of this law through the state and county public welfare machinery. North Dakota, among other states, has a similar law. To protect men from these new obligations which might be based on unfounded paternity claims, some states, such as New York, allow them to introduce blood tests in evidence to establish the scientific impossibility of their parenthood.

The trend of modern legislation in this field of legitimacy has been to enlarge the rights of children born out of wedlock as against the father, and to impose upon the state a definite obligation to assist in the enforcement of those rights, in addition to a general duty of public guardianship and protection for such children.

See Ernst Freund, "Illegitimate Laws of the United States," in *U.S. Children's Bureau Publication* no. *42* (Washington, D.C., 1919).

(W. Ho.; K. R. R.)

LEGITIMISTS, the name of the party in France which after the revolution of 1830 continued to support the claims of the elder line of the house of Bourbon as the legitimate sovereigns "by divine right."

The death of the comte de Chambord in 1883 dissolved the party, only an insignificant remnant, known as the Spanish Whites *(Blancs d'Espagne)*, repudiating the act of renunciation of Philip V of Spain and upholding the rights of the Bourbons of the line of Anjou.

The word *légitimiste* (from *légitime,* lawful) was not admitted by the French academy until 1878; but meanwhile it had spread beyond France, and the English word "legitimist" is now applied to any supporter of monarchy by hereditary right as against a parliamentary or other title.

LEGNAGO, fortified town of Veneto region, Italy, province of Verona, on the Adige river, 29 mi. by rail E. of Mantova, 52 ft. above sea level. Pop. (1951) 7,202. Legnago is one of the famous quadrilateral fortresses. The fortifications (largely dismantled by modern times) were made in 1815. older defenses having been destroyed by Napoleon in 1801. The territory is fertile, rice, cereals and sugar being grown.

LEGNANO, a city of Lombardia region, Italy, province of Milano, 17 mi. N.W. of it by rail, 682 ft. above sea level. Pop. (1951) 37,430. The church of S. Magno, built in the style of Bramante by G. Lampugnano (1504–29), contains an altarpiece by Luini. Legnano is the seat of important cotton (especially cotton finishing) and silk industries, and it has machine shops, boiler works and dyeing. Close by, the Lombard league defeated Frederick Barbarossa in 1176. A monument to commemorate the battle was erected on the field in 1876.

The battle is of significance in military history as foreshadowing the end of the great era of cavalry supremacy. Frederick, in the spring of 1176, sending for reinforcements from south Germany, planned a determined effort to crush the league of the Guelph cities. With a small body of knights he marched to Como to meet these reinforcements and then sought to regain his headquarters at Pavia by a circuit round the enemy stronghold of Milan. Meanwhile, however, the Milanese had rallied to them large contingents of their allies and, quitting Milan, placed themselves astride Frederick's route. He attacked at once, despite his inferiority of numbers, and his cavalry scattered the Lombard cavalry, then pressing on to attack the infantry mass which lay in rear. But their charge was brought to a standstill by the close-knit ranks of the Milanese pikemen. Their resistance allowed their own cavalry to rally, and these, reinforced by the arrival of a fresh body from Brescia, charged the flank of Frederick's cavalry. Frederick himself was unhorsed, and his troops thereupon broke and fled. The small body of infantry — furnished by the citizen militia of Come — were slaughtered or captured without difficulty. Frederick, however, managed to escape and reach Pavia. On the Lombard side, the battle had given an illustration of the possibilities of a staunch infantry body as a stable pivot to the mobile arm.

LEGOUIS, EMILE (1861–1937), French scholar, was born at Honfleur on Oct. 31. 1861. He was educated at Honfleur and in Paris, and after teaching for a year at the Collège d'Avranches was made *agrégé d'anglais* in 1885. He was next appointed lecturer at Lyons; after passing his doctorate in 1896, he became professor at Lyons. In 1904 Legouis was appointed special lecturer in English at the Sorbonne. He was the author of many important critical works on English literature, notably, with L. Cazamian, of the excellent *Histoire de la Zittkrature anglaise* (1924).

Among his publications are *Le Général Michel Beaupuy,* with G. Bussière (1891); *La Jeunesse de Wordsworth: étude sur "Le Prélude,"* crowned by the Académie française (1897); *Shakespeare* (1899); *Morceaux choisis de la littérature anglaise,* with *M.* Beljame (1905); *Chaucer* (1910); and *Edmund Spenser* (1923). He also collaborated in the translation of Chaucer's *Canterbury Tales,* crowned by the Académie française, 1908.

LEGOUVÉ, GABRIEL JEAN BAPTISTE ERNEST WILFRID (1807–1903), French dramatist, born in Paris on Feb. 5, 1807. Legouvé collaborated with A. E. Scribe in *Adrienne Lecouvreur* (1849), in which the title part was created by Rachel. Of the plays which he wrote alone the most famous is *Médée* (1855), which gave Ristori a great part and led to Legouvé's election to the French academy.

As time passed on, however, he devoted more and more of his energy to lecturing and propaganda on woman's rights and the education of children, in both of which directions he was a pioneer in French society. His *La Femme en France au XIX^me^ siècle* (1864), reissued, much enlarged, in 1878, and his other works exercised great influence. He was for many years inspector-

general of female education. In 1886–87 he published in two volumes Soixante ans de souvenirs, an autobiography. He was raised in 1887 to the highest grade of the Legion of Honour.

Legouvé mas always an advocate of physical training. He was long accounted one of the best shots in France, and he made the art of fencing his lifelong hobby. After the death of Désiré Nisard in 1888, Legouvé became the "father" of the French academy.

He died on March 14, 1903.

LEGROS, ALPHONSE (1837–1911), French painter, etcher and medalist who taught at the Slade school, London, was born at Dijon in Burgundy on May 8, 1837. After attendance at the École des Beaux-Arts and a short apprenticeship with a decorator, Maitre Nicolardo, during 1850, Legros left Dijon for Paris in 1851. spending six months at Lyons, working in fresco under Beuchot in the chapel of Cardinal Bonald. In Paris he studied with C. Cambon, a scene painter, then with Lecoq de Boisbaudran in the company of I. Fantin-Latour. F. Bonvin and Regamey, and at the evening classes of the École des Beaux-Arts.

Legros first exhibited at the Salon of 1857 where his profile portrait of his father (Tours) attracted the attention of Champfleury; another portrait was rejected, but was shown by Bonvin in his studio. The "Angelus" (Salon, 1859) was singled out by Charles Baudelaire, and the "Ex Voto" (Dijon) attained an honourable mention in the Salon of 1861. At this time Legros was in intimate contact with painters such as James Whistler and Edouard Manet and seems to have been regarded as an important figure by the champions of the "new realism," Champfleury, Baudelaire and L. Duranty.

Encouraged by Whistler, Legros settled in London in 1863. taking out naturalization papers in 1881. He became teacher of etching at the South Kensington schools and was appointed Slade professor at University college, London, in 1876. His work at the Slade school (1876–92) is to be remembered for his insistence upon sound constructional drawing at a time when draftsmanship was at a low ebb in England. He died at Watford on Dec. 8, 1911.

Important collections of Legros' work. some including bronzes, etchings and drawings. are in Paris and London Collections of etchings and drawings are in Boston, Mass., and Washington, D.C. Among his notable paintings are "Amende Honorable" and "Dead Christ" (Paris); and "Demoiselles du Mois de Marie," "The Tinker" and "Repas des Pauvres" (London).

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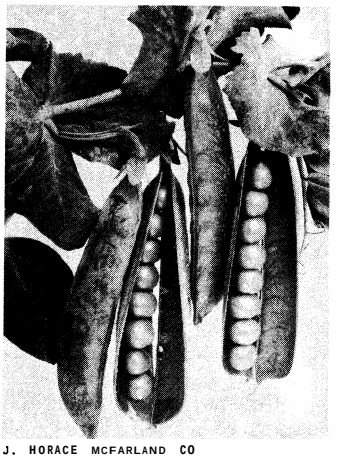
LEGUÍA, AUGUST0 B. (1863–1932), Peruvian man of affairs, statesman and executive, was born in the department of Lambayeque in 1863. He received his early education in Chile and served with the Peruvian forces during the War of the Pacific (1879–81). At the end of the war he entered upon a business career, became head of the Latin-American department of the New York Life Insurance company, and later was intimately connected with other business enterprises and industries. Turning his attention to politics in 1903, he was appointed secretary of the treasury, and in 1908 he was elected president of the republic. In May 1909 a revolution in the capital very nearly cost him his life, and foreign complications throughout his term made it a stormy one. After his retirement he was the object of political persecution and in 1913 was driven into exile. He returned to Peru in 1919 and was again elected president. but before the end of his predecessor's term, being warned that he would be prevented from taking office, he headed a revolt and seized the government by a coup *d'état.* The following year he secured the passage of a new constitution embodying several of the principles of the Mexican constitution of 1917. In 1923 and again in 1927 the constitution was amended to permit his re-elections. Under Leguia's administration Peru experienced an era of prosperity. His government procured the investment of large sums of foreign capital in the country and made notable progress in public works and education, in stimulating industries and exploiting natural resources, in the construction of roads and railways, in the organization of a navy and naval defense (under United States guidance) and especially in reclaiming large tracts of desert land by means of irrigation.

See Graham H. Stuart, ***The*** Governmental System of Peru (1925). (W. B. P.)

LEGUME, a dry pod formed from one carpel, splitting by both the front and the back suture into two similar pieces or valves. It characterizes such leguminous plants as the bean, etc. The extended sense, usually in the plural, applied to any vegetable used for food is seldom used. See FRUIT; LEGUMINOSAE; PULSE.

LEGUMINOSAE, a family of plants comprising approximately 600 genera and 13,000 species (thus second only to the Compositae in number of species), cosmopolitan in distribution at all elevations and readily adaptive to various habitats. It includes herbs, lianas, shrubs and trees. A few species are aquatic. The family is regularly divided into three subfamilies: Papilionoideae or sweet pea, Mimosoideae or sensitive plant and Caesalpinioideae or senna. A specific pod type of fruit, the legume, characterizes all three subfamilies. In English the noun legume may be used in two senses, the more comprehensive meaning being the leguminous plant as a whole; the more specific, one part of the plant, the fruit.

Economic Importance. — The legumes are economically important as food, medicinals, chemicals, forage, timber. etc. The seeds of bean. pea. soybean and lentil have been staple food for centuries. Some pods are edible; *e.g.,* the fruit of the carob tree is St. John's bread. The pod of the tamarind tree furnishes an acid pulp used in preservatives and beverages. Chemicals and medicinals are invariably the product of trees or shrubs of the warmer climates: Indian senna is a cathartic from a species of Cassia; hematoxylin is a purple dye from the heartwood of the logwood tree, useful in staining tissues; gum arabic is from a species of Acacia; rotenone (an insecticide) from *Lonchocarpus;* gum tragacanth from the milk vetch; balsam of copaiba is an oleoresin from various species of *Copaifera;* true copal, the resinous exudates from various species of principally tropical African Caesalpinioideae, is useful in lacquers and varnishes; etc. Herbs, too, are occasionally chemically and medicinally important; *e.g.,* the indigo plant as a source of the blue dye; the licorice plant. whose root yields licorice. Forage plants include many legumes almost exclusively belonging to the Papilionoideae, such as various species of lespedeza and clover, partridge pea. wild alfalfa, soybean. lotus, etc. All of these are abundant in temperate climates. Cajan bean and horse bean (*Canavalia*) are grown for forage in tropical areas. The timber trees are principally tropical; e.g , the dalbergias, including rosewood and blackwood; a few acacias. *e.g.,* the blackwood of Australia; the purpleheart trees (Peltogyne), the nallabas (*Eperua*); ironwood (*Apuleia*) from South America. The false acacia or black locust of the more temperate climates is an exception.



J. HORACE MCFARLAND CO

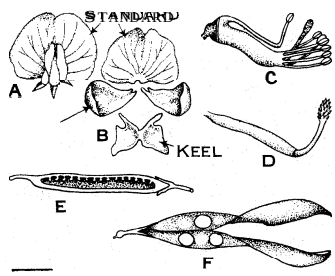
GARDEN PEAS (PISUM SATIVUM)

Surprisingly few herbs are cultivated in gardens, with lupine, wild indigo, sweet pea and everlasting pea as examples of exceptions. Lianas, such as wistaria, horse bean and butterfly pea, are treasured by gardeners. Well-known shrubs include broom, scotch broom (*Cytisus scoparius*), bladder senna, peacock flower, the Amherstza *nobilis,* a Burmese species considered by many to be the most attractive of all shrubs. The list of showy leguminous trees is impressive: the spectacular poinciana tree native to Madagascar, the coral tree, silk tree, redbud, Japanese pagoda tree, etc. A few species native in temperate climates are cultivated; *e.g.,* redbud.

The Flower. — The Leguminosae is closely allied with the rose family (Rosaceae), the two being grouped in the order Rosales. Individual blossoms of the Leguminosae usually have the complete

complement of four whorls: the outermost calyx, usually green and cup shaped, occasionally persisting in fruit; the corolla of one to five often highly coloured petals: the male organs (stamens); and the centrally located female organ (pistil), from which the legume will form.

The subfamily Papilionoideae (often raised in status as a family, Papilionaceae) has relatively large flowers bearing a fancied resemblance to a butterfly (Lat. *papilio*, "butterfly"); *e.g.*, sweet pea. The two basal petals are united into a boat-shaped keel (carina), the two lateral ones resembling wings (alae), and the single superior petal (vexillum) conspicuous and flaring In the bud the vexillum lies outside the other petals. In the kidney bean the corolla is conspicuously twisted; clovers and sweet clovers have the vexillum much larger than the other petals; in the lead plant (*Amorpha*) the petals are solitary (vexillum).



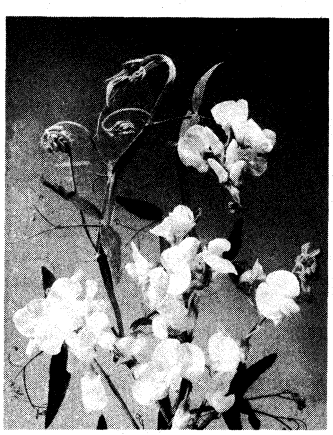
ADAPTED FROM G. LAWRENCE, "INTRODUCTION TO PLANT TAXONOMY,"; REPRODUCED BY PERMISSION OF THE MACMILLAN COMPANY

SECTIONS OF LATHYRUS LATIFOLIUS

(A) Flower, face view; (B) corolla; (C) flower, less perianth; (D) pistil; (E) ovary, vertical section; (F) legume, dehisced

The stamens, arising near the base of the pistil, are regularly ten, the small pollen-bearing sacs (anthers) borne on slender stalks united (monadelphy) along much of their length as a delicate sheath investing the ovary. Occasionally the tenth stamen is free (diadelphy). In the sophoras, such as the Japanese pagoda tree, all the stamens are free. In leguminous plants the central and solitary pistil has a slender compressed ovary surmounted by a more slender style with a simple or highly modified stigmatic surface. Many flowers are insect pollinated, and the floral mechanisms to allow pollen from the anthers to reach the stigmas of the pistils are intricate. In the peanut (groundnut) the stalk below the ovary elongates during fruit formation, forcing the legume beneath the soil.

In the Mimosoideae the petals do not overlap each other in the bud. Individual flowers are often pomponlike in appearance, with the outermost parts arranged in raylike fashion (radial symmetry), the stamens being numerous and elongate; *e.g.*, silk tree, acacia. In the Caesalpinioideae the flowers are usually bilaterally symmetrical with five petals. In the bud the vexillary petal is overlapped by the others.



ROCHE

PERENNIAL **SWEET** PEA (LATHYRUS LATIFOLIUS)

The flowers of the legumes are rarely solitary (some species of *Astragalus* and *Swartzia*), usually occurring in clusters (inflorescences). The individual flowers regularly occur on stalks (pedicels) disposed along an axis, *e.g.*, lupine, or are compressed in dense heads; e g, many Mimosoideae, clover. alfalfa. *Brownea*, etc. The inflorescences may terminate the shoot (prairie clover) or may arise laterally (locust). Pendent inflorescences are usually attractive, as in wistaria and laburnum.

The Fruit.——As in the case of the floners the fruits are very important in distinguishing the kinds of leguminous plants. The fruit of legumes are narrowly oblong, splitting open uniformly to form two valves. the seeds being arranged in rows. There is great variation in size. shape, texture. external ornamentation, thickness, mode of splitting open (dehiscence), etc.

The pods of Entada *phaseoloidis* and yard-long bean, both tropical, may reach a metre in length. Minute flowers often form elongate fruits; the pinhead-size pistils of Prioria and of some species of *Dimorphandra* may form pods six inches or more in length. Striking shapes, such as orbicular (Pterocarpus), club shaped (balsam of Peru), coiled (alfalfa) and corkscrew shaped (*Prosopis*), are not unusual. The term loment is applied to those pods whose valves are constricted along their length as a series of joints, the whole somewhat beadlike in appearance; *e.g.*, tick trefoil, sophoras, some acacias? etc. Pods are occasionally four angled (Inga). Winged legumes are not uncommon (Ptevogyne, sainfoin) while some pods may remain hairy (some lupines); in tick trefoil the hairs are hooked. The valves may be conspicuously warty (courbaril), spinose (*Tessmannia*, Sindoru). pitted (sainfoin) or glandular (*Hofmanseggia*). Resinous deposits are occasional (courbaril, copaiba). Some pods may remain paperlike in thickness (some vetches), while others may be thick walled and leathery (Kentucky coffee tree). Occasionally the outer part of the valves will break away from the inner portion (endocarp), the latter enclosing the seeds. Some fruits are indehiscent at maturity (peanut). The bulk of the wall may be pulpy (tamarind); if the wall is both fleshy and indehiscent (*Detarium* and some species of Andira), the fruits are drupaceous. Examples of colourful pods are those of the hyacinth bean, purple in colour, and those of black medick.

The vast majority of fruits dehisce with the valves separating evenly (garden pea) or occasionally twisting and curling (lotus). In the bladder senna these may open elastically, discharging the seeds in explosive fashion. The internal wall of the valves may be smooth or variously modified to form septa dividing the fruit into chambers or cells, usually with one seed per chamber (purging cassia). Occasionally pulpy material may envelop the seeds (Kentucky coffee tree).

Seeds are as valuable for diagnostic purposes as the valves enclosing them. Single-seeded pods are occasional (water locust, lespedeza). Seeds vary greatly in shape, size, texture and colour of the seed coat, food material (endosperm), etc. Oblong, kidney-shaped and round seeds are common. The similarity of the lens of the eye to the seed of the lentil prompted the animal anatomists to use the genus name Lens for this anatomical part. The testa is often brilliantly coloured (*e.g.*, seeds of coral tree, some species of Ormosia). Seeds like the bean and the pea have very thin testae, while others (tamarind, carob tree) have very hard coats. The shape and position of the hilum, marking the point of attachment of the seed stalk (funicle), are important distinguishing features. The funicle may differentiate as an aril, in whole or in part covering the seed coat. The aril is often fleshy and spectacular in colour.

Leaves **and** Roots.—Simple leaves (*i.e.*, those with blades not divided into leaflets) are rare among leguminous plants (*e.g.*, redbud). Compound leaves are typical, with the leaflets often arising in fingerlike fashion from the leafstalk or petiole (digitately palmate); *e.g.*, cassia, black locust. In the Mimosoideae the leaf axis is usually subdivided into branchlets bearing leaflets. *i.e.*, are twice pinnate; *e.g.*, sensitive brier, acacia. Bipinnate leaves also characterize a number of the groups of the Caesalpinioideae.

In the bauhinias (mostly vines) the leaves, while simple, are conspicuously two lobed above the middle of the blade; this influenced Linnaeus, the great Swedish taxonomist of the 18th century, to name the group in honour of the Bauhin brothers, famous herbalists of the previous century.

The leafstalk of leguminous plants has a pair of small leaflike organs (stipules) at the base; occasionally these are rather large (garden pea) or are reduced to thorns (Robinia, some acacias). Many of the acacias and cassias have obvious glands on the leaves, useful in diagnosing the species. A few groups (Acacia, *Tachigalia, Sclerolobium*) have petioles swollen as insect homes (myrmecodomatia), with ants as the principal inhabitants. In some acacias the hollowed-out thorns serve as ant homes. Climbing organs (tendrils) occasionally terminate the leaf axis (garden pea). *Mimosa pudica*, the sensitive plant of South America, has foliage remarkably responsive to touch, the pairs of leaflets often folding together and the entire leaf drooping. Sudden changes in water content of small organs (pulvini) at the base of the individual leaflets and the unit leaf account for this. Throughout the daytime the leaves of many leguminous plants change position.

e.g., clover, alfalfa, bean, rain tree, etc., a response to differences in light intensity ("sleep movements"). The leaflets of the telegraph plant of tropical Asia may change position every few minutes. In certain acacias the petioles may be enlarged so as to resemble leaf blades (phyllodes), the true blades being reduced or absent.

In many leguminous plants, especially in arid regions, the roots penetrate the soil to considerable depths, being much longer than the shoots above. On the rootlets of leguminous plants are small swellings (nodules) containing nitrogen-fixing bacteria of the genus *Rhizobium.* The nitrogen-fixing bacteria live in beneficial association (symbiosis) with the root tissues. They take the free nitrogen from the air and fix it into complex nitrogenous compounds. The excess nitrogenous compounds elaborated by the bacteria are utilized by the green plant for growth. When these plants die and decay, the nitrogenous material in the nodules is made available to the soil.

Many farmers rotate such plants as clover or alfalfa with regular crop plants to avoid impoverishment of the soil. By the same token leguminous plants like soybean may be grown exclusively on the same site, serving not only to maintain a rich soil but also as crops useful for food, fodder, sources of oil, plastics, etc. Soybean, once grown exclusively in the orient, is grown extensively in the United States: especially in the midwestern states, and represents one of the most important U.S. crops. The role of industrial chemistry in the development of many soybean derivatives is a commercial saga almost without parallel. *See* also ACACIA.

(J. D. DR.)

LEH, the capital of Ladakh and Baltistan which are both included in Ladakh district, Jammu and Kashmir state. Pop. (1941) 3,372. Leh and the southern part of Ladakh lie south of the cease-fire line (midnight, Dec. 31, 1948) and are within the Indian sector of Kashmir: the northern part of Ladakh and Baltistan are in the sector held by Pakistan. Leh was the scene of fighting between the forces of India and Pakistan in 1948.

The town is situated 4 mi. from the right bank of the upper Indus, 11,300 ft. above sea level: in the Ladakh range of mountains, 160 mi. E. of Srinagar and 300 mi. S. of Yarkand (by map measurement). It is the great emporium of the trade which passes between India, the Chinese province of Sinkiang and Tibet. There the routes leading from Kashgar, Yarkand, Khotan and Lhasa meet.

The two chief roads from Leh to India pass via Srinagar and through the Kulu valley respectively. Leh has formed the starting point of many an adventurous journey into Tibet, the best-known route being that called the Janglam, the great trade route to Lhasa and China, passing by the Manasarowar lakes and the Mariam La pass into the valley of the Tsanpo. Leh is the site of a meteorological observatory and of a palace of former rajas of Kashmir who ruled over the country before the Dogra dynasty of the 19th and 20th centuries. *See* LADAKH.

LEHAR, FRANZ (1870–1948), Hungarian operetta composer, was born at Komárom, Hung., April 30, 1870. After studying at Vienna, Aus., and Prague, Czech., he became a conductor. His opera *Kukuska,* afterward called *Tatiana,* was performed in 1896, and he later wrote about 30 operettas. The popularity of his music is due to the charm of its melodies; and especially to the orchestration of his waltz themes. His most famous musical comedies are *The Merry Widow* (1905) and *The Count of Luxemburg* (1909).

Lehar also wrote *The Man with the Three Wives, Gipsy Love,* Eva and *Paganini* (1925). He died Oct. 24, 1948, at Bad Ischl, Aus.

LEHMANN, LILLI (1848–1929), one of the greatest Wagnerian sopranos of all time. was born in Wurzburg, Ger., Nov. 24, 1848. She was taught singing by her mother. Marie Loew, who had sung opera at Kassel. The daughter debuted at Prague in 1865 and at Berlin in 1870. In 1876 she sang in the first production of Wagner's *Ring* at Bayreuth. She debuted in London in 1880 and sang at the New York Metropolitan opera in 1885-89 and 1891-99. At both places she introduced many Wagnerian roles. After her return to Europe she became associated with the Salzburg festival in 1905 and taught singing. She wrote *Meine Gesangskunst* (1900) and the autobiographical *Mein Wen* (1914). She died in Berlin on May 17, 1929.

LEHMANN. PETER MARTIN ORLA (1810–1870), Danish statesman, was born at Copenhagen on May 19, 1810. Although of German extraction his sympathies were with the Danish national party and he contributed to the liberal journal the *Kjöbenhavnsposten* while a student of law at the University of Copenhagen. From 1839 to 1842 he edited, with Christian N. David, the *Fadrelandef.*

In 1848 Lehmann became leader of the "Eiderdanen," that is, of the party which regarded the Eider as the boundary of Denmark, and the duchy of Schleswig as an integral part of the kingdom, and a member of the cabinet of Count Moltke. He was employed on diplomatic missions to London and Berlin in connection with the Schleswig-Holstein question, and was for several months in 1849 a prisoner of the Schleswig-Holsteiners at Gottorp. A member of the *folketing* from 1851 *to* 1853, of the *landsting* from 1854 to 1870, and from 1856 to 1866 of the *reichsrat,* he became minister of the interior in 1861 in the cabinet of K. C. Hall, retiring with him in 1863. He died at Copenhagen on Sept. 13, 1870. His book *On the Causes oj the Misfortunes oj Denmark* (1864) went through many editions.

LEHMBRUCK, WILHELM (1881–1919), German sculptor, best known for his single nudes, was born Jan. 4. 1881, at Meiderich near Duisburg. The son of a miner, he went through the art schools in Diisseldorf on scholarships. Although formally inspired by recent French sculpture, his art, like that of many of his German contemporaries, was sensitive, intense and pessimistic. Lehmbruck alone, however, achieved a style that was monumental as well as tragic. Almost all his greatest works are simply posed, lean, angular, agonized. These he studied and restudied, sometimes making a sequence of variants. While living in Paris between 1910 and 1914 he created statues of melancholy, brooding girls. The statues of youths modeled in Berlin and Zurich, Switz., during World War I turn in upon themselves, tortured and despairing. He himself committed suicide in Berlin, March 25, 1919. Since his favourite materials were bronze and synthetic stone (a kind of concrete), his principal works exist in several casts. Among his works are: "Standing Woman" (1910), "Kneeling Woman" (1911), "The Overthrown" (1916), "Seated Youth" (1918). He also made portrait busts, paintings, etchings and lithographs. The Museum of Duisburg and the Museum of Modern Art in New York contain the largest collections of his works.



COURTESY OF THE MUSEUM OF MODERN ART, MRS. JOHN D. ROCKEFELLER FUND

LEHMBRUCK'S "KNEELING WOMAN" (1911). CAST STONE, 69½ IN. HIGH. IN THE MUSEUM OF MODERN ART, NEW YORK CITY

BIBLIOGRAPHY.—Paul Westheim, *Wilhelm Lehmbruck,* 2nd ed. (1922); August Hoff, *Wilhelm Lehmbruck seine Sendung und seine Werke* (1936); Reihe Europaische Bildhauer, *Wilhelm Lehmbruck* (1957).

(J. P. C.)

LEHNIN, a village in the district of Potsdam, Ger., between two lakes, which are connected by the navigable Emster with the Havel, 12 mi. southwest from Potsdam. Pop. (1950) 3,809. It contains the ruins of a Cistercian monastery called Himmelpfort am See, founded in 1180 and dissolved in 1542; and a parish church, formerly the monasterial chapel, restored in 1872–77. Brickmaking and sawmilling are the chief industries.

The *Lehnin Prophecy* (*Lehninsche Weissagung, Vaticinium Lehninense*), a poem in 100 Leonine verses, made its appearance about 1690 and caused much controversy. It came to be regarded as a compilation and the date of its authorship placed about the

year 1684; it had been thought to date from about 1350.

LEHRS, KARL (1802–1878), German classical scholar. was born at Konigsberg on June 2, **1802.** He was of Jewish extraction, but in **1822** he embraced Christianity. In **1845** he was appointed professor of ancient Greek philology in Konigsberg university, and he died on June 9, 1878. His most important works are: *De Aristarchi Studiis Homericis* (1833, 2nd ed. by A. Ludwich, 1882), which laid a new foundation for Homeric exegesis (on the Aristarchean lines of explaining Homer from the text itself) and textual criticism; *Quaestiones Epicae* (1837); *De Asclepiade Myrleano* (1846); *Herodiani Scripta Tria emendatiora* **(1848);** *Populäre Aufsätze aus dem Altertum* (1856, and much enlarged ed., 1875), his best-known work; *Horatius Flaccus* (1869), in which. on aesthetic grounds. he rejected many of the odes as spurious; *Die Pindarscholien* (1873). Lehrs was a man of very decided opinions, "one of the most masculine of German scholars"; he believed in a single authorship of the *Iliad,* and comparative mythology and the symbolical interpretation of myths he regarded as a species of sacrilege.

A. Ludwich edited Lehrs' correspondence (1894) and his Kleine *Schriften* (1902).

LEIBL, WILHELM (1844–1900), German portrait and subject painter, who has been called the first modern German realist! was born on Oct. **23. 1844,** in Cologne, where his father was *Musikdirektor* of the cathedral. In **1861** he became the student of H. Becker and in **1864** entered the Munich academy. where his teachers were Strahuber and Anschütz. He then studied with Avon Ramberg (1866–68) and Piloty **(1869).** In **1869** he exhibited his first painting at the Munich exhibition. In the following year he gained the Paris gold medal with his "Portrait of Frau Gedon," painted in the manner of Rembrandt. Coming under the influence of Courbet, he then went to work in Paris, but the outbreak of the Franco-German War sent him home after nine months. From **1870** to 1873 he lived in Munich and afterward worked at small country places in Bavaria, settling at Berbling (1878–81), Xibling (1881–92) and Kutterling (1892–1900), where he led the life of a peasant and. in opposition to the prevailing style of romantic idealism, painted the scenes around him.

As Leibl grew older he ceased to imitate the Dutch masters and followed his own strong instinct for colour, reproducing what he saw with a bold, sure touch. His superb technique enabled him to paint liquidly and broadly and yet to do detail work of the utmost delicacy. Leibl also etched 19 plates. He died at Würzburg on Dec. **4,** 1900.

LEIBNITZ or LEIBNIZ, **GOTTFRIED WILHELM** (1646–1716), German philosopher, mathematician and man of affairs, one of the major systematic thinkers of modern times, important both as a metaphysician and as a logician and distinguished also for his independent invention of the differential and integral calculus, was born on July 1 (new style; June 21, old style), **1646,** at Leipzig, where his father was professor of moral philosophy. Though the name Leibniz, Leibnitz or Lubeniecz was originally Slavonic, his ancestors were German and for three generations had been in the employment of the Saxon government. Young Leibnitz was sent to the Nicolai school at Leipzig, but from 1652, when his father died, seems to have been for the most part his own teacher. From his father he had acquired a love of historical study. The German books at his command were soon read through. and with the help of two Latin books—the *Opus Chronologicum* of Sethus Calvisius and an illustrated edition of Livy—he learned Latin at the age of eight. Before he was 12 he could read Latin easily and had begun Greek; he had also remarkable facility in writing Latin verse. He next turned to the study of logic, attempting already to reform its doctrines and zealously reading the scholastics and some of the Protestant theologians.

At the age of 15, Leibnitz entered the Gniversity of Leipzig as a law student. His first two years were devoted to philosophy under Jakob Thomasius, a Neo-Aristotelian. who is looked upon as having founded the scientific study of the history of philosophy in Germany. It was at this time, probably, that he first made acquaintance with the thinkers who had already revolutionized science and philosophy, Francis Bacon, Cardan, Campanella, Kepler, Galileo and Descartes; and he began to consider the difference between the old and new ways of regarding nature. He resolved to study mathematics. It was not, however, till the summer of **1663.** which he spent at Jena under Erhard Weigel, that he obtained the instruction of a mathematician of repute. The next three years he devoted to legal studies, and in **1666** he applied for the degree of doctor of law, with a view to obtaining the post of assessor. Being refused because of his youth, he left his native town forever. At Xltdorf—the university town of the free city of Nuremberg—his dissertation *De casibus perplexis* procured him the doctor's degree at once (Nov. **1666)** and the immediate offer of a professor's chair, which, however, he declined, having, as he said, "very different things in view."

Leibnitz, not yet 21 years of age, was already the author of several remarkable essays. In his bachelor's dissertation *De principio individui* (1663), he had defended the nominalistic doctrine that individuality is constituted by the whole entity or essence of a thing; his arithmetical tract *De complexionibus,* published in an extended form under the title *Dissertatio de arte combinatoria* (1666), was an essay toward his lifelong project of a reformed symbolism and method of thought; and besides these there were juridical essays, including the *Nova methodus docendae discendaeque jurisprudentiae,* written in the intervals of his journey from Leipzig to Altdorf. This last essay is remarkable, not only for the reconstruction that it attempted of the *Corpus Juris* but also as containing the first clear recognition of the importance of the historical method in law. Nuremberg was a centre of the Rosicrucians, and Leibnitz, busying himself with the writings of the alchemists. soon gained such a knowledge of their tenets that he was supposed to be one of the secret brotherhood and was even elected their secretary.

Mainz and the Visit to France.—A more important result of his visit to Nuremberg was his acquaintance with Johann Christian von Boyneburg (1622–72), formerly first minister to the elector of Mainz and one of the most distinguished German statesmen of the day. By his advice Leibnitz printed his *Nova methodus* in **1667,** dedicated it to the elector and, going to Mainz, presented it to him in person. It was thus that Leibnitz entered the service of the elector of Mainz, Johann Philipp von Schonborn, at first as an assistant in the revision of the statute book, afterward on more important work.

The policy of the elector, which the pen of Leibnitz was now called upon to promote, was to maintain the security of Germany, threatened on the west by the aggressive power of France, on the east by that of Turkey. Thus in **1669,** when the crown of Poland was vacant, it fell to Leibnitz to support the claims of the German candidate, which he did in his first political writing, *Specimen demonstrationum politicarum pro eligendo rege Polonorum,* attempting, under the guise of a Catholic Polish nobleman, to show by mathematical demonstration that it was necessary in the interest of Poland that it should have the count palatine of Neuburg as its king. But neither the diplomatic skill of Boyneburg, who had been sent as plenipotentiary to the election at Warsaw, nor the arguments of Leibnitz were successful, and a Pole was elected to fill the vacant throne.

A greater danger threatened Germany in the aggressions of Louis XIV. Though Holland was in immediate danger, the seizure of Lorraine in **1670** showed that Germany also was threatened. It mas in this year that Leibnitz wrote his memorandum on "public safety and the present state of affairs," in which he urged the formation of a new "Rhenish league" for the protection of Germany and contended that the states of Europe should employ their power, not against one another, but in the conquest of the non-Christian world, in which Egypt. "one of the best situated lands in the world," would fall to France. The plan was discussed with Boyneburg and obtained the approval of the elector. French relations with Turkey were at the time so strained as to make a breach likely and at the close of **1671,** when the Third Dutch War was imminent, Louis himself was approached by a letter from Boyneburg and a short memorial from the pen of Leibnitz, who attempted to show that Holland itself, as a mercantile power

trading with the east, might be best attacked through Egypt. while nothing would be easier for France or would more largely increase its power than the conquest of Egypt. On Feb. *12, 1672,* a request came from the French secretary of state, Simon Arnauld de Pomponne (1618–99), that Leibnitz should go to Paris. Louis seems still to have kept the matter in view, but never granted Leibnitz the personal interview that he desired, while Pomponne wrote. "I have nothing against the plan of a holy war, but such plans, you know, since the days of St. Louis, have ceased to be the fashion." Not yet discouraged. Leibnitz wrote a full account of his project for the king *(De expeditione Aegypfiaca . . . justa dissertatio)* and a summary of the same *(Consilium Aegyptiacum)* evidently intended for Boyneburg. But Boyneburg died in Dec. *1672,* before the *Consilium* could be sent to him; nor did the former ever reach its destination. The French quarrel with the Turks was made up, and the plan of a French expedition to Egypt disappeared from practical politics till the time of Napoleon, who, on taking possession of Hanover in *1803,* learned that the idea of a French conquest of Egypt had been first put forward by a German philosopher.

Political duties, however, never made Leibnitz lose sight of his philosophical and scientific interests. At Mainz he was still busied with the question of the relation between the old and new methods in philosophy. In a letter to Jakob Thomasius *(1669)* he contends that the mechanical explanation of nature by magnitude, figure and motion alone is not inconsistent with the doctrines of Aristotle's *Physics,* in which he finds more truth than in the *Meditations* of Descartes. Yet these qualities of bodies, he argues in *1668* (in an essay published without his knowledge in *1669* under the title *Confessio naturae contra atheistas*), require an incorporeal principle, or God, for their ultimate explanation. He also wrote at this time a defense of the doctrine of the Trinity against Xndreas Wissowatius (1669), and an essay on philosophic style, introductory to an edition of the *Anti-barbarus* of Marius Nizolius *(1670).* Clearness and distinctness alone, he says. are what makes a philosophic style, and no language is better suited for this popular exposition than the German. In *1671* he issued a *Hypothesis physica nova,* in which, agreeing with Descartes that corporeal phenomena should be explained from motion, he carried out the mechanical explanation of nature by contending that the original of this motion is a fine ether, similar to light. or rather constituting it, which, penetrating all bodies in the direction of the earth's axis, produces the phenomena of gravity, elasticity. etc. The first part of the essay, on concrete motion, was dedicated to the Royal Society of London, the second, on abstract motion, to the Paris academy.

Leibnitz therefore had other than political considerations in mind during his visit to France. In Paris he met Antoine Arnauld, Nicolas Malebranche and Christiaan Huygens. This was preeminently the period of his mathematical and scientific activity. Before leaving Mainz he was able to announce (in a letter to John Frederick, duke of Brunswick-Luneburg) an imposing list of discoveries and plans for discoveries — arrived at by means of his new logical art, in natural philosophy, mathematics, mechanics, optics. hydrostatics. pneumatics and nautical science. not to speak of new ideas in law, theology and politics. Chief among these discoveries was that of a calculating machine for performing more complicated operations than that of Pascal — multiplying, dividing and extracting roots, as well as adding and subtracting. This machine was exhibited to the Académie des Sciences in Paris and to the Royal Society of London, and Leibnitz was elected a fellow of the latter society in April *1673.* He was made a foreign member of the Paris academy in 1700. He had gone to London as an attaché on a political mission from the elector of Mainz in Jan. *1673* and had there become personally acquainted with Heinrich Oldenburg, the secretary of the Royal society, with whom he had already corresponded. with Robert Boyle the chemist and with John Pell the mathematician. It is from this period that we must date the impulse that directed him anew to mathematics. By Pell he had been referred to Nicolaus Mercator's *Logarithmotechnia* as already containing some numerical observations which Leibnitz had thought original on his oun part. On his return to Paris (March 1673), he devoted himself to the study of higher geometry under Huygens, entering almost at once upon the series of investigations which culminated in his discovery of the differential and integral calculus *(see* CALCULUS, DIFFERENTIAL AND INTEGRAL).

The Hanoverian Service. — Shortly after his return to Paris, Leibnitz ceased to be in the Mainz service any more than in name. In the same year, however, he entered the employment of the duke of Brunswick-Luneburg, with whom he had been corresponding for some time. In 1676 he moved, at the duke's request, to Hanover, traveling by way of London and Holland. At The Hague he had several conversations with Spinoza, read the latter's manuscript *Ethica* and copied various passages from it.

For the remaining *40* years of his life Leibnitz was in the service of the house of Brunswick, with his headquarters at Hanover, where he had charge of the ducal library. Much of his time, in consequence, was occupied in working to serve the political and dynastic ambitions of his patrons: as a beginning he published two pamphlets *(1677)* in support of their claim to be represented at the congress of Nijmegen. In addition, he was concerned with a scheme for the reunion of the Catholic and Protestant churches and, in *1686,* wrote his *Systema theologicum* in an attempt to find common ground for them in the details of their creeds; but the project had soon to be abandoned. A further scheme of church union in which Leibnitz was engaged, that between the Reformed and Lutheran churches, met with no hetter success.

Researches into the genealogy of the house of Brunswick involved Leibnitz in a long period of travel (1687–90) in southern Germany and in Italy, in the course of which he was successful in establishing the ancestral connection between the ducal houses of Brunswick (Guelph or Welf) and of Modena (Este). His collection of historical documents enabled him not only to begin a voluminous series of histories of the house of Brunswick but also to publish materials for a code of international law *(Codex juris gentium diplomaticus,* 2 vol., 1693–1700).

Hanover (Brunswick-Luneburg) was raised to the status of an electorate in *1692;* and on the attainment of this long-pursued end the princes of Brunswick came to regard Leibnitz' academic propaganda as being no longer of such great practical value. The electress Sophia, however, and her daughter Sophia Charlotte, electress of Brandenburg, continued to respect the philosopher; and in 1700, through Sophia Charlotte's influence, he was invited to Berlin. Then, on July 11, 1700, the Berlin Academy was founded. in accordance with Leibnitz' recommendations and with Leibnitz as its first president. Sophia Charlotte's death *(1705)* was a great blow to Leibnitz, and after 1711 his visits to Berlin ceased. From 1712 to 1714 he was in Vienna, where he had the rank of imperial privy councillor, as well as the title of Freiherr.

Controversy over priority in the discovery of the calculus *(see* NEWTON, SIR ISAAC) embittered Leibnitz' closing years. He died in Hanover, neglected, on Nov. *14, 1716.* His secretary, J. G. von Eckhart, was his only mourner; and an eyewitness of the funeral records that "he was buried more like a robber than what he really was, the ornament of his country" *(Memoirs of John Ker of Kersland, 1726).* In London and in Berlin likewise his death passed unnoticed.

Leibnitz possessed a wonderful poner of rapid and continuous work; even when traveling his time was employed in solving mathematical problems; and to the last he preserved the indomitable energy which has won him recognition as a man of almost universal attainments and almost universal genius. He is described as moderate in his habits. quick of temper but easily appeased, charitable in his judgments of others and tolerant of differences of opinion, though impatient of contradiction on small matters. He is also said to have been fond of money to the point of covetousness; he was certainly desirous of honour and felt keenly the neglect in which his last years were passed.

(W. R. So.; M. KE.)

PHILOSOPHY

With the exception of the *Dissertatio de arte combinatoria* of 1666, which is important for his logic, Leibnitz' major philosophical works were composed in the years between *1685* and *1716.*

His system appears to have been completed in outline in 1686, when he wrote the *Discours de métaphysique* (unpublished till 1846); but he never published a full and systematic account of his doctrine. Of his more extensive works, the only one published separately in his lifetime was the *Essais de théodicée sur la bonti de Dieu, la liberti de l'homme, et l'origine du mal,* 2 vol. (Amsterdam, 1710), originally undertaken at the request of the electress Sophia Charlotte. nho desired a reply to Pierre Bayle's opposition of faith and reason. He did, however, publish occasional articles in learned periodicals such as the *Acta Eruditorum* (Leipzig) and the *Journal des Savants* (Paris). For an understanding of his system, then, we must consult not only the writings published in his lifetime but also his letters to other philosophers (the correspondence nith Samuel Clarke, belonging to the last two years of Leibnitz' life, is particularly illuminating "on God, the soul, space and duration") and the major works published posthumously. These include the *Nouveaux essais sur l'entendement humain* (1704; first published, Amsterdam and Leipzig, 176j), *Principes de la nature et de la grâce, fondés en raison* (1714; first published in *L'Europe savunte,* 1718) and *La Monadologie,* which he wrote for Prince Eugene of Savoy (also 1714; first published in Latin, as *Principia philosophiae,* in the *Acta Eruditorum,* 1721).

The philosophy of Leibnitz forms a highly complex but well-integrated system. The width of his interests and his temperamental inclination to accept rather than to reject the doctrines of his predecessors (this is noted by him in a letter to Gabriel Wagner of 1696) and to attempt to reconcile apparently opposing points of view make it possible to interpret the system in different mays. His central doctrines may be presented as arising from reflection on logical, scientific or purely metaphysical problems. It is useless to ask which of these interpretations represents the real or fundamental thought of Leibnitz. To him the different aspects of his system appeared to be complementary, and his central theses seemed to derive support from all sources.

His philosophy may nevertheless be presented in the clearest and most elegant form as derived from logical premisses. He presents it in this way himself in the *Discours de métaphysique* of 1686 and in the letters to Antoine Arnauld written to defend it. In the *Discours* the system is virtually complete: only the name "monad," which plays an important part in his later writings, is missing. The same derivation is given extremely succinctly in an undated paper, *Primae veritates* (1st ed. by L. Couturat. *Opuscules et fragments inédits de Leibniz,* Paris. 1903, p. 518). In his published works Leibnitz preferred a more popular approach. but each of them can be seen as an attempt to explain and to recommend to the public one side of the system presented in the *Discours.*

Leibnitz derives the notion of substance, which is of central importance in his philosophy, from that of true predication (*Discours,* 8). In all true predication, he says, the predicate is expressly or virtually contained in the subject. Since the ultimate subject of predication is substance (a doctrine derived from Aristotle), "the nature of an individual substance is to have a notion so complete that it is sufficient to comprise and to allow us to deduce from it all the predicates of the subject to which this notion is attributed." In other words, the individual substance is a self-complete entity such that, given complete knowledge, all true propositions concerning it can be derived from the consideration of it alone, without any reference to other substances. Leibnitz assumes that there is a plurality of such substances. He offers some argument for this in the paper *Considit-ations sur la doctrine d'un esprit universe1* (written in 1702), but in general the assumption seems to have been uncritically taken over from the common-sense belief in the plurality of bodies and minds.

An ultimate substance must necessarily be simple, that is, without parts, for the properties of a composite will be determined by the properties of its parts, while the properties of a substance are determined by nothing but its own nature. It is with the notion of simple substance in this sense that Leibnitz begins the argument of the *Monadologie* (1714), often regarded as the most complete summary of his system, From this he quickly derives the propositions that the monad is nonspatial *(Monadologie,* 3) and that it can be neither brought into being nor destroyed by natural means *(Monadologie,* 4–6). Each substance must differ from every other in quality, constantly change in quality and possess a variety of qualities at any given moment. It is necessary to assume these propositions in order to account for the variety and change observable in everyday life *(Monadologie,* 8–10) Although all these propositions are supported only by empirical evidence in this section of the *Monadologie,* the requirement that each substance must differ from every other may also be derived directly from the definition of substance given in the *Discours,* for since the nature of a substance is the sum of its predicates, two substances with identical predicates would be identical (the identity of indiscernibles). The qualities and modes of change of substances must be very different from what they are believed to be by common sense; for not only the sense-qualities, but also space, time and motion. which Descartes and Locke had called real and primary, are merely phenomenal *(De modo distinguendi phaenomena realia ab imaginariis).* They are, however, *phenomena bene fundata,* or "well-founded"; *i.e.,* they have real analogues in the monads themselves.

In order to have the properties ascribed to them, all monads must in reality partake of the nature of mind; for only in perception do we find the unity in variety essential to substance (*Monadologie,* 13–14). The elements of reality are thus spiritual atoms. mind or quasi-minds. Since it would be absurd to suppose that the reality behind all natural phenomena is conscious mind, Leibnitz thus arrives at the important concept of subconscious or unconscious mind (*Monadologie,* 19–21). This concept is developed in most detail in Leibnitz' argument against Locke. *Nouveaux essais sur l'entendement humain.* In the introduction to this work various empirical and a priori arguments for the existence of unconscious perceptions are put forward.

What appears to us as matter is in reality an aggregate or mass of low-grade monads, having only rudimentary perceptions. Leibnitz believed that this metaphysical view is strongly confirmed by what he regarded as a scientific discovery; viz.. that the fundamental conservation law in physics is the conservation of energy and not, as Descartes had maintained, that of momentum *(Discours,* 17–18), Leibnitz also argues against the Cartesians that, if the essence of body is taken to be extension, the phenomena of inertia cannot be explained. Every portion of matter is endowed uith a certain amount of force, *vis viva* This is the physical quantity mv^2 (the product of the mass and the square of the velocity; *see* ENERGY), in terms of mhich Leibnitz expressed his conservation law, but which he also seems to identify nith mental energy. thus connecting his physics with his metaphysics.

The laws of nature, including the conservation laws, are phenomenally true and may be used without error in the explanation of natural change. Such explanation is not incompatible with explanation in terms of final causes, but is complementary to it *(Discours,* 22). The laws of nature are those which must hold in a world having the greatest possible metaphysical perfection

The notion of causation nhich is used in the expression of natural laws is not, however, metaphysically valid. Since the properties of a monad at any given moment belong to it in virtue of its own nature alone, no monad has any influence on any other. The monads are windowless *(Monadologie,* 7). Causation is the phenomenal analogue of the fact that the clarity of perception in one monad is increasing, while that of another is decreasing (*Discours,* 1j; *Monadologie,* 50–52). Changes in all monads are correlated because it is the nature of a monad to reflect or to express the whole universe from its own point of view. Each monad is a living mirror of the whole universe *(Discours,* 14; *Monadologie,* 56). There is thus necessarily a "pre-established harmony" *(q v.)* between the changes in all monads. Leibnitz regards the theory of pre-established harmony as affording a solution of the mind-body problem *(see* DUALISM), raised in such an acute form by the Cartesian philosophy. This is argued in detail in the *Système nouveau de la nature et de la communication des substances,* nhich was published in the *Journal des Savants* in 1695 and followed by three explanations in reply to criticisms. The

mind is a monad with relatively clear perceptions in close association with a group of monads with relatively obscure perceptions which form its body. Such a monad is called a soul or entelechy *(Monadologie,* 70). Leibnitz also believes that every monad is an entelechy relative to some group of lower monads. Nature is organic throughout and infinitely divisible into organisms *(Monadologie,* 64). Leibnitz was encouraged in this belief not only by his mathematical discoveries, which led him to suppose such a system abstractly possible, but also by the recent discovery of minute organisms by the use of the microscope, which seemed to confirm its actual existence.

The system of monads constitutes the best possible world and for this reason was chosen from among all other possible worlds to be actualized by God. Leibnitz uses the traditional ontological and cosmological arguments for the existence of God *(Monadologie,* 39–45). In his hands the cosmological argument takes the form of an appeal to the "principle of sufficient reason," the second of the fundamental principles which he recognizes. the other being the "law of contradiction" *(Monadologie,* 31–32). On the distinction between these principles is founded that between truths of reason and truths of fact. Truths of reason are those which cannot be denied without self-contradiction. All truths concerning individual substances are, therefore, in principle truths of reason; but since there are many conceivable simple substances and combinations of simple substances, the fact that a particular combination exists cannot be a truth of reason. All existential truths are dependent on the principle of sufficient reason and are contingent. The sufficient reason for the existence of the actual world is the choice of God, who necessarily wills the best.

In his later works. especially in the correspondence with Samuel Clarke *(Fifth Letter,* 21), Leibnitz derives the identity of indiscernible~from the principle of sufficient reason, arguing that if two substances differed merely numerically, God would have no reason for determining their relative positions. The principle of the identity of indiscernibles is in conformity with the view that this is the best of all possible worlds, for the metaphysically best is that which contains the maximum variety consistent with harmony *(Monadologie,* 58).

The notion of the metaphysically best is most fully explained in a paper of 1697, *De rerum originatione radicali* (published in 1840). This begins with an argument to the existence of God from the principle of sufficient reason, but nevertheless reveals in a striking way the difficulty nhich Leibnitz has in fitting God into his system. He maintains that the existence of a series of contingent things demands something noncontingent as its sufficient reason. We cannot regard any event in the series as sufficiently explained by a preceding event, for that would like ise demand an explanation. The sufficient reason for the temporal lies therefore in the eternal; *i.e.,* in God. But why should the eternal give rise to the temporal at all? Leibnitz answers that every possibility has a certain claim to, or nisus toward, existence, "Whence it follows that all possible things tend by equal right toward existence, according to their quantity of essence or reality, or according to the degree of perfection that they contain, for perfection is nothing else than quantity of essence." If this is so, it would seem that the best possible world would exist by its own right, forcing itself, as it were, into existence. without any necessity for choice by God. In order to avoid this, Leibnitz would have to deny the necessary connection between perfection of essence and existence. He cannot do this, for the ontological argument, to which he adheres, also depends on this connection *(see* THEISM; also *RATIONALISM).* The only way out of the dilemma is to identify the best possible world in its totality with God, but this is the position of Spinoza, which Leibnitz found intolerable.

Two other problems of a metaphysical-theological nature arise very acutely in the system of Leibnitz: the problem of evil and that of free will. It is hard to reconcile the existence of evil with the doctrine that this is the best possible world; and the pre-established harmony seems inconsistent with the freedom of the will. Leibnitz struggles with these problems in his longest published work, the *Essais de théodicée.* It was by this work of a semipopular character that Leibnitz was best-known in the 18th century, and it was against its doctrines that Voltaire leveled his satire in *Candide.* In spite of much ingenuity, it cannot be said that Leibnitz succeeds in solving his problems. The account of freedom which logically fits his system resembles that given by Spinoza, by whom he may have been influenced. Freedom is a relative notion, and a substance is free in proportion to its activity; *i.e.,* in proportion to the clarity of its perceptions. This account, however, gives no real meaning to the freedom of choice which Leibnitz wishes to allow to human beings.

In spite of his theory that variation among the monads is continuous from the lowest to the highest (letter to Pierre Varignon, 1702), Leibnitz accords a special status to human souls *(Discours,* 34–36; *Monadologie,* 29). They alone are self-conscious and aware of the truths of reason and of God. It is therefore their duty to worship God and consciously to further his purpose of metaphysical perfection. In this way Leibnitz reconciles his philosophy with the Christian religion and with ordinary ethical thinking.

In theory of knowledge, Leibnitz is committed by his metaphysics to the doctrine of innate ideas, which he defends against Locke *(Nouveaux essais,* book i). Since all that happens to a monad springs from its own nature, all a man's thoughts are inherent in him, waiting to be developed. Thus, in a sense, all ideas are innate. Nevertheless some ideas, for instance those of number and of substance, which are involved in all thinking. are innate in a special sense. being ideas of the mind's own properties; and it is legitimate to think of other ideas as empirical, in so far as experience provides the occasion for our becoming conscious of them. The ideas of all spatial and sensory qualities involve the confusion which is inevitable in the created monad. Sensation is in fact confused thinking. An intellect quite free from confusion, such as belongs only to God, would not be aware of sensory properties.

To it all knowledge would be a priori, and the whole history of the world could be deduced from the facts concerning a single monad. Human beings, however, must take as primary the facts of their own perception together with abstract, a priori truths such as those of logic and mathematics. Their generalizations concerning the actual world will of necessity be only probable. For this reason Leibnitz urged the importance of the development of the logic of probability, then in its infancy.

In his account of ideas, Leibnitz exhibits a marked advance over Descartes. In the paper *Quid sit idea* (written *c.* 1678), he points out that to have an idea of something is to express it; *i.e.,* as the context shows, to represent it symbolically in some way. Further, in the paper *De cognitione, veritate et ideis* (in the *Acta Eruditorum* of 1684), he makes a number of distinctions which had not been made by Descartes, in spite of his free use of the term "clear and distinct idea." Ideas, says Leibnitz, are either clear or obscure. An obscure idea is one which does not suffice for the certain recognition of that which it represents, while a clear idea gives the possibility of such recognition. Clear ideas are further either distinct or confused. They are distinct when the person possessing them is able to enumerate separately the marks which enable him to recognize the thing represented; otherwise, they are confused. Distinct ideas again are either adequate or inadequate. Adequate ideas depend upon complete analysis and are probably not possessed by human beings, but our ideas of numbers approach rnost closely to the ideal. Distinct ideas may also be classified as either symbolic or intuitive. They are necessarily symbolic for human beings when they are so complex that it is impossible to grasp all the parts in a single act of consciousness. We must then use symbols as in algebra. Leibnitz points out that, because we must think symbolically, we are in danger of falling into hidden contradiction. The symbol "greatest number" represents nothing, for the ideas represented by the component symbols are incompatible. He therefore insists on the distinction between real and nominal definitions. A real definition must make clear the possibility of its object. Not any conjunction of meaningful words will yield a real definition. This consideration leads Leibnitz, in spite of his early approval of nominalism, to reject the extreme nominalism or conventionalism of Hobbes.

Truths may depend upon definitions, but they are not therefore arbitrary, for definitions are not arbitrary.

In pure logic, Leibnitz anticipated many of the developments of later mathematical logicians. In particular he presented several versions of a calculus similar to George Boole's algebra. In his interpretation of his logical calculi, however. he was hindered by his adherence to the subject-predicate logic central to his metaphysics and so failed to appreciate the importance of the logic of relations. (For a more detailed account of Leibnitz' logic *see* LOGIC, HISTORY OF.)

His interest in abstract logical calculi was partly due to the fact that he saw them as sketches for the syntax of the ideal language *(lingua characteristica universalis)*, the development of which was one of his most cherished schemes. In this language each simple idea was to be represented by a single symbol, and the rules for combination were to be so simple and clear that it would be possible to decide mechanically which combinations were possible and which not. Disputed questions could thus be determined by calculation.

Linked with the project of the ideal language was that of the universal encyclopaedia. which would contain a summary of all human knowledge, systematically arranged. These projects are unfortunately interdependent. it being impossible to devise the language until the encyclopaedia is completed and impossible to express the facts of the encyclopaedia with complete clarity until the language is devised. Yet. although it is now known that Leibnitz' ideals are unrealizable. they have in modified form inspired much later intellectual endeavour, especially the attempts of Gottlob Frege, A. N. Whitehead and Bertrand Russell to develop a system of mathematical logic as the grammar of all science.

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LEICESTER, EARLS OF. The first holder oi this English earldom belonged to the family of Beaumont. although a certain Saxon named Edwin has been described erroneously as the 1st earl of Leicester. Robert de Beaumont (d. 1118) "is said to have become earl of Leicester but, being already count of Meulan, was never so styled" *(Complete Peerage).* His son Robert. however. nas styling himself earl of Leicester by 1119. The 3rd Beaumont earl. another Robert (d. 1190), was also steward of England, a dignity attached to the earldom of Leicester from this time until 1399. The earldom reverted to the crown when Robert de Beaumont, the 4th earl, died in 1204.

In 120j or 1206 Simon IV, count of Montfort, nephew and heir of the 4th earl of Leicester. was confirmed in the possession of the earldom by King John, but it was forfeited when his son. the iamous Simon de Montfort. was attainted and was killed at Evesham in 1265. Henry III's son Edmund. earl of Lancaster, was also earl of Leicester and steward of England, obtaining these offices a few months after Earl Simon's death, and the title remained with his heirs until it was merged in the crown on the accession of Henry of Bolingbroke, duke of Lancaster and earl of Leicester, as Henry IV in 1399.

In 1564 Queen Elizabeth I created her favourite, Lord Robert Dudley, earl of Leicester (*q.v.*). At his death in 1588 the title became extinct. In 1618 the earldom of Leicester was revived in favour of Robert Sidney. Viscount Lisle *(see* LEICESTER, ROBERT SIDNEY), a nephew of the late earl and a brother of Sir Philip Sidney; it remained in this family until the death of Jocelyn (1692–1743), the 7th earl of this line, in 1743. Jocelyn left no legitimate children, but a certain John Sidney claimed to be his son and consequently to be 8th earl of Leicester.

In 1744, the year after Jocelyn's death, Thomas Coke. Baron Lovel (1697–1759), was made earl of Leicester, but the title became extinct on his death in 1759. The next family to hold the earldom was that of Townshend, George Townshend (1755–1811) being created earl of Leicester in 1784. When his son George Ferrers Townshend, the 2nd earl (1778–185j), died the earldom again became extinct.

In 1837 another earldom of Leicester was created in favour of Thomas William Coke, who had inherited the estates of his relative Thomas Coke, earl of Leicester. To distinguish his earldom from that held by the Townshends, Coke was ennobled as earl of Leicester of Holkham.

See G. E. C(okayne), *Complete Peerage,* vii (London, 1929). (R. B. WM.)

LEICESTER, ROBERT DUDLEY, EARL OF (1j32 or 1533–1588), fifth son of John Dudley, duke of Northumberland (*q.v.*), was born on June 24, 1j32 or 1533. In 1549 he married Amy Robsart. In 1j53 he was sent to the Tower and attainted after his father's conspiracy to place Lady Jane Grey, his sister-in-lam, on the throne. Eventually, however, he was released, served with the English forces in France in 1557, and was restored in blood in March 1j58. With the accession of Elizabeth I, who had known him at Edward VI's court, his fortunes soared rapidly. He at once became master of the horse and in April 1j59 a privy councillor and K.G. A tall. handsome, affable man, of great ambition and considerable ability, he soon won the queen's affection as well as her favour. His pretensions aroused bitter jealousy at court; and the all-too-opportune death of his wife, who. as a coroner's jury found, fell downstairs and broke her neck at Cumnor place in Berkshire in Sept. 1560, spread his unpopularity still more widely. For. although it seems probable that Amy's death was in fact due to accident or suicide, rumour had already anticipated it as a thing that would remove an obstacle to his marriage with Elizabeth.

For a time it seemed likely to have this effect, and the queen even allowed him to sound the Spanish ambassador about Catholic support for the match. Yet, though Dudley appealed powerfully to the woman and the Boleyn in Elizabeth, she was too much of a queen and a Tudor not to realize that Amy Robsart was an even greater obstacle dead than alive. Possibly his importunities

hastened this realization. Certainly, although the queen's favour did not diminish. the prospect of their marriage gradually receded and in 1j64 Elizabeth even suggested Dudley as a husband for Mary, queen of Scots. It was probably to further this project that in Sept. 1564 she created him earl of Leicester. He did not yet entirely lose hope and now began to seek Puritan support. if not for his own marriage. at least to spoil the chances of his rival, the Austrian archduke Charles. Possibly his support in 1569–70 for the intrigue against Sir William Cecil (later Lord Burghley) and for the marriage of the duke of Norfolk to Mary was his last effort in this direction.

At all events. in 1571 he seems to have contracted himself to the dowager Lady Sheffield. and two years afternard he secretly went through a form of marriage with her. Four or five years later he cast her off. to marry Lettice Knollys, widow of Walter Devereux. earl of Essex—again secretly and once again to the accompaniment of unpleasant rumours about her former husband's death. Meantime. he continued high in the queen's favour and in 157j he entertained her and her court with great magnificence and much pageantry at Kenilworth castle. He was settling down. too. as leader, or perhaps figurehead. of that section of opinion which. in opposition to the more cautious policies of Lord Burghley and the earl of Sussex. favoured vigorous action against Spain abroad and against the Roman Catholics at home. He strongly favoured the French alliance and intervention on behalf of William of Orange in the Netherlands in 1572. He was a shareholder in Sir Francis Drake's voyage of 1577–80. He did his best, however. to thwart the proposed match between Francis, duke of Anjou, and Elizabeth and suffered a temporary disgrace when his secret marriage to Essex' widow was revealed to the queen by Anjou's agent in 1579. Yet when the French match was tacitly shelved, Elizabeth chose Leicester to escort Xnjou to Antwerp to be invested with .the government of the Netherlands (Feb. 1581), an office which Leicester was suspected of coveting for himself.

As England drew nearer to war with Spain in the 1580s, men of militant views rallied round Leicester. At home he pressed in council and through his supporters in the house of commons for sterner measures against the Catholics and in 1584 he inaugurated the association for the defense of the queen against conspirators. His zeal drew upon him the famous attack, supposed to be the work of the Jesuit Robert Parsons, known as Leicester's Commonwealth (1584). This was suppressed by letters of the privy council. which declared that the charges against the earl were to the queen's certain knowledge untrue. As historical evidence it is, indeed. almost valueless: but it has been widely read and was the ultimate source of Sir Walter Scott's account of Amy Robsart in his novel *Kenilworth*.

In 158j Elizabeth agreed to send the United Provinces 6,000 troops to assist their revolt against Spain. The general of these troops was to be an English nobleman who was also to share executive authority with the Provinces' council of state. For this post she chose Leicester. As a general, he did not distinguish himself, although in the summer campaign of 1586, in which Sir Philip Sidney (*q.v.*) was killed, he at least strengthened temporarily the Provinces' vulnerable eastward defenses along the Ijssel. As a politician. his blunders brought the Provinces into the gravest danger. He first allowed the states-general to thrust upon him an authority far wider than the queen. anxious not to commit herself too deeply. had intended him to enjoy. Soon afterward he quarrelled with the states as well and began to build up a faction of his on-n. The confusion was increased by his return to England at the end of 1586 and was worse confounded by his supporters' unsuccessful efforts to seize power when he came back in the following summer. When he was finally recalled at the close of 1587. the Provinces seemed almost on the verge of civil war and dissolution. Nevertheless, the queen in 1588 appointed him lieutenant general of the army mustered at Tilbury against the Armada and was even considering his appointment as lieutenant general of England and Ireland. However. on Sept. 4, while on his way to Kenilworth, he died at his house at Cornbury in Oxfordshire.

He was a considerable patron of learned men and (despite his support of the Puritans) of the drama also, keeping a company of actors headed by James Burbage.

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LEICESTER, ROBERT SIDNEY, 1ST EARL OF (1563–1626), second son of Sir Henry Sidney (*q.v.*), was born at Penshurst. Kent. on Nov 19. 1563, and was educated at Christ Church. Oxford afternard travelling on the continent for several years between 1578 and 1583. In 1585 he was elected member of parliament for Glamorganshire; and in the same year he went with his elder brother Sir Philip Sidney (*q.v.*) to the Netherlands. where he served (1586–87) in the war against Spain under his uncle Robert Dudley, earl of Leicester. and was knighted in 1j86. In the autumn of 1588 he was sent on a mission to Scotland. Then in 1589 he was appointed governor of Flushing. He returned to the Netherlands to take up this post in 1590 and during the next tmo years saw much active service with Maurice of Nassau and Sir Francis Vere. After a mission to France in 1593–94. he again spent much of his time in the Netherlands until 1603. distinguishing himself at the battle of Turnhout (1 598). On the accession of James I. he returned to England. James raised him at once to the peerage as Baron Sidney of Penshurst, and he was appointed chamberlain to the queen consort. In 1605 he was created Viscount Lisle. and in 1618 earl of Leicester, the latter title having become extinct in 1588 on the death of his uncle, whose property he had inherited (*see* LEICESTER, EARLS OF). Leicester was a man of taste and a patron of literature, whose cultured mode of life at his country seat. Penshurst, was celebrated in verse by Ben Jonson. He died at Penshurst on July 13, 1626.

ROBERT SIDNEY, 2nd earl of Leicester of the 1618 creation (1 595–1677), born on Dec. 1. 1595, was educated at Christ Church. Oxford; he was admitted to Gray's Inn in 1618, having already served in the army in the Netherlands during his father's governorship of Flushing, and having entered parliament as member for Wilton in 1614. In 1616 he was given command of an English regiment in the Dutch service; and having succeeded his father as earl of Leicester in 1626, he was employed on diplomatic business in Denmark in 1632 and in France from 1636 to 1641. He was then appointed lord lieutenant of Ireland in place of the earl of Strafford, but he waited in vain for instructions from the king, and in 1643 he was compelled by the king to resign the office to the earl of Ormonde without having set foot in Ireland. In 1644 he retired into private life. In 1649 the younger children of the king were for a time committed to his care at Penshurst. He died at Penshurst on Nov. 2, 1677.

Leicester's eldest son. PHILIP: 3rd earl (1619–98), known for the greater part of his life as Lord Lisle, served as lieutenant general in Ireland under the earl of Ormonde; he strongly favoured the parliamentary cause and in 1646 he was appointed lord lieutenant of Ireland by the parliament. Named one of Charles I's judges, he refused to take part in the trial; but he afterward served in Oliver Cromwell's council of state, and sat in the protector's house of lords. Lisle stood high in Cromwell's favour, but nevertheless obtained a pardon at the Restoration. He succeeded his father as earl of Leicester in 1677 and died in London on March 6, 1698.

See *Sydney Papers*, ed. by A. Collins, 2 vol. (London, 1746); *Sydney Papers*, cd. by R. W. Blencowe (London, 1825), containing the 2nd earl of Leicester's journal; Hist. MSS. Comm., *De L'Isle* and *Dudley MSS*. (R. B. WM.)

LEICESTER, a city, county and municipal borough and the county town of Leicestershire. Eng., on the Soar river. a southern tributary of the Trent, 96 mi. N.N.W. of London by road. It is served by the Midland and Eastern regions of British railways and by the Leicester canal. In 1961 the population was 273,298.

The Romano-British town of Ratae Coritanorum, on the Fosse way, was a municipality in A.D. 120–121. Leicester was called a "burh" in 918 and a city in Domesday Book, and until 874 it was

the seat of a bishopric. In 1086 the king and Hugh de Grentemesnil had much land there but by 1101 the latter's share had passed to Robert of Meulan, to whom the rest of the town belonged, and Leicester thus became the largest mesne borough. In the 13th century the town developed its own form of government by a mayor and 24 jurats. In 1464 Edward IV made the mayor and four of the council justices of the peace and Henry VII added 48 burgesses to the council and made it a close corporation in 1489. A hundred years later Elizabeth I incorporated the town. James I granted charters in 1605 and 1610. and Charles I in 1630, but in 1684 the charters were surrendered and a new one granted by James II was rescinded by proclamation in 1688. Leicester became a county borough in 1888 and the bounds were extended and constituted a civil parish in 1892. It was created a city in 1919 and the boundaries were again extended and revised in 1935 and 1936.

Roman remains include a portion of Roman masonry known as the Jewry wall, parts of the forum and a large public bath; several pavements have been unearthed; among other remains is a milestone from the Fosse way, marking a distance of two miles from Ratae. Many of the remains are in the city museum and art gallery. St. Nicholas' church is early Norman with Roman material and St. Mary de Castro's and All Saints have Norman remains. St. Martin's. which became the cathedral church when the diocese of Leicester was created in 1926, and St. Margaret's are Early English. North of the town are remains of an abbey of Black canons founded in 1143. The ruins of the castle include parts of the Norman hall, two gateways and the artificial mount on which stood the keep. The old town hall (14th century) was formerly the guildhall of Corpus Christi. There is a valuable library founded in the 17th century. The Trinity hospital was founded in 1331 by Henry Plantagenet, earl of Lancaster and of Leicester, and Wyggeston's hospital in 1513. In 1841 Thomas Cook, tourist agent. organized the first excursion by rail—from Leicester to Loughborough and back. In 1919 a university college was founded, and in 1957 it was granted full university status. To relieve traffic congestion the first section of ring roads was opened in 1933. Leicester was represented in parliament by two members from 1295 to 1918, when the number was increased to three; in 1948 it was increased to four. It has had a prescriptive market held on Wednesday and Saturday since ihe 13th century. The city has been a centre for brewing and the manufacture of woolen goods since the 13th century. Knitting frames for hosiery were introduced about 1680 and hosiery is the staple trade. The manufacture of footwear is a big industry and the city is the largest distribution centre for boot and shoe multiple firms. Other industries are elastic fabrics, sewing cotton, yarns, typewriters, brickmaking and fine printing.

LEICESTER OF HOLKHAM, THOMAS WILLIAM COKE, EARL OF (1754–1842), English agriculturist, who revolutionized British farming by the introduction of improved methods on his Norfolk estate, was the eldest son of Wenman Roberts: who assumed the name of Coke in 1750. He was born on May 6, 1754, and was Whig M.P. for Norfolk, 1776–84, 1790–1807, 1807–32; and for Derby, Feb.–April 1807. He was the youngest member when he first entered parliament, the oldest when he retired. He was offered a peerage seven times, under six different prime ministers. He is remembered, however, not as a lifelong friend of Charles James Fox but as a famous agriculturist. Inheriting his father's estates at Holkham and elsewhere in 1776, he was largely instrumental in transforming the agriculture of his county. introducing the greatly improved methods of arable farming and cattle breeding associated with the names of Jethro Tull, Lord Townshend and Robert Bakewell. Under his direction the rental of the Holkham estate is said to have increased from £2,200 to over £20,000 a year (but he spent over £500,000 on electioneering). In 1837 he was created earl of Leicester of Holkham. By his second wife, whom he married in 1822, when he was 68, he had five sons and a daughter. He died at Longford hall, Derbyshire; on June 30, 1842. Thomas William, the eldest son (1822–1909), succeeded to the earldom.

See A. M. W. Stirling, *Coke of Norfolk and His Friends,* new ed. (London, New York, 1912). **(A. AL.)**

LEICESTERSHIRE, a midland county of England, bounded north by Nottinghamshire, east by Lincolnshire and Rutland, southeast by Northamptonshire. southwest by Warwickshire and northwest by Derbyshire, also touching Staffordshire on the west. The area is 831.9 sq.mi., with a population (1951) of 631,077.

Physical Features.— The main topographical feature of Leicestershire is the broad valley of the Soar, running south and north and separating the Charnwood forest from the uplands of the east. The river also divides the county geologically, the Jurassic forming the higher land of the east. and the Triassic the plain of the west with masses of older rocks protruding in places forming higher land. Northwest of Leicester is the Charnwood forest, composed of pre-Cambrian volcanic ashes. grits and slates into which igneous rocks of granitic and dioritic composition were intruded in later pre-Cambrian times. These emerge from the Trias plain of Keuper hlarls and form a series of barren ridges which contrast with the deep fertile valleys of red marl between them. There are intrusions of igneous rocks southwest of Leicester at Sapcote, Croft, etc. West of the Charnwood forest are the outcrops of the Carboniferous Limestones and Coal Measures of the Leicester coal field which represents the southward projection of the Pennine system below the Trias. These are faulted in places. The region was heavily glaciated in the Pleistocene and the older beds have been covered with boulder clay, while the gravel and sand beds in the valleys, which have yielded remains of mammoths, represent a late phase of the Ice Age.

History.—Leicestershire is poor in prehistoric remains, the earliest being Neolithic implements of flint and other stone found on the north of the Charnwood forest, around Leicester and Mountsorrel, and at Osbaston in the southwest in the unforested patches. There is some evidence of Bronze Age settlements in south Leicestershire, and also on Beacon hill in the Charnwood forest which seems to have been in early times an important place for defensive purposes. At the time of the Roman invasion the region was sparsely populated by the Coritani. Even in Roman times there is little evidence of settlement apart from Ratae (Leicester) itself, and Venonae at the crossing of the Fosse way and Watling street. Leicester also was a crossroad on the Fosse way. There are a few minor settlements along these two routes, on Watling street, which runs along the southwestern boundary, and Fosse way, traversing the country northward through Leicester to Lincoln.

Nothing is known of the circumstances attending .the decline of Roman rule in these parts. The district subsequently underwent two waves of invasion; first by the Angles in the 6th century and secondly three centuries later by the Danes. These two peoples coalesced to determine the chief characteristics of the area which is now Leicestershire. The Angles, advancing by the Trent, the Soar and the Welland. reached the district in the second hali of the 6th century. From 6j3 Leicestershire was part of the kingdom of Mercia. In 737 Leicester became the permanent see of the bishop for the Middle Anglian diocese; it remained so until the Danish invasions. In the second half of the 9th century the district was subjugated by the Danes and in 877 Leicester became one of the five Danish boroughs. In 918 the Danish army quartered at Leicester submitted to Xethelflaed and the region developed into a shire in much the same way as those in other parts of England under the house of Wessex, though there were important differences. For the Danish occupation was more than a military occupation; the social structure of the county was profoundly modified by the swelling of the ranks of the Anglo-Saxon freemen (ceorls) \\-ith Danish freemen or sokemen and the extent of their settlement is still borne out by the many Scandinavian place names in the county. The Norman conquest produced great changes. The Domesday survey of 1086 reveals that the large Leicestershire estates formerly held by Earls Ralph, Morcar, Waltheof and Harold were taken over by Norman landholders, only a few estates being retained by Englishmen as undertenants. Hugh de Grentemesnil became the largest fief holder in the county. Other powerful Norman lords were Robert, count of Meulan, who later acquired De Grentemesnil's estates

and became earl of Leicester; Robert de Todeni; Robert de Bucy; and Nigel de Albine, ancestor of the Mowbrays, after whom Melton Mowbray takes its name.

As a result of the monastic revival in the 12th century a number of religious houses were established in Leicestershire. The only pre-Conquest house. the Benedictine monastery at Breedon-on-the-Hill, was destroyed during the Danish invasion in the mid-9th century. Garendon (Cistercian) was founded, in 1133; Croxton Kerrial (Premonstratensian), *c.* 11j4; houses of Augustinian canons at Leicester in 1143; Launde, c. 112j; Breedon, 1122; Ulverscroft, c. 1153; Owston, c. 1161; Charley, c. 1190; Bradley, between 1220 and 1234; and Kirby Bellars, c. 1360. Benedictine nuns were established at Langley in the mid-12th century and Augustinian nuns at Gracedieu between 1235 .and 1241.

Leicestershire was not deeply implicated in the anarchy of Stephen's reign but was involved in the revolt against Henry II and in the civil struggles of the 13th century culminating in the triumph and then defeat of Simon de Montfort, earl of Leicester, in 1264–65. The battle of Bosworth which finally ended the dynastic struggle of the 15th century and established the Tudors on the throne was fought in the county in 148j. In the Civil War of the 17th century the county was the scene of division between parliamentary and royalist supporters. The parliamentarians were strongly supported by the newer families among the gentry, led by the Greys, earls of Stamford, but the older established families inclined more to the royalist side, under the leadership of the Hastings', earls of Huntingdon. Leicester was sacked by the royalists in 1645 and the Civil War came to an end in Leicestershire with the destruction of Ashby castle. the seat and stronghold of the Hastings family, later in the same year. The fall of Ashby castle also marked the end of the political influence of the Hasting family in the county. They were replaced by the Manners, the dukes of Rutland, at Belvoir castle. who had strongly supported them in the royalist cause in the Civil War. For another two centuries the political life of the county continued to be dominated by the aristocracy in accordance with their family divisions until the extension of the franchise and the introduction of the secret ballot in the second half of the 19th century.

Antiquities.—In Leicester the site of the Roman forum mas excavated and laid out before the outbreak of World War II. Noteworthy churches are to be found at Ashby-de-la-Zouch, Hinckley, Leicester. Loughborough, Lutterworth. Market Bosworth, Market Harborough. Melton Mowbray, Stoke Golding, King's Norton and Stapleford. There are remains of religious houses at Ulverscroft and Gracedieu. Parts of the castle built at Ashby-de-la-Zouch by William. Lord Hastings, at the close of the Wars of the Roses. still stand, while at Kirby Muxloe there are the remains of the picturesque fortified mansion which was also built by Lord Hastings about the same time. Belvoir castle is a 19th-century building erected to replace the former castle destroyed by fire. In Bradgate park there are the ruins of the unfortified mansion built by Thomas Grey. marquis of Dorset. *c.* 1500. Quenby hall is a fine example of a Jacobean house and there are a number of good Georgian mansions. Good examples of yeomen's houses of the later 16th century survive at Littlethorpe and South Kilworth.

Agriculture. — The soil is loamy and affords rich pasture for cattle and sheep, especially east of the Soar. while the corn crops are grown chiefly on the lighter soil of the west. At the beginning of the 14th century sheep were already being kept in considerable numbers and their wool was rated at a high value. In 1939, 67,618 ac. were given over to arable farming and 378.120 ac. to pasture farming. During World War I1 a considerable quantity of land was put under the plow for the first time since its enclosure but. after the termination of the war, there was a tendency for it to revert to pasture. In 1953, 213,995 ac. were under tillage and 231,028 ac. were pasture. Dairy farming is extensively carried on in the Melton Mowbray area. particularly in the vale of Belvoir, and Stilton cheese. first made at Quenby. is a famous product from this area. Leicester is well known for the scientific stock breeding of Robert Bakewell of Dishley grange, near Loughborough, especially for his New Leicester sheep; but by the end of the 19th century his breeds no longer found favour with the Leicestershire farmers. In 1953 there were 166,567 head of cattle and 166,412 sheep and lambs in the county.

Leicestershire is specially favoured for fox hunting, being the home of the Quorn, Fernie and Atherstone hunts. Loughborough, Market Harborough and Melton Mowbray are the hunting centres.

Industries. — Mining and quarrying were the earliest industries to develop in Leicestershire. Coal mining goes back to the late 13th century but it is confined to a relatively small area in the west centred on Coalville (*q.v.*), Coleorton and Moira. Quarrying, which had been practised to some extent in the Roman period. was also revived in the 13th and 14th centuries. Slate pits flourished at Swithland from at least 1343 until 1877 when the famous Swithland slates could no longer compete successfully with the cheaper slates from Wales. Lime was quarried at Barrow upon Soar as early as 1396 and lime workings were also developed at Breedon-on-the-Hill, Barrow hill and Cloud hill by the end of the 18th century. Quarrying of hard stone. which was begun at Mountsorrel, was extended in the first half of the 19th century to Bardon Hill: Stoney Stanton, Croft. Enderby and Huncote. The Leicestershire setts thus produced were widely used for road making in the midlands and Yorkshire and the Mountsorrel sett makers carried their skill to all the quarrying districts of England and Wales and the United States of America. Ironstone workings were developed during the late 19th century in the northeast of the county and iron furnaces were established at Holwell and Asfordby.

Apart from mining and quarrying, hosiery is the staple manufacture of the county. Framework knitting was introduced into Leicestershire at Hinckley about 1640 and Hinckley. Earl Shilton, Loughborough, Shepshed and Leicester soon established themselves as the main centres with dependent frames working in many villages in the western half of the county and the Soar valley. The application of mechanical power to the frames in the second half of the 19th century did not destroy completely the domestic and rural character of the manufacture. Smaller factories were established in the larger villages and "outdoor work" executed in the home remained a feature of the industry. Other industries include footwear, engineering and bell founding, for which Loughborough is a world-famed centre.

Communications. — By 1814 Leicestershire was linked with the main inland waterways connecting London with the north, constructed in the second half of the 18th century. The principal canals are the former Soar navigation. Leicester navigation, the Union canal and the Grand Union canal which connect the Trent river through Loughborough, Leicester and Market Harborough with the Grand Junction canal. The Ashby-de-la-Zouch canal. now closed. connected the mining areas of the west with Coventry.

The county is well served with railways. The Midland region line of British railways serves Market Harborough, Leicester and Loughborough, being part of the main line from London to Derby, Nottingham and the north. Branches radiate from Leicester to Melton Mowbray and to the mining district of the west and northwest. The main London to Nottingham line of the Eastern region passes through Lutterworth, Leicester and Loughborough.

In 1954 there were 1.84; mi. of roads in the county.

Population and Administration. — There is within the ancient shire of Leicester one county borough. the city of Leicester, and one municipal borough, Loughborough. The administrative county covers 805.3 sq.mi., the county borough 26.5 sq.mi. and the population in 1951 was: administrative county, 345,896, and 'county borough. 285,181; Loughborough 34,731. Originally there were four hundreds in the county: Guthlaxton, Goscote. Gartree and Framland; by 1300 the western part of Guthlaxton was formed into the separate hundred of Sparkenhoe and. under Elizabeth I, Goscote was divided into East and West. There are 9 urban districts, 9 rural districts and 227 civil parishes. The county is in the midland circuit and has one court of quarter sessions. The county borough of Leicester has a separate court

of quarter sessions and a separate commission of the peace. In 1290 the county returned two members of parliament; under the Reform act of 1832 it was divided into two, each division returning two members, and since 1885 it has been divided into four: Melton, Loughborough, Bosworth and Harborough, each returning one member. The parliamentary borough of Leicester after 1948 returned four members.

Ecclesiastically, Leicestershire formed an archdeaconry within the diocese of Lincoln from 1092 until its transference to Peterborough in 1837. In 1926 the county was constituted the diocese of Leicester when this ancient see, which had disappeared at the time of the Scandinavian invasions, was restored.

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LEIDY, JOSEPH (1823–1891), U.S. anatomist, parasitologist and paleontologist who performed pioneer research on U.S. fossil deposits, was born at Philadelphia, Pa., on Sept. 9, 1823. After receiving an early education in private schools. he entered the University of Pennsylvania, Philadelphia, and in 1844 graduated in medicine. He soon after became librarian and a curator at the Academy of Natural Sciences of Philadelphia, and in 1847 was made chairman of the board of curators, which position he held for a period of 44 years. In 1853 he was appointed professor of anatomy at the University of Pennsylvania, which position he held until his death, becoming director of the biological department in 1884. In addition to these duties he was professor of natural history at Swarthmore college, Swarthmore, Pa., from 1871.

Leidy won distinction as an anatomist especially in the field of comparative anatomy. His *Elementary Treatise on Human Anatomy* (1861; rev. and enl., 1889) was for many years the classic American textbook on the subject. His *Researches Into the Comparative Anatomy of the Liver* (1848) was the first thorough study of that organ. Leidy spent much time in microscopical study of the lower forms of life. His book *A Flora and Fauna Within Living Animals* (1853) was the first important study of the parasites of the alimentary canal. Leidy's discovery of *Trichina spiralis* in pork led to Karl I. F. R. Leuckart's discovery of the cause and mode of preventing trichinosis in man. He also became the chief American authority of his time on protozoa. His *Fresh Water Rhizopods of North America* (1879) remained a standard work. This, and many others of his books, are illustrated by his own drawings, noted for their delicate accuracy, especially in microscopical studies. His *Synopsis of Entozoa* described and named more than 100 new species.

It was as a vertebrate paleontologist, however, that Leidy won his chief fame. Before his time there were but a few scattered papers on the subject in America, and the discovery of new fossil deposits in the western states offered him an unparalleled opportunity to lay the foundation of American paleontology, his knowledge of comparative anatomy being his chief aid in the work. His *Ancient Fauna of Nebraska* (1854) was the most important contribution to the subject in America up to that time. He followed this with monographs on the extinct sloth tribe, the extinct ox, horse, etc., and in 1865 published *Cretaceous Reptiles* of *the United States.* All the fossils of the Ferdinand V. Hayden expedition in the Rocky mountains were given to Leidy for determination, the results appearing in a study on extinct Mammalia of Dakota and Nebraska *(Journal,* Academy of Natural Sciences of Philadelphia, 1869) which contained many species and genera unknown to science and others hitherto not known to have existed on the American continent. The book is described by H. F. Osborn as "with the possible exception of Cope's *Tertiary Vertebrates,* the most important paleontological work which America has produced." The discovery of Eocene material in Wyoming and Oregon beds, geologically older than the Nebraska and Dakota beds, provided the material for Leidy's last major paleontological work, *Contributions to the Extinct Vertebrate Fauna of the Western Territories* (1873). His death occurred at Philadelphia on April 30, 1891.

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LEIF ERICSSON (fl. 999–1000), Scandinavian discoverer of America, of Icelandic family, the first known European discoverer of "Vinland." "Vineland" or "Wineland, the Good," in North America. He was a son of Eric the Red *(Eirikr hinn raudi Thorvaldsson),* the founder of the earliest Scandinavian settlements—from Iceland—in Greenland (985).

In 999 he went from Greenland to the court of King Olaf Tryggvason in Norway, and was commissioned by him to proclaim Christianity in Greenland. Leif was driven far out of his course by contrary weather—this time to lands (in America) "of which he had previously had no knowledge," where "self-sown" wheat grew, and vines, and "mosur" wood. Leif took specimens of all these, and returned to his father's home in Brattahlid on Ericsfiord in Greenland.

Such is the account of the *Saga of Eric the Red,* supported by a number of briefer references in early Icelandic and other literature. The less trustworthy history of the *Flatey Book* makes Biarni I-Ieriulfsson in 985 discover Helluland (Labrador?) as well as other western lands which he does not explore, not even permitting his men to land; while Leif Ericsson follows up Biarni's discoveries, begins the exploration of Helluland, Markland and Vinland, and realizes some of the charms of the last named, where he winters. But this secondary authority (the *Flatey Book* narrative) which for some time formed the basis of all general knowledge as to Vinland, abounds in contradictions and difficulties from which *Eric the Red Saga* is comparatively free. Looking at the record in *Eric the Red Saga,* it would seem probable that Leif's Vinland answers to some part of southern Nova Scotia. *See* VINLAND. (As to Helluland and Markland *see* THORFINN KARLSEFNI.)

The manuscripts of *Eric the Red's Saga* are no. 544 and 557 of the Arne-Magnaean collection in Copenhagen; the manuscript of the *Flatey Book* was presented in 1662 to the Royal Library of Denmark, of which it remained one of the chief treasures. These leading narratives are supplemented by Adam of Bremen, *Gesta Hammaburgensis eccleszae pontificum,* ch. 38 (247 Lappenberg) of book iv (often separately entitled *Descriptio Insularum Aquilonis;* Adam's is the earliest extant reference to Vinland, *c.* 1070); there are also notices of Vinland in the *Libellus Islandorum* of Ari Frodi (c. 1120), the oldest Icelandic historian; in the *Kristni Saga* (repeated in Snorri Sturlason's *Heimskringla);* in *Eyrbyggia Saga (c.* 1250); in *Gretti Saga (c.* 1290); and in an Icelandic chorography of the 14th century or earlier, partly derived from the famous traveler Abbot Nicolas of Thing-eyrar (d. 1159). (C. R B.)

LEIGH, EDWARD (1602–1671), English Puritan and theologian, born at Shawell, Leicestershire, was educated at Magdalen hall, Oxford, from 1616, and subsequently became a member of the Middle Temple. In 1636 he entered parliament as member for Stafford, and during the Civil War held a colonelcy in the parliamentary army. The public career of Leigh terminated with his expulsion from parliament with the rest of the Presbyterian party, in 1648.

Leigh's works include: *Critica Sacra, Containing Observations on all the Radices of the Hebrew Words of the Old and the Greek of the New Testament* (1639–44; new ed. with supplement, 1662).

LEIGH, a market town and municipal borough (1899) in the Leigh parliamentary division of Lancashire, Eng., 13 mi. W. of Manchester and 21 mi. E.N.E. of Liverpool by road, and served by the Bridgewater and Leeds canal and the Liverpool canal. Pop. (1951) 48,728. Area 9.9 sq.mi.

The ancient parish church of St. Mary the Virgin was, with the exception of the tower, rebuilt in 1873. The grammar school dates from pre-Elizabethan times and several fine old houses remain in the neighbourhood. Thomas Highs of Leigh constructed an early spinning jenny in 1763–64. The chief industries are textiles, coal mining, electric cable manufacturing, agricultural and

general engineering.

LEIGHTON, ROBERT (161 1–1684), archbishop of Glasgow, n-as born. probably in London (others say at Ulishaven. Forfarshire), the eldest son of Alexander Leighton, the author of *Zion's Plea Against the Prelacie,* and one of the victims of the Laudian persecution. Robert was educated at the University of Edinburgh. where he took his M.A. in 1631. He then spent several years in France. Either at this time or later he came into contact with the Jansenists. In 1641 he was ordained Presbyterian minister of Newbattle, Midlothian, and in 1643 signed the Covenant. In 1652 he resigned his charge and went to Edinburgh. where early in 1653 he was appointed principal of the university and primarius professor of divinity.

In 1661, when Charles II had resolved to force episcopacy once more upon Scotland, he fixed upon Leighton for one of his bishops (see SCOTLAND. CHURCH OF). The episcopacy which he contemplated was that modified form which had been suggested by Archbishop Ussher. and to which Baxter and many of the best of the English Nonconformists would have readily given their adherence. Leighton traveled with the new bishops in the same coach from London toward Scotland, but having become. as he told Burnet, very weary of their company (as he doubted not they were of his). and having found that they intended to make a kind of triumphal entrance into Edinburgh, he left them at Morpeth and retired to the earl of Lothian's at Newbattle. He very soon lost all hope of being able to build up the church by the means which the government had set on foot, and his work, as he confessed to Burnet, "seemed to him a fighting against God." He did. however, what he could, governing his diocese (that of Dunblane) mith the utmost mildness, and endeavouring to persuade the Presbyterian clergy to come to an accommodation with their episcopal brethren. After a hopeless struggle of three or four years to induce the government to cease the persecution of the Covenanters! he went up to London in 166j to resign his bishopric, but was induced by Charles to remain. In 1669 Leighton again went to London and made fresh representations on the persecution of the Covenanters, and in 1670 he reluctantly agreed to accept the archbishopric of Glasgow. He now redoubled his efforts for conciliation between Presbyterians and the episcopacy, but had no success. He resigned the archbishopric in 1674 and retired to Broadhurst. Sussex, where he spent the happiest years of his life. He died suddenly in a London inn in 1684.

Leighton was little suited to the part he had to play in Scotland. He was made for the meditative life, and his aloofness from everyday life brought on him the dislike of both the conflicting parties in the church. It is stated that he left orders that all his manuscripts should be destroyed after his death. But fortunately for the world this charge was disregarded. His writing seems to flow without effort; it is the easy unaffected outcome of his saintly nature. It was a common reproach against Leighton that he had leanings toward Roman Catholicism, and perhaps this is so far true that he had formed himself in some degree upon Pascal and 'Thomas à Kempis.

The best account of Leighton's character is that of Bishop Burnet in *History of His Own Times* (1723–34). *See* the editions of his *Works* published by W. West, 7 vol. (1869–75), selections (mith biography) by Blair of Dunblane (1883); Andrew Lang, *History of* Scotland (1902).

LEHGHTON BUZZARD, a market town and urban district of Bediordshire. Eng.. 20 mi. S.W. of Bedford by road. Pop. (1951) 9,025. Area 3.9 sq.mi. It lies in the valley of the Ouzel, a tributary of the Ouse, on the other side of which (in Buckinghamshire) is the Grand Junction canal, giving the town water communications. Its position on the sand and near the chalk hills has been the chief cause of Leighton's prosperity. More than 60 types of sand are dug, ranging from the coarsest to pure silver sand. and lime is quarried in the hills. The market cross dates from 1330 and the Early English church of All Saints has a central tower and spire and contains medieval woodwork.

LEIGHTON OF STRETTON, FREDERIC LEIGHTON, BARON (1830–1896), English academic painter of immense prestige in his own time, was horn on Dec. 3. 1830. at Scarborough, Uorkshire. After an education in many European cities, his artistic studies began at the Accademia in Florence under G. Bezzuoli and C. Servolini; he then came under J. Becker at the Staedel'sches Institut, Frankfurt am Main (1846–48). In 1848 he studied at Brussels and in 1849 in Paris, where he copied in the Louvre. Returning to Frankfurt at the age of 19 he became a pupil of Johann Eduard Steinle. whose instruction he came to value above that of his other teachers. After painting "The Plague of Florence" to Boccaccio's description. he left for Rome late in 1852. There his social talents won him the friendship of (among others) Thackeray. George Sand. Robert Browning, the painters J. L. Gérôme and A. W. Bouguereau and John Gibson: the English neoclassical sculptor. Leighton's painting "Cimabue's Madonna." at the Royal Academy's exhibition in 1855, was bought by Queen Victoria. It marked the entry into England of a new cosmopolitan academic manner in which grandeur of scale and forms of Phidian and high Renaissance extraction are used to embody subject matter of an anecdotic and superficial nature. Leighton came to London in 1858 to enjoy this triumph but did not settle there until 1860.

He mas a steady exhibitor at the Royal Academy from 1860 to 1866, showing his "Paolo and Francesca" and "Dante at Verona." He was made associate of the Academy in 1864. In 1865 he painted "The Wise and Foolish Virgins" in Lyndhurst church, Hampshire; in 1868 he visited Egypt; and in 1869 he exhibited "Electra at the Tomb of Agamemnon," and was made a royal academician. In 18jo he was influential in starting the important series of winter exhibitions of old-master paintings at the Royal Academy. In 1873 he revisited the east and collected titles for the Arabian hall at his house in Kensington (now a memorial museum). In 1876 and 1878 respectively the "Daphnephoria" and the "Nausicaa" appeared, while in 1877 Leighton made a new departure in exhibiting the sculpture "Athlete Struggling With Python." In 1878 he mas elected president of the Royal Academy, was knighted and began the large wall paintings in spirit fresco in the south court of the Victoria and Albert museum, London. In 1886 he was made a baronet. in 1890 he painted the famous "Bath of Psyche," and on Jan. 24, 1896, was made a baron, being the first English painter to be so honoured; but he died the next day at his Kensington home. Twelve of his works, including the "Psyche" and the "Athlete Struggling With Python," are in the Tate gallery, London.

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LEININGEN, the name of an old German family, whose lands lay principally in Alsace and Lorraine. The first count of Leiningen about whom anything certain is known was a certain Emicho (d. 1117), whose family became extinct in the male line when Count Frederick, a minnesinger, died about 1220. Frederick's sister. Liutgarde. married Simon, count of Saarbriicken, and Frederick. one of their sons. inheriting the lands of the counts of Leiningen. took their arms and their name. Having increased its possessions the Leiningen family was divided about 1317 into two branches; the elder of these? whose head was a landgrave, died out in 1467.

On this event its lands fell to a female, the last landgrave's sister Margaret. wife of Reinhard. lord of Westerburg, and their descendants were known as the family of Leiningen-Westerburg. Later this family was divided into tn-o branches. those of Alt-Leiningen-Westerburg and Neu-Leiningen-Westerburg. Meanwhile the younger branch of the Leiningens, known as the family of Leiningen-Dagsburg, was flourishing, and in 1560 this was divided into the lines of Leiningen-Dagsburg-Hartenburg. founded by Count John Philip (d. 1562), and Leiningen-Dagsburg-Heidesheim or Falkenburg, founded by Count Emicho (d. 1593). In 1779 the head of the former line was raised to the rank of a prince of the empire.

In 1801 this family was deprived of its lands on the left bank of the Rhine by France. but in 1803 it received ample compensation for these iosses. A few years later its possessions were mediatized. They mere included mainly in Baden, but partly in Bavaria and in Hesse.

See Brinckmeier, *Genealogische Geschichte des Hauses Leiningen* (Brunswick, 1890–91).

LEINSTER, a province of the Republic of Ireland, occupying the central and southeastern parts of the island. Pop. (1956) 1,338,942. Area 7,642 sq.mi. Including the whole eastern seaboard southward of Carlingford lough and extending uestward to the river Shannon. it contains the following counties: Carlow, Dublin, Kildare, Kilkenny, Leix (Laoighis), Longford, Louth, Meath, Offaly, Westmeath, Wexford, Wicklow.

Leinster (Laighen) succeeds to the name of an ancient Gaelic kingdom which contained an area roughly equal to the southern half of the modern province. Meath preserves the name of another of the Gaelic kingdoms. Dermot MacMurrough, the last king of Leinster, driven from his throne in a dynastic war, offered the hand of his daughter Aoife (Eva) and succession to his kingdom as the prize for restoring him to power. Richard Fitz-Gilbert—the "Strongbow" of later historians—accepted his offer, invaded Ireland and married Aoife (1170) but preferred to base his claim to Leinster on a feudal grant of Henry II. His daughter Isabel married William Marshal, earl of Pembroke, and on the failure of the male line in this family. the inheritance was shared among heiresses who brought the liberties of Carlow, Kilkenny, Wexford, Kildare and Laoighis to their respective husbands. From these liberties the modern counties developed. The MacMurroughs maintained their independence in the regions of Carlow and Wexford until the 16th century. (U. G. F.)

LEIPZIG, a city of the German Democratic Republic and chief town of the district (Bezirk) of the same name, lies 350 ft. above sea level in a plain, just above the junction of three small rivers, the Pleisse, the Parthe and the Elster, which flow in various branches through or around the town. Leipzig consists of the old, or inner city, and of the inner and outer suburbs. Many villages have been incorporated with the city which is 70 mi. N.W. of Dresden and 111 mi. S.W. of Berlin by rail. Pop. (1939) 707,365; (1946) 607,655; (1956 est.) 607,523.

The old town has narrow streets and numerous houses of the 16th and 17th centuries, with high-pitched roofs. Upon the market square the four main business streets converge. and its east side is occupied by the old Rathaus, a Gothic edifice built in 1558. Behind the market square and the main street lies a labyrinth of narrow streets interconnected by covered courtyards and alleys, with extensive warehouses and cellars. Close to the old Rathaus is Auerbach's **Hof,** built about 1530 and immortalized in Goethe's *Faust*. It has a curious old wine vault (Keller) which contains a series of mural paintings of the 16th century, representing the legend on which the play is based. Nearby is the picturesque Konigshaus, for several centuries the palace of the Saxon monarchs in Leipzig. In the southwestern corner of the inner town lay the Pleissenburg, or citadel, modeled, according to tradition, on that of Milan, and built early in the 13th century. Here Luther in 1519 held his momentous disputation. The round tower was long used as an observatory and the building as a barrack. With the exception of the tower, the citadel has been removed and its site is occupied by the new Rathaus. The business of Leipzig is chiefly concentrated in the inner city, but the headquarters of the book trade lie in the eastern suburb. Upon the Augustusplatz is the main building of the university. The oldest church, in its present form, is the Paulinerkirche, built in 1229–40, and restored in 1900, with a curiously grooved cloister; the largest in the inner town is the Thomaskirche. with a high-pitched roof dating from 1496, and memorable for its association with J. S. Bach, who was organist there. On the east is the Johanneskirche, around which raged the last conflict in the battle of 1813, when it suffered severely from cannon shot. In it is the tomb of Bach, and opposite its main entrance is the Reformation monument, with bronze statues of Luther and Melanchthon. Here is the new Gewandhaus, or Konzerthaus, built in 1880–84, the old Gewandhaus. or Drapers' hall, in the inner town having again been devoted to commercial use as a market hall during the fairs. Immediately opposite to it is the university library. Between the university library and the Gewandhaus stands a monument of the composer Felix Mendelssohn. Immediately to the east of the school of arts is the building of the supreme tribunal of the German republic, the Reichsgericht, which was built in 1888–95, and bears a dome crowned by a bronze figure of Truth. In the centre of the book-trade quarter stand close together the modern Buchhändlerhaus (booksellers' exchange), the great hall decorated with allegorical pictures by Sascha Schneider, and the Buchgewerbehaus, a museum of the book trade. The city also has an astronomical observatory.

The university of Leipzig. founded in 1409 by a secession of 400 German students from Prague, was before World War II one of the largest in Germany. After the war it became the largest university of the German Democratic Republic. As a musical centre Leipzig is known all over the world for its associations with Bach, for its excellent conservatorium and for the series of concerts given annually in the Gewandhaus. The prominence of the publishing interest has attracted to Leipzig a large number of authors, and made it a literary centre of considerable importance. Hundreds of newspapers and periodicals were published here, and the city has always been distinguished for its cosmopolitan spirit.

Commerce.—The outstanding importance of Leipzig as a commercial town is mainly derived from its great fairs, which annually attract merchants from all parts of Europe, and from Asia. The most important fairs are held at Easter and in September, and are said to have been founded as markets about 1170. Under the fostering care of the margraves of Meissen, and then of the electors of Saxony. they attained great popularity. In 1268 the margrave of Meissen granted a safe-conduct to all frequenters of the fairs, and in 1497 and 1507 the emperor Maximilian I greatly increased their importance by prohibiting the holding of annual markets at any town within a wide radius of Leipzig. During the following centuries on account of the wars the trade of the Leipzig fairs considerably decreased, but it recovered after the accession of Saxony to the German Customs union (Zollverein) in 1834. Since then wares that could be safely purchased by sample appeared at the fairs in steadily diminishing quantities, while others, such as hides, furs and leather, which require to be actually examined, showed an increase. The principal commodity is furs (chiefly American and Russian). After World War II the Leipzig fairs lost much of their importance although in the 1950s the Communist government of the German Democratic Republic tried to restore their old fame by emphasizing their part in fostering east-west trade. In 1958 the spring fair occupied an area of 276,000 sq.yd., and 9,168 firms (1.466 from the German Federal Republic) exhibited their wares.

In the trades of bookselling and publishing Leipzig occupies a unique position; before World War II it was said to take the first place in the world for the number and total value of its sales. The city contains about zoo printing works, some very large, and a corresponding number of type foundries, binding shops and kindred works.

Other industries include the manufacture of textiles, chemicals, automobiles, steel products, electrical equipment, surgical and musical instruments, plastics, glass and leather.

Leipzig possesses one of the largest railway stations in the world and from it radiate lines to all the chief German cities and through them to the rest of Europe. It is also a great road centre. There is an airport in the northern suburb of Mockau and one 10 mi. N.W. at Sehkeuditz (used also by Halle).

History.—Leipzig owes its origin to a Slavonic (Lusatian) settlement between the Elster and the Pleisse, which was in existence before the year 1000, and its old name Lipsk to the Slavonic word *lipa,* "a lime tree." There was later a German settlement near this spot, probably around a castle erected early in the 10th century by the German king, Henry the Fowler. The district was part of the mark of Merseburg, and the bishops of Merseburg were the lords of extensive areas around the settlements. In the 11th century Leipzig is mentioned as a fortified place and in the 12th it came into the possession of the margrave of Meissen, being granted some municipal privileges by the margrave, Otto the Rich, before 1190. Its favourable situation in the midst of a plain intersected by the principal highways of central Europe, together with the fostering care of its rulers. co-operated toward raising Leipzig to the position of a very important commercial town. Powers of

self-government were acquired by the council *(Rat)* of the town. the importance of which was enhanced during the 15th century by several grants of privileges from the emperors. When Saxony was divided in 148j Leipzig fell to the Albertine, or ducal branch of the family, whose head. Duke George, gave new rights to the burghers.

During the Thirty Years' War Leipzig suffered six sieges and on four occasions was occupied by hostile troops, being retained by the Swedes as security for the payment of an indemnity from 1646 to 1650. After 1650 its fortifications were strengthened; its finances were put on a better footing; and its trade, especially with England, began again to prosper, important steps being taken with regard to its organization. Toward the end of the 17th century the publishing trade began to increase very rapidly, partly because the severity of the censorship at Frankfurt-on-Main caused many booksellers to remove to Leipzig. After 1825 it became the general headquarters of the German book trade.

The immediate neighbourhood of Leipzig has been the scene of several battles. two of which are of more than ordinary importance. These are the battles of Breitenfeld, fought on Sept. 17, 1631, between the Swedes under Gustavus Adolphus and the imperialists. and the great battle of Leipzig, known in Germany as the *Völkerschlacht* (Battle of the Nations). *(See* LEIPZIG, BATTLE OF.)

In the German revolution which followed the end of World War I, Leipzig was the scene of much bloodshed. Further disturbances continued for several days during the revolutionary agitation which recurred in the spring of 1920.

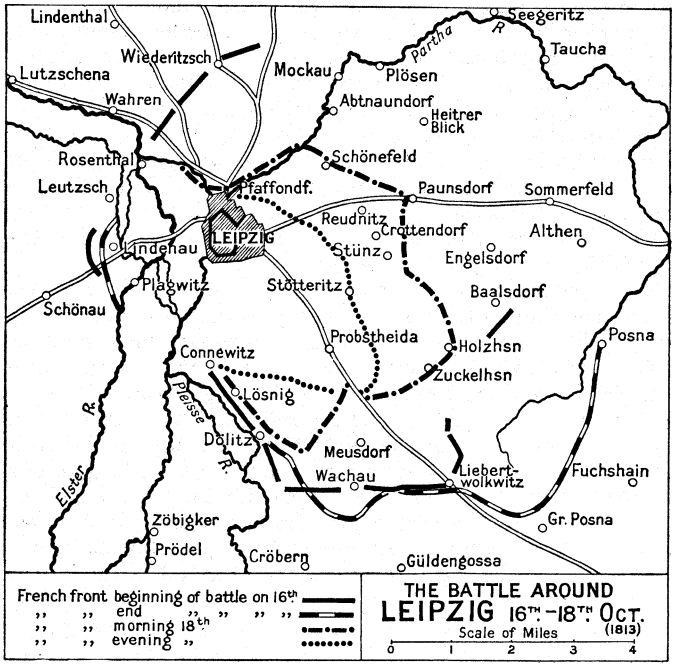
Toward the middle of the 18th century Leipzig was the seat of the most influential body of literary men in Germany, over whom Johann Christoph Gottsched, like his contemporary. Samuel Johnson, in England, exercised a kind of literary dictatorship. Then, if ever, Leipzig deserved the epithet of a "Paris in miniature" (*Klein Paris*) assigned to it by Goethe in his *Faust*. The young Gotthold Lessing produced his first play in the Leipzig theatre, and the university counts Goethe, Klopstock. Jean Paul Richter, Fichte and Schelling among its alumni. Schiller and Gellert also resided for a time in Leipzig, and Bach and Mendelssohn filled musical posts there. Among the celebrated natives of the town are the philosopher Leibniz and the composer Wagner.

Because of its importance as a railway centre, Leipzig was heavily bombed by the R.A.F. and the U.S.A.A.F. in 1943–44. About a quarter of its houses were destroyed. It was taken on April 19, 1945, by the 1st U.S. army but later was handed over to the Russian army. Although after World War II the eastern German government resided in eastern Berlin, Leipzig was the most lively city of the German Democratic Republic and its most important economic and cultural centre.

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LEIPZIG, BATTLE OF, or more grandiloquently, BATTLE OF THE NATIONS, the engagements of Oct. 16, 18 and 19, 1813, which ended in the defeat of Napoleon and the destruction of what remained of the *grande armée*. That Napoleon fought at Leipzig at all was due to the allied threat to concentrate at that city and cut him off from his base, marked on Oct. 3 by Gebhard Bliicher's defeat of Henri Bertrand, and advance to Kemberg, Bernadotte's passage of the Elbe at Acken and Rosslau, and Schwarzenberg's advance south of Leipzig. The initiative, as throughout the war of 1813, had passed to his opponents: moreover, in pursuance of diplomatic rather than strategic ends, he left St. Cyr and Lobau with three corps in Dresden even after he had decided to move westward (Oct. 8).

On Oct. 14–1j the first conflict took place at Wachau, where Joachim Murat threw back the van of Schwarzenberg's army advancing from the south. Napoleon's dispositions were complete by the night of Oct. 15 and the battle began next morning *(see* plan). The allies were in two armies, the Prussian Blucher attacking from the north, the Austrian Schwarzenberg from the south. Bernadotte with his Swedes was hanging back. He had no wish, entertaining the hopes he did of a French crown, to become



famous for a victory over French troops and he probably shared in an unusual degree the general fear of Napoleon's abilities. Blucher's main strength lay on the eastern side of the river Elster, before Möckern, where he faced Auguste de Marmont. West of the Elster Bertrand covered the sole French line of retreat, the Frankfort highway, his opponent being François Gyulai. The main attack was made by Schwarzenberg from the south, and against him Napoleon launched his heaviest blows. The allies had 325.000 effective troops to the French 214,000.

Schwarzenberg, a commander of second-rate abilities, nearly gave the victory to the French early in the day. He adopted the plan of attempting to outflank Napoleon's forces by extending his army to the left, beyond Connewitz. Such a movement was perfectly possible on paper, but in fact the low-lying meadows of the Pleisse and Elster were an almost impassable swamp. The Austrian forces were before long helplessly entangled: they were in fact mired. Meanwhile, the French troops had withstood the general assault and by midday Napoleon judged that the time was ripe for his grand stroke, which was to be to smash through the enemy's centre as far as Guldengossa and roll up his right. It is stated that the artillery attack at this time was so severe that the French cannon was no longer heard in separate shots but as one continuous roll. By two o'clock Claude Victor, Charles Oudinot, Edouard Mortier and Alexandre MacDonald were beyond Guldengossa, but the village itself still held out, until the cavalry, directed by Murat, François de Kellermann and Latour Maubourg, were launched upon it. The allied forces were driven out in apparent disaster, but ruin was averted by the tsar Alexander, who overruled Schwarzenberg, withdrawing from him the Russo-Austrian reserves! which he sent with the Cossack guard against Murat, who was forced to retreat. Marmont meanwhile had been forced to withdraw before Bliicher, while Bertrand had driven back Gyulai.

The day had thus ended indecisively, but victory might yet have gone to the French. On the next day, however, when the allies did not attack, Napoleon was overcome by the curious lassitude which reappears so frequently in this campaign. "a carelessness," wrote Marmont, "which it is impossible to explain."

He amused himself by sending a useless message to the emperor of Austria suggesting negotiations and on the 18th, when the Allies renewed the attack, the French position was unimproved, while the Allies had at last received the assistance of Bernadotte. The battle of the 18th, as may be seen from the plan, was fought on a somewhat different field. In the north, as before, Marmont slowly withdre before Blücher. Ney (around Paunsdorf) before Bennigsen and Bernadotte. Beyond the Elster Bertrand routed Gyulai. The fiercest fighting of all took place at Probstheida and Stötteritz, under Napoleon's own eyes, where the combined Russians and Austrians repeatedly flung themselves in vain upon the French lines, until human bodies formed the ground upon which the armies fought. The ferocious conflict continued until nightfall when with the cessation of the battle news was brought to Napoleon that his Saxon troops had deserted to the enemy. This, together with the absence of the victory on which he had calculated, made retreat essential, but the emperor sat for nearly an hour in a stupor before he gave the necessary orders.

The French troops streamed all night across the one stone bridge over the Elster (the temporary wooden structure erected by French engineers early collapsed). In the morning the Allies, realizing what was occurring, pressed their attack, and the retreat grew hastier and more confused. At last, at two o'clock, as the main French army had crossed the river, the Allies stormed the town. By an idiotic mistake a French subaltern had blown up the bridge, and as the French rear guard came crashing through the town they found their last retreat cut off. Horse and foot were forced into the river; some, like MacDonald, swam across; many, like Poniatowski, were drowned; 20,000 French soldiers were captured (*see* NAPOLEONIC CAMPAIGNS; NAPOLEON I).

(R. W. P.)

LEIRIA, an episcopal city on the river Liz and on the Lisbon-Figueira da Foz railway. Pop. (1950) 7,123; district. pop. (1950) 395,990; area 1,326 sq.mi. The principal buildings of Leiria are the ruined citadel. nhich dates from the 13th century and the cathedral, a small Renaissance building erected in 1571 but modernized in the 18th century. The main square of the city is named after the poet Francisco Rodrigues Lobo, who was born here about 1580. Between Leiria and the Atlantic there are extensive pine woods known as the Pinhal de Leiria, which were planted by King Dinis (1279–1325) with trees imported from the Landes in France, in order to give firmness to the sandy soil. In the neighbourhood there are glass and iron foundries. oil wells and mineral springs. Leiria, the Roman Colippo, was taken from the Moors in 1135 by Alphonso I. King Dinis made it his capital. In 1466 the first Portuguese printing press was established here; in 1545 the city was made an episcopal see.

LEISHMANIASIS (LEISHMANIOSIS) is the name applied to a group of infections of man and certain animals caused by parasitic microorganisms of the genus *Leishmania.* Certain of these infections are manifested as debilitating or disfiguring diseases of man and dogs and are of considerable local importance in various parts of the world. The parasites are found in the skin or in the deep organs, or both, and their distribution in the host determines the nature of the clinical signs and symptoms.

Discovery of the microorganism in the visceral disease by Sir William Leishman in 1900 (independently reported by Leishman and Charles Donovan in 1903) and in the cutaneous disease by P. F. Borovsky in 1898 (redescribed and named by J. H. Wright in 1903) established the parasitic nature of the infections and the similarity of the agents producing them. The parasite is unusual in that it lives within the phagocytic cells of the lymphoid-macrophage system of the vertebrate host. Since these phagocytic cells are part of the host's mechanism of defense against invading organisms, the capacity to live in such an intracellular location affords the *Leishmania* unique protection against these host defenses.

The *Leishmania* are flagellated protozoa of the family Trypanosomidae. Three species of *Leishmania* infecting man are recognized: *L. donovani,* in the deep organ or visceral infections; *L. tropica,* for the old world skin disease; and *L. braziliensis,* for the American cutaneous affliction.

Nature of Infections.—Visceral leishmaniasis. also known as kala-azar, is an insidious, chronic disease characterized by fever, reduction in white blood cell numbers, mild anemia, wasting, gross enlargement of the liver and especially of the spleen and derangement of amounts and kinds of serum proteins. Symptoms appear tao or more months after infection and gradually become more intense; death occurs in one to two years in 95% of the untreated cases. Death often occurs as a result of a secondary infection, such as pneumonia, developing in the debilitated patient, and the clinical picture is often complicated by nutritional deficiencies or other diseases.

Major focuses of kala-azar are known in India, northern China, East Pakistan and parts of middle Asia, the entire Mediterranean littoral and parts of the middle east, Kenya and Sudan, Brazil, Paraguay and Venezuela.

One or more slowly healing ulcers on exposed parts of the body characterize leishmaniasis of the skin. Moist- or dry-type ulcers are produced by different strains of *L. tropica.* American leishmaniasis usually produces a skin ulcer earlier than does the old world type, and is further distinguished by its tendency to produce secondary lesions of the mucocutaneous surfaces, especially of the nose, mouth and pharynx. The old world variety, often called oriental sore, is known all around the Mediterranean, in central and northeast Africa and in west and south Asia. American cutaneous leishmaniasis has been reported from every country in central and south America except Chile.

The close affinity of all the leishmania1 infections is evidenced by the variability of their invasiveness. *L. tropica* occasionally invades the deeper organs, and *L. donovani* sometimes produces not only what is called post-kala-azar skin leishmaniasis but also nasopharyngeal lesions.

A durable immunity follows recovery from infection with a particular kind of leishmaniasis. This was long recognized in some of the oriental sore areas, where infection often was induced artificially on covered parts of the body to avoid the disfigurement of natural infections on the exposed skin areas.

Transmission.—All varieties of leishmaniasis are transmitted by small, bloodsucking sand flies of the genus *Phlebotomus,* the species of fly involved differing with the geographic area and the type or types of leishmaniasis found in the area.

The leishmania1 parasites exist in two forms: a round or oval Leishman-Donovan body, which lives and multiplies in the phagocytic cells of the vertebrate host; and an elongate, motile, flagellated organism, called a leptomonad, found in the alimentary tract of the sand fly. The Leishman-Donovan bodies, taken in with the meal of the fly, develop into leptornonads in the stomach of the fly and multiply there. Finally, migration of the leptomonads forward into the mouth parts of the fly occurs, from which the leptomonads enter the wound made at the next feeding to initiate a new infection.

Epidemiology.—Few generalizations can be made about the natural history of leishmaniasis. Except for the kala-azar of India, Sudan and Russian Turkistan, it does not assume epidemic proportions. Except for Indian and some middle east kala-azar in which man himself is the reservoir, it is transmitted to man from infections in animal reservoirs. Some of the reservoirs of visceral leishmaniasis are dogs (China, Mediterranean), jackals (Turkistan) and wild dogs (Brazil); of cutaneous leishmaniasis, dogs (Mediterranean), gerbils and ground squirrels (Turkistan) or rain forest rodents (Central and South America). Although often rural, urban transmission is known in some areas. The visceral disease, chiefly a disease of young adults in India, in the Mediterranean is predominantly an infection in children under five. The cutaneous infection is an occupational hazard among the chicle workers of the rain forests of the Americas and the caravaneers of the steppes of middle Asia.

Treatment and Control.—Effective treatment of the visceral infections is accomplished by intramuscular or intravenous injections of certain pentavalent organic antimonials (sodium antimony gluconate or Neostibosan) or aromatic diamidines (pentamidine or stilbamidine). The disease in India seems to be most easily cured, though drug resistance to the antimonials has been reported, while that observed in Sudan is much more resistant to treat-

ment. The skin lesions, in addition, also respond to certain other local treatment, though the mucocutaneous involvements of late American leishmaniasis require the most vigorous treatment regimens.

Prevention of access of flies to infected reservoirs or of infected flies to susceptible human beings leads to control. Thus, sprays of residual insecticides, such as DDT, applied to habitations where transmission occurs indoors, or mass reduction of infected gerbils or dogs. have led to effective control in particular areas.

Leishmaniasis of other animals is known (lizards, guinea pigs) but has no known relationship to human infection. *See* also PARASITIC DISEASES.

See David L. Belding, *Textbook of Clinical Parasitology,* 2nd ed. (1952); Thomas T. Mackie, George W. Hunter III and C. Brooke Worth, *A Manual of Tropical Medicine,* 2nd ed. (1954). (L. A. S.)

LEISLER, JACOB (c. 1635–1691), American political agitator, was born probably in Frankfurt am Main, Germany, about **1635.** He went to New Netherland in **1660** as a soldier in the service of the Dutch West India company, married a wealthy widow and successfully engaged in trade. When news of the imprisonment of Governor Andros in Massachusetts was received, a group of rebels under Leisler's command, fired largely by anti-Papist sentiment, took possession of Ft. James, and announced their determination to hold it until the arrival of a Protestant governor commissioned by the new sovereigns. After Lieut. Governor Francis Nicholson sailed for England, a committee of safety was organized by the popular party, and Leisler was appointed commander-in-chief. Under authority of a letter from the home government addressed to Nicholson, or in his absence to "such as for the time being take care for preserving the peace and administering the laws in His Majesty's province of New York," he assumed the title of lieutenant governor in Dec. **1689,** appointed a council and took charge of the government of the entire province. He summoned the first intercolonial congress in America, which met in New York on May 1, 1690, to plan concerted action against the French and Indians. Leisler refused to surrender the fort to Maj. Richard Ingoldsby, who landed with his soldiers in Jan. **1691,** and after some controversy an attack was made on March **17** in which two soldiers were killed and several wounded. When Col. Henry Sloughter, who had been commissioned governor of the province, arrived two days later Leisler hastened to give over to him the fort and other evidences of authority. He and his son-in-law, Jacob Milborne, who had many powerful colonial opponents, were charged with treason for refusing to submit to Ingoldsby, were convicted, and executed on May **16, 1691.** Their estates were, however, later restored to their families and the attainder reversed. There has been much controversy among historians with regard both to the facts and to the significance of Leisler's brief career as ruler in New York.

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LEITMOTIV ("leading motif"), a musical term for a type of recurring theme. The term was first used in connection with Wagner's later works. It was not invented by him, but by the writers who first analyzed his music dramas. The word is inexact as applied to the "representative themes" which are the outstanding characteristic of Wagner's later dramatic and quasi-symphonic style, and the sense in which these themes are said to be "leading" has never been properly defined.

The designation has, however, become useful for a particular technical procedure in musical composition. Its intended significance is universally understood, and it may therefore be accepted for current use in musical terminology.

No more than the term did Wagner originate the use of the *Leitmotiv;* but he brought it to its logical conclusion, not because of any special superiority to great composers who worked before his time. but because he found in the course of his development as a creative artist that it was the natural expression for his particular genius. Such close thematic workmanship as is found in his work. from the *Ring* onward (with *Tristan* and *Die Meistersinger* interrupting the tetralogy), does not necessarily suggest the greatest power of invention. In a sense, in fact. it obviates invention to a great extent, substituting thematic development for the constant devising of new ideas. But if Wagner's recurring motifs call for comparatively little further effort of invention, they do demand gifts of the highest order in the way of logical and skilful contrivance, as well as the keenest intelligence in making the themes work, not only in a symphonic way that is musically satisfying, but at the same time so as to enrich the dramatic happenings with constant references called for by the words and action.

It is Wagner's awareness of such suggestions and his subtlety in weaving them into his musical fabric to anaken in the listener's mind all kinds of extramusical ideas relevant to the dramatic events which makes him the greatest exponent of the *Leitmotiv* system. Nothing was done by any later composer to expand or improve upon his procedure. Richard Strauss, for instance, makes elaborate use of it, but on the whole with less close reference to the dramatic action and more often as material for purely musical development. It is in his symphonic poems rather than his operas that his use of *Leitmotiv* is most dramatic, for the simple reason that there is no stage action to carry on the plot.

The *Leitmotiv* has two distinct dramatic functions, which may operate separately or together. one is allusion. the other transformation. Both go back a good way beyond Wagner. Mozart's



for example, is allusive. but appears in a rudimentary form, as a motto rather than a *Leitmotiv,* somewhat like Alfred de Musset's play titles (*Il ne faut jurer de rien,* etc.). Another good early example of such allusive use occurs in Weber's opera *Der Freischütz,* at the moment when Max hesitates to descend into the wolves' glen and the orchestra urges him on derisively with an echo of the mocking chorus that had teased him in the first act. But Weber also used the *Leitmotiv* symphonically to some extent in *Euryanthe,* where Sir Donald Tovey finds no fewer than **13** motifs which are transformed or developed. Transformation is also found early in Hector Berlioz' *Symphonie fantustique* and *Harold en Italie;* in the former work the *idde fixe,* as he calls it, appears in different forms, first like the poet's thought of his beloved as an ideal and lastly in a nightmarish distortion, where he fancies her taking part in the witches' Sabbath. But in a sense this is still a motto, like the "fate'! motif in each movement of Tschaikovsky's Fifth Symphony. and indeed it has not yet become an entirely organic part of the musical structure, as is proved by the fact that the "March to the Scaffold" was taken from an earlier work and the *idde fixe* simply inserted into it like a patch of foreign material.

In Wagner allusion and transformation are both used in rich abundance. either separately or in combination. Purely allusive, for instance, is the death theme in *Tristun und Isolde:*



which tells us that a character is thinking of death or that a situation suggests it, but does not undergo development, although it can be used simultaneously with other material, like a symphonic theme. The most familiar example of Wagnerian transformation —too familiar to quote in music type—is the horn call in the second act of *Siegfried,* which later. in *Götterdämmerung,* turned from **6-8** into 4–4 time, becomes the theme for the matured and heroic Siegfried and, further modified in rhythm and enriched in texture, forms the basis for the great orchestral threnody after his death. To quote a less obvious example. here is the Rhine

maidens' joyful song about the as yet unravished treasure in *Rheingold:*



and here the new form of the theme representing the evil power the gold has acquired in the hands of Alberich:



Wagner contrives endless ingenuities both of allusion and of transformation. not to speak of symphonic development; on the other hand it is possible for commentators to see connections nhere none may have been intended, as between the theme of Wotan's spear throughout the *Ring:*



and that of Briinnhilde's self-justification in the third act of *Die Walküre:*



Strauss's transformations are more often than not musical developments rather than dramatic references. Allusions he often uses with quite as much subtlety as Wagner, as for example uhere the Princess in *Der Rosenkavalier* tells Ochs that she has a headache, while the theme of her love for Octavian in the orchestra apprises us that it is really a heartache from which she suffers. Other followers of Wagner, however, have done less than nothing to improve on his methods. partly because he left them little to do and partly because they happened to be composers of much smaller stature. On the whole the *Leitmotiv* never again showed the same flexibility and power after him.

Wagner's great original contribution to the use of *Leitmotiv* is that of allusion: transformation was not his invention, for it is already well advanced not only in the works by Berlioz, but in Liszt's symphonic poems, where musically it is applied too mechanically, but where it does a good deal to clarify the outline of the program. Post-Wagnerian composers, too, could be unduly mechanical in its application; *e.g.,* Nicholas Rimsky-Korsakov and, on a lower level, Gustave Charpentier.

Claude Debussy. on the other hand, used the principle in the most purely musical manner of which it is capable, and never, as he said maliciously but not altogether unjustifiably of Wagner's method. to make the characters on the stage present their visiting cards, as it were. This does happen in Wagner's work, but there is very much more in it than that.

In some other later composers there is much less: but, like Bizet or Puccini, for instance, they can be very effective when they do use representative themes. However, Puccini and others often do little more than indulge in sentimental reminiscence, which it must be admitted can be very moving if it is used with the mastery of Verdi, who was fond of recalling past happiness during a final tragic situation by means of a melody associated with it earlier.

With lesser masters. or those who are not masters at all, this device degenerates into the naïve one of the "theme song." which is not a modern invention except for its name, for a good example is a song as early as "Home. Sweet Home" in H. R. Bishop's *Clari* (1823), where, moreover. we already find rhythmic transformation. (E. W. Bm.)

LEITRIM, a county of Ireland in the province of Connaught, bounded northwest by Donegal bay, northeast by Fermanagh, east by Cavan, southeast by Longford, south est by Roscommon and west by Sligo. Population (1956) 37,056, The land area is 588.6 sq.mi.

The county has a floor of Carboniierous Limestone, which forms scarped hills near Donegal bay. The northern part of the county is a tableland. of which the highest summits belong to the Truskmore hills. reaching *2,102* ft.; with Benbo, 1.367 ft., and Lackagh, 1,451 ft. The underlying sandstone appears at Lough Melvin, and again on the margin of a Silurian area in the extreme south. The Upper Carboniferous series, dipping southward, form mountainous country round Lough Allen, where the name of Slieve Xnierin records the abundance of clay-ironstone beneath the coal seams. The sandstones and shales of this series scarp boldly toward the valley of the Bonnet. across which rises the ridge of ancient gneiss which forms, in Benbo, the northeastern end of the Ox mountains. The ironstone was smelted in the upland at Creevelea down to 1859, and the coal is worked in a few thin seams. In 1956 the Electricity Supply boardwas erecting a coal-powered generating station which was intended to give a stimulus to local coal production.

The principal river is the Shannon, which. issuing from Lough Allen, forms the southwestern boundary of the county with Roscommon. The Bonnet rises in the northwest and flows to Lough Gill. and the streams of Drowes and Duff separate Leitrim from Donegal and Sligo respectively. Besides Lough Allen, which has an area of 14 sq.mi., the principal lakes are Lough Macnean, Lough Scur, Lough Garadice and Lough Melvin. Lough Melvin and the coast rivers afford rod fishing, the lough being noted for its trout.

County Leitrim, under the name of Hy Bruin-Brenny, formed the western part of Brenny or Breffny. It was for a long time held by the O'Rourkes, a family which long maintained its independence. Leitrim was not created a county until 1583. Large confiscations were made in the reigns of Elizabeth I and James I, in the Cromwellian period and after the revolution of 1688.

There are "druidical" remains near Fenagh and at Letterfyan, and monastic ruins at Creevelea near the Bonnet and in the parish of Fenagh. There was a Franciscan friary at Jamestown. The abbeys of Mohill, Xnnaduff and Drumlease have been converted into parish churches. Among the more notable old castles are Manorhamilton now in ruins, the Castle John on an island in Lough Scur. A village named Leitrim about 4 mi. N. of Carrick-on-Shannon is said to have been the seat of an early bishopric.

The climate is moist and unsuitable for grain crops. On the higher districts the soil is stiff and cold. and retentive of moisture, but some valleys are fertile. Lime, marl and similar manures are abundant. Potatoes are grown. but oats, the principal grain crop, is scanty. The livestock consists chiefly of cattle. pigs and poultry. Industries include buttons (Manorhamilton) and plastic electric fittings (Carrick-on-Shannon).

The Sligo. Leitrim and Northern Counties railway, connecting Sligo with Enniskillen, crosses the north of the county, by way of Manorhamilton; the Mullingar and Sligo line of the Great Southern has a station at Carrick-on-Shannon, the county town. Leitrim returns three members to *dail eireunn.*

LEIX (or Laoighis) (formerly Queen's county). a county in the province of Leinster, Republic of Ireland. bounded northwest and north by County Offaly, east by Kildare, south by Carlow and Kilkenny and west by Tipperary. Land area 663.8 sq.mi. Pop. (1956) 47,087. The limestone plain prevails in the county. hut

the high coal field, shared with Kilkenny and Carlow, rises from it in the south; while the Slieve Bloom mountains (Arderin, 1,734 ft.) a round-backed Old Red Sandstone mass with Silurian inliers, dominate the lowland west of Port Laoighise (Maryborough). The limestone itself produces a range of hills near Stradbally, on which stands the fortress of Dunamase. Esker gravels provide sandy soils in many places. Clay ironstone was formerly raised in connection with the anthracite from the coal field. The Barrow, with its source in the Slieve Bloom mountains, which forms at various points the boundary with counties Offaly, Kildare and Carlow, and the Nore, which enters the county from Tipperary near Borris-in-Ossory, are the principal rivers. The largest lake is Lough Anaghmore on the northwestern boundary. The Grand canal enters the county at Portarlington and runs southward to the Barrow in Kildare, a branch passing westward 12 mi. to Mountmellick.

The territory now included in County Laoighis covered the districts of Laoighis. Slievemargy. Irey and part of Glenmaliry. until in 1556 it was made shire ground. Three miles south of Stradbally is Dun of Clopook, an ancient dun or fort occupying the whole hill. Aghavoe, where there are the ruins of the abbey, was formerly the seat of the bishopric of Ossory. There are no remains of the abbey of Timahoe founded by St. Mochua in the 6th century, but in the neighbourhood there is a round tower, 96 ft. high. Abbeyleix, a small. market town south of Port Laoighise, had a famous 12th-century Cistercian foundation. The church of Killeshin. in the southeast of the county. exhibits Norman carving. Among the principal old castles are the ruined fortress of the O'Moores occupying the precipitous rock of Dunamase. 3 mi. E. of Port Laoighise. Borris-in-Ossory on the Nore and Lea castle on the Barrow, near Portarlington. erected by the Fitzgeralds about 1260. burned by Edward Bruce in 1315, again rebuilt and in 16jo laid in ruins by the soldiers of Oliver Cram\\-ell.

Originally a great extent of the surface was covered by bog, but much was recovered by draining. It is generally fertile except in the hilly districts toward the north, and there is some remarkably rich land in the southeast. From 1930 to 1940 Laoighis with Cork and Galway grew great quantities of sugar beets and contributed to making Ireland self-sufficient in sugar. Dairy farming is extensively practised and agriculture forms the chief occupation. The manufacture of woolen and worsted goods is carried on at Port Laoighise. and leather goods are manufactured at Mountmellick and Portarlington. The main line of Coras Iompair Eireann rail!?-ay traverses the county from northeast to southwest by way of Portarlington and Port Laoighise. The administrative counties of Laoighis and Offaly together return five members to *dail eireann.* The county town is Port Laoighise (pop., 1956, 3,196).

LEJEUNE, LOUIS FRANÇOIS, BARON (1775–1848), French general, painter and lithographer who was chiefly responsible for the introduction into France of lithography as an artistic medium, was born Feb. 3, 1775, probably at Strasbourg. From 1789 to 1791 Lejeune studied art under Valenciennes. He took part in many of the Napoleonic campaigns, and his vigorous battle pictures. executed mainly from sketches and studies made on the battlefield. enjoyed a great vogue; many were engraved by J. J. Coiny and E. Bovinet. The German campaign of 1806 brought him to Munich. where he visited the workshop of Alois Senefelder (*q.v.*), the inventor of lithography. Fascinated by the possibilities of the new method. Lejeune then and there drew on the stone his famous "Cosaque." and immediately pulled 100 proofs of it. one of which he later submitted to Napoleon.

Lejeune also painted many landscapes and portraits. In 1837 he became director of the École des Beaux-Arts and curator of the museum at Toulouse. where he died on Feb. 29. 1848.

LEKAIN (HENRI LOUIS CAIN) (1729–1778), French actor, whom Voltaire regarded as the greatest tragedian of his time, was born in Paris on March 31, 1729. After having been coached by Voltaire. Lekain made his debut at the Comédie Française in 1750. He scored his greatest successes in plays by Voltaire. notably as Gengis Khan in *L'Orphelin de la Chine* and in the title role of *Tancrède.* In 1759 Lekain drew up plans for a Royal School of Dramatic Art. He developed a strong interest in the reform of theatrical costume. discarding the traditional heroic paraphernalia when playing Oreste in Racine's *Andromaque* and adopting a pseudo-Grecian costume. As a disciple of Voltaire he campaigned successfully for the banishment of spectators from the stage of the Comédie Française. He died in Paris on Feb. 8, 1778, and his *Mémoires* were published in 1801. (A. M. N.)

LEKEU, GUILLAUME (1870–1894) Belgian composer who was a follower of Cesar Franck. Born at Heusy, near Verviers, Jan. 20, 1870, he first learned music from the organist of his native village. Later, while at school at Poitiers, he made an intensive study of the quartets of Beethoven. In 1888 he took his degree in philosophy at the University of Paris and then studied music there with Gaston Vallin. He visited Bayreuth in 1889, and on his return was a pupil of César Franck for about a year. Deeply affected by Franck's death in 1890, he was guided in his studies by Franck's pupil, Vincent d'Indy. In 1891 he wrote a piano sonata and a piano trio and won the second Belgian Prix de Rome with his cantata, *Andromkde,* a scene of which, arranged for voice, piano and string quartet, he conducted in Brussels in 1892. As a result of this performance, the famous Belgian violinist, Eugène Tsaye, commissioned him to write a piano and violin sonata, performed by Ysaye at Brussels on March 7, 1893. In the same year Ysaye conducted his *Fantaisie symphonique* on two folksongs of Anjou.

He died at the age of 24 from typhoid, contracted from contaminated sherbet, on Jan. 21, 1894, at Angers. He left many works that remained either undiscovered or unpublished, including two early quartets, a suite for cello and orchestra, a symphonic study on the subject of *Hamlet,* and *Epithalame* for strings, trombones and organ. His cello sonata and his piano quartet were completed by Vincent d'Indy.

Though Lekeu's technical accomplishment was uneven, he gave proof, particularly in the piano and violin sonata and the *Fantaisie symphonique,* of an original style which he had evolved from his studies of the works of Beethoven and Franck.

He also had a sensitive literary gift, seen in a long series of letters to his parents, and in a set of poems, notably his "Invocation a Mallarmé."

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LELAND, CHARLES GODFREY (1824–1903), U.S. author and journalist known for his popular humorous verse in dialect. was born at Philadelphia. Pa.. Aug. 15, 1824. and graduated at Princeton in 1845. He was in Paris during the revolution of 1848. and took an active part in it. He then returned to Philadelphia, and after being admitted to the bar in 1851, devoted himself to writing and to editorial work on various papers and magazines in Philadelphia. New York city and Boston. He served in the Union army for a brief time, prospected for oil and then returned to journalism. In 1868 he became known as the humorous author of *Hans Breitmann's Party,* which was followed by other volumes of the same kind. collected in 1871. with the title of *Hans Breitmann's Ballads.* These pioneer dialect poems. burlesquing the German American, at once became popular and resulted in his being given a master's degree from Harvard, largely at the instance of James Russell Lorvell. In 1869 he went to Europe. and till 1880 was occupied with literary work. After returning to Philadelphia for six years. he again lived in Europe, generally at Florence. where he died March 20. 1903.

Though his humorous verses were most attractive to the public. Leland was a serious student of folklore, particularly of the gypsies.

His numerous publications include *Poetry and Mystery of Dreams* (1855), *Meister Karl's Sketchbook* (18jj), *Sunshine in Thought* (1863), *Egyptian Sketchbook* (1873), *Abraham Lincoln* (1879), *The Minor Arts* (1880), *Algonquin Legends of New England* (1884), *Hans Breitmann in Tyrol* (1894).

See his *Memoirs* (1893), and *Charles Godfrey Leland* by his niece

Elizabeth R. Pennell (1906), who also wrote a memoir for the 1914 edition of the *Hans Breitmann Ballads*.

LELAND (LEYLAND or LAYLONDE), **JOHN** (c. 1506–1552), English antiquary, born in London, was educated at St. Paul's school under William Lilly, and at Christ's College, Cambridge. He graduated at Cambridge in 1521, and subsequently studied at All Souls college, Oxford, and in Paris under François Dubois (Sylvius). On his return to England he took holy orders. He had been tutor to Lord Thomas Howard, son of the 3rd duke of Norfolk, and to Francis Hastings. afterward earl of Huntingdon. Meanwhile Henry VIII presented him to the rectory of Peuplingues in the marches of Calais in 1530. He was librarian and chaplain to the king, and in 1533 he received a novel commission under the great seal as king's antiquary, with power to search for records, manuscripts and relics of antiquity in all the cathedrals, colleges and religious houses of England. Probably from 1j34 and definitely from 1536 to 1542, he was engaged on an antiquarian tour through England and Wales. He sought to preserve the manuscripts scattered at the dissolution of the monasteries, but his powers did not extend to their actual collection. Some valuable additions, however, he did procure for the king's library, chiefly from the abbey of St. Augustine at Canterbury. He received the rectory of Haseley in Oxfordshire; his support of the church policy of Henry and Cranmer being further rewarded by a canonry and prebend of King's college (now Christ Church), Oxford, and a prebend of Salisbury. In a *Strena Henrico* (1546). addressed to Henry VIII in 1545, he proposed to execute from the materials he had collected in his journeys a topography of England, an account of the adjacent islands, an account of the British nobility and a history of the antiquities of the British Isles. He did not complete these great undertakings, for he was certified insane in March 1550 and died on April 18, 1552.

The bulk of Leland's work remained in manuscript at the time of his death, and various copies were made. one by John Stowe in 1576. After passing through various hands the greater part of Leland's manuscripts were deposited by William Burton, the historian of Leicestershire. in the Bodleian at Oxford. They had in the meantime been freely used by other antiquaries, notably by Bale, Camden and Dugdale. The account of his journey in England and Wales received its name *The Itinerary of John Leland* from Thomas Burton and was edited by Thomas Hearne, 9 vol. (Oxford. 1710–12; other editions in 1745 and 1770). The scattered portions dealing with \Vales were re-edited by Miss L. Toulmin Smith in 1907. His other most important work, the *Collectanea*, in four folio manuscript volumes, was also published by Hearne, 6 vol. (Oxford. 1715). His *Commentarii de scriptoribus Britannicis*, which had been used and distorted by his friend John Bale, was edited by Anthony Hall. 2 vol. (Oxford, 1709). Some of Leland's manuscripts, which formerly belonged to Sir Robert Cotton, passed into the possession of the British Museum.

For accounts of Leland *see* John Bale, *Catalogus* (1557); Anthony à Wood, *Athenae Oxonienses;* W. Huddesford, *Lives of Those Eminent Antiquaries John Leland, Thomas Hearne and Anthony à Wood* (Oxford, 1772). *A* life of Leland, attributed to Edward Burton (*c.* 1750), from the library of Sir Thomas Phillipps, printed in 1896, contains a bibliography. *See* also the biography by Sidney Lee in the *Dictionary of National Biography.* The *Strena Henrico* was re-edited in 1549 by John Bale as *The Laboryeuse Journey and Serche of J. Leylande for Englandes Antiquitees geven of him for a Neu Yeares Gifte*, etc., modern ed. by W. A. Copinger (Manchester, 1895).

LELEGES. Various traditions were current among the Greeks respecting earlier inhabitants of their country. They were inclined to assign the comprehensive name of Pelasgians to all such peoples, but among them distinguished Carians and Leleges whom they regarded as akin. The Carians existed as a people in southwestern Anatolia in historical times, and the earliest extant mention of the Leleges is the record in the Iliad (x, 429, xx, 96) of their presence at Troy as allies of the Trojans. They were from Asia Minor. Herodotus records their former presence in the Greek islands. while both Strabo and Pausanias place them in various regions of the Peloponnesus and central Greece. There is evidence that they were settled also in parts of Thrace, Macedonia and Illyria.

A large class of Greek place names testifies to the presence on the mainland of a people closely associated with Asia Minor. A view now widely held is that Greek-speaking peoples first went to Greece from the north about the 17th century B.C., subduing the population, who had been in contact with the Minoan civilization. and attacking the Cretans themselves. It was these people, according to this view, who set up the Mycenaean civilization. Of the language of the early inhabitants nothing is known and it would be rash to assert that they did not speak Creek. This in no way means that the Minoans did so. The Carian language is now definitely regarded as non-Indo-European. Moreover, though the conquest of Greece by northern tribes is an undoubted fact, the question of the Greek-speaking peoples' occupation of Greece is not so simple as to be solved by the mere postulation that northern conquerors brought the language. The Achaeans were a great power in the eastern Aegean in the 14th century, and the view is gaining ground that there were early Greek migrations from east to west across the Aegean. It is, however, certain that there were Asianic peoples occupying the islands and the Greek mainland in a period that the historical Greeks regarded as ancient, and that the name of one of these tribes was Leleges. (B. F. C. A.)

LELEWEL, JOACHIM (1786–1861), Polish historian, geographer and numismatist, born at Warsaw on March 22, 1786, was educated at the University of Vilna and became in 1807 a teacher in a school at Krzemieniec in Volhynia. in 1814 teacher of history at Vilna and in 1818 professor and librarian at the University of Warsaw. He returned to Vilna in 1821. His popularity with the students made him obnoxious to the Russian government. and at Vilna Novosiltsev was then all-powerful. Lelewel was removed from his professorship in 1824, and returned to Warsaw, where he was elected a deputy to the diet in 1829 and joined the revolutionary movement. On the suppression of the rebellion he escaped to Germany, and went on to Paris in 1831. The government of Louis Philippe, at the request of the Russian ambassador, ordered him to quit French territory in 1833. He went to Brussels, where for nearly 30 years he earned a scanty livelihood by his writings. He died on May 29, 1861, in Paris.

Lelewel, a man of austere character, simple tastes and the loftiest conception of honour, was a lover of learning for its own sake. His literary activity was enormous, extending from his *Edda Skandinawska* (1807) to his *Géographie des Arabes* (2 vol., Paris, 1851). One of his most important publications was *La Géographie du moyen âge* (5 vol., Brussels, 1852–57), with an atlas (1849) of 50 plates entirely engraved by himseli. His works on Polish history are based on minute and critical study of the documents; they were collected under the title *Polska, dzieje i rzeczy jej rozpatrzywane (Poland, Her History and Affairs Surveyed)*, in 20 vol. (Posen, 1853–76).

See autobiography *(Adventures While Prosecuting Researches and Inquiries on Polish Matters)* printed in his *Polska.*

LELY, SIR PETER (PIETER VAN DER FAES) (1618–1680), Dutch-English portrait painter of the Flemish school, was born in Westphalia, the son of J. van der Faes, probably a Dutch mercenary. The origin of the name Lely is uncertain. He went to England with William of Orange in April 1641, painted that prince and his bride, the princess royal, and gained the court patronage. also painting Charles I and James, duke of York. He was a buyer at the sale of the king's pictures (1649–53) and about 1651 petitioned parliament for the mural decoration of Whitehall.

He prospered during the Commonwealth, and even more at the Restoration. In 1661 he received a pension of £200 a year, "as formerly to Van Dyck." Pepys' *Diary* shows in what great state he lived, and Charles Beale's "Diaries," in the British museum, throw light on his studio practice. By his "reputed wife," Ursula, he had three children, of whom John and Anne survived him. He was knighted in Jan. 1680 and died in London the same year, being buried at St. Paul's. Covent Garden, in December.

Some of Lely's early portraits have passed as Van Dycks. During the Commonwealth he adopted a severe, puritanical style, while his Restoration portraits of women catered to the sensual temper of the court. But simultaneously he painted the "Admirals" at Greenwich. the best of them rugged and severe. Toward the end his work gained in breadth and freedom.

Lely was a connisseur with a fine collection, and a good draftsman and colourist.

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LE MACON (or LE MASSON), **ROBERT** *(c.* 1365–1443), chancellor of France, was born at Château-du-Loir (Sarthe). He was ennobled in March 1401 and became six years later a councillor of Louis II, duke of Anjou and king of Sicily. A partisan of the house of Orléans, he was appointed chancellor to Isabella of Bavaria (1414) and to the count of Ponthieu, afterward Charles VII (1416). When Paris was surprised by the Burgundians on the night of May 29, 1418, he assisted Tanneguy-Duchâtel in saving the dauphin. By the influence of John the Fearless, duke of Burgundy, he was excluded from the political amnesty known as the peace of St. Maur des Fossés, though he retained his seat on the king's council. He became the chief councillor of the dauphin and was by his side when John the Fearless was murdered at the bridge of Montereau on Sept. 10, 1419. He resigned the seals, which he had held from 1418, at the beginning of 1422 but continued to exercise great influence; in 1426 he effected a reconciliation between the king and the duke of Brittany. He supported Joan of Arc at court, and he signed the patent of nobility for the Arc family in Dec. 1429. In 1430 he was once more entrusted with an embassy to Brittany. He died on Jan. 28, 1443.

See C. Bourcier, "Robert le Masson," *Revue historique de l'Anjou* (1873); G. de Beaucourt, *Histoire de Charles VII,* 6 vol. (Paris, 1881–91).

LE MAIRE DE BELGES, JEAN (1473?–1525?), Flemish poet, historian and pamphleteer, writing in French, who was the last of the rhetoricians and the chief forerunner. both in style and in thought, of the Renaissance humanists in France and Flanders. He was born at or near Bavai, Hainaut, about 1473. He led a wandering life in the service of various princes, and was often at the court of Margaret of Austria, regent of the Netherlands, acting as her librarian at Malines.

An innovator of wide intellectual curiosity. Le Maire had a sense of literary beauty nhich set his works apart from those of his contemporaries. Most of his poems are occasional pieces in memory of some prince His tno *Épitres de l'amant vert* (1505) are full of metrical innovations and foreshadow the light verse of Clément Marot. His *Concorde des deux langages (c.* 1513; modern ed. 1947) attempts to reconcile the influence of the Italian Renaissance with French tradition.

His most extensive nork is a poetical legendary romance in prose. *Illustrations de Gaule et singularités de Troie* (1510–13), shoning exuberant imagination and a modern appreciation of classical antiquity. Another prose work, *Différence des schismes et dcs conciles* (1511), is written with a polemical vigour which was to be surpassed and amplified by the Reformation pamphleteers of the 16th century. Le Maire's work is of genuinely high quality and deserves to be better known.

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LEMAÎTRE, JULES (1853–1914), French critic and dramatist, was born at Vennecy (Loiret) on April 27, 1853. His early years were spent in university teaching, but from 1884 onward he devoted himself entirely to literature. He succeeded J. J. Weiss as dramatic critic of the *Journal des débats,* and subsequently filled the same office on the *Revue des deux mondes.* His volumes of *contes* include *Myrrha* (1903) and *En marge des vieux livres* (1905–07). His plays include: *Révoltée* (1889), Le *député Leveau,* and *Le Mariage blnnc* (1891), *Les Rois* (1893), *Le Pardon* and *L'Age difficile* (1895), *La Massière* (1904) and *Bertrade* (1905). He was admitted to the French academy on Jan. 16, 1896. His political views were defined in *La Campagne nationaliste* (1900), lectures delivered in the provinces by him and by G. Cavaignac. He conducted a nationalist campaign in the *Echo de Paris,* and was for some time president of the Ligue de la Patrie Française, but resigned in 1904. He died Aug. 5, 1914.

See Henri Bordeaux, *Jules Lemaitre* (1920).

LE MANS, a town of northwestern France, capital of the *département* of Sarthe, 77 mi. S.W. of Chartres on the railway from Paris to Brest. Pop. (1954) 103,346. As the capital of Aulerci Cenomanni, Le Mans was called Suindinum or Vindinum. The Romans built walls round it in the 3rd century, and traces are still to be seen. In the same century the town was evangelized by St. Julian, its first bishop. Ruled at first by his successors—notably St. Aldric—Le Mans became in the middle ages the capital of the counts of Maine. About the middle of the 11th century the citizens secured a communal charter, but in 1063 the town was seized by William the Conqueror, who deprived them of their liberties, which were recovered when the countship of Maine had passed to the Plantagenet kings of England. Le Mans was taken by Philip Augustus in 1189, recaptured by John, subsequently confiscated and later ceded to Queen Berengaria, who did much for its prosperity. It was several times besieged in the 15th and 16th centuries. In 1793 it was seized by the Vendéens, who were expelled by the Republicans. In 1799 it was again occupied by the Chouans. It stands just above the confluence of the Sarthe and the Huisne. Several bridges connect with the quarter of Pré on the right bank. The cathedral was originally founded by St. Julian, to whom it is dedicated. The nave dates from the 11th and 12th centuries. Some stained glass in the nave, from the first half of the 12th century, is the oldest in France; the west window represents the legend of St. Julian. The south lateral portal (12th century) and the choir are richly decorated. The cathedral also has curious tapestries and some remarkable tombs, including that of Berengaria, queen of Richard Coeur de Lion. Close to the western wall is a megalithic monument nearly 15 ft. in height. The church of La Couture, part of an old abbey founded in the 7th century by St. Bertrand, has a porch of the 13th century with fine statuary. The hôtel de ville was built in 1756 on the site of the former castle of the counts of Maine; the prefecture (1760) occupies the site of the monastery of La Couture, and contains an archaeological museum. Among the old houses are the Hôtel du Grabatoire of the Renaissance, once a hospital for the canons and the so-called house of Queen Berengaria (16th century). Le Mans is the seat of a bishopric dating from the 3rd century, of a prefect, and of a court of assizes. Important industries are the state manufacture of tobacco, tanning, hemp-spinning, bell-founding. flour-milling, the founding of copper and other metals, and the manufacture of railway cars, machinery and agricultural implements, motors, rope, cloth and stained glass. The fattening of poultry is an important industry, and there is trade in cattle, cloth, farm-produce as well as in wines. The town is a railway centre and the site of the international endurance auto races.

Battle of Le Mans.—Le Mans (Jan. 10–12, 1871) was the culmination of General Chanzy's retreat into western France after the winter campaign in Beauce and Perche *(see* FRANCO-GERMAN WAR). The Germans advanced with three army corps in first line and one in reserve. On Jan. 9 the centre corps (III) drove an advanced division of the French from Ardenay (13 mi. E. of Le Mans). On the next day Chanzy's main defensive position was approached and there was a severe struggle for the villages along the front of the French centre. On the 11th Chanzy attempted a counteroffensive from many points, but the Germans were able to drive him back; and as their cavalry now began to appear beyond his extreme left flank, he retreated in the night of the 11th on Laval, the Germans occupying Le Mans after a brief rear-guard fight on the 12th.

LE MARCHANT, JOHN GASPARD (1766–1812), English major-general, was the son of an officer of dragoons, John Le Marchant, a member of an old Guernsey family. Le Marchant entered the army in 1781, and attained the rank of lieutenant-colonel in 1797. In 1801–02 his schemes for establishing at High Wycombe and Great Marlow schools for the military instruction of officers was sanctioned by parliament, and a grant of £30,000 was voted for the "royal military college," the two original departments being afteruards combined and removed to Sandhurst. Le Marchant was its lieutenant-governor for nine years, and he trained many officers who served under Wellington in the Peninsula. Le Marchant was given the command of a cavalry brigade in 1810, and distinguished himself in several actions; he was killed at the battle of Salamanca on July 22, 1812.

See Sir *D. Le* Marchant, *Memoirs of General* ***Le Marchant*** *(1841).*

LEMAY, CURTIS EMERSON (1906–), US. air force officer, noted as a strategic bombardment commander, was born in Columbus, O., on Nov. 15, 1906. LeMay entered the U.S. air corps in 1928 and advanced to the position of bombardment group commander in 1942. Flying with the 8th air force from England in 1942–44, eventually as a bombardment division commander, he became known for his development of advanced bomber tactics. including pattern bombing and the combat box formation. After commanding B-29s in India and China during 1944, LeMay took over the 21st bomber command in the Marianas in Jan. 1945 and inaugurated the low level bombing tactics which burned out Japanese cities. He was selected to head the U.S. strategic air command in Oct. 1948, and promoted to the rank of general in Oct. 1951.

In April 1957 LeMay was named vice-chief of staff of the U.S. air force. (A. Gg.)

LEMBERG: ***see*** L w .

LEMBERG, BATTLES OF. Lemberg (Polish, Lwów), the capital town of Galicia, was twice during the World War the centre of a series of battles. The first series constituted the opening campaign between Russia and Austro-Hungary in Aug. and Sept. 1914; it resulted in the defeat of the Austrians and the occupation by the Russians of the whole of Eastern Galicia. The second series was fought some ten months later during the great Russian retreat which was started by Mackensen's offensive on the Dunajec in May 1915. It gave Austria re-possession of Lemberg and of practically the whole of Eastern Galicia.

The main concentration of the Austro-Hungarian forces for action against Russia at the opening of war in Aug. 1914 was made in Central and Eastern Galicia. In the general plan of the Central Powers the rôle of the Austro-Hungarian army was to engage the main Russian forces till the German army had overwhelmed France and was free to transfer its principal weight to the Eastern theatre. Two main alternatives were open to the Austrians, to await attack or themselves to take the offensive. If the former course were chosen, the line of the river San, between the Carpathians and the Vistula, was indicated as the strongest available position. On this they might well hope by an active defence to hold up the maximum Russian effort for some time and to win local successes by counter-attack. But defence entailed not only the abandonment of Eastern Galicia but also the surrender of the passes over the Eastern Carpathians and the opening of a road into Hungary. This might have serious political consequences. Moreover, in the years preceding the War, the military opinion of almost every country in Europe had proclaimed insistently that offensive action was the solution of all major difficulties in war. Certainly Conrad von Hotzendorf, the chief of the Austrian general staff, optimistic by temperament, was not the man to adopt a defensive attitude willingly. He determined to attack, though the advantages hoped for from a speedier mobilization were not secured owing to errors made during the preliminary deployment against Serbia.

The chosen line of attack was northwards against one flank of the Polish salient; probably Conrad hoped that a German offensive might eventually be made from East Prussia against the other flank of the salient. The problem of supply was not easy, since the terrain between the Vistula and Bug rivers, where the advance was to be made, had been left, at the instance of the Russian general staff, without good communications in anticipation of the Austrian plan. It was indeed the obvious direction of any invasion of Russia from Galicia, since an advance eastwards would leave the lines of communication exposed, while to the north-east lay the trackless marshes of the Pripet.

The Rival Forces.—The Austrian main forces were divided into four armies, of which two, the I. (Dankl) and IV. (Auffenberg), were to carry out the offensive directed on Chelm (Kholm) and Lublin respectively; the II. (Bohn-Ermolli) and III. (Brudermann) were to be deployed east of Lemberg to hold off the Russian armies advancing from the Kiev district. The II Army had, however, been originally dispatched to the Serbian frontier, and was at first represented by one corps only, the XII. (Kövess). North of the Vistula, Kummer's group of Austrian Landsturm and Woyrsch's corps of German Landwehr were to advance on Sandomierz and Doblin (Iwangorod) respectively, to protect the left flank of the I. Army and to foster a Polish rising in favour of Austria.

The Russians also deployed four armies on their south-western front. Their plan was almost the exact counterpart of the Austrian. They purposed to hold the Austrian offensive wing by a defensive force of two armies on the line Lublin-Chelm, and to smash the Austrian defensive wing by an offensive group of two armies advancing west from the Kiev military district on Lemberg. Each of the opponents was thus dependent on the power of his defensive wing to resist the shock of the other's striking force long enough to enable him to gain a decision by his main effort.

Both armies had large masses of cavalry, but there was a pronounced difference in their tactics. The Austrian cavalry seldom practised dismounted fire action and were singularly ineffective on foot; the Russian cavalry, on the other hand, fought largely as mounted infantry. The Russian artillery shot well and was far more effective than the Austrian, but the musketry of the Austrian infantryman was better than that of his rival; he was also handier in manoeuvre. The morale on both sides was excellent at the beginning, although that of the Austrian was to deteriorate rapidly under defeat. In the higher command the Russians held the advantage. Ivanov, the generalissimo of the south-western front, was no strategist, though an experienced and well-loved commander; but his chief of staff, Alexeyev, was one of the best brains of the army; and in Ruzski (III. Army), Plehve (V. Army), Brusilov (VIII. Army), and Ewarth (IV. Army) he had under him probably the four ablest army commanders in Russia—certainly the four most successful Conrad, the virtual commander-in-chief of the Austrian armies—the Archduke Friedrich was the nominal head—was a man of determined and obstinate character, but a better strategist in the office than in the field; nor were the Austrian army commanders the equals of the Russian.

Numerically, the Russians had a slight advantage. The Austrian striking wing, which comprised 350 battalions, 150 squadrons and 150 batteries, was superior in strength to the Russian IV and V. Armies which had each four corps and two cavalry divisions; but their defensive wing (200 battalions, 170 squadrons, 130 batteries) was considerably inferior to the Russian III and VIII. Armies, especially before the arrival of the two corps of the II. Army which had been left opposite Serbia.

On Aug. 15, before concentration was complete, the Austrian cavalry pushed forward to ascertain the Russian movements, but gathered little information. On Aug. 20 the I. and IV. Armies began their offensive. The first engagements in the neighbourhood of Krasnik were favourable to the Austrians, the advanced troops of the Russian IV. Army being driven back on Lublin The Austrian I. Army was strengthened by Kummer's Landsturm Corps, which crossed the Vistula to join it, while Woyrsch's Corps of German Landwehr was in close touch on the left bank of the Vistula. The mission of these two formations to foment an insurrection in Russian Poland had proved fruitless.

The Battles of 1914.—The Austrian IV. Army now became engaged in a battle with the Russian V. Army, which lasted from Aug. 26 to Sept. 1. Assisted by the Archduke Joseph Ferdinand's group, which had been formed from troops of the III Army to manoeuvre between its left and right of the IV. Army, Auffenberg attempted a double envelopment of ihe Russian force This manoeuvre gained a considerable initial success, but before the Austrians could exploit it, events in Eastern Galicia occasioned their recall.

Meanwhile the Austrian covering force (II. and III Armies) had met with disaster Although the II. Army consisted of one corps only and the III Army was weakened by the absorption of the Archduke Joseph Ferdinand's group in the Kómarow battle, yet the High Command sent the two armies forward to the attack. They joined battle with the Russian III and VIII Armies on Aug. 26 on the line of the Złota Lipa about Złoczów On the evening of Aug. 27 they were forced to retreat. Reinforced by the VII. Corps from Serbia, they again gave battle on the Gnila

Lipa on Aug. 29 and 30, and again suffered defeat. They now fell back through Lemberg, which was evacuated on Sept. 2, and took up a defensive position west of the city on the line of the Wereszyca and the Gródek lakes.

The rear of the advancing Austrian I. and IV. Armies was seriously threatened by the failure of the eastern wing. The question now arose of withdrawing the whole of the Austrian forces to the line of the San, or of continuing the battle round Lemberg on a different plan. Conrad chose the bolder course and determined to seek an immediate victory. He ordered the IV. Army to break off pursuit of the Russians and to change front from north to south. The plan was that this army should strike towards Lemberg at the right flank of the advancing Russians, while the II. and III. Armies held them frontally. The complicated wheel of the IV. Army had been executed by Sept. 5. On Sept. 6 it commenced its march southwards, leaving behind a group under the Archduke Joseph Ferdinand to protect its rear. As it advanced south, its left column became engaged with the right of the Russian III. Army and was pinned to the east of Rawa-Ruska, while the centre and right columns, meeting no resistance, continued southwards, and eventually wheeled into line with the Austrian III. and II. Armies, facing east.

Conrad changed his plan again; he had missed with his left, so now, like an obstinate but unskilful boxer, swung his right at the enemy, viciously but ineffectively. On Sept. 7 he ordered the IV. Army to stand fast and hold the Russians to their ground, while the II. and III. Armies left their prepared defensive positions and struck northward at the Russian left wing. A radical change of plan so hurriedly evolved was hardly likely to succeed. The II. and III. Armies could make little ground, while the position of the IV. Army rapidly became untenable. In its rear the I. Army was being forced back from Lublin by the reinforced Russian IV. Army, while the Russian V. Army had rallied and was again advancing, driving before it the Archduke Joseph Ferdinand's weak group. Finally the left wing of the IV. Army itself was being outflanked north of Rawa-Ruska by the Russian III. Army. On Sept. 11 Conrad issued orders for a general retreat to the line of the San.

Austrian Retreat.—The withdrawal was successfully carried out without serious interference by the Russians. The II. Army retired in the direction of Sambor, and the III. towards Przemyśl, the IV. on Jarosław, and the I., together with Kummer's and Woyrsch's forces, to the lower San. The detachments farther east, along the Dniester, retired to the Carpathians. The line of the San was not held for long The Russian IV. Army had been reinforced by the IX. Army from Warsaw and forced a passage of the lower San on Sept. 14. The Austrians were too shaken and disorganized to enter on a new battle, and resumed their retreat, leaving the fortress of Przemyśl to stand siege. They finally halted on Sept. 26 some 50 m. E. of Cracow on the line of the Dunajec by Tarnow and Gorlice to the Carpathians. The Russians, who also required a pause for reorganization—since the losses had been very heavy on the Russian as well as on the Austrian side—made no serious attempt to follow up beyond the San.

The advantage of "interior lines" which the Austrians enjoyed in this campaign had been partly discounted by the great size of modern armies and the time required to obtain the decision in a battle. It is true that the Germans were at this very period gaining brilliant successes by action on interior lines against Samsonov and Rennenkampf in East Prussia, but their achievements were only rendered possible by the inertia of Rennenkampf. In Galicia, the continued pressure of Ruzski's and Brusilov's armies on the Austrian detaining wing denied to Conrad the time required to complete his successes in Poland. But the Austrian High Command appear to have depended too much on opportunist strategy. It is difficult to trace in their original organization for the campaign any recognition of the need for that "mass of manoeuvre," capable of being transferred from one wing to the other, which is the essence of action on interior lines. Also, the ineffectiveness for delaying action of their masses of cavalry deprived the Austrians of a powerful weapon. The Russian scheme of operations was straightforward and demanded only driving power by the higher commanders and hard fighting and marching by the troops. An opportunity of turning the Austrian retreat into a rout seems, however, to have been missed, when the IX. Army from Warsaw directly reinforced the IV. Army instead of being directed west of the Vistula on the Austrian line of retreat.

The Battles of 1915.—The second series of battles round Lemberg, the great German-Austrian offensive of 1915, began in May with two attacks on the Russians around the Dunajec and San rivers. After being driven from the San, the Russian III. Army (now under Lesh instead of Radko Dimitriev) and VIII. Army (Brusilov) took up a position to the north-west and west of Lemberg. Their line ran from the Vistula along the heights north of the Tanew, thence west of Rawa-Ruska by Magierów and Janów to the Wereszyca and Gródek lakes. The XI, and IX. Armies continued the line south-east along the Dniester.

Mackensen's pursuing force consisted of the Austrian IV., German XI. and Austrian II. Armies, in that order from north to south. On the Dniester were Linsingen's Southern Army and Pflanzer-Baltin's VII. Army. In the number of available formations there was no great disparity between Mackensen's group of armies and the Russian III. and VIII. Armies; on each side there were about 40 infantry divisions, and the Russians had five or six cavalry divisions to Mackensen's two. But the two Russian armies now embraced an improvised assembly of formations and units taken from all parts of the line; even so their losses had not been made good and they were much under strength; there was a shortage of ammunition, both for guns and rifles; and morale had suffered under two and a half months of continual defeat.

As usual, the main thrust at the Russian position was delivered by the German XI. Army. It was directed through Magierów against the line Zólkiew-Rawa-Ruska, approximately at the joint between the Russian III. and VIII. Armies. The assault was made on June 19, after the Russian position had been battered by the German guns, and the attackers broke right through to the Rawa-Ruska-Lemberg railway. Brusilov held on to a fortified position west of Lemberg till the 22nd, and then evacuated it under the threat that came from the north and the direct pressure from the Austrian II. Army.

The Russian armies were now split apart; the VIII. Army retired fighting to the line of the Upper Bug and Gnila Lipa; at the same time the XI. and IX. Armies gave up the Dniester line below Halicz. The III. Army meanwhile, to protect the left flank of the Warsaw salient, was forced to retire north towards Lublin and Chełm. To fill the gap between the III. and VIII. Armies, a new army, the XIII. under Gorbatovski, was formed of troops drawn from the right of the III. Army and left of the VIII. The Austrian armies were also re-grouped; the II. Army, the Southern Army and VII. Army were to continue the pursuit eastwards; Mackensen with the IV., XI. and a new "Army of the Bug," to be formed under Linsingen, was to strike northwards between the Bug and Vistula; while the I. Army, withdrawn from the west of the Vistula, was to fill the gap between the two army groups.

The Eastern group drove the Russians back at the beginning of July from the Gnila Lipa to the Zlota Lipa; no further fighting took place here till the end of August. Farther east, Pflanzer-Ealtin's VII. Army and Lechitski's IX. were engaged in an indecisive conflict along the Dniester between July 14 and 19. Meanwhile on Mackensen's front the Austrian IV. Army had been heavily counter-attacked near Krasnik by the Russian IV. Army and had been driven back some distance, losing 17,000 prisoners.

The check was only temporary, and so soon as the re-grouping was completed, Mackensen again advanced.

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(A. P. W.)

LEMERCIER, NÉPOMUCÈNE (1771–1840), French poet and dramatist. was born in Paris on April 21, 1771. His father had been intendant successively to the duc de Penthièvre, the comte de Toulouse and the unfortunate princesse de Lamballe, who was the boy's godmother.

Lemercier wrote his tragedy of *Méléagre,* produced at the Théâtre Français, before he was 16. *Le Tartufe révolutionnaire,* a parody full of the most audacious political allusions, was suppressed after the fifth representation. In 1795 appeared Lemercier's masterpiece *Agamemnon,* called by Charles Labitte the last great antique tragedy in French literature. It was violently attacked later by Geoffroy, who stigmatized it as a bad caricature of Crebillon.

Quatre métamorphoses (1799) was written to prove that the most indecent subjects might be treated without offense. The *Pinto* (1800) was the result of a wager that no further dramatic innovations were possible after the comedies of Beaumarchais. It is a historical comedy on the subject of the Portuguese revolution of 1640. This play was construed as casting reflections on the first consul, who had hitherto been a firm friend of Lemercier. His extreme freedom of speech finally offended Napoleon, and the quarrel proved disastrous to Lemercier's fortune for the time. None of his subsequent work fulfilled the expectations raised by *Agamemnon,* with the exception perhaps of *Frédégonde et Brunehaut* (1821).

In 1810 he was elected to the academy, where he consistently opposed the romanticists, refusing to give his vote to Victor Hugo. In spite of this. he has some pretensions to be considered the earliest of the romantic school. Indeed his *Christophe Colomb* (1809), advertised on the playbill as a *comédie shakespirienne (sic).* showed no respect for the unities. Its numerous innovations provoked such violent disturbances in the audience that one person was killed and future representations had to be guarded by the police.

Lemercier wrote four long and ambitious epic poems: *Homère, Alexandre* (1801), *L'Atlantiade, ou la théogonie newtonienne* (1812) and *Moïse* (1823). as well as an extraordinary *Panhypocrisiade,* a romantic production in 20 cantos, which has the subtitle *Spectacle infernal du XVI^e^ du siècle.* The first 16 cantos appeared in 1819; the last 4 in 1832. In it 16th century history, with Charles V and Francis I as principal personages, is played out on an imaginary stage by demons in the intervals of their sufferings. Lemercier died on June 7, 1840, in Paris.

LEMMING, a small arctic mouselike rodent, *Lemmus lemmus,* belonging to the subfamily Microtinae and nearly related to the voles or meadow mice. About five inches long, the lemming's prevailing colour is tawny yellow, shading to reddish-brown, with a dark back stripe running from head to tail. The head is short and rounded, the eyes bead-like and the short, rounded ears are almost concealed by the fur. The tail is short and the feet small, each with five claws adapted to digging. The usual habitat of lemmings is the highlands or fells of the great central mountain chain of Norway and Sweden, from the southern branches of the Langfjeldene in Christiansand *stift* to the North Cape and the Varangerfjord. South of the Arctic circle they are, under ordinary circumstances, confined to the plateaus covered with dwarf birch and juniper above the conifer region, though north of the Arctic circle, in Lapland, they occur in all suitable localities down to the level of the sea. The nest, under a tussock of grass or a stone, is constructed of short dry straws and usually lined with hair. The number of young in each nest is generally five, sometimes only three, occasionally seven or eight; and at least two broods are produced annually. Their food is entirely vegetable, especially grass roots and stalks, shoots of dwarf birch, reindeer lichens and mosses, in search of which they form, in winter, long galleries through the turf or under the snow. They are restless, courageous and pugnacious little animals. When a lemming is suddenly disturbed, instead of trying to escape it sits upright, with its back against a stone, hissing and showing fight in a determined manner.

The circumstance which has given popular interest to the lemming is that certain districts of the cultivated lands of Norway and Sweden, where under ordinary conditions they are unknown, are at uncertain intervals overrun by an army of lemmings. These emigrations, which usually occur every three or four years, although occasionally the interval between them is longer, are always downhill toward the sea—hence westward in central Norway, northward in Lapland, eastward in central Sweden and southward in southern Norway and Sweden. The lemmings advance steadily and slowly, regardless of all obstacles, swimming streams and even lakes of several miles in breadth and committing considerable devastation on their line of march by the quantity of food they consume. In their turn they are pursued and harassed by crowds of beasts and birds of prey, as well as by man. and even domestic animals such as cattle, goats and reindeer join in the destruction, stamping them to the ground with their feet and even eating their bodies. Numbers also die from an epidemic disease known as "lemming fever" (apparently tularemia), seemingly epidemic from overcrowding. None returns and the onward march of the survivors never ceases until they reach the sea, into which they plunge and are drowned.

These sudden appearances of vast bodies of lemmings and their singular habit of persistently pursuing the same onward course of migration have given rise to various speculations, from the ancient belief of the Norwegian peasants that they fall down from the clouds, to the hypothesis that they are responding to an inherited instinct and travelling to the place where their ancestors of the Miocene period, at a time when there was dry land over the Baltic and North seas, emigrated when driven from their ordinary dwelling-places by crowding or scarcity of food.

The principal facts of these emigrations seem to be that when any combination of circumstances has occasioned an increase in the number of lemmings in their ordinary habitats, impelled by a migratory instinct they begin to move toward lower-lying land. The whole body moves forward slowly, always advancing in the same general direction in which they originally started, but following more or less the course of the great valleys. They march largely by night, usually feeding and sleeping by day. although they have often been seen moving through brush and woods in the daytime and when swarming on the lowlands, they commonly appear by day, moving through towns, swimming rivers, climbing ships' hawsers and devouring all vegetable matter that comes in their way. The emigration may last from one to three years, according to the route taken and the distance to be traversed before they reach the seacoast, and notwithstanding the destructive influences to which they are exposed, lemmings breed with such prodigality as actually to increase their numbers during the journey. Their ultimate goal is either the Atlantic ocean or the Gulf of Bothnia, depending on whether their emigration began from the west or the east side of the central elevated plateau. Those that finally perish in the sea, committing what appears to be a voluntary suicide, are only acting under the same blind impulse which had led them previously to cross shallower pieces of water with safety. Lemmings are divided by naturalists into two genera. *Lemmus* and *Dicrostonyx,* each with a number of species and races. The genus *Dicrostonyx,* which is largely American, turns white in winter and is popularly known as the pied or collared lemming. The American lemmings live like the Scandinavian variety. They inhabit the tundra and have been found emigrating even on arctic ice. 30 mi. from land.

See Charles Elton. *Voles, Mice and Lemmings: Problems in Population Dynamics,* ch. x and xxi (Oxford, 1942).

LEMNA: *see* DUCKWEED.

LEMNISCATE: *see* **CURVES,** SPECIAL.

LEMNOS, an island in the north of the Aegean sea; area 186 sq.mi. Population (1951) 24,016. Lemnos is mountainous, with sheep pasture and very fertile valleys. No forests remain and all wood is brought from Thasos or the mainland. There are mulberries and other fruit crops but no olives. The population is Greek, formerly with a Turkish minority.

The chief towns are Kastro, on the west coast, with excellent harbour, foreign consulates and the archbishoprics of Lemnos and the neighbouring island of Ai-Strati (St. Eustratius): Mudros on the south coast, at the head of a spacious landlocked bay of high

naval value.

The most famous product of Lemnos is the medicinal earth, *terra sigillata,* formerly popular over western Europe, and still used locally. The name (=Gr. Λημνία σφραγίς) is derived from the stamp impressed on each piece; in ancient times the stamp was the head of Artemis. The earth was considered in ancient times a cure for old festering wounds and for the bite of poisonous snakes. The Turks now believe that a vase of this earth destroys the effect of any poison drunk from it—a belief which the ancients attached to the earth from Cape Kolias in Attica. Galen went to see the digging of this earth; on one day in each year a priestess performed the due ceremonies, and a wagonload was dug out. At the present time the day is Aug. 6, the feast of Christ the Saviour. Till recently the Turkish *hodja* as well as the Greek priest were present to perform the ceremonies, which take place before daybreak. The earth is sold by apothecaries in stamped cubical blocks. The hill from which the earth is dug is a dry mound, void of vegetation, beside the village of Kotchinos and about two hours from the site of Hephaestia *(Palniokastro)* on the east coast. In ancient times the island was sacred to Mephaestus, who fell when Zeus hurled him out of Olympus. This tale and the name Aethallia were supported by stories of volcanic activity and subsidence of islets. But all such disturbance has ceased. The name Lemnos is said to be Thracian, and the earliest inhabitants, the Sinties, have a Thracian tribe-name. The proverbial "Lemnian deeds" were the murder of all the men by the island women on two traditional occasions. The Argonauts found only women on the island, ruled over by Hypsipyle, daughter of the old king Thoas. From the Argonauts and the Lemnian women were descended the race called Minyae, whose king Euneus, son of Jason and Hypsipyle, sent wine and provisions to the Greeks at Troy. The Minyae were expelled by a Pelasgian tribe who came from Attica, and survivors found refuge in Sparta and colonized Thera later. The historical element underlying these traditions is probably that the original Thracian people were gradually brought into communication with the Greeks as navigation began to unite the scattered islands of the Aegean; the Thracian inhabitants were barbarians in comparison with the Greek mariners. The worship of Cybele was characteristic of Thrace, whither it spread from Asia Minor at a very early period, and it deserves notice that Hypsipyle and Myrina (the name of one of the chief towns) are Amazon names.

Lemnos was conquered by Otanes, one of the generals of Darius Hystaspis, but was soon reconquered by Miltiades, the tyrant of the Thracian Chersonese. Miltiades afterwards returned to Athens, and Lemnos continued an Athenian possession (secured by a cleruchy [*q.v.*]) until Macedon acquired it. The Romans declared it free in 197 B.C. but gave it over in 166 to Athens, which retained nominal possession of it till the whole of Greece was made a Roman province. A colony of Attic cleruchs was established by Pericles, and many inscriptions on the island relate to Athenians. After the division of the empire, Lemnos passed under the Byzantine emperors; it shared in the vicissitudes of the eastern provinces, being alternately in the power of Greeks, Italians and Turks, till finally the Turkish sultans became supreme in the Aegean. In 1476 the Venetians successfully defended Kotschinos against a Turkish siege, but in 1657 Kastro was captured by the Turks from the Venetians after a siege of 63 days. Kastro was again besieged by the Russians in 1770. All these changes reflected its great naval importance.

Homer speaks as if there were one town in the island called Lemnos, but in historical times there was no such place. There were two towns, Myrina, now Kastro, and Hephaestia. The latter was the chief town; its coins are found in considerable number, the types being sometimes the Athenian goddess and her owl, sometimes native religious symbols, the caps of the Dioscuri, Apollo, etc. Few coins of Myrina are known. They belong to the period of Attic occupation and bear Athenian types. A few coins are also known which bear the name not of either city but of the whole island. Conze was the first to discover the site of Hephaestia, at a deserted place, named Palaeokastro on the east coast. It once had a splendid harbour which later filled up. Its situation on the east explains why Miltiades attacked it first when he came from the Chersonese. It surrendered at once, whereas Myrina, with its very strong citadel built on a perpendicular rock, sustained a siege. It is said that the shadow of Mount Athos fell at sunset on a bronze cow in the agora of Myrina. Pliny says that Athos was 87 mi. to the northwest, but the real distance is about 40 English mi.

One legend about Lemnos is that Philoctetes was left there by the Greeks on their way to Troy during the Trojan War and there suffered 10 yrs.' agony from his wounded foot until Ulysses and Neoptolemus induced him to accompany them to Troy. This story is the subject of Sophocles' *Philoctetes.* He is said by Sophocles to have lived beside Mount Hermaeus, which Aeschylus in *Agamemnon* makes one of the beacon points to flash the news of Troy's downfall home to Argos.

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LEMON, *Citrus limon,* a small tree or spreading bush and its fruit; it was considered by Linnaeus as a variety of *Citrus medica,* the citron. The origin of the lemon is not certain. It should probably be considered as a "satellite" species of the citron, though it may ultimately prove to be of hybrid origin, perhaps having the citron and lime for parent species.

The lemon seems to have been unknown to the ancient Greeks and Romans and to have been introduced into Spain and the north African countries some time between the years A.D. 1000 and 1200. At about this same time, it was further distributed through Europe by the crusaders, after they found the fruit growing in Palestine. In 1494 the fruit was being cultivated in the Azores and shipped largely to England. In China the lemon is found only as a plant of relatively recent introduction and is very rare even in the southern provinces, where other citrus are grown. It is also rare in India. As a cultivated tree, the lemon is now grown throughout the Mediterranean countries. It is extensively grown in the southwestern United States, in Italy and in Spain and is grown to a limited extent in almost all tropical and subtropical countries.

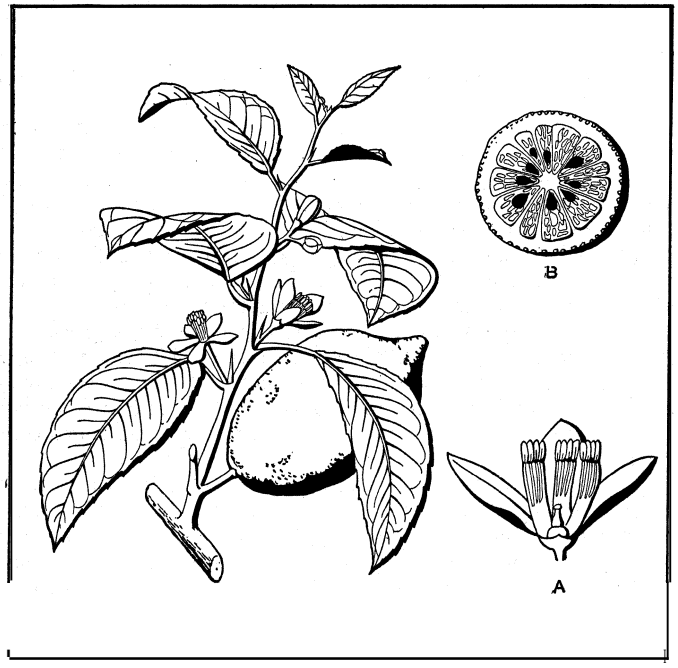
Plant Characteristics.—Growth Form.—Unlike the orange, which forms a close head of deep-green foliage, the lemon forms a spreading bush or a small tree, 10 to 20 ft. high if not pruned. The leaves of the lemon are paler and more scattered than those of the orange; the young leaves, when one-eighth to one-quarter grown, have a decidedly reddish tint, later turning green. The foregoing description is typical of the Eureka lemon variety and others similar to it, such as the Villafranca; the various selections of the Lisbon lemon varieties grow more like an orange or grapefruit, so far as size of leaves and density of foliage are concerned. The young branches of the lemon are angular, and in some varieties, such as the Lisbon, there are sharp thorns at the axils of the leaves. The flowers possess a sweet odour comparable to that of the orange; they are rather large, solitary or in small clusters in the axils of the leaves; reddish-tinted in the bud; petals white above and reddish-purple below.

The Fruit and Its Composition.— The fruit is oval with a broad, low, apical nipple and eight to ten segments; an outer rind or peel, yellow when ripe and rather thick in some varieties, is prominently glandular-dotted; seeds are small, ovoid, pointed, sometimes few or none; pulp is decidedly acid. The white spongy inner part of the peel, called the mesocarp or albedo, is nearly tasteless and is the chief source of the commercial grades of pectin.

Volatile oils are contained in the oil glands of the outer lemon peel (flavedo); these consist largely of limonene (terpene) in amounts ranging from 85% to 95%, with corresponding percentages (15% to 5%) of aldehydes and esters. The aldehydes and esters are largely responsible for the flavour and odour of the citrus oils. The white spongy inner part of the peel, the mesocarp (albedo), consists of cellulose, hemicellulose, lignin, pectin, pentosans, sugars, glycoside, bitter substances and mineral matter. One of the glycosides is hesperidin. The pulp of the lemon is made

up of soluble solids, in solution in the juice, and of insoluble solids consisting of segment and juice-cell walls. Soluble solids are largely sugars or acids. The predominant acid is citric, which may amount to 5% or more on the fresh weight basis of the juice, but small quantities of malic acid have been reported. The juice of lemons is rich in vitamin C and contains smaller amounts of the B vitamins (B_1, B_2 and niacin).

Varieties. — The cultivated lemon varieties are of mixed parentage and do not come true to seed. Lemon trees for commercial planting are therefore usually propagated by budding the desired variety on seedlings of other citrus species, such as the sweet orange (Citrus sinensis), grapefruit (C. paradisi), mandarin orange (C. reticulata), sour orange (C. *aurantium*) or the intrageneric hybrid Sampson tangelo (C. paradisi crossed with C. *reticulata*). Seedlings of any of these species are superior to lemon seedlings as rootstocks because they are more uniform, and the ultimate orchard trees are less susceptible to the various crown- and root-rot diseases (see Diseases, below). The first four rootstock species are listed in the order of their increasing relative resistance to crown-rot diseases; the Sampson tangelo is nearly as resistant as the sour orange.



FLOWERING BRANCH OF THE LEMON TREE (CITRUS LIMON)
(A) Flower with two petals and two bundles of stamens removed; slightly enlarged. (B) Fruit cut across to show structure and seeds

The two chief varieties of lemons grown in California are the Lisbon, a variety introduced from Australia; and the Eureka, a variety originated from a seedling tree grown in California. Many of the orchards planted after 1922 are of selected strains of the Eureka, a precocious, practically thornless tree, smaller and less vigorous than the Lisbon. The fruit is almost seedless and keeps especially well under average storage conditions.

Webber (1943) enumerated 21 varieties of lemons, and there are many others cultivated in the Mediterranean countries. The numerous varieties include those with pink pulp, those with variegated foliage and those so low in acid that they have a sweet or insipid flavour; otherwise, the varieties are typical of the species Citrus limon.

Cultivation and Picking. — The total heat requirement of the lemon is lower than that of the orange, and the relatively cool, equitable climatic zones of the coastal portions of Italy and California are therefore especially favourable for successful cultivation of this fruit.

Lemon trees are commonly grown in orchards, with the trees 15 to 25 ft. apart, the spacing depending upon the varieties and the cultural conditions. Although all citrus trees are susceptible to injury by extreme cold — temperatures ranging from 25° to 20° F. or below---the lemon tree, after the lime, is the most tender; and even in areas relatively frost-free it is necessary to provide wind machines and orchard heaters for use during cold winter nights (see ORANGE). In Italy, protection against frost damage is accomplished by laying grass or straw mats over a permanent framework of poles; these act as a cover for the trees in winter. The trees are gronn on soils which are relatively fertile; in order to produce large commercial crops, larger applications of fertilizers are made than are customary with many agricultural crops.

Lemon trees bloom throughout the year, unless unfavourable extremes of temperature delay the blossoms. Fruit is picked from six to ten times a year, the number of pickings depending upon the marketable size of fruit or the state of maturity. Full-sized fruit, for commercial purposes, is about two inches in diameter. The best-keeping and best-quality fruit is that which reaches a desirable size while still green and is then picked and cured at a temperature of 57° to 60° F. and a relative humidity of 85% until the peel is clear-yellow. Good sound fruit may be kept three months or more in storage without loss of quality or commercial value. An application of the plant growth regulator 2,4-D increases storage life to as much as six months by delaying aging; the button (calyx end receptacle) is kept green and thus resistant to Alternaria black rot (see *Fungus* Diseases, below).

Great care is taken in picking and handling the fruit to prevent bruising or breaking of the peel by thorn pricks, stem punctures or fingernail cuts. The pickers commonly wear cloth gloves and clip the lemon stems very close to the fruit by means of small clippers. Careful handling is essential to prevent loss of fruit in storage and transit by fungus diseases.

Young lemon trees reach a bearing age very quickly; some fruit is usually produced during the third year after planting of trees in the orchard, and commercial crops may be expected during the fifth year. The mature lemon tree produces a remarkably large number of fruits; an unusual bearer may produce as many as 7,000 fruits in one year, but the average, satisfactory orchard yield is about 20% of this amount.

Packing. — In the United States, lemons are commonly packed in fibreboard cartons holding 40 lb. of fruit each. (Production figures, however, are often based upon boxes of 76 lb. each, used internationally.) The fruit is graded in the packing house for size, quality and degree of maturity. The grades, which depend on maturity, are based on the colour of the fruit: green, light green, silver and tree-ripe (yellow). Fruit of the last-mentioned grade is fully ripe and must be packed and sold at once or used for processing. The other grades are held in storage until they become a uniform lemon-yellow colour. In packing, fruits of the same size are placed in the cartons. The number of lemons packed per carton may range from 105 to 245; the medium-sized commercial lemon is 2.1 in. in diameter and packs 150 per carton. Lemons of the most desirable sizes and of the best quality are sold in the fresh-fruit market; the remainder of the crop is used in the manufacture of such products as citric acid and pectin. The proportion of the crop sold in the fresh-fruit market depends upon supply and demand.

LEMON DISEASES

Pests. — Insect pests common to other species of citrus are also troublesome on lemons. In California, among the most important of these pests are the following: four species of common scale insects, red scale (Aonidiella auranti), black scale (Saissetia oleae), yellow scale (Aonidiella *citrina*) and purple scale (*Lepidosaphes becki*); four species of mealybugs (Pseudococcus gahani, P. citri, P. longispinus and P. *maritimus*); the citrus thrips (Scirtothrips citri); and two species of mites, the citrus red mite or red spider (Paratetranychus citri) and the citrus bud mite (Eriophyes *sheldoni*). Some of these pests may be reasonably well controlled, at least below the level of economic harm, by their natural enemies. The citrophilus mealybug (Pseudococcus gahani), for example, has been well controlled in California since 1931 by parasites introduced from Australia. Most of these insect pests, however, are controlled by spraying or dusting with

poisonous materials. Some of these pests, or related species, and certain others are generally distributed throughout the lemon-growing districts of the world; their control is one of the largest items in the cost of producing lemons. (For more details on control of pests, see ORANGE.)

Fungus **Diseases.**—Numerous fungus diseases are troublesome to the growth of the lemon tree and in the production and storage of the fruit. Of these diseases, most serious to the tree is brown-rot gummosis (foot rot) caused by any of a number of fungi (*Phytophthora* species). This disease affects the crown of the tree just below the surface of the ground and a few inches above it. Dark, water-soaked-appearing areas, from which gum sometimes exudes and beneath which the cambium layer is brown and dead, are characteristic of this disease. If the spread is not prevented by tree surgery, the tree may be killed. The same organisms cause decay of the fruit before it is picked and when it is in storage, unless precautions are taken. Such decay is characterized by a dull-bronn appearance of the fruit, which soon becomes soft and worthless. Spray mixtures in which copper is the lethal element are commonly used to control brown rot in the orchard. The spread of this disease, and of such diseases as green mold (*Penicillium digitatum*), blue mold (*P. italicum*), black rot (*Alternaria citri*) and others is often prevented by thorough cleaning of the fruit with soap and hot water and then dipping it in cool or warm solutions containing copper, sodium carbonate or other fungicides.

Other treatments to reduce decay during storage, transit and marketing consist of spraying; impregnating tissue wrappers, crate liners or cartons with fungicidal and bactericidal solutions; or fumigating with various gases in special enclosures.

Nonparasitic Diseases (Physiological Diseases).—Lemons are also subject to injury due to chilling; e.g., albedo browning, pitting, watery breakdonn and scald. These disorders as well as the fungus diseases mentioned earlier are aggravated by storage of lemons at 32° F. in poorly ventilated spaces. Held at 58° F. in well-ventilated enclosures until ready to ship, clean lemons often escape these disorders.

Virus Diseases.— It has been discovered that there are hosts of virus infections among citrus trees generally. Many of them are symptomless, and the trees, appearing to be perfectly healthy, may survive for many years. On the other hand, sudden and unaccountable wilting and drying of foliage may indicate more serious virus infections such as tristeza (quick decline) and the psorosis complex—a group of closely related virus diseases which attack primarily fruit and immature foliage.

Many of the virus diseases are transmitted mechanically during grafting operations and as a result of direct contact with diseased trees; some, however, are carried by insect vectors. Quarantines have been somewhat effective as a means of control, but far more important measures appear to be the use of resistant varieties and the destruction of the carrier insects where these have been shown to be resoonsible.

LEMON PRODUCTION AND USE

World Production.— The total annual world production of lemons is estimated at almost 1,900,000,000 metric tons (in boxes of 76 lb. each, more than 30,000,000). Of this figure the U.S.—viz.. California— produces about 30%; Italy about 20%; and the other lemon-producing countries, e.g., Spain, Mexico, Argentina, Australia. Greece, Algeria, produce the remainder, about 50%.

U.S. Production and Consumption.— Production in the United States is centred in seven counties of southern California. The lemon districts are mainly within 1 to 40 mi. of the ocean. Lemons do not thrive so well as oranges and grapefruit in inland desert regions, nhere extremes of temperature and wide daily ranges of temperature are commonly experienced. Florida has not developed an important lemon-producing area, apparently because of the presence of certain diseases which thrive there and because of the difficulty of curing the fruit properly in the very humid climate.

Lemon production in California has increased more than four-fold since 1915–20, when an annual average of 3,554,000 packed boxes was produced.

Fresh Lemons.— A considerable portion of lemon production has been used for processing, but more than 50% of the crop is usually shipped to the fresh-fruit market, the amount depending on volume of crop and marketing conditions. The per capita consumption of lemons has not increased so greatly as has that of oranges and grapefruit. The principal factors influencing lemon consumption are price, maximum summer temperatures, the prevalence of colds and the buying power of the public. The influence of summer temperatures upon the use of lemons is brought out by the fact that 50% or more of the lemons shipped from California are picked in the late winter and early spring and then forwarded during the four months May to August, inclusive. The ultimate use of most of this fruit is in lemonade and other beverages.

Lemon Juice Products.— The commonest method of preserving lemon juice for medicinal or domestic use is to concentrate the juice at a ratio of 3:1 to 6:1, depending upon the total solids present in the original juice and upon the intended use. Defective fruits that do not come up to high standards of soundness are not usable for juice purposes but are used for making products such as pectin, citric acid, etc. The washing of the fruit is the first step in the extraction of the juice. The fruit then enters the automatic reaming machines, where it is cut in halves which are picked up by rubber caps for extraction of the juice by reaming. Such reaming machines may have a capacity of as much as 100 gal. of juice an hour. The yield of juice under factory conditions may be from 70 to 9j gal. per 2,000 lb. of fruit. The juice is repeatedly screened to remove all seeds, remaining segment walls and pulp. The high vitamin C content is preserved by quickly passing the juice into a tank maintained under a vacuum. The juice is left in the tank for about 30 min.. and the rapid loss of vitamin C by oxidation is thus prevented. The juice is then flash-pasteurized at 200° F. for one minute. to kill microorganisms present; it is immediately chilled and temporarily held in a tank until passed to the vacuum concentrating tank, where the water is evaporated off. The important constituent, as regards final concentration, is the acid. Normal California lemon juice contains more natural acid than sugar. The total soluble solids, including the acids, sugars and other constituents, compose on the average 9% of the fresh weight of the juice. The concentrated juice is from 30% to 50% soluble solids. The final step is the addition of some preservative. To the juice exported to the British commonwealth, sulfur dioxide is added (500 parts per 1,000,000). Some juice concentrate is preserved and held in refrigerators, and some is stored as frozen concentrate. To illustrate the saving in shipping space, an average carload of 120 barrels (50 gal. each) of concentrated juice would be equivalent to about 28 carloads of fresh fruit.

Lemon juice is also processed into powdered form. This powdered juice is not pure lemon juice but is a combination of dried lemon juice and corn-sugar sirup. The mixed juice and sirup are sprayed into a desiccating chamber containing hot dehumidified air and are dried to a powder almost instantly. A later process of drying citrus juice using a high vacuum at low temperature gives a product that is puffy and light with a minimum change in the taste and flavour of the original juice. Other constituents are added; these include ascorbic acid or vitamin C, citric acid and sugar. This combination powder is used in baked and other food products and sometimes constitutes a part of the rations of the army and navy of the United States.

Lemon juice and also lime juice were for many years the most important food materials used on shipboard as a preventive of scurvy; their value is now known to be due to their high content of vitamin C. As early as 1867, by the Merchant Shipping act of that year, every British ship going to countries where lemon or lime juice could not be obtained was required to take enough to give 1 oz. to every member of the crew daily.

Other Lemon Products.— Among the important by-products resulting from the processing of lemons, after removal of the juice, are citric acid, citrate of lime, lemon oil and pectin. Expression of the oil is an important industry in Sicily. The oil finds use in perfumes, soap and flavouring extracts. Citric acid is used in beverage manufacturing, and lemon juice concentrated to 30%

citric acid is considered by many to be a superior substitute. Pectin has long been an important material for making fruit jellies; it has also been used in medicine in the treatment of intestinal disorders, as an antihemorrhagic, as an antigen and for other purposes. *See* also ORANGE.

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LEMONADE. A beverage consisting of lemon juice mixed with water and sweetened. The word is sometimes used to designate what is merely flavoured aerated water (*see* SOFT DRINKS), in which case the true lemonade is called lemon squash (a name originally applied to the pulp of lemons drunk with sugar and soda water). Lemonade of excellent quality is made by squeezing the juice of lemons, to which is added boiling water, white sugar (to taste, but plentifully) and the rinds of the squeezed lemons. The mixture is covered and left to grow cold. If it is to be kept for any length of time, it is strained and usually a very small amount of tartaric or citric acid is added.

LEMONNIER, (ANTOINE LOUIS) CAMILLE (1844–1913), hailed during his lifetime as *le maréchal* of Belgian letters. He was one of the outstanding personalities of the 19th-century French literary renaissance in Belgium; and the publicity given to his work in 1883 by the group of writers associated with the periodical *La Jeune Belgique* did much to consolidate his fame.

Born at Ixelles, Brussels, on March 24, 1844, Lemonnier, who was extremely hard-working, led a life of considerable activity as novelist, writer of short stories and art critic. He entered the civil service but soon resigned to become a journalist, writing at first on a wide variety of subjects but quickly becoming known as an art critic. The defeat of the French army at Sedan inspired his first novel, *Les Charniers* (1871). In 1873 he began work on *Un Mâle,* published in 1881, one of his most outstanding works. During this period of his career, he divided his time between Belgium, living either in the Meuse valley or in the Walloon district of Brabant, and Paris, where he was a contributor to the journal *Gil Blas.* In it he published, in 1888, a story which led to his prosecution for an offense against public morals. After a sensational lawsuit, which ended in his being fined, he settled finally in Belgium, where he wrote prolifically, producing, among other works, *Contes flamands et wallons* (1875); *Le Mort* (1882); *Histoire de huit bêtes et d'une poupée* (1884); *Happe-Chair* (1886); *La Belgique* (1888); *La Fin des bourgeois* (1892); *La Faute de Madame Charnet* (1895); *L'Ile Vierge* (1897); *L'Homme en amour* (1897); *Au Cœur frais de la forêt* (1900); *Le vent dans les moulins* (1901); *Les Deux Consciences* (1902); *Le Petit Homme de Dieu* (1902); *Comme va le ruisseau* (1903); and *La Maison qui dort* (1909). He died at Ixelles, June 13, 1913.

Lemonnier's first outstanding novel, *Un Mâle,* shows the influence of the naturalists. Like *Happe-Chair* and several of his other novels, it is a work of great violence, describing characters of unbridled instincts and passions against a background at once savage and luxuriant—the forest. Later, in the work of his middle period, he ceased to follow the path taken by Émile Zola and turned to psychological analysis, condemning the conservative tendencies of the bourgeois. Finally, he returned to naturalism. His style had gained in subtlety without losing its force, and many consider *Le Petit Homme de Dieu,* a late naturalist novel, his masterpiece.

To modern taste, his works seem somewhat dated, partly because his prose, overweighted by a consciously learned vocabulary, is pretentious and heavy. In spite of his frequent word-coinages and laboured effects based on ultraelaborate research, however, many of his novels are still worth reading for their psychological insight, their feeling for nature and their faithful descriptions of the Flemish countryside, particularly its rich colouring. Lemonnier had a marked feeling for painting, and this explains the taste and truth to nature, resembling that of an artist's brushwork, with which he wields his descriptive power. His independence and uncompromising truth to life as he saw it made him an inspiration to a generation of writers.

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LEMONNIER, PIERRE CHARLES (1715–1799), French astronomer who contributed to the reform of French practical astronomy by his introduction of English methods and instruments, was born in Paris on Nov. 23, 1715. He was the son of the professor of philosophy at the Collège d'Harcourt, from whom he derived his interest in astronomy. For an elaborate map of the moon which he constructed from his own observations he was admitted to the Académie des Sciences at the early age of 20. He went to Lapland for geodetical work with P. L. M. de Maupertuis and A. C. Clairaut (1736–37), but thereafter his work was mostly astronomical; indeed he was an indefatigable observer over a period of 50 years. He took a great interest in the astronomical instruments and methods used at Greenwich, Eng., and did much to introduce similar instruments to the Paris observatory, many of them by the best English makers. In particular he was responsible for the introduction of the transit instrument to France. He corresponded with J. Bradley at Greenwich and in 1748 went to Scotland to observe an annular eclipse of the sun. He made a dozen observations of the planet Uranus between 1765 and the time in 1781 when Sir W. Herschel discovered its planetary nature. As four of Lemonnier's observations were made on consecutive days, even a cursory examination of them would have revealed the planet's motion. He carried out researches in terrestrial magnetism, atmospheric electricity and celestial mechanics.

He left behind him numerous textbooks as well as his great mass of observations. He obtained the favour of Louis XV, who provided him with funds for instruments, but he does not appear to have won the esteem of some of his most distinguished colleagues.

Lemonnier died at Héril near Bayeux in Normandy on April 2, 1799. (J. JN.)

LEMOYNE, JEAN BAPTISTE (1704–1778), French sculptor, the pupil of his father, Jean Louis Lemoyne, and of Robert Le Lorrain, was born in Paris in 1704. Although J. B. Lemoyne carried out large decorative sculptures, such as the fountain of Neptune at Versailles, his chief importance is as a portrait sculptor. Appointed sculptor to Louis XV, Lemoyne executed many likenesses of the king, either as large sculptures—the vanished statues of the royal squares at Bordeaux (1743) and at Rennes (1745)—or as busts. Indeed, he produced portrait busts of much of the society of his day: of military leaders (Marshals Saxe and d'Harcourt), of writers (Fontenelle, 1745; Voltaire, 1748; Montesquieu, 1760) and of many women, notably actresses (Mlle. Clairon; Mlle. Dangeville, 1760), but also of Mme. de Pompadour and of Marie Antoinette as dauphine. Lemoyne died in Paris on May 25, 1778.

See L. Réau, *Une Dynastie de sculpteurs: les Lemoyne* (1927). (P. LN.)

LEMUR, the name applied to the more primitive members of the PRIMATES (*q.v.*), which do not come under the designation of either monkeys or apes, and constitute the sub-orders *Lemuroidea* and *Tarsioidea,* the latter including only the Malayan genus *Tarsius.* The other sub-order includes the true lemurs of Madagascar and the Comoro Islands, the galagos (*q.v.*) of tropical East Africa, the lorises (*q.v.*) of eastern Asia and the aye-aye (*q.v.*) from Madagascar. In the true lemurs, the tail is long and imperfectly prehensile. With the exception of the second toe of the hind-foot, the digits have well-formed, flattened nails as in

the majority of monkeys. In the members of the typical genus *Lemur,* as well as in the allied *Hapalemur* and *Lepilemur,* none of the toes or fingers are connected by webs, and all have the hind-limbs of moderate length, and the tail long. The maximum number of teeth is 36. Some of the species are nocturnal and others diurnal; all subsist on a mixed diet, which includes birds, reptiles, eggs, insects and fruit. Most are arboreal, but the ring-tailed lemur (L. *catta)* often dwells among rocks. The species of the genus *Lemur* are diurnal, and may be recognized by the length of the muzzle, and the large tufted ears. In some cases, as in the black lemur (L. *macaco)* the two sexes are differently coloured. The gentle lemurs (*Hapalemur*) have a rounder head, with smaller ears and a shorter muzzle and a bare spiny patch on the fore-arm. The sportive lemurs (*Lepilemur*) are smaller and the adults generally lose their upper incisors. The head is short and conical, the ears large, round and mostly bare, and the tail shorter than the body. Like the gentle lemurs they are nocturnal. *(See* AYE-AYE; GALAGO; INDRI; LORIS; POTTO; SIFAKA; and TARSIER.)

LENA, THE, river of U.S.S.R., which flows from the western slopes of the Baikal mountains to the Arctic ocean and has a length of 2,653 mi. and a drainage area of roughly 936,293 sq.mi. Its tributaries probably number 1,000 and the volume of its water entering the Arctic is calculated to be 11,000 cubic yds. per second. It rises in 54" 10′ N. and 107° 55' E. as a clear mountain torrent and, until it is joined by the Vitim on its right bank, flows through forest-clad cliffs of red sandstone. The Vitim rises in a small lake in the Barguzinsk mountains at 5,530 ft. above sea level, 80 mi. from the east coast of Lake Baikal. After a semicircular course of 1,132 mi. through a little-explored tundra and forest plateau region, it joins the Lena at the town of Vitim in 59" 55′ N., 112° 23' E., and altitude 670 ft. The Lena then flows through thickly wooded plains until it receives its right bank tributary the Olekma, whose head-waters are on the eastern slopes of the Vitim plateau. The Olekma flows for 814 mi, through an almost uninhabited valley, in a forested and mountainous country and enters the Lena near Olekminsk, at an altitude of 375 ft. above sea level; its strong current affects the Lena for 20 mi. below the confluence. Some distance further down, the Botama joins the Lena on the right, and in this neighbourhood are the famous Lena *Stolbi* or columns of perpendicular limestone cliffs, rising in places to 2,000 ft. and having remarkably even green and red strata, each about 20 in. thick. Yakutsk in 62° 5′ N., 129° 40′ E., is a nodal trading point, where the river widens and trails branch off on the west to the Vilui river and its short portage to the Lower Tunguska, and on the east through Allakh to Okhotsk, and also northward to the Kolyma river. A hundred miles below Yakutsk, on the right bank, the Lena is joined by the Aldan, 1,289 mi. in length and navigable for 1.020 mi. The headwaters of this stream rise near those of the Zeya and Olekma on the Xldan plateau; its eastern branches are but 40 to 50 mi. from the Sea of Okhotsk, and of its tributaries, the Uchur is 468 mi. long, the Amga 1,025 mi. and the Maya 563 mi. Below the mouth of the Aldan, the Lena flows for 1,200 mi. with an average fall of 2 in. per mile; throughout this part of its course it is a majestic stream varying from 4 to 20 mi. in breadth, with unstable alluvial islands interrupting its course and with sandy banks stretching inland on either side. About lat. 64° N, it is joined on the left bank by the Vilyuy, rising south of the Vilyuy mountains, and flowing for 1,512 mi. to its delta on the Lena. It is navigable for 727 mi., and has a drainage area of about 189,575 sq.mi., the northeast of which is mainly marsh. From lat. 66° N. it becomes narrower, and from Bulun to the delta flows between the Khara-Ulakh mountains on the east and the Lower Chekanovsk mountains on the west. It discharges in a delta which begins 100 mi. inland and is 250 mi. wide on the coast line. This delta is a vast sandbank, intersected in every direction by numberless channels of all sizes, which change their direction from year to year and render navigation difficult. The many low flat islands are covered with moss and grass during the short summer, when fish is abundant. In winter the natives rely entirely on dried or frozen fish, but their stock often gives out with disastrous results. Upon the breaking up of the ice in the upper portions of the river, great blocks are carried down by the floods and piled up on the delta, still frozen to a depth of several feet; these blocks tear away huge portions of the bank and alter the navigable channels completely. The delta ice, as a rule, begins to break up about July 10 and freezing over is usually complete by Oct. 15. At Yakutsk the respective dates are June 10 and Oct. 12, while at Kirensk in 57° 56' N. they are May 24 and Nov. 4. Steamer traffic on the Lena has a total annual freightage of about 15.000 tons and consists mainly of stores for the Vitim mining districts, and to a small extent of trade from Okhotsk via the Aldan and other routes. Furs, fossil ivory and small quantities of fish are brought from the north. The delta was discovered in 1637 by the Cossack Elisei Busa, who sailed down the Lena and through the western arm of the delta to the Olenek river where he wintered. In 1737 Prontschischev and his young wife attempted to sail from the Lena delta to the Yenisei, but both died of scurvy. Laptev made further attempts in 1739. Dezhnev's voyage from the Lena through the straits later named after their re-discoverer Bering, took place in 1648. A tragedy of the Lena delta was the loss of many of de Long's party in 1881. He was an American whose steamer the *Jeannette* was wrecked in June, 1881, northeast of the New Siberian islands in 77° 15′ N. and 154° 59' E. His party broke up into three groups; one boat. under Chipp, was lost and the other two boats, under Melville and de Long were separated. Melville and his party reached the Lena delta safely and at Bulun met two of de Long's party sent on to search for food and help. Melville arrived too late and found de Long and his party dead from starvation, under circumstances showing that his last act had been to try to place the results of his observations in safety. A wooden cross is erected on Monument Cape in memory of de Long and the eleven others who perished. In 1878 Nordenskiold on the Vega expedition was accompanied by a vessel, the *"Lena,"* which, under the command of Johansen successfully sailed from the Arctic up the Lena to Yakutsk, and this vessel later continued to make three voyages per annum from Yakutsk to Bulun, a distance of 800 mi. The Lena and its tributaries are rich in minerals; the Vitim and Aldan gold mines and the salt of the Vilyuy are successfully exploited. For further details *see* under YAKUT, as also for the sulfur springs and iron and aluminum mud cures.

See A E. Nordenskiold, *The Voyage of the Vega* (1881) ; *G.* W. Melville. In *the Lena Delta* (1885), *Handbook of Siberia and Arctic Russia, I.D.* 1207 (1920).

LE NAIN, the name of three brothers, ANTOINE. LOUIS and MATHIEU, who occupy a peculiar position in the history of French art. Although they figure among the original members of the French Academy, their works show no trace of the influences which prevailed when that body was founded. Rather, their sober execution and choice of colour (particularly Louis's) recall characteristics of the Spanish school, and when the world of Paris was busy with mythological allegories and the "heroic deeds" of the king, the three Le Nains devoted themselves chiefly to subjects of humble life such as "The Peasant's Family." "The Forge" or "The Peasant's Meal" (Louvre. Paris). The Le Nain signature is rare, and is never accompanied by initials. Little is known about their lives. They were all born at Laon in Picardy; Antoine in 1588, Louis in 1593 and Mathieu in 1607. About 1629 they went to Paris; in 1648 the three brothers were received into the Academy. and on May 23 and 25 of that year Anton and Louis died. Mathieu lived until April 20, 1677; he bore the title of "chevalier." and painted many portraits and religious compositions. The National gallery. London, has a small "Portrait Group" signed Le Nain, while the Victoria and Albert museum contains one of Louis's masterpieces "The Horseman's Rest." *See* PAINTING: *France: 17th and 18th Centuries.*

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LENARD, PHILIPP EDUARD ANTON (1862–1947), German physicist whose researches on the cathode rays led to his

receiving the Nobel prize for physics in 1905. He was born on June 7, 1862, at Pozsony (Bratislava), Czech., and educated in the universities of Budapest, Vienna. Berlin and Heidelberg. his teachers including H. von Helmholtz, G. H. Quincke and R. W. von Bunsen (*qq.v.*). After becoming *Privatdozent* (official but unpaid lecturer) in the University of Bonn in 1893 and assistant to Heinrich Hertz (*q.v.*), he was professor of physics successively in Breslau (1894), Aachen (1895), Heidelberg (1896), Kiel (1898) and again in Heidelberg (1907–31). At Heidelberg from 1909 he was also director of the Radiological institute. Among his extensive researches in physics he studied ultraviolet light, the photoelectric effect. the electrical conductivity of flames. phosphorescence and, above all. cathode rays. He showed that phosphorescence in such substances as calcium sulfide after exposure to sunlight was due to the presence of metallic impurities, the light causing emission of electrons from these impurities and the return of the electrons producing the phosphorescence. In his experiments on the cathode rays he had applied Heinrich Hertz's discovery that they passed through thin leaves of metal and he had constructed a cathode-ray tube with an aluminum "window." The rays passed out to the external air. Using a phosphorescent screen, he showed that the phosphorescence decreased as the screen was retracted, ceasing at a distance of eight centimetres, that the absorbing power of substances depended on their density and not on their chemical nature and that absorption decreased with increasing velocity of the rays. In similar experiments he showed that the photoelectric effect in metals was caused by the release of cathode rays through the action of ultraviolet light on the metals. He was one of the first to realize that the atom had a structure and that it was mostly empty space. He died on May 20, 1947.

(D. McK.)

LENAU, NIKOLAUS (pseudonym of NIKOLAUS FRANZ NIEMBSCH VON STREHLENAU) (1802–1850), Austrian poet of German origin, was born at Csatad, near Temesvar, Hungary, Aug. 15, 1802. His father died when he was five, and his mother allowed him to indulge his musical gifts and early passion for wandering. Later his restless intellect was stimulated rather than satisfied by his studies of philosophy, medicine and law at Vienna and Pressburg, and he never entered a profession, a legacy in 1830 enabling him to devote himself to literature and poetry. After his mother died in 1829, Lenau found a second home in Stuttgart, where his friendship with the Swabian poets (Gustav Schwab, Ludwig Uhland, Karl Mayer, Justinus Kerner and others) helped to counteract the depression engendered by his mother's death and a disillusioning love affair. He dedicated his first volume of *Gedichte* (1832) to Gustav Schwab; but, chafing under political tyranny and a press censorship which compelled him to publish under a pen name, he decided to emigrate to America. He landed in Baltimore, Md., in Oct. 1832. The sea, he said, "went to his heart," but he was bitterly disillusioned by the materialism of a country labouring, as he wrote in a letter, under the curse of being bereft of nightingales and other singing birds. Niagara falls impressed him, but the primeval forests dismayed him, exhibiting nature in its terrifying and destructive aspect; and the American venture increased his tendency to hypochondria and his temperamental instability. Leaving his estate in Crawford, Ohio, in untrustworthy hands, he returned to Europe, arriving in Vienna in Oct. 1833. His poems had made him famous, and his life might have entered a happier phase had it not been for his semiplatonic passion for Sophie von Lowenthal, the wife of an intimate friend, which became the central, tormenting and finally disastrous fact of his emotional existence. Twice he tried to free himself by an engagement, with the singer Karoline Unger in 1839 and with Marie Behrends in 1844, but on each occasion Sophie intervened; and the frenzied poet, after an attack of paralysis in Sept. 1844, sank into insanity, dying in an asylum near Vienna, Aug. 22, 1850. Lenau's fame rests mainly on his shorter lyrical poems; melodious and mournful, they combine the magic of music and of nature in a fashion perhaps only surpassed by Leopardi. His *Schilflieder* (1832) and Waldlieder (1844) are his most perfect lyrics; and his balladlike poems, such as "Der Postillion" and "Die drei Zigeuner," rank with the best of their kind. He wrote in the tradition of romantic pessimism, and although his genius was essentially lyrical and subjective, there is cosmic resonance in his Faust (1836; augmented ed., 1840) in which the final statement transcends personal issues. Savonarola (1837), brilliant in parts, is the weakest of his longer works and represents an ultimately unsuccessful effort to solve his metaphysical doubts by christian mysticism; but in his masterpiece, Die *Albigenser* (1842), he combines Schopenhauer's *Wille* and Hegel's *Weltgeist* to produce a tragic, yet heroic and hopeful, philosophy of history, the 12th-century crusade against the Albigenses prophetically prefiguring modern ideological warfare. Don Juan (1844), although it contains the final scene, was not completed. It is remarkable for the hero's irresistible charm; and the musical quality. which it shares with *Faust,* inspired Richard Strauss's version (1888). Lenau's longer works deserve more notice than has generally been shown them; but his exquisite lyrics have thrown them into the shade, and Goethe's Faust has deflected attention from Lenau's tragic answer.

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(E. M. BR.)

LENBACH, FRANZ VON (1836–1904), German portrait painter who helped prepare the way for the realistic movement in Germany, was born at Schrobenhausen in Bavaria, on Dec. 13, 1836. At a time when idealized and effeminate portraits were the fashion, he succeeded in becoming the most favoured portrait painter in Germany by his powerful interpretations of men of strong character. Among his sitters were the greatest men of his time; his portraits of Bismarck, of whom he made about 80 pictures. are famous. He also painted the emperor William I, Richard Wagner, Franz Lizst, Helmholtz and Gladstone.

Lenbach was the son of a mason, and because he was intended to follow his father's trade, he was sent to school at Landsberg (1852), and then to the polytechnic school at Augsburg. However when he had seen the galleries of Augsburg and Munich, he obtained his father's permission to become an artist. Lenbach's earliest teachers were A. Sikkinger and J. B. Hofner. He then worked for a short time in the studio of Grafle, after which he devoted much time to copying. He was already accomplished in technique when he became the pupil of Piloty (1857). In 1858 he accompanied Piloty to Italy. A few interesting works remain as the outcome of this first journey. They were painted from nature and often attacked for their "trivial realism." Lenbach returned to Munich (1862) but was soon appointed professor at the academy at Weimar. Shortly afterward he made the acquaintance of Count Schack who commissioned a great number of copies for his collection. Lenbach returned to Italy and there copied many famous pictures (1863–66). He set out in 1867 for Spain where he copied pictures by Velázquez in the Prado as well as landscapes in the museums of Granada and the Alhambra (1868). The remaining years of his life were spent between Munich, Vienna and Berlin, with visits to Egypt and Rome. Lenbach once estimated his total work at about 4,000 pieces. He died in Munich, May 6, 1904.

LENCA Indians, in the 16th century, extended throughout eastern El Salvador, highland Honduras and possibly the islands of Fonseca bay. But by the 20th century they had been reduced to northeastern El Salvador and southwestern Honduras. Archaeologically they are known for fortified hilltops and cave burials, often with painted petroglyphs on the walls.

Lenca groups are characterized by separate communities with marked variation from physical type and speech to social and economic organization, but bound together by the custom of Guancasco or agreement ceremonies. Lenca culture is associated with Central America. evidencing both northern and southern traits. They are much influenced by the surrounding ladino (mestizo) cultures.

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LENCLOS, NINON DE, properly ANNE DE LAKCLOS (1620–170j), was born in Paris, the third child of Henry de Lanclos, sieur de La Douardière. Her father, a gentleman of epicurean and skeptical principles and a virtuoso amateur lutanist, killed Louis de Chabans in 1632 and had to leave France. Ninon had no prospect of marriage and, after two love affairs and an attempted renunciation of the world, folloned the example of her friend Marion Delorme (*q.v.*). Mercenary only as far as necessity required, she got two indifferent gentlemen to pap jointly for her upkeep and then began the career of free love that made her first reputation. From the princes and noblemen attending her receptions she would choose one to be her lover for the duration of her caprice, after which she would relegate him to the level of ordinary friendship.

Among her lovers were: Gaspard de Coligny, marquis d'Andelot, and Louis de Bourbon, duc d'Enghien, both disappointing; Pierre de Villars "Oroondate." whom she pursued to Lyons (where she had difficulty in repelling the archbishop); the marquis de Sévigné; Antoine Rambouillet; Louis de Mornay, marquis de Villarceaux, whom she loved for three years (1652–55), bearing him a son and breaking with her paymasters; and Charles de Sévigné, the marquis' son, her last (1671). Her intellectual admirers. on the other hand. included not only prominent skeptics such as Saint-Evremond (*q.v.;* a lifelong friend and correspondent) but also notorious *lihertins* who boldly used their atheistic and antinomian doctrines to justify scandalous lives.

It was largely her irreligious attitude that incurred her persecution by the Compagnie du Saint Sacrement. In 1651 she deflected Anne of Austria's sentence that she retire to a convent by impudently stipulating that it be a convent of Cordeliers; but in 1656 she was incarcerated first in the Madelonnettes in Paris and then. when sympathizers threatened to free her. at Lagny, whence Queen Christina of Sweden, after a visit. secured her liberation.

Her book, *La Coquette vangée* (1659), was a counterblast to Félix de Juvenel's *Portrait de* la *coquette.* Her friend Molière's *Tartuffe* may be modeled on the abbé de Pons. whose attentions she rejected. Her long friendship with Scarron led to her being protected by Mme. de Maintenon; and on her retirement from love after 1671 (with 7.000 livres a year), her receptions became not only extremely fashionable but also highly respectable. In later life François Arouet *père* managed her private business, and her will assigned 1,000 fr. to buy books for the young Voltaire (not. as he thought. 2,000). She died on Oct. 17, 170j.

Voltaire's famous letter on her, the source of many later biographies, is full of inaccuracy. *See* rather G. Tallemant des Réaux, *Historiettes;* and Emile Magne, *Ninon de Lanclos,* definitive edition (1948) (J. G R-S.)

LEND-LEASE: *see* INTER-ALLIED DEBTS

L'ENFANT, PIERRE CHARLES (1754–1825), French-U.S. engineer and architect. who designed the basic plan for Washington, D.C.. was born in Paris on Aug. 2, 1754. He studied art under his father at the Academie Royale de Peinture et de Sculpture from 1771 until he enlisted in 1776 as a volunteer in the American Revolutionary army. He was commissioned lieutenant of engineers. and in 1778 was made captain. At Charleston, S.C.. L'Enfant was captured by the British and not exchanged until 1782. In recognition of his services congress promoted him to major of engineers in 1783.

The medal and diploma of the Society of the Cincinnati, an association of former Revolutionary officers. were designed by L'Enfant, and upon returning to Paris he helped organize the French branch of the society. L'Enfant came again to America in 1784 and settled in New York. There. in addition to small architectural jobs. he renovated the old city hall for the U.S. congress as Federal hall (1787). For this, his first major architectural essay. he added star decorations to the Doric order in honour of his adopted country.

When congress decided to build a federal city on the Potomac, President Washington hired L'Enfant in 1791 to prepare a plan for it. The plan devised was a brilliant combination of mall, broad avenues, parks and squares. using to advantage the uneven ground and preparing adequately for future transportation needs. Secretary of State Thomas Jefferson provided L'Enfant with maps of various European cities, but instead of copying any L'Enfant took ideas from several. The influence of planning at Versailles appears. and there are close resemblances to the London plans of Sir Christopher Wren and John Evelyn. L'Enfant said himself that "the plan should be drawn on such a scale as to leave room for that aggrandisement and embellishment which the increase of the wealth of the Nation will permit it to pursue at any period however remote." However, Washington was forced to dismiss L'Enfant in 1792 for his obstinacy in defying the commissioners of the city. and particularly for his highhanded procedure in removing the house of Daniel Carroll, an influential resident, to make way for an avenue. Nevertheless, his plan of the city was generally followed. L'Enfant later attempted to obtain $95,500 as payment for his services. Congress gave him what they thought proper, about $3,800.

In old age he lived with friends at "Green Hill." Prince Georges county, Md., where he died penniless on June 14, 1825. In 1909 his body was removed to Arlington National. cemetery where a suitable monument was erected to him by congress.

See Elizabeth S. Kite, *L'Enfant and Washington, 1791–1792* (1929); H. P. Caemmerer, *The Life of Pierre Charles L'Enfant* (1950). (P. F. N.)

LENGLEN, SUZANNE (1899–1938), French tennis player, six-time Wimbledon champion who dominated women's lawn tennis from 1919 to 1926. was born at Compiegne on May 24. 1899. She was deleated only once in amateur play, by Molla Mallory, in 1921. at Forest Hills, N.Y. The fiery French star won at Wimbledon five years in a row (1919–23), and then again in 1925. At Cannes, in 1926, Miss Lenglen defeated the U.S. champion, Helen Wills. 6–3, 8–6, the only time they ever faced each other. Miss Lenglen became a professional in 1926. She died in Paris of pernicious anemia on July 4, 1938. *See* also LAWN TENNIS AND TENNIS: *Women Players.* (J. D. McC.)

LENIN, the name[1] in history of VLADIMIR ILYICH ULYANOV (1870–1924), founder of bolshevik communism and by far the greatest single driving force behind the Soviet revolution of Oct.–Nov. 1917, and the Russian Marxist who adapted Marxism as an instrument for socialist revolution in Asia. He was born on April 22 (new style; April 10, old style), 1870. at Simbirsk (later renamed Ulyanovsk), on the Volga. His father. Ilya Nikolaevich Ulyanov, was a schoolmaster who rose to the position of director of schools for the whole Simbirsk guberniya; his mother was a doctor's daughter.

His elder brother Aleksandr, while a university student, joined a group aiming to revive the practices of the Narodovoltsy (or Populists. of the organization Narodnaya Volya, which hoped by assassinations to frighten the imperial government into granting political freedom to Russia), took part in a plot to assassinate Alexander III and was executed (1887). This is believed to have turned young Vladimir's mind to revolution. Vladimir, however; eventually turned to Marxism as his guide, not to Populist doctrines. He entered Kazan university as a law student in 1887, but in December of the same year was expelled from the university (and, for about a year. from Kazan itself as well) for taking part in a student gathering. He finally got his degree in law in 1891 frorn St. Petersburg university. as an external student. Between 1887 and the autumn of 1893 he lived in various places, all on or near his native Volga. When he moved to St. Petersburg in 1893 he already was an authority on Marxism.

Marxism as **Applied** to Russia.—Russian Marxism grew and gathered strength in a struggle against Populism, and it was natural that Lenin's first work of importance, *Who are these "Friends of the People"?* (1894; circulated in hectographed copies), should have been directed against the Populists. The concluding para-

[1]At the end of 1901 V. I. Ulyanov assumed the pseudonym N. Lenin (sometimes iater interpreted as standing for Nikolay Lenin). As he became more and more of a public figure, identified under this pseudonym, variants such as V. I. Lenin and V. I. Ulyanov Lenin also came into use.

graphs of that work well show what Marxism already then meant to Lenin in application to Russia: "It is to the working class that the Social-Democrats will give their whole attention and all their energy. When its advanced representatives have appropriated the ideas of scientific socialism, the idea of the historic mission of the Russian worker, when those ideas have received wide circulation, and when strong organizations have been created among the workers, then the Russian worker, having put himself at the head of all the democratic elements. will overthrow absolutism and lead the Russian proletariat (side by side with the proletarians of all countries) by the straight road of open political struggle to a victorious communist revolution." Implied in this statement is the admission that, in the language of those days, the expected Russian revolution would not be the final socialist, or social, revolution that would abolish capitalism and the division of society into classes, but only a political, or bourgeois, revolution! necessarily to be followed by an indefinite period of capitalism in economics and of bourgeois democracy in politics. On the other hand, there is the claim that already in the bourgeois revolution the proletariat should act as a separate class, through organizations of its own; and, moreover, that it should act as the leader of all the democratic elements in the country. That was Marxism for Russia as at that time interpreted, in particular, by G. V. Plekhanov, the most prominent figure among the few Russian *émigrés,* all ex-Populists, who in 1883 had established themselves in Geneva as the Liberation of Labour group to teach Marxism to Russian revolutionaries.

In 1895 Lenin went abroad for a period in the summer (May 7–Sept. 19) to establish contacts with this group and to learn something at first hand about European socialism. On returning to Russia he took part in organizing, in St. Petersburg, the Union for the Struggle for the Liberation of the Working Class (similar organizations had appeared or were appearing in various industrial centres in Russia); but on the night of Dec. 20–21 he was arrested. After about 14 months in prison, he was in 1897 exiled to the village of Shushenskoye in the Yenisey guberniya of Siberia for three years. There he was joined by Nadezhda Krupskaya, whom he had first met on revolutionary work in St. Petersburg at the beginning of 1894; and on July 22, 1898. they were married.

The Minsk Congress and the Economists.—In March 1898, while Lenin was in Siberia (where he managed to maintain close connections with his associates both in Russia and abroad), members of various Russian Marxist organizations, meeting in Minsk, proclaimed the formation of the Russian Social-Democratic Workers' party (R.S.D.W.P.) and elected a central committee which soon issued a manifesto substantially in the spirit of the teachings of the Liberation of Labour group. Lenin approved of this, but other developments in Russia were disquieting: there was a tendency growing up among the Social-Democrats, particularly the younger ones, to concentrate on helping the working class to fight for immediate improvements in its conditions of life. that is to say, on economics (they were therefore contemptuously nicknamed "Economists" by their opponents), and to turn their back, at least for the time being, on the aim which Lenin, in accord with the Liberation of Labour group, wished to impose at once—namely, that of organizing themselves as a political party with the object of putting the working class at the head of the people's onslaught on the autocracy, at the same time training and equipping it for the further onslaught on the very foundations of bourgeois society. The Minsk congress, which had been organized in great secrecy by the elder elements in the movement, met with little enthusiasm from the "peripheral" workers when they learned about it. When the central committee elected by the congress was wiped out by arrests, no attempt was made to rebuild it.

In his exile Lenin raised the alarm *(A Protest* by *the Russian Social-Democrats,* Aug.–Sept. 1899. and *A Backward Trend in Russian Social-Democracy,* later in the same year). The new tendencies were the more hateful to him as he saw in them the influence of the "revisionists" of Marxism (Eduard Bernstein and others in Germany and the so-called "Legal Marxists" in Russia who because of their criticism of the doctrine were allowed to publish openly there). Having completed his term of exile (Feb. 10, 1900), he settled for some time in Pskov (not far from St. Petersburg, which was still forbidden to him). There he applied himself to the double task of bringing the movement back to its political groove. which to him meant bringing it back to true Marxism, and of building up a strong, strictly centralized party capable of taking charge of it.

In his schemes he gave a place of prominence to a newspaper (for which he chose the name *Iskra,* "The Spark"), which was to be published abroad but circulated in Russia. On July 29, 1900, he left Russia for more than five years, going first to Switzerland, then to Germany, to London, to Paris and then back to Switzerland. The first copy of *Iskra* appeared in Dec. 1900 in Munich. From then onward, through *Iskra* and outside it, Lenin devoted almost superhuman energy, with attention to the smallest detail, to the work of collecting round himself all who seemed suitable for the future party and, in particular, of converting to his views (which then, to all appearances, were shared by all his colleagues on the editorial board of *Iskra,* L. Martov, A. N. Potresov. G. V. Plekhanov, P. B. Akselrod and V. I. Zasulich) the largest possible number of "committees" (as Marxist organizations such as the Unions for the Struggle were now called) in Russia. An important document of the period is Lenin's pamphlet *What is to be Done?,* composed in the winter of 1901–1902. Against the Economists' belief that, so long as enough was done to rouse the workers to fight for better living conditions, socialism might be left to take care of itself, Lenin put forward the proposition that socialism was not at all something natural to a worker: "The history of all countries," he wrote, "witnesses that left to itself the working class may rise only to the idea of trade-unionism; *i.e.,* to the conviction of the necessity to combine into unions, to fight the employers, to demand from the government the passing of the laws necessary for the workers, and so on. As to socialism, its teachings grew out of those philosophical, historical, economic theories which were the province of educated representatives of the propertied classes." Against the Economists' argument that it would be better to allow workers' organizations to develop democratically from below, Lenin put forward the idea of a party of professional revolutionaries, all completely under the orders of their central committee and bound together by military discipline. Only such a party, he argued, could prove a match to the police and beat them at their own game. Paraphrasing Archimedes, he declared, half jokingly, half in earnest, that with such a party one could turn the whole of Russia upside down.

The Second Party Congress: Bolsheviks and Mensheviks. —The second congress of the R.S.D.W.P. (July 30–Aug. 23, 1903) met in Brussels and in London. When the majority of the delegates professed themselves to be Iskraists it seemed as if Lenin's efforts had not been in vain; and the program and statutes which the congress adopted for the party had Lenin's full approval except for one point. However, during the congress it became clear that not all the Iskraists, indeed not even all his colleagues on the board of *Iskra,* were on Lenin's side in everything. The first clash occurred on the question of the right to claim party membership (article 1 of the party statutes). Martov and with him the majority of the congress were willing to accord that right to everyone "accepting the program of the party, supporting it financially and giving it regular personal succour under the guidance of one of its organizations." Instead of "giving regular personal succour" etc., Lenin wished to stipulate "taking part by personal work in one of the party's organizations." That first clash was met by both sides with comparative calm. But things took a grimmer turn at the election of the central committee and of the editorial board of *Iskra,* which had meanwhile been declared the official organ of the party. As some non-Iskraists had already left the congress in protest, Lenin and his supporters were on this occasion in the majority, and they did not hesitate to make full use of it. From then onward Lenin and his supporters came to be known as "bolsheviks" ("those of the majority") and his opponents within the party as "mensheviks" ("those of the minority"). Thus the rift within the R.S.D.W.P. started, almost simultaneously with its formation. That for a long time the rift did not seem fatal to those concerned can be seen from their numerous attempts to patch it up. That it was fatal has been proved by their failure.

In retrospect, the main cause for the split seems reasonably clear. It was the contradictory nature of the formula as it had come to all the Iskraists from the Liberation of Labour group: a bourgeois revolution under proletarian hegemony. It was as if the two sides to the breach divided the formula between themselves, each choosing the half most suitable to its innermost inclinations. Lenin took for his guidance that half of the formula which demanded that already in the bourgeois revolution leadership should belong to the proletariat. In practice that to him could only mean working for seizure of power by his party; and to that end he directed all his energies. Moreover. as his numerous writings of that time testify (in particular *What is to be Done?*), he was from the very beginning planning to establish the twofold dictatorship of his party over the proletariat (if necessary, "from without") and of his central committee over the party. On the other hand the mensheviks, believing in the bourgeois character of the expected revolution, devised their tactics in accordance with that belief, even to the extent of being ready to leave leadership in it to the bourgeoisie.

So absolute was their conviction that the revolution could have no other end than bourgeois domination that they half seriously suggested that Lenin. with his concentration on the fight against the autocracy, might after all turn out to be not a Marxist socialist but a bourgeois revolutionist.

The Approach to the Peasantry.—A landmark in the history of Lenin's political strategy was his new appreciation, about the beginning of 1905, of the possible use that might be made of the Russian peasantry in the interests of revolution. As a Marxist, he could only mock at the Populist belief that the Russian peasant was a born socialist and the village commune a socialist organization. Rather, as a Marxist, he was bound to look on the Russian peasant as a petty bourgeois, a greater obstacle to socialism than a big landowner. But about 1905 he came to see the sterility of such an attitude to the peasantry. He appreciated how, by promising them the lands of the landlords, he could enroll the peasants as a class on the side of revolution; and a revolution based on the confiscation of those lands promised much greater possibilities than one limited to the abolition of autocracy in favour of representative government.

Having despaired of getting the party united on his conditions, Lenin organized in April–May 1905, in London, a congress of his own bolsheviks (the 3rd congress of the R.S.D.W.P. in bolshevik numeration).. One of the resolutions of the congress promised the peasantry support in all its revolutionary endeavours, up to the confiscation of the lands of the landlords (there had been no such promise in the party program of 1903). Another resolution put on record that Russia was on the eve of an armed uprising against the autocracy and urged the proletariat to prepare itself to lead it. A further resolution called for the early formation in Russia of a provisional revolutionary government to direct the revolution and admitted that, in certain circumstances, with the condition of remaining under the strict control of the party, representatives of the party might join that government. Who the other members of such a government were to be was not specified in the resolution, but from Lenin's writings of that time it is clear that they were expected to be chiefly peasants.

Soon, however, Lenin began to claim that his party should not merely join the revolutionary government but rather guide and control it. For the combination of the proletariat with the peasantry, to the complete exclusion of the bourgeoisie proper. under a government controlled by the proletariat. Lenin coined the term "the revolutionary-democratic dictatorship of the proletariat and the peasantry" (a term sometimes, misleadingly, shortener1 into "democratic dictatorship"). The adjective "democratic" was to characterize not the dictatorship while it remained in being, but its final objective: namely, that of leading Russia to a constituent assembly and to bourgeois democracy (not yet to the dictatorship of the proletariat and socialism). In that way Lenin avoided, or tried to avoid, the reproach of departing from Marxism in the matter of the sequence of social formations. But the immediate aim was stated by Lenin with complete clearness: seizure of power by a government controlled by his party (see *Social-Denzocracy and the Provisional Revolutionary Government,* March–April 1905, and *Two Tactics for Social-Democracy in a Democratic Revolution,* June–July, 1905).

The Revolution of 1905 **and World War** I.—The Russian revolution of 1905 fell short of Lenin's expectations and failed to offer him the opportunity for giving effect to his scheme for a revolution in Russia. He arrived in St. Petersburg about Nov. 20, 1905, and spent some time there, but lived for the next two years mostly in Finland, journeying to Stockholm for the so-called Unity congress of the R.S.D.W P. (April 23–May 8, 1906) and to London for the fifth congress (May 13–June 1, 1907). In Dec 1907, however, he had to start a second period of life in emigration (Switzerland, Paris, Austria, Switzerland, Austria, Switzerland) which ended only with the revolution of Feb.–March 1917. This second emigration was psychologically much more difficult to Lenin than the first one, and sometimes he even allowed himself to complain (see his letter to Maxim Gorky of April 11, 1910). He had to fight not only the mensheviks, but also various deviations, philosophical as well as political. within the ranks of his own bolsheviks. He broke completely with the mensheviks in Jan. 1912 by organizing in Prague a purely bolshevik conference which elected a purely bolshevik central committee. In 1918 he was to cause his party to drop the very name R.S.D.W.P. and to assume the style of "Russian Communist Party," with the addition of the word "bolsheviks" in parentheses: R.C.P.(b.).

When World War I started, in 1914, the readiness of the various socialist parties, members of the Second International, to make a truce with their own bourgeoisie in the interests of national defense was treated by Lenin as a betrayal of international socialism, and he supported the left-wing socialists' conferences at Zimmerwald (Sept. 1915) and at Kienthal (April 1916) in so far as they opposed such a truce. (The foundation of the Comintern under his auspices in 1919 was a consequence of his disappointment in the Second International in 1914; *see* **International, The**.) For Russia he continued to preach immediate revolution, even at the risk of defeat by Germany.

Lenin in 1917.—When the revolution of Feb.–March 1917 broke out, Lenin was in Switzerland. Unable to return to Russia without crossing enemy territory, he availed himself of the facilities provided by the Germans to travel, together with other Russian socialists, across Germany in a sealed train; and on April 16, 1917, he arrived in Petrograd. This time he found in Russia all the conditions for which he had been looking since 1905. In May 1906 *(see* his *Report on the Unity Congress)* he had twice explained that what he really wished to see was not the confiscation of the lands of the landlords in the interests of the peasantry as a result of legislation to that effect. but the seizure of the land by the peasantry, which might later. perhaps, be sanctioned by law: only a rush for land by the peasantry in its scores of millions regardless of any lax could shake the old fabric of the Russian state profoundly enough to allow him to seize power with a hope of retaining it.

In 1917 the peasantry did indeed rush for land regardless of law; and moreover there was the war, with millions of peasants in the trenches who could not be expected to stay there nhen in their native villages the estates of the landlords were being seized. The shock to the existing system was bound to be so much the greater. It was only then that Lenin came out with the idea of a soviet constitution, something he declared better than anything so far known even to the most advanced countries of the world, a constitution based on seizures by every mob wherever it might be, instead of laws previously discussed and adopted by some central authority *(On Dual Authority,* April 1917). A theory, presumably applicable to the whole world, by itself completely fantastic, mas put forward to serve a very temporary need: to encourage the peasantry in its rush for land and to silence those who were advising it to wait until the passing of a land reform by the constituent assembly.

Simultaneously Lenin replaced his slogan "a revolutionary-democratic dictatorship of the proletariat and the peasantry" by the more extreme one: "the dictatorship of the proletariat." At first, the change was met by the majority of his own followers with

amazement and with something like a revolt; but their reaction proved, not Lenin's inconsistency, but the inability of his nearest followers to understand the natural implications of his fundamental policies. Lenin might fail, as he had failed in 1905, to establish his revolutionary-democratic dictatorship of the proletariat and the peasantry, which presumably was to lead Russia to bourgeois democracy. But under his control the two kinds of dictatorship were bound to prove identical. He always knew the truth that "the fundamental question of every revolution is the question of power in the state" (ibid.) and seizure of power in the state was his avowed aim under one slogan as under the other. Moreover, already in Social-Democracy and the Provisional Revolutionary *Government* (1905) he had made it clear that the ending of the provisional revolutionary government in bourgeois democracy was not the only possibility envisaged by him: another one was its holding out until the social revolution in the west. In 1917 dictatorship of the proletariat meant to him just such holding out. Lenin generally was not afraid of ambiguities and even contradictions when they seemed to him politically useful.

After the disturbances at the beginning of July (Old Style) the provisional Russian government ordered Lenin's arrest. and he went into hiding. From his hiding place he continued to write. to guide his party and. from the middle of October, to goad it into an immediate armed uprising. Finally, not without difficulties, he won it to his side.

He emerged from hiding on Nov. 7 to become the chairman of the new Soviet government (the Council of People's Commissars, or Sovnarkom), formally elected to this position by the second congress of soviets, which was then in session.

Lenin in Power. — The history of Lenin's remaining years of life is the history of Russia (q v.). In judging him as a ruler, two points in particular must be taken into consideration.

In the first place, he firmly believed on the one hand that only force could produce serious social change (the statement "Not a single problem of the class struggle has ever been solved in history except by violence." which occurs in his Report to the *Third* All-Russzan *Congress* of Soviets, Jan. 24, 1918, is echoed many times in almost identical terms throughout his writings): and on the other hand that by force almost any desired change could be effected. Dictatorship he always defined in the sense of power based neither on law nor on elections but on violence directly applied (see for instance An Epidemic of Confidence, June 1917, and For the *History* of *the* Question of Dictatorship, Oct. 1920). It is remarkable and sinister how the very word "dictatorship" appears to have attracted him: no regime, one might say. no aspect of social life. seemed to Lenin worthy of his attention, whether hostile or benevolent. unless he could discern dictatorship in it. In praise and encouragement of terror he was second to none: "We have just learnt in the Central Committee." he wrote to G. Zinoviev on June 26, 1918, "that the workers in Petrograd wished to react to the assassination of Volodarsky by mass terror and that you . . . stopped them. I decisively protest. . . . This is im-pos-sible! . . . One ought to encourage the vigour and the wholesale character of the terror against the counter-revolution~sts, this especially in Petrograd whose example is decisive"; and there are many similar passages in his collected works.

A lawyer by education, he was completely blind to law as an instrument of social organization. In the historical conflict betneen government through law (general norms) and government by discretion. through man directly operating on man, he definitely was on the side of government by men. He legislated on a vast scale, but without himself recognizing in his laws the element that alone makes an order a law, its binding force on all concerned. P. I. Stuchka. a high legal dignitary under him, declared that to Lenin, "the program of the party and the revolutionary decrees were things of the same kind, both binding and not binding, according to circumstances and the course of development" *(13* Lyet *Borby,* Moscon. 1931).

Secondly. at least at the beginning. the whole venture of the revolution was regarded by Lenin as something temporary, to last only until the social revolution in the west should relieve mankind from any constitutional problems. Even to Lenin there could be no justification for his self-appointed party's dictatorship over scores of millions other than the belief that it was only engaged on some surgical operation, or that the regime was "in transition": after that, the whole problem of government was expected to disappear. In the constitution of the Russian Soviet Federated Socialist Republic (R.S.F.S.R.) of July 1918 the belief in the speedy disappearance — via dictatorship — of all government on earth was given the force of a law.

As a ruler Lenin could not avoid compromises. Before the October revolution he had threatened the whole imperialist world, and Germany especially, with a "revolutionary war" if and when he should come into power, unless they gave up their evil designs. After his successful revolution, arguing now that in the interests of world revolution there was nothing more important than the preservation of the newly born Soviet state, he accepted from the Germans, against opposition in his own party, the humiliating peace of Brest-Litovsk (hlarch 1918). In economics! Lenin quite soon aiter the October revolution moved in the direction of integral socialism, up to the complete abolition of markets, of exchange and of money ("War Communism" in the later classification) ; but early in 1921 he had to start a retreat under the "New Economic Policy," which allowed the peasants to sell their surplus in the open market and, at the same time, brought a general 'reversion to' an economy based on money and partly on exchange.

Symptoms of a serious illness (sclerosis of the cerebral arteries), not to mention the effects of the wounds sustained when Fanny Kaplan shot him Aug. 30, **1918,** began to appear in Lenin at the end of 1921. On May **26,** 1922, he had his first stroke. On Oct. 2 he again started attending his office, hut only intermittently and ior short hours. On Dec. **16** he had a second stroke and became paralyzed in the right arm and leg. He died on Jan 21, 1924, at 6:50 P.M., at Gorki near Moscow.

On Lenin as a person the testimony of his great collaborator L. Trotsky is not without interest:

"Lenin's outward appearance was distinguished by simplicity and strength. He was below the middle height, with the plebeian features of the Slavonic type of face, brightened by piercing eyes; and his powerful forehead and still more poweriul head gave him a marked distinction. He was tireless in work to an unparalleled degree. He put the same exemplary conscientiousness into reading lectures in a small workmen's club in Zurich and into organizing the first Socialist State in the world. He appreciated and loved to the full science, art and culture, but he never forgot that as yet these things are the property of a small minority. His way of life in the Kremlin mas little different from his life as an *émigré* abroad. The simplicity of his habits was due to the fact that intellectual work and intense struggle not only absorbed his interests but also gave him intense satisfaction."

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LENINGRAD (formerly ST. PETERSBURG, renamed PETROGRAD in Aug. 1914) is. after Moscow. the largest city and the most important cultural and industrial centre of the U.S.S.R. The capital of Russia from 1712 until March 1918, it has been. since Aug. 1. 1927, the chief town of the Leningrad region (*oblast*) of the Russian federation. Situated on both banks of the mouth of the river Neva on the Gulf of Finland. as well as on many islands of the Neva delta. Leningrad is an important railway junction and a maritime and river port. Pop. (1897) 1,267,023; (1939) 3,191,304; (1959) 3,321,196. Area (1939) 113.5 sq.mi.

The islands and banks along the Neva are low and flat. They are exposed to floods especially when the autumn minds from the west carry the waters of the Gulf of Finland into the Neva channels. The floods of 1824 and 1924 were particularly disastrous. The climate is maritime with a comparatively mild winter (mean January temperature 16° F.) with frequent thaws and a moderately mild summer (54° F. in July). Winter lasts from November to April and the Neva is frozen for four to five months. June and July. with their "white nights." recall an arctic summer.

Architecture. — Architecturally Leningrad is one of the most beautiful cities in the world. It combines severe and stately

architecture with planned squares, wide avenues and straight streets, and many parks and gardens. The smooth surface of the Neva river uith its branches and canals is framed by the gray and pink granite embankments. with more than 120 bridges.

The first large building erected in 1703 (rebuilt in 1706–87) was the Peter and Paul fortress situated on the small Zayachi Island at the point where the Small Neva separates. to the north, from the main river. Not far from this point, on the southern (or left) bank of the Great Neva, stands the Admiralty building, originally a dockyard and a fortress, entirely rebuilt in 1727–38 by I. K. Korobov and in 1806–23 by Andrian Zakharov.

From the Admiralty radiate three avenues constituting, with the Neva embankments, the basic plan of the city centre. The Nevski Prospekt, 2.5 mi. long, running eastward toward Aleksandr Nevski square, is the chief avenue.

After the transfer of the Russian capital from Moscow to St. Petersburg in 1712, there began the construction of many large buildings. in the erection of which outstanding Russian and foreign architects took part. At the beginning of the 18th century were built: the 12 collegia (ministries) on Vasilyevski Island, by Domenico Tresini and Mikhail Zemtsov (which now form the Leningrad university); the cathedral of the Peter and Paul fortress (the burial place of Russian tsars from Peter I); the summer residence of Peter I, and the Kunstkamera. These buildings are distinguished for their simple appearance, clarity of plan and restrained use of raised decoration.

In the middle of the 18th century, at the time of Peter I's successors, Bartolomeo Rastrelli built a number of palaces in the Russian baroque style. the most notable being the imperial Winter palace (*Zimni* Dvorets), on the left bank of the Great Neva, and the Stroganov and the Vorontsov palaces. By him was begun the building of the Smolny monastery group in the eastern part of the city. completed by Vasili Stasov. Savva Chevakinski built the Nikolski military-naval cathedral and other buildings. Characteristics of these grandiose structures were splendour and solemnity and richness of form and décor.

In the second half of the 18th century. Russian classicism. leaning toward clarity and simplicity, predominated. In the transitional period Aleksandr Kokorinov and Jean Baptiste de la Motte erected the Academy of Arts (on Vasilyevski Island). Ivan Starov the Trinity cathedral in the Aleksandr Iievski abbey, and Antonino Rinaldi the Marble palace, all of which preserve the baroque influence. In the last quarter of the century, stately buildings were erected in pure classical style: the Taurida palace (which from 1906 to 1917 housed the *duma*) by Starov, the Academy of Sciences and the Smolny institute (where Lenin established his headquarters in Nov. 1917) by Giacomo Guarenghi.

At the beginning of the 19th century more spacious groups and monumental buildings in the Russian classical style were erected. Thomas de Tomon built the beautiful Stock Exchange of the Vasilyevski Island; Andrei Voronikhin the Kazan cathedral, with a square framed uith a colonnade; Carlo Rossi the Elagin palace, the Mikhailovski palace (now the Russian museum) and the General Staff building, with a large triumphal arch; at the same time, Stasov erected the Narva Triumphal gates. The grandiose St. Isaac cathedral, erected according to Auguste Monferrand's design, took almost four decades to complete. Monumental sculpture took on great significance in the city and was placed in many squares, streets and parks. The best-known examples are the monument to Peter I (the "Bronze Horseman") by Étienne Maurice Falconet. that to Suvorov by Mikhail Kozlovski, and the four horse tamers group by Peter Klodt on the Anichkov bridge over the Fontanka canal.

In the second half of the 19th century an eclectic and dry officiality predominated in the architecture of the centre of Petersburg. At the beginning of the 20th century modern currents in architecture became widespread. These were opposed by the works of several prominent architects (*i.e.*, Ivan Fomin. Vladimir Shchuko and Lev Ilyin) who based their works on the classical heritage. After the Revolution and the civil war, especially in the 1930s, extensive building was carried out in the interest of the growing population. Large domestic building programs were undertaken both in the old parts of the city and in the new area around it. Apart from living accommodation. new administrative buildings were put up. A huge Kirov stadium on the Krestovski Island was also built. All new construction was carried out according to a general plan of city development. A number of historic palaces and parks of the tsarist era are to be found in the suburbs of Leningrad, at Pushkin (formerly Tsarskoyc Selo), Petrodvorets (Peterhof), Lomonosov (Oranienbaum), Pavlovsk and Gatchina. After 1917 these palaces became museums open to the public.

Scientific and Educational Institutions. — From the first years of its existence Petersburg began to play the part of a great Russian scientific centre. Peter I founded the Academy of Sciences (1724). Later a number of institutions of higher education were established, namely: the Mining college (1733), the Medico-Surgical academy (1798), the Forestry school (1803), the Communications institute (1810), the university (1819), the Technological institute (1828) and others. The scientific associations of Petersburg played an important part in the development of sciences: the Mineralogical society was founded in 1819, the Geographical in 1845, the Engineers' in 1866, the Chemists' in 1868, the Physics in 1872, the Medical in 1883 and others. After the Russian Revolution the network of scientific institutions greatly expanded. in spite of the fact that the Academy of Sciences was transferred in 1934 to Moscow. Several new, specialized institutes of the U.S.S.R. Academy of Sciences were founded in Leningrad. In all, in the 1950s, the city had 187 scientific institutions.

In the late 1950s there were in Leningrad more than 470 primary, seven-year and secondary schools with nearly 380,000 pupils, 180 schools for the working youth and for adults with 80,000 pupils. In all these schools 18.600 teachers were employed. There were also about 100 technical and other secondary vocational schools with nearly 80,000 pupils and 48 institutions of higher education with more than 155,000 students.

Leningrad is one of the leading museum centres of the world. In the late 1950s there were 49 museums, including the famous Hermitage where art from all nations from the earliest times is collected. The Russian museum is the largest museum (with the Tretyakov gallery in Moscow) where Russian art is shown exclusively. There are also 1,719 public libraries, the largest being the Saltykov-Shchedrin library (founded in 1795) which contained in the late 1950s more than 25,000,000 items. including 12,000,000 books. There are 16 theatres in Leningrad, the most important being the Kirov (formerly Mariinski) Grand Opera and Ballet, the Small Opera and the Pushkin (formerly Aleksandrinski) theatre, used for drama. There are also 125 civic cultural centres and 218 motion-picture theatres. The Zhdanov Palace of Pioneers is housed in the beautiful Anichkov palace (built by Zemtsov in 1741–50, rebuilt by Starov in 1778–79).

Industry and Communications.-In Leningrad's industry mechanical engineering and metalworking predominate; this category includes shipbuilding, machine building, precision instruments and electrotechnical equipment. There are also important chemical, woodworking, textile, leather-footwear and food-processing industries. The most important plants are: the Kirov (formerly Putilov, founded in 1801), the oldest Russian ordnance factory; the Metallicheski (producing chiefly steam and hydraulic turbines); the Elekrosila (equipment for power stations); the Svetlana (electric lamps); the Nevski machine-building factory; the Russian diesel plant; the Baltiyski shipbuilding plant; the Krasny Treugolnik (rubber goods); the Skorokhod (producing about 17,000,000 pairs of shoes per annum); the Red Banner (knitted goods); and the Lomonosov china factory.

Many large power stations were built in and near Leningrad after the Revolution. The Red October power station, opened in 1922. works on peat; the Volkhov hydroelectric power station was brought into use in 1926. Other power stations have been inaugurated since. After World War II, the supply of fuel improved greatly through the import of coal from the Pechora, Ckhta and Vorkuta basins. as well as of gas (by pipeline) from the Estonian oil shale centres at Kohtla-Jarve and Ahtme.

Leningrad has five railway stations, one of which, the Finland, lies on the right (or northern) bank of the Neva. The four others are the Moscow (formerly Nikolayevski), the Vitebsk, the Warsaw and the Baltic (to Tallinn).

History.—The site on which the town of St. Petersburg was founded on May 16 (old style; 27. new style), 1703, had been since the 9th century part of the Russian state of Novgorod. The area was sparsely populated by the Ingers (in Russian, Izhors), a Finnish tribe. When the Teutonic Knights, having conquered Estonia, attacked Novgorod, they suffered a heavy defeat (1242). In the second half of the 16th century Sweden seized Estonia and, in 1617, annexed Ingria (Ingermanland), thus assuring its land connection between Estonia and Finland (which had been part of Sweden since the 13th century). But, during the Great Northern War, Tsar Peter I reconquered the mouth of the Neva, opening a "window to Europe" through the Swedish barrier. Without waiting for the peace settlement (which came only in 1721), he ordered the building of St. Petersburg under the protection of the Peter and Paul and the Kronstadt (on the island of Kotlin) fortresses. He erected the city very quickly indeed. In 1704 about 40,000 people were occupied with the construction. In the mid-18th century St. Petersburg had 95,000 inhabitants and about nine-tenths of the entire foreign trade of the country passed through its port. In 1792 the number of ships calling at Petersburg was 1,038, mainly foreign (a considerable percentage being English).

In the 19th century the development of industry as well as of railways favoured a rapid increase of population. It amounted to 539,400 in 1864 and 1,418,000 in 1900. The growth of industry brought about that of the proletariat. The manufacturing industry alone employed in 1910 about 504,000 workers in Petersburg and its suburbs. The misery of the working people formed a sharp contrast with the extravagant living of the court and the ruling class. It is not to be wondered at that the history of Petersburg in the last four decades before World War I was marked by numerous disturbances and strikes. With the shooting down by the tsarist troops of a peaceful procession of workers toward the Winter palace, on Jan. 9 (O.S.; 22, N.S.), 1905, began the first Russian revolution of 1905–07.

At the beginning of World War I Tsar Nicholas II changed the German name of the capital into a Russian one. As a result of the March (February) revolution of 1917 Nicholas abdicated on March 15 (O.S.; 28, N.S.), and on April 3 (O.S.; 16, N.S.) V. I. Lenin returned to Petrograd from exile. His aim was that the Communist party should gain power. This he achieved by a successful uprising of the working masses on Oct. 25 (Nov. 7), an event that changed the course of Russian and world history.

Until March 11, 1918, before the transfer of the Soviet government to Moscow, Petrograd was the capital of Soviet Russia. During the period of civil war and foreign military intervention both the German army and Russian counterrevolutionary forces tried to seize Petrograd, but the city workers played a decisive part in the defense of the capital.

After the civil war the population of Petrograd fell from 2,415,000 in 1916 to 722,000 in 1920. When Lenin died, the second congress of the soviets of the U.S.S.R. decreed, on Jan. 26, 1924, the renaming of Petrograd as Leningrad. By the end of 1931, in the course of the realization of the first five-year plan, Leningrad's industry surpassed the prewar level.

During World War II, from mid-Aug. 1941, Leningrad was a besieged city with the Finns to the north and the Germans to the south. Communication with the rest of the country was possible only in winter months across the frozen Ladoga sea. The city was heavily damaged by German artillery fire and air bombing. But in spite of the great shortage of supplies and fuel, the Soviet armed forces repelled all German attacks while the citizens of Leningrad worked to supply matériel for the front. After a 900-day siege Leningrad was freed from the blockade at the end of Jan. 1944. During the fighting 3,174 buildings were burned to the ground and 7,143 damaged by shells and bombs. By 1950 the city's reconstruction was basically completed. From 1944 to 1957 more than 4,300,000 sq.mi. of new living space were laid down. In 1955 the first section of the Leningrad underground railway was inaugurated. (V. A. K.)

LENINGRAD REGION, an administrative division (*oblast*) of the Russian S.F.S.R., U.S.S.R.. created in June 1927, from the provinces of Leningrad, Murmansk, Novgorod, Pskov and Cherepovetz. Area 32,934 sq.mi. Pop. (1956 est.) 4,364,000 (rural 619,000, urban 3,745,000), of whom 2,814,000 are concentrated in the town of Leningrad. The Murmansk (*q.v.*) district, with the Kola (*q.v.*) peninsula, is distinct from the rest of the area in structure, climate and general conditions of life, but has been included in the Leningrad area because of the importance of Murmansk as an ice-free port all the year round, and because of the completion in 1917 of a railway line between Leningrad and Murmansk. The remaining provinces Leningrad, Cherepovetz, Pskov and Novgorod adjoin and consist mostly of flat and marshy land, except for the Valdai plateau (600–1,000 ft.) which extends into the southeastern part of the province of Novgorod and the small Duderhof plateau (300–550 ft.) in the south of Leningrad province.

The whole region is covered with boulder clay, very often arranged in *eskers* or ridges, the bottom moraine of the Scandinavian and Finnish ice sheet which covered the region in the glacial epoch. Numerous small lakes, with some large ones, notably Ladoga, Peipus or Chudskoe (the southern extension of which is often called Pskov), Ilmen and Byelo Ozero, immense marshes, often covered with forests of birch and elm, and small streams flowing either into the Baltic sea, the lakes, or the tributaries of the Volga and the western Dwina, are the most characteristic features of the district. The marshes can be crossed only when frozen. Six centuries ago they were even less accessible, but the slow upheaval of northwest Russia, going on at a rate of three or more ft. per century, has exercised a powerful influence on the drainage of the country, while artificial drainage has been carried out on a large scale. The soils consist mainly of glacial sands, post glacial clays, sands and peat bogs, with thick alluvial deposits in the valleys of the Neva and some other streams.

The proximity of the Baltic influences the climate, which is damp and cold, average January temperature at Leningrad, Novgorod, and Pskov respectively 11° F., 14.5° and 17.1°, average July temperature 64°, 62.5° and 64.8°. The average annual rainfall is 20 in., with a maximum in July and August and a minimum in spring and the prevailing winds are from the southwest. The rivers are frozen from 140 to 160 days, while snow lies on the ground from 120 to 160 days.

Forest covers 50% of the area, Cherepovetz and Leningrad having most and Pskov least forest; the oak is found south of a line roughly from the town of Cherepovetz to that of Leningrad, while north of that line are coniferous forests.

Soil and climatic conditions are more favourable to cattle and dairy produce and root, grass and technical cultures than to grain growing, especially as heavy summer rain may ruin grain crops. Leningrad provides a ready market for meat and dairy produce and flax is in great demand for the textile industry and is also exported. But much grain is grown for local needs. Pskov is the most important meat producing region, while Novgorod, Leningrad and Cherepovetz come next. Beef, veal, pork and mutton are produced in quantity, but the town of Leningrad needs more meat than is produced in all four provinces. Milk is Produced in Leningrad province for sale in the town, while Novgorod and Cherepovetz are the chief butter producing areas; dairying is just beginning intensively in Pskov. Wool is used by the peasants for homespun. Beekeeping is a supplementary source of income; honey and wax were exports from Kovgorod in very ancient times.

The system of cultivation in the division is still in many cases the uneconomical three-field of tradition, but more productive; many field systems with more frequent sowing of grass and clover are being introduced. The use of manure is increasing. Better agricultural implements have been introduced. The government and co-operative societies grant credit to peasants for the purchase of such instruments.

Collective farming is little developed, possibly 1% of the land being worked in this way. Co-operative systems are more numer-

ous in Cherepovetz and Leningrad than in Pskov and Novgorod. Flax growing is improving and increased. In Leningrad province flax is less cultivated; it demands 102 working days as against 24 for grass and the peasants in this area are attracted to factory labour.

The chief grain crops are rye and oats, barley occupying a much smaller place except in Pskov. Potatoes and vegetables are increasingly produced for the Leningrad market, Pskov and Leningrad provinces occupying the first place and Cherepovetz the last in this respect. The area under potatoes has been increased in Novgorod. Apples are grown in Pskov and Novgorod and berry fruits in Leningrad province for the town market.

Agriculture and stock raising suffered severely during the terrible times follo ing the 1914 war and especially in the post-revolution period, but since 1924 a marked improvement has set in and in some cases the 1913 level has been passed. Cattle-breeding and flax cultivation have again attained an export character; grain growing is still for local needs only and the town of Leningrad depends on the Ukraine, the Volga area and Siberia for its grain supply and upon Vologda province and Siberia to supplement its meat, eggs and butter supplies. The Ukraine, the southeast region, Turkestan and Siberia supply sugar, tobacco, oil seeds, wool, cotton, silk, leather and hemp to the town.

Timber production is fully developed as regards sawmilling, but except in Leningrad paper, cardboard and cellulose production has no importance. Matches are made in Novgorod, Leningrad and Cherepovetz. The peasants make wooden articles of every description, household utensils, sledges, carts, etc. Timber is still the chief fuel used by the peasants. In the forested areas hunting is a supplementary source of income, though in Cherepovetz (*q.v.*), it has an export character. Wolves and bears greatly increased and rewards are offered for their capture. At the same time efforts are being made to introduce laws for the prevention of the destructive exploitation of fur-bearing animals in Cherepovetz, Pskov and Novgorod. In Leningrad province there is very little hunting. Fishing is productive in the lakes and streams, especially in Ilmen and Byelo Ozero. There is little mineral wealth.

The region is deficient in fuel, but has much unexploited hydro-electric poaer. The first step in its utilization was the opening of the Volkhov hydro-electric station in 1926–27, which has a capacity of 55,000 kilowatts A drawback to this station is the low aater in late summer when only three out of its eight turbines are working.

The Red October station on the right bank of the Neva river near Leningrad, working on peat fuel, is able to supplement this deficiency. Two smaller stations have been opened on the Svir river and the Marii waterway and part of the railway will in future use electricity.

The cheapening of manufactured products now that factories depend less on imported coal, with heavy freight costs, is already apparent. Moreover the use of hydro-electric power and peat permits the export of timber which was previously used for fuel.

Industries. — The striking feature of industrial production in the area is the concentration of factory industry in the town of Leningrad (*q.v.*), which had a population of 3,191,304 in 1939.

The smaller industries of the provinces of Novgorod, Pskov and Cherepovetz, which depend on local raw material and local markets, recovered from the disastrous 1914–20 years much more rapidly than Leningrad, where large scale industry dependent on other regions for fuel and raw material and to a large extent on foreign capital and markets, had reached a complex stage in pre-war times. Novgorod has recovered most rapidly, its sawmilling, furniture, match, pottery, glass and paper industries being now at pre-World War I level.

Other industries of the province are linen manufacture, brewing, distilling, the making of leather goods, bricks, tiles, candles, etc.

In Cherepovetz sawmilling is the most important industry, though it is still less than in pre-war times, partly because of efforts to prevent destructive exploitation of the forests. Leather goods, boots and shoes and matches are produced in considerable quantities.

Peasant industries throughout the whole region are less developed than in other parts of Russia.

Communications. — Although Leningrad has three waterways. the Mariinski, Tikhvin and Vyshne-Volochok, linking it with the Volga system, the railways take a far greater share in freightage than the waterways. The severity of the climate prevents navigation for five to six months during the winter, and low water in late summer also hampers it. The Tikhvin waterway is available for small steamers only, and most goods go via the Mariinski canal route.

Road communication suffers here, as in many other regions of Russia from the spring thaws and the autumn rains, which convert unmetalled tracks into seas of mud. In connection with the general poor road construction in Russia it must be remembered that Russia was the eastern outpost of Europe against nomad raiding tribes and that the government was thus obliged to concentrate on a few strategic roads for protection against them. The Soviet government endeavours to provide better surface roads to enable agricultural products to reach the railways and in the Leningrad area many miles of macadamised roads have been laid doun. The two ports of the area are Leningrad and Blurmansk. Most imports and exports go through the former, since the latter is in an initial stage of development and also involves heavy rail freightage costs. The chief towns are Leningrad, Pskov, Novgorod, Staraya Russa, Kronstadt and Cherepovetz (*qq.v.*).

Population and History. — The population in Novgorod, Pskov and Cherepovetz provinces is mainly Great Russian, with 1% of Estonians in Pskov, and 1% of Karelians in Cherepovetz In Leningrad province, excluding the city itself 77.9% are Great Russians, 11.5% Finns and 5.5% Estonians. The population of the town, as of all seaports, is mixed. 83% being Russian; other nationalities represented are Poles, Jews, Estonians, Letts, Lithuanians and Finns.

An interesting commentary on the present stage of development in Russia and on the lack of communications is the fact that in 1925–26, Professor Zolotariev discovered in the Leningrad province tribes of Veps, Izhors and Vods, numbering 10 to 15,000, whose language, akin to Finnish had been thought to be extinct. The Vod tribes were living in mud huts; they hand on swords from generation to generation instead of names. A settlement of Veps in the Lodeinopol district had no wheeled vehicles. Settlement, especially in Novgorod province. where stone age remains of Neolithic date are numerous round the beds of former lakes, is very ancient. The region between Lake Ladoga and the Gulf of Finland was inhabited in the 9th century chiefly by Finnish tribes, though even at that date there was some Slav penetration.

The site of Leningrad was at that time a swamp. But Novgorod (*q.v.*), about 100 mi. S.E. of Leningrad, was already a flourishing city, with a marked republican tendency, where merchants trading in slaves, fur, honey and wax along the Baltic-Black sea route nere in the ascendancy. The Varangian chief, Rurik, according to Nestor's chronicle, fortified a small Slav town on the Volkhov, called it Novgorod (New Town) and established himself there as prince.

After the decline of Kiev, Novgorod became the chief centre of Russian city life and later extended its power over the surrounding district and established colonies in the Far North. extending from Lapland to Siberia; possibly traders from these colonies penetrated to the Ob in their quest for fur. At its period of greatest expansion all the lands beyond Byelo Ozero, including the north Dwina country, Russian Lapland, the region between Lake Onega and the White Sea coastlands, the upper Kama basin, the Pechora basin and the land on both sides of rhe Urals, had trading colonies from Novgorod.

In 1700 Peter the Great declared war on Sweden, and in 1703 captured the Swedish fortress on the Neva, and laid the foundations of the cathedral to St. Peter and St. Paul and of a fort which received his own name.

In 1704 the fort of Kronslott (present day Kronstat) was

erected on the island of Kotlin, and the Admiralty on the Neva, opposite the fortress. Determined "to open a window to the west," and wearied of the opposition of Moscow to his reforms, the emperor decided to build a new city on the marshy ground, driving piles into the swamp to serve as foundations.

In thus founding a channel for trade with the Baltic, Peter the Great restored an ancient trade current of Russia, to which Novgorod and Pskov had owed their rise., and the new city rapidly developed. The later construction of canals and railways linking it with the rest of the Russian empire further added to its importance. The development of the Ural and of the Ukrainian mining and metallurgical industries did not destroy the importance of the city. Even the removal after the 1917 revolution of the administrative centre to Moscow, the real heart of Russia, at a time when industry was at its lowest ebb and when the loss of the Baltic provinces and Poland was adversely affecting Leningrad, has merely checked, not ruined, the development of the city. One factor in this is that the very loss of these areas concentrated all trade through the Baltic to Russia in the only remaining port, Leningrad.

The presence of this large city population has modified local agriculture in the direction of meat, milk, dairy and vegetable production, has markedly diminished peasant petty trades and has intensified forest clearing to meet its fuel needs. Along with this has gone the opening up of the four provinces by canals, roads and railways, though much remains to be done. The general literacy rate, especially in the environs of Leningrad is high. (*See* NOVGOROD; PSKOV.)

LENKORAN, a town in the Azerbaijan S.S.R., U.S.S.R.. 38° 46' N., 48° 51' E.. on the Caspian sea, at the mouth of a small stream of the same name, close to a large lagoon. Population about 26,000. Principal industries include fishing, food-processing and sawmilling. Taken by storm on New Year's day 1813 by the Russians. Lenkoran was surrendered by Persia to Russia by the Treaty of Gulistan, along with the khanate of Talysh, of which it was the capital.

The *rayon* (district) of Lenkoran (2.117 sq.mi.) is a thickly wooded mountainous region, shut off from the Persian plateau by the Talysh range (8,182 ft. at highest point), and with a narrow marshy strip along the coast. The climate is exceptionally moist and warm (annual rainfall 52.79 in.: mean temperature in summer 75° F., in winter 40°), and fosters the growth of even Indian species of vegetation. The iron tree *(Pail-otia persica)*, the silk acacia. *Carpinus betulus, Quercus iberica,* the box tree and the walnut flourish freely, as well as the sumach, the pomegranate. and the *Gleditsia caspica*. The Bengal tiger is not infrequently met with, and wild boars are abundant. The Talyshes. belonging to the Iranian family, and speaking an independently developed language closely related to Persian, are the aboriginal population.

In the northern half of the district the Tatar element predominates and there were a number of villages settled by Russian Raskolniks (Nonconformists). Agriculture, forestry, beekeeping, silkworm-rearing and fishing are the principal occupations.

LENNEP, JACOB VAN (1802–1868), Dutch poet and novelist, was born on March 24, 1802 at Amsterdam, where his father, David Jacob van Lennep (1774–1853), a scholar and poet, was professor of eloquence and the classical languages in the Athenaeum. Lennep graduated in law, and settled as an advocate in Amsterdam. He made his first real hit with the *Nederlandsche Legenden* (a vols., 1828) and his fame was further raised by his patriotic songs at the time of the Belgian revolt, and by his comedies *Het Dorp aan de Grenzen* (1830) and *Het Dorp over de Grenzen* (1831), which also had reference to the political events of 1830. In 1833 he broke new ground with the publication of *De Pleegzoon* (*The Adopted Son*), the first of a series of historical romances in prose, which gave him in Holland a position somewhat analogous to that of Sir Walter Scott in Great Britain. He died at Oosterbeek near Arnheim on Aug. 25, 1868.

There is a collected edition of his *Poetische Werken* (13 vols., 1859–72), and also of his *Romantische Werken* (23 vols., 1855–72). *See* also *a* bibliography by P. Knoll (1869); and Jan ten Brink, *Geschiedenis der Noord-Nederlandsche Letteren in de XIXe Eeuw* (No. iii.).

LENNGREN, ANNA MARIA (née MALMSTEDT) (1754–1817), Swedish poet whose neoclassical satires and pastoral idyls show a balance of moderation characteristic of the Gustavian period and are still read for their gaiety and elegance. was born at Uppsala on June 18, 1754. Educated by her father. a lecturer at Uppsala university Uppsala. she began to publish poetry when she was 18. She married Carl Lenngren (1750–1827), founder, nith J H. Kellgren. and, later, editor, of the influential *Stockholmsposten*, in 1780, and thereafter contributed anonymously to it Her best work nas written in the 1790s. Her most famous idyls are *Den glada fasten* ("The Merry Festival." 1796) and *Pojkerna* ("The Boys," 1797). Of her satires. *Poitiaitena* (1796) and *Grefvinnans besok* ("The Countess's Visit," 1800) are particularly outstanding. Although. as she says, she was "seldom far from home," she combined clear-sighted knowledge of the world nith kindly tolerance of its foibles. Her poetry is classical in form, and remarkable for its restraint and purity of style and diction She died in Stockholm on March 8, 1817. Her *Skaldeförsök* ("Poetical Exercises") mere collected in 1819. A critical edition of her *Samlade Skrifter,* by T. Hjelmqvist and K. Warburg, appeared in 3 vol. (1916–26).

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LENNOX, a name given to a large district in Dumbartonshire and Stirlingshire, which was erected into an earldom in the latter half of the 12th century. It embraced the ancient sheriffdom of Dumbarton and 19 parishes with the whole of the lands round Loch Lomond.

Alwin, first earl of Lennox, died before 1217. The second Alwin had ten sons; one founded the clan Macfarlane. Maldouen, the 3rd earl, was a witness to the treaty between Alexander II., of Scotland, and Henry III., at Newcastle in 1237.

In 1392 the earldom reverted to the king, who re-granted it to Duncan the 8th earl. In 1424, when Murdoch, then duke of Albany, ransomed James I. from his long captivity, Duncan went with the Scottish party to Durham, and next year he was executed; the widowed duchess of Albany, now also countess of Lennox, lived at Inchmurrin, Loch Lomond, until her death. Elizabeth, her sister, married Sir John Stewart of Darnley. Their grandson, Sir John Stewart, made a lord of parliament as Lord Darnley, became earl of Lennox in 1473. Matthew, 2nd earl of this line, left a son John, 3rd earl, who was murdered in 1526. His son Matthew, the 4th earl, married Margaret Douglas, the heir of the 6th earl of Angus by his wife, Margaret Tudor, sister of Henry VIII. and widow of James IV. Their eldest son Henry Lord Darnley married Mary, queen of Scots. He was murdered in 1567, and his son James became king of Scotland.

The title passed from James VI. to the king's uncle, Charles; in 1578 it was granted to Robert Stewart, second son of John, 3rd earl, but he in 1580 exchanged it for that of earl of March, and the earldom of Lennox was given to Esme Stewart, grandson of the 3rd earl. In 1581 Esme became duke of Lennox, earl of Darnley, Lord Aubigny, Tarboulton and Dalkeith. His son, Ludovic, was given his father's honours and estates, and was created Lord Settrington (1613), earl of Newcastle and duke of Richmond (1623). He died in 1624, being succeeded in his Scottish titles by his brother Esme, already earl of March, Lord Clifton of Leighton Bromswold (1619) and seigneur d'Aubigny in France. James, 4th duke of Lennox, was created duke of Richmond in 1641. In 1660 the titles passed from the 5th duke to Charles, Lord Stuart of Newbury and earl of Lichfield. He was drowned in 1672, and his sister Katharine, wife of Henry O'Brien, heir apparent of the 7th earl of Thomond, was served heir to him. Her only daughter, the countess of Clarendon, was mother of Theodosia Hyde, ancestress of the present earls of Darnley.

The Lennox dukedom was given by Charles II., with the titles of earl of Darnley and Lord Tarbolton to Charles Lennox, duke of Richmond, earl of March and Lord Settrington, son of the duchess of Portsmouth. The ancient lands of Lennox he sold to

the duke of Montrose.

The wife of the 4th duke, Lady Charlotte Gordon, brought her family estates to the Lennoxes; the additional name of Gordon being taken by the 5th duke of Richmond and of Lennox. The 6th duke was granted the titles of duke of Gordon and earl of Kinrara (1876).

See *Scots Peerage,* ed. by J. B. Paul, vol. v. (Edinburgh, 1904–11); *The Lennox* by William Fraser (Edinburgh, 1874) and G. E. C[okayne], *Complete Peerage,* vol. v., pp. 6—68 (1893).

LENNOX, CHARLOTTE (1720–1804), British writer, daughter of Colonel James Ramsay, lieutenant-governor of New York, was born in 1720. She went to London in 1735, and, being left unprovided for at her father's death, she began to earn her living by writing. She made some unsuccessful appearances on the stage and married in 1748. Her chief works are: *The Female Quixote; or the Adventures of Arabella* (1752), a novel; *Shakespear illustrated; or the novels and histories on which the plays . . are founded* (1753–54); *The Life of Harriet Stuart* (1751), a novel; and *The Sister,* a comedy produced at Covent Garden (Feb. 18, 1769).

LENNOX, MARGARET, COUNTESS OF (1515–1578), daughter of Archibald Douglas, 6th earl of Angus, and Margaret Tudor, daughter of Henry VII of England and widow of James IV of Scotland, was born at Harbottle castle, Northumberland, on Oct. 8, 1515. Because of her nearness to the English crown, Lady Margaret Douglas was brought up chiefly at the English court in close association with the Princess Mary, who remained her fast friend throughout life. She was high in Henry VIII's favour, but was twice disgraced; first for an attachment to Lord Thomas Howard, who died in the Tower in 1537, and again in 1541 for a similar affair with Sir Charles Howard, brother of Queen Catherine Howard. In 1544 she married a Scottish exile, Matthew Stewart, 4th earl of Lennox (1516–71), who was regent of Scotland in 1570–71. During Mary's reign the countess of Lennox had rooms in Westminster palace; but on Elizabeth's accession she removed to Yorkshire, where her home at Temple Newsam became a centre for Catholic intrigue. By a series of successful maneuvers she married her son Henry Stewart, Lord Darnley, to Mary, queen of Scots. In 1566 she was sent to the Tower, but after the murder of Darnley in 1567 she was released. She was at first loud in her denunciations of Mary, but was eventually reconciled with her daughter-in-law. In 1574 she again aroused Elizabeth I's anger by the marriage of her son Charles, earl of Lennox, with Elizabeth Cavendish, daughter of the earl of Shrewsbury. She was sent to the Tower with Lady Shrewsbury, and was only pardoned after her son's death in 1577. Her diplomacy largely contributed to the future succession of her grandson James to the English throne. She died on March 7, 1578.

LENORMAND, HENRI-RENÉ (1882–1951), French dramatist, mas born on May 3, 1882, in Paris. He was educated at the Lycée Jansen de Sailly, afterward graduating at the Sorbonne. His first important play, *Les Possédés,* was produced in 1909 at the Thkbtre des Arts; but for his first success he had to wait until nine years later when Georges Pitoeff staged at his theatre in Geneva *Les Rate's* (1918) and *Le Temps est un songe* (1919). These plays were subsequently transferred to Paris and were well received. They were followed by *Le Simoun,* produced by Firmin Gémier and Gaston Baty at the Comédie Montaigne (1920), and by *Le Mangeur de rives,* produced by Pitoeff first in Geneva and afterward in Paris (1922).

The author by this time held a leading position among the younger dramatic authors of France, and in 1923 became president of the Théâtre des Jeunes Auteurs. Gémier, director of the Odéon, revived *Le Simoun* in 1922, and produced in succession *La Dent rouge* (1922) and *L'Homme et ses fantômes* (1924). His later plays include *A l'Ombre du mal* (1924), *Le Lâche* (1925), *L'Amour magicien* (1926), *Mixture* (1927), *Asie* (1931), *Les Trois chambres* (1931), *Crépuscule du théâtre* (1934). After *Les Rate's,* the first of the plays included in the complete edition of his dramatic works (Georges Crès et Cie), was published, Lenormand's plays were produced throughout the world and translated into many languages. He died in Paris on Feb. 17, 1951.

The fundamental inspiration of Lenormand was the conflict of positive good with an equally positive and creative principle of evil, combined with an equally vivid sense of destiny as determined by motives, latent and often unconfessed, in the minds of his protagonists. *Le Mangeur de rives* should be read not as the analysis of a Freudian complex but as a modern replica of the tragedy of *Oedipus Rex.* In the modern tragedy, however, the fate of the characters is determined by a revelation of motives existing subconsciously in their minds. (J. PA.; X.)

LENORMANT, FRANÇOIS (1837–1883), French Assyriologist and archaeologist, was born in Paris on Jan. 17, 1837. His father, Charles Lenormant, distinguished as an archaeologist, numismatist and Egyptologist, made him begin Greek at the age of 6, and the child responded so uell to this precocious scheme of instruction, that when he was only 14 an essay of his on the Greek tablets found at Memphis appeared in the *Revue archéologique.*

In 1859 he accompanied his father on a journey of exploration to Greece, during which Charles Lenormant succumbed to fever at Athens on Nov. 24. In 1874 Lenormant was appointed professor of archaeology at the National library, and in the following year he collaborated with Baron De Witte in founding the *Gazette archéologique.* As early as 1867 he had turned his attention to Assyrian studies; he was among the first to recognize in the cuneiform inscriptions the existence of a non-Semitic language, now known as Accadian. He died in Paris on Dec. 9, 1883.

Probably the best known of his books are *Les Origines de l'histoire d'après la Bible,* and his ancient history of the east and account of Chaldean magic.

LENOX, JAMES (1800–1880), U.S. book collector and philanthropist, was born in New York city on Aug. 19, 1800. His father was a wealthy Scottish merchant from whom Lenox inherited several million dollars as well as valuable properties in New York city. A graduate of Columbia college (1818) and a member of the bar, he devoted the bulk of his life to collecting rare books. manuscripts and art objects and to public and private philanthropy. As a book collector he was a distinguished pioneer in the United States. His special interests were in Bibles, books about North and South America, early Americana, first person accounts of the great voyages of the age of discovery, and all editions of the works of John Bunyan, William Shakespeare and John Milton. The collection was originally intended for the use of scholars, but in 1870 was made available to the public. In 1895 the Lenox library (containing about 85,000 volumes), the Astor library and the Tilden foundation were consolidated to become the New York Public library. Lenox died in New York city on Feb. 17, 1880.

See Henry Stevens, *Recollections* of *James Lenox and the Formation of his Library* (1886).

LENS, a town of northern France, *département* of Pas-de-Calais. 13 mi. N.N.E. of Arras by rail on the Déûle and on the Lens canal. Pop. (1954), 40,753. In 1648 the neighbourhood of Lens was the scene of a celebrated victory gained by Louis II of Bourbon, prince of Condé, over the Spaniards. Lens was captured by the Germans in Oct. 1914 and held until 1918. In this district the front line remained stable, with the result that Lens was reduced to a heap of ruins.

It was gradually reconstructed. Lens occupies a central position on the coal fields of Pas-de-Calais and was in 1914 one of the chief coal-mining centres in France. but destruction of the machinery and flooding of the mines during the German occupation caused immediate postwar production to be far below prewar output. Liévin (pop. 1954, 18,005), likewise a coal centre. lies 2½ mi. W.S.W.

LENS, in optics, a device for forming an image, real or virtual, by the refraction of light. The simplest lens is a piece of glass provided with spherical convex, concave or plane surfaces. The word is Latin for lentil, the resemblance of a convex lens to a lentil being obvious. The surfaces of a lens are sometimes made cylindrical or aspheric if the application requires it, but practically all lenses (except spectacles) made today have truly spherical surfaces. The term lens is often applied to compound lens sys-

tems; *e.g.,* telescope objectives, microscope objectives, eyepieces. etc. The only lens found in nature is the so-called crystalline lens of the eye, but even this is actually part of a compound optical system comprising the curved cornea, the aqueous humour, the iris and the crystalline lens situated immediately behind the iris (see EYE, HUMAN), which work together to form an image of external objects on the retina of the eye.

Lenses have been knonn for thousands of years. if only in the crude form of a spherical glass bottle full of water used as a burning glass. Meissner (1260–80) stated that old people derive advantage from spectacles. Indeed, the science of optics aould be more than justified even if its only accomplishment were the extension of man's useful life by 20 or 30 years as a result of the availability of spectacles and magnifiers. When we add to this such devices as lighthouses, microscopes, telescopes, binoculars, cameras and motion-picture projectors, all of which depend on lenses for their action, we see that the lens maker is truly one of the benefactors of mankind.

The Action of a Lens.—The simplest forms of a lens are the well-known convex and concave lenses indicated in Fig. 1. Here a parallel beam of light from a small distant source is shown entering the lens from the left; it is converged to a real image of the source at the focus, B, by the convex lens, and diverged as from a virtual image of the source at C by the concave lens.

Unfortunately, the image formed by a single lens is not good enough for serious work in such fields as astronomy, microscopy or photography. For these and many other exacting applications it is necessary to combine in one mount several lens elements, some of which may be convex or concave, some made of dense high-refracting or high-dispersive glass, while others are made of low-refracting or low-dispersing glass, the lenses being mounted at carefully calculated separations depending on the needs of the optical designer (see OPTICS). In this way, the various aberrations of a simple lens can be corrected, and an acceptably sharp image obtained. Sometimes two or more single elements are cemented together with a transparent cement, both as an aid to mounting the lenses and also to prevent internal reflection from occurring at the adjacent lens surfaces.

The components of a complicated objective must be mounted with the greatest care, not only to secure the specified separations between the elements but more importantly to ensure that all the lenses are properly centred; *i.e.,* the centres of curvature of all the lens surfaces lie on a single straight line called the lens axis. Failure to meet this condition will yield a lens incapable of forming a sharp image, a large part of the cost of a fine objective being due to the difficulty of securing perfect relative centring of the parts.

Lenses vary in size from large astronomical telescope objectives (the largest is that at Yerkes observatory, Williams Bay, Wis., 40 in. in diameter) down to the smallest microscope objectives in which a lens element as small as $\frac{1}{16}$ in. diameter is sometimes used. The largest astronomical telescopes, such as those at Mount Wilson and Palomar observatories, use a concave mirror in place of a lens, but the processes of grinding and polishing a telescope mirror are virtually the same as for a lens, and require even greater care in their execution. (See TELESCOPE; MICROSCOPE.)

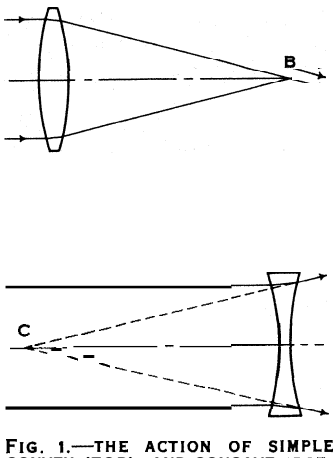


FIG. 1.—THE ACTION OF SIMPLE CONVEX (TOP), AND CONCAVE (BOTTOM) LENSES

The theory of the formation of images by lenses was studied by Isaac Newton, Christiaan Huygens. René Descartes, Robert Smith. Thomas Young, Henry Coddington and particularly by K. F. Gauss (1777–1855), who introduced the concept of the focal length of a lens system. The systematic development of the theory of lens aberrations was initiated by L. P. Seidel (1821–96), and from his work has grown the whole science of lens design as practised today. (See OPTICS.)

THE MANUFACTURE OF LENSES

G. Battista della Porta in his famous book *Magia naturalis,* published in 1589, described the process of lens grinding and polishing as it mas carried out in his time. and indeed as it was performed until well into the 20th century with scarcely any modification. A piece of the desired type of glass is chosen, and chipped around with a hammer or soft-jawed pliers to make it roughly the size and shape of the finished lens. The surfaces are then ground, or more strictly lapped, to a spherical form in a cup-shaped iron tool of the correct radius of curvature if the surface is convex, or on a dome-shaped tool if concave. using a wet mud of sand (later coarse emery) as an abrasive (Fig. 2). Successive stages

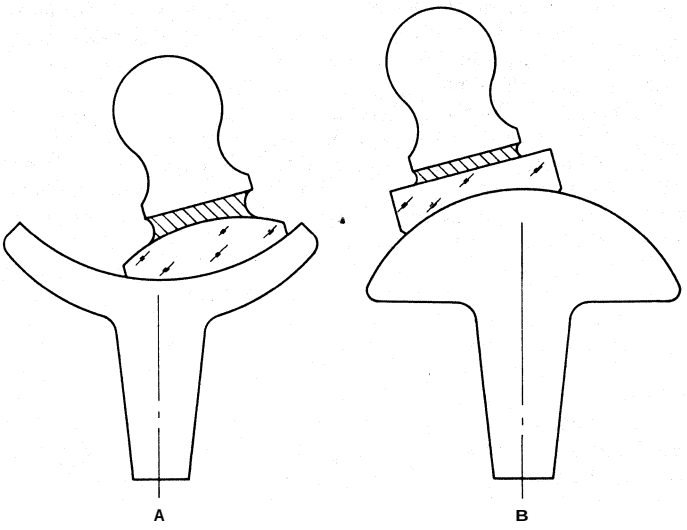


FIG. 2.—SIMPLE TOOLS FOR LENS GRINDING: (A) FOR A CONVEX SURFACE: (B) FOR A CONCAVESURFACE

of fine grinding follow, each using progressively finer emery powder on a smoother and more accurately formed tool. Then the lens is polished with wet jeweler's rouge (ferric oxide) on a metal tool coated with a layer of pitch or wax to act as a polisher. When both sides have been polished, the lens is ground around the edge to centre it and give it the correct diameter. In the days of Huygens (1655), it was customary to polish a lens on a dry bed of tripoli powder deposited in the bottom of the iron grinding tool; the discovery that wet jeweler's rouge could be used for this purpose must have ranked as a major invention.

Essentially the same processes are used in small shops today. Slabs of glass are often cut with a glass saw, or slitting disk, which is a thin soft-iron disk having small diamond chips embedded in its rim, used like a circular saw rotating at about 240 revolutions a minute. Thinner sheets of glass are often cut with a glass cutter, like window glass. The square blocks are then either chipped to a rough round blank or, if a suitable furnace is available, they are often heated to redness, rolled to a round shape like a pat of butter and pressed in a mold to the desired size and with approximately the desired surfaces.

Rough Grinding is still performed in the old way, carborundum being often substituted for coarse emery, but many shops are now making use of a curve generator equipped with diamond tools (Fig. 3). This machine operates on the principle that any circular ring will fit perfectly on any spherical surface having a radius of curvature greater than the radius of the ring. A rotating diamond-edged, cup-shaped tool is mounted so that its axis of rotation intersects the axis of the lens at the centre of curvature, C, of the desired spherical surface. The diameter of the diamond tool must be somewhat greater than the semidiameter of the lens, and the obliquity of the tool axis must be adjusted so that the rim of the tool cuts across the centre of the lens being generated. As the tool and lens rotate about their respective axes, the geom-

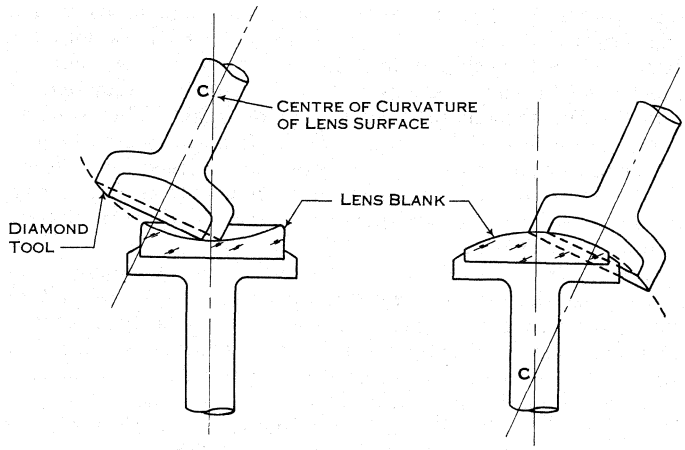


FIG. 3.— CROSS-SECTION VIEW OF A CURVE GENERATOR FOR CONCAVE (LEFT) AND CONVEX (RIGHT) SURFACES

etry of the situation shows that a spherical surface of the desired radius of curvature must be generated on the lens. The diamond tool wears slightly, of course, but this does not affect the radius of curvature of the surface being generated provided the rotation axes of tool and lens always intersect the centre of curvature C.

Fine Grinding, or Smoothing, is done on an accurately formed spherical tool, using carefully graded emery flour as an abrasive. During the grinding process the emery is partially broken down into a mixture of smaller sizes, and these must be separated before re-use by a process of elutriation using a slow stream of water, the particles being allowed to settle into a series of different grain sizes. Even a single larger emery grain present in fine grinding may cause a severe scratch on the lens, which would necessitate a return to a previous rough grinding stage for its removal.

Blocking.— Small lenses are usually grouped together for fine grinding and polishing on an iron block or body, both to economize grinding time and also to improve the accuracy of the lens surfaces. For less precise work, the lenses are sometimes blocked by cementing them into carefully bored recesses on the surface of an iron tool (Fig. 4), using a thin hot cement to hold them in place. For more accurate work, however, each rough-ground lens is backed up with a small button or mallet of pitch, and a number of lenses are laid face down on the surface of the fine-grinding tool and held temporarily in place by wetting them. A heated iron body is then pressed down on to the group of pitch buttons, which soften nith the heat and adhere to the body. The whole is chilled with cold water, making an accurate block which is ready for fine grinding and polishing (Fig. j). It should be observed that the pitch-blocking process does not significantly affect the thickness or centration of the lenses. so these two features must be carefully controlled in the rough grinding or curve generation stage before the lenses are blocked.

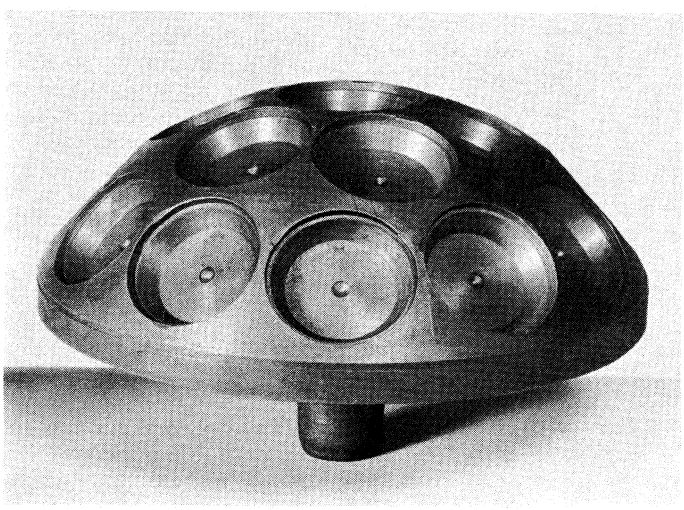
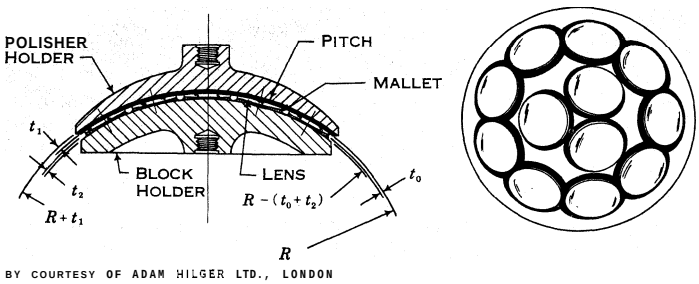


FIG. 4.— ARECESSED BLOCK TO HOLD SEVERAL LENSES DURING SMOOTHING AND POLISHING

Polishing is still performed in the classical manner, using a pitch-covered tool in place of the fine-grinding tool, the convex member (lens or polisher) being generally below, and the concave member (polisher or lens) above. The upper member is made to oscillate from side to side while the lower meinber rotates continuously about a vertical axis. The pitch lining of the polisher is preformed to the correct radius of curvature by pressing it while warm on the opposite-curved smoothing tool. For this reason lens tools are always made in pairs, one convex and one concave, the two members of a pair being fine ground on each other to ensure that they are spherical and match perfectly.

As a substitute for pitch, various waxes are sometimes used, or even wax-impregnated felt for lower-grade lenses. F. Twyman has given recipes for various polishing compounds, one of which consists of the follow-ing ingredients: pitch. 8 parts; rosin, 1 part; and beeswax, 1 part. For a wax rather than a pitch polisher he recommends: beeswax, 14 parts; rosin, 8 parts; pitch, 1 part; plus a little tallow. However, the recipe must be varied greatly in hot and cold climates to maintain a satisfactory slightly plastic



BY COURTESY OF ADAM HILGER LTD., LONDON

FIG. 5.— MAKING A BLOCK OF LENSES

Left, a section through polisher, block holder, lenses and mallets; right, plan of the finished block. If R is the radius required for the polished surface, the radius of the polisher holder should be $R+t_1$ and that of the block holder $R-(t_0+t_2)$, where t_0, t_1 and t_2 are respectively the thickness of the lens, the thickness of the polishing pitch and the thickness of the mallet

physical condition. After the polisher has been molded to the correct radius of curvature, it is usually scored in a pattern of straight crosscuts or rings to provide a series of spaces to hold the wet polishing material.

The Nature of the Grinding and Polishing Processes has been the subject of much debate and experiment. It appears certain that during grinding (lapping) the sharp pieces of emery powder roll over and the corners apply sufficient local pressure on the glass to cause a small piece to be chipped out. resulting eventually in the familiar ground glass appearance of a ground or smoothed lens. The polishing process is, however, far less clearly understood. One school of opticians claiins that polishing is similar to fine grinding except for the very minute size of the rouge particles; the other school claims that the rouge particles become embedded in the soft pitch and then exert a scraping or sandpapering action on the glass which wears away the high spots and eventually brings the whole surface to a common level. It is probable that there is also some plastic flow of the glass during polishing, tending to smear over and cover up the fine grinding marks, narrow scratches, etc. If a polished glass surface is lightly etched with hydrofiuoric acid, many of the former scratches and other marks which had been polished away become visible again. By its very nature, glass must be regarded as a fluid of almost infinite viscosity, and because it is a fluid, some slight surface flow may well occur during polishing. A very well-polished surface scatters virtually no light, whereas ground glass is an efficient scatterer.

Aluminum oxide has become popular as a substitute for emery for fine grinding, and the familiar rouge (ferric oxide) has been almost universally replaced by cerium and zirconium oxides, either pure or mixed with other materials: which polish much faster and are less likely to soil the operator's hands and clothing. At one

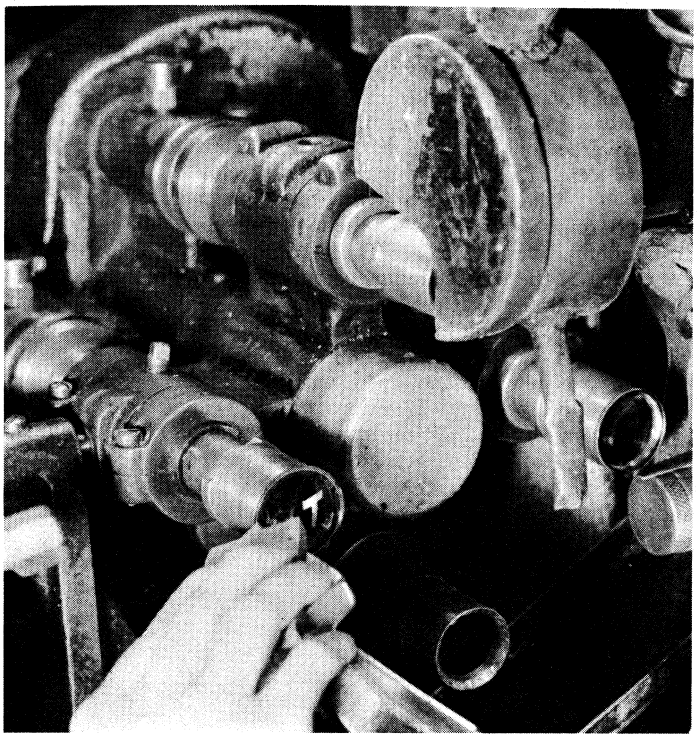


FIG. 6.— A FOUR-SPINDLE LENS-CENTRING AND EDGE-GRINDING MACHINE. NOTE THE REFLECTION OF THE LETTER "T" IN LEFT LENS. USED AS AN AID IN CENTRING THE LENS ON ITS SPINDLE

time tin oxide (known as putty powder) was a popular polishing material, but its use is now restricted to the polishing of some soft crystalline materials, for which purpose it has proved to be particularly suitable.

Centring and Edging. — Because it represents an important step in the manufacture of a well-corrected objective, the centring process has been the subject of much experimentation and mechanical development. Until recent years, the polished lens was mounted by a suitable thin hot cement to the end of a hollow chuck on a lathe spindle, and while the cement was still soft the reflected images of a nearby lamp formed by the two lens surfaces were watched as the spindle was slowly rotated (Fig. 6). If the reflections moved it indicated a lack of centring. and the lens would then be pushed by the operator in such a direction as to tend to neutralize the image motion. Finally, when the reflected images in both of the lens surfaces remained perfectly still while the lathe was turned, the cement would be allowed to set. The edge of the lens would then be ground down to the desired diameter, either on a flat piece of brass with wet emery powder on it, or by the use of a rotating emery wheel, or with a diamond-coated copper drum made for the purpose.

After about 1930 various mechanical centring devices were developed which depend on clamping the lens between the polished rims of two similar coaxial steel tubes or cups. It is evident that if the cups are perfectly coaxial, the optical axis of the lens must coincide with the mechanical axis of the cups: and it is a simple matter then to rotate the cups slowly while grinding the rim of the lens with a suitable grinding wheel.

Surface Coating. — Every polished glass surface reflects a small fraction of the incident light, the exact reflectivity depending on the obliquity of the light and the refractive index, n, of the glass. For normal incidence, Fresnel's formula gives the reflected fraction as follows:

$$R = \left(\frac{n-1}{n+1}\right)^2$$

This represents about 4% reflection for ordinary glass ($n=1.5$), rising to $7\frac{1}{2}\%$ for glass having an index n as high as 1.7j. A complicated photographic objective thus acts partially as a mirror, reflecting a very significant fraction of the incident light. This would not be too serious, however, except that the glass-air surfaces within the objective reflect some light, and in its turn a fraction of this light is again partially reflected back into the camera where it eventually finds its way to the film, causing fog. Furthermore. because the lens surfaces are spherical, they tend to form sharply focused reflected images of bright lights situated in or near the field of the camera, which often show up in the useful picture area as ghosts or flare-spots. Any method for reducing the reflectivity of lens surfaces is therefore doubly useful, both to remove ghost images or stray light and to increase the over-all light transmittance of the lens.

As early as 1896 H. Dennis Taylor noticed that some old lenses in his possession having tarnished surfaces actually transmitted more light than a newly polished lens of the same type, and he made many experiments to induce an artificial tarnish by chemical means. The process was unsuccessful, and nothing more was done in the matter until 1936, when John Strong (J. Opt. *Soc. Amer.*, 26:73–74, 1936) showed that. the reflectivity of a glass surface could be drastically reduced by evaporating a thin layer of a low-index material like calcium fluoride upon it in a vacuum. During World War II the process was studied extensively in many countries, and by 1945 it had become the universal practice to "coat" the surfaces of all lenses except the very simplest with an evaporated layer of magnesium fluoride. When properly produced, such a coating is as hard and resistant as the glass itself, and it effectively reduces the surface reflection to only 1% or 2% of the incident light. Even this small residual reflection can be further reduced, if necessary, by the use of multilayer coatings of various kinds.

Cementing. — It has been already mentioned that in compound objectives two or more lenses are often made with the same radius of curvature on adjacent surfaces so that they can be cemented together with a suitable transparent cement. The classical cement for this purpose is Canada balsam. It is applied to the adjacent lens faces while hot, the excess cement is squeezed out by rubbing the lenses together, and the lenses are then most carefully centred relative to each other and set aside to cool. After 1940 various thermosetting and thermoplastic materials replaced Canada balsam for this purpose, chiefly because lenses cemented with balsam may come apart at very low temperatures, such as those encountered in the arctic or at high altitudes. A common modern cement is butyl methacrylate, but many other polymers have been used for this purpose.

Lenses over about three inches in diameter are not usually cemented because of the risk of distortion due to the unequal thermal expansions of crown and flint glass. Such lenses are either designed to have at least a small definite separation or, if they must be in close contact, they are prevented from actually touching by three little pieces of tinfoil equally spaced around the edge.

Mounting. — The various lens elements of a complete objective are mounted in metal cells to keep them together in correct relationship. The cell is provided with a carefully turned seat to hold each of the lenses, the lens being held in position either by a screw clamping ring (Fig. 7), or by having the metal rim made very thin so that it can be spun over the edge of the lens while the operator holds the lens in position. In some cases, the lens is held in its mount with a hard cement, a common example being the tiny front lens of a high-power microscope objective.

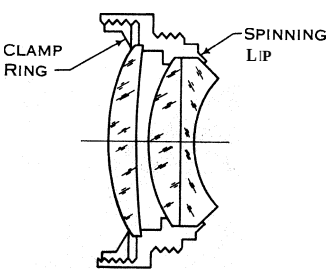


FIG 7.—CROSS SECTION OF A TYPICAL MOUNT FOR A PHOTOGRAPHIC OBJECTIVE

Lenses with **Nonspherical** Surfaces. — Spherical surfaces are almost universally employed in high-grade lenses because the sphere is the only geometrical form which can be generated automatically with great exactness. In the type of grinding and polishing procedure described above where one part is slid over a mating

part in an irregular manner, with complete surface contact, then no matter how irregular the surfaces are at the beginning they must end up as perfect spheres. If one wishes to generate a surface other than a sphere (a plane is. of course, a sphere of infinite radius) then some form of line or point contact must be used between lens and polisher, and the tool must be caused to travel in a specified manner across the lens during the grinding and polishing processes. Paraboloidal surfaces are often made in this may by means of a flat vertical metal blade resting on the glass, which is made to travel back and forth across the rotating lens without tilting.

The term "aspheric" is used in reference to a nonspherical surface having an axis of rotation coinciding with the axis of the system. Aspheric surfaces having a more general form than the parabola have been made by molding under pressure while the glass is hot enough to be soft. by sagging a sheet of glass by heat into a preformed mold, and by brute-force grinding with a succession of progressively more accurate metal tools formed to the desired surface shape, the tool being rotated about its axis while it is forced against the glass with wet emery as a loose abrasive. In this case the fine-ground aspheric surface must be polished by the use of a flexible polisher such as a sheet of thick rubber carrying numerous small oitch pellets. pressure being applied from behind the rubber by a bag of shot or by some other evenly applied force which will not tend to alter the form of the surface during polishing. Molded aspheric surfaces are commonly employed in condenser lenses, and the more accurate forms have been embodied in the eyepieces of prism binoculars and in a few recent types of photographic objective. The reflecting telescope developed by Bernhard Schmidt in 1931 comprises a spherical concave mirror and a thin aspheric glass plate to correct the aberration of the mirror. This plate is either sagged or hand polished to the desired form.

A cylindrical surface is an exception in that it can be polished by lapping a lens against a matching cylindrical tool of the opposite curvature. However, some means must be provided for maintaining the cylinder axis of the lens always exactly parallel to the cylinder axis of the polisher. If the lens were free to rotate, the surface would very soon become a sphere and not a cylinder.

OPTICAL MATERIALS OTHER THAN GLASS

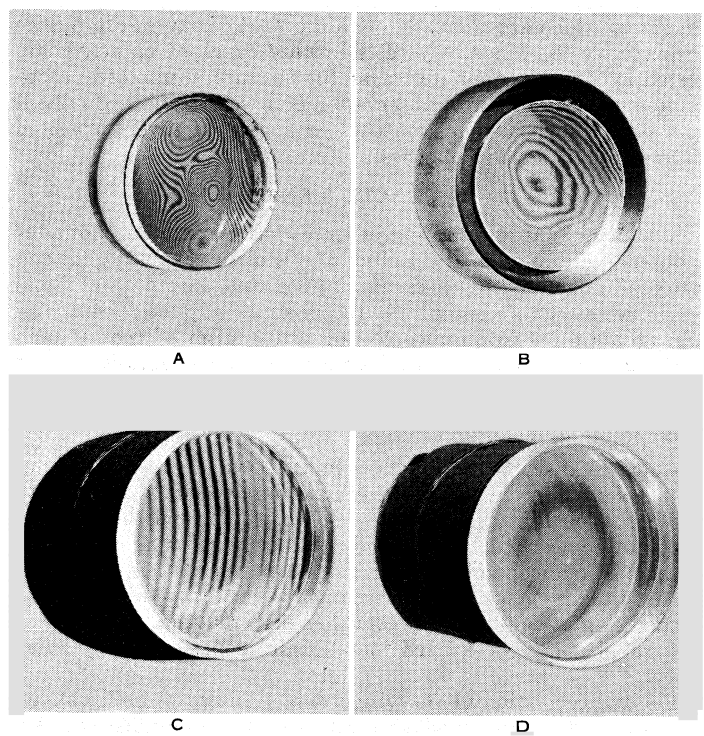
Liquids have occasionally been used to fill thin glass shells to make lenses, but this procedure has many obvious disadvantages. Lenses molded from methyl-methacrylate polymer (Lucite, Perspex, etc.) are satisfactory for many purposes, and they are very low-priced when they are molded by heat from a sheet of plastic material, or by injection-molding in the liquid state. The best plastic lenses are made by polymerizing the fluid monomer in a mold having polished glass faces, but the cost of manufacture is then comparable to that of glass lenses, and the use of plastic material loses its point. However, the reduction in weight when very large lenses are made of plastic materials instead of glass is sometimes a real advantage. Once the mold has been made, aspheric surfaces are of course just as easy to make in plastics as spherical surfaces.

There have been some attempts to produce complete telescope and photographic objectives in plastic materials, a suitable methacrylate being used for the crown glass, and polystyrene for the flint glass elements. but the variations in the materials due to inhomogeneity, humidity and temperature have introduced many difficulties, and the low refractive index of plastics compared with glass presents a serious design problem.

In the ultraviolet region of the spectrum, glass is unfortunately opaque and certain crystals such as calcium fluoride, lithium fluoride or quartz are extensively used, especially for spectroscopy. In the infrared region, where much activity is now appearing, other crystalline materials such as rock salt, potassium iodide, thallium bromide-iodide, silver chloride, arsenic sulfide, silicon and germanium are coming into use. These unusual materials present many problems to the optician. not the least being that most of them are opaque to visible light.

LENS TESTING

Single Lens Elements. — The surfaces of a lens are tested periodically during manufacture to ensure that they are spherical and of the correct radius of curvature. In the fine-grinding stage, this is done by pressing the lens against a gauge consisting of a thin brass plate of which one edge has a circular outline of the desired radius, the gauge being held edgewise against the lens surface. By feeling the fit of the lens against the gauge, the operator can readily judge whether his lens is too strong or too weak, and can adjust the grinding process accordingly. The perfection of sphericity of a lens surface during polishing is tested by gently pressing the surface against a polished glass test plate having the desired but opposite radius of curvature; that is, a convex lens surface of 100-mm. radius is tested by pressing it against an accurate concave test plate of 100-mm. radius. If the contacting surfaces are truly spherical and of precisely the same radius of curvature, the thin air film between them will show a single shade of colour due to interference between the light beams reflected from the two faces of the air film, in the same way that light reflected by a soap bubble shows a colour which depends on the thickness of the soap film. However, if the lens is irregular or of a slightly incorrect curvature, the air film between the lens



BY COURTESY OF BAUSCH & LOMB OPTICAL CO., INC.

FIG. 8.— TESTING AN OPTICAL SURFACE WITH THE AID OF A POLISHED GLASS TEST PLATE AND NEWTON'S RINGS

(A) Lens showing Newton's rings caused by two glass surfaces, one of which is not accurately polished, revealing colour fringes like contour lines. (B) Lens showing interference of light reflected from two surfaces not in perfect contact. Colour bands, as in soap bubble film, are shown. (C) Test glass applied to lens showing that it has a good surface. This is shown by tilting one glass slightly to introduce a prism of air, producing even interference bands as shown. (D) A pair of accurate test glasses superimposed, showing one interference band covering the entire lens area. The variation is less than 1/100,000 in. on the entire lens surface

and the test plate will vary in thickness from point to point, resulting in a set of Newton's rings, which are bands or fringes of colour due to interference (Fig. 8). If the rings are circular, then the lens surface has axial symmetry but it is not quite of the correct radius of curvature; if the rings are elliptical or irregular, then the lens surface is nonspherical, and it may even need regrinding and repolishing if it departs too much from the desired form. Testing an aspheric surface is very much more difficult. as it is hard to make an accurate aspheric test plate having a polished surface which is the precise reverse of the desired lens surface.

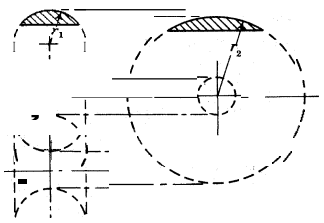


FIG. 9.—A TORIC SURFACE HAVING TWO PERPENDICULAR RADII, R_1 AND R_2

Before assembly into its mount each lens element is also tested for thickness and centring. and for defects in the glass such as bubbles, striations and strain.

Complete Objectives. — A complete system such as a photographic objective is thoroughly tested after assembly, generally by examining microscopically the quality of the image of a distant "star" or point source of light formed by the lens. If the lens is well designed and well made, with all the separate elements perfectly centred relative to one another, and all the air spaces correctly established, then the image of a point source should be a very small spot of light. Experienced inspectors are able to judge the quality of an objective from an examination of this image, both on the lens axis and at various obliquities corresponding to the field angle covered by the lens in the camera. Often the inspector is able to recommend small adjustments to be made in the lens to improve the flatness of the field, or the sharpness of definition. etc. The final test is, of course, to take actual photographs with the lens in a camera, the results of which are compared with the "star" images seen by the inspector in his laboratory tests. Other types of objective are tested in other appropriate ways; for instance, a microscope objective is tested by direct observation of a well-established critical test object such as fine scratches in a film of silver deposited chemically on a plate of glass.

SPECTACLE LENSES

The manufacture of spectacle lenses has become an enormous industry. In 1954, in the United States alone, about 33,000,000 pairs of single-vision lenses and 14,000,000 pairs of multifocal lenses were manufactured. Of these, about 40% were spherical and 60% toric (used for correcting astigmatism of the wearer's eye). A modern spectacle lens is a precision-made optical element involving unusually difficult mechanical and optical problems in its design and manufacture, in spite of which it must be made to sell at a reasonable price.

A spherical single-vision spectacle lens, generally of a meniscus shape, is made by the conventional procedure described above. with the exception that the lens must be very thin, and the surfaces need not be nearly as accurate as would be necessary for a photographic or telescope objective. The outer rim of the lens, which must fit the spectacle frame, is ground on a wet stone wheel. the shape being controlled by a metal template rotating with the lens and rubbing against a fixed metal plate alongside the grinding wheel.

For the correction of the visual defect known as astigmatism, lenses must be made in which the power in one meridian, for example the vertical, is different from the power in the perpendicular meridian, which mould then be the horizontal. This result is obtained by using a lens surface which is actually toric in form. A toric surface is similar to a slice off the tread of a motor tire, the radius of curvature in one meridian being, say, $3\frac{1}{2}$ in., while in the other meridian it may be 14 in. (Fig. 9). A convex toric surface can be generated by mounting a number of lens blanks around the rim of a wheel of the desired long-radius r_2, where they are ground with a rotating cylindrical diamond tool which is made to oscillate about an axis at the desired shorter radius r_1 (Fig. 10). A corresponding mechanism is used to generate concave toric surfaces. Polishing is performed by oscillating a preformed and somewhat flexible felt polisher against the lens while it is slonly moved from side to side under the polisher.

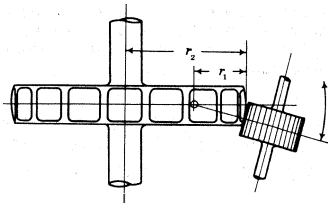


FIG. 10.— GENERATING A CONVEX TORIC SURFACE

Multifocal Lenses. — The basic idea of combining in one spectacle frame an upper half-lens suitable for distant vision, with a lower half-lens suitable for reading, is credited to Benjamin Franklin. Modern bifocal spectacle lenses are made either by polishing two different surfaces on the same side of a single lens blank (the one-piece construction), or by fusing a segment of high-refracting glass onto a facet polished on a low-refracting blank, a single spherical surface being then ground and polished across both pieces of glass (Fig. 11). The additional lens power required for reading results from the higher refraction of the dense glass used to make the fused segment.

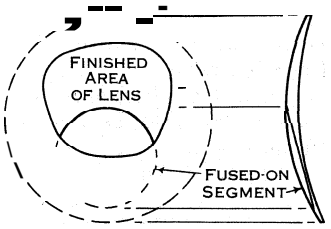
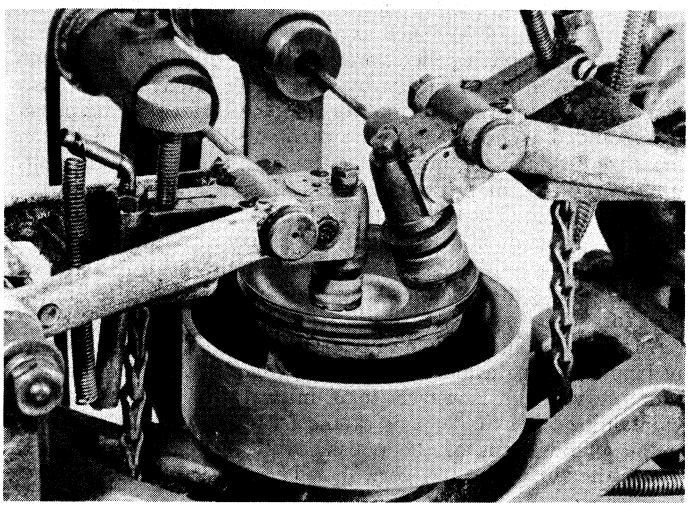


FIG 11 — CONSTRUCTIONOF A FUSED BIFOCAL LENS WITH CIRCULAR SEGMENT

One-Piece Bifocals. — These were introduced about 1910 by Bentzon and Emerson of the Carl Zeiss Works, Germany. Two different coaxial spherical surfaces are generated with diamond curve-generators on the concave side of a large saucer-shaped blank, one generator being used to form the outer (distant vision) area, the other to form the inner (reading) area. Care must be taken, of course, in setting up the machine that there is no ledge remaining between the two areas. Polishing is performed on a similar machine, the diamond generators then being replaced by wax polishers (Fig. 12). Last, the blank is cut across the middle, each half being used to make one spectacle lens of a pair.



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FIG. 12.— TWO-SPINDLEMACHINE FOR POLISHING ONE-PIECE BIFOCAL LENS FOR SPECTACLES

Fused Bifocals. — Bifocal spectacles having a cemented segment of high-refracting glass were introduced in 1899 by J. L. Borsch of Philadelphia. About 10 years later he succeeded in actually fusing the segment to the main lens by heat. and this practice is followed universally today. A blank of approximately the form of the finished lens has a spherical facet polished on the convex side, at the position of the desired reading segment. The radius of curvature chosen for this facet depends on the amount of lens power that is to be added for reading. If the segment is to be circular in shape, a disk of a particular type of high-index glass, chosen to have the same thermal expansion as the main lens and a slightly lower melting point, is polished on the underside to the same radius of curvature as the facet. The disk is laid in place on the polished facet, supported by small bits of mire at its edge, and the lens and disk are heated together in a furnace until the disk softens and sinks onto the facet of the main lens, contact starting in the middle and slowly working outward to drive out all the air from between the lenses. After cooling and annealing, this compound blank is made into a spectacle lens by polishing suitable surfaces on both sides, care being taken, of course, in cutting the finished lens from this compound blank to ensure

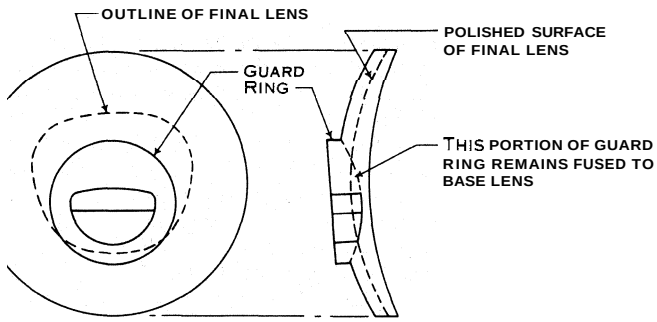


FIG. 13.— CONSTRUCTION OF A FUSED TRIFOCAL SPECTACLE BLANK WITH A FLAT-TOPPED SEGMENT

that the fused segment comes at the desired position.

In making a bifocal or trifocal segment with a flat top, a molded hollow support ring is first prepared, made from the same kind of glass as is used for the main lens. the hole in the ring having exactly the shape and size of the desired bifocal or trifocal segment. Into this support ring are placed the one or two pieces of high-refracting glass which are to compose the segment, and the whole is fused together in a furnace to make a rigid disk. This is then polished on the underside to match the facet which was previously polished on the main lens, and the whole assembly is fused to the main lens as if it were a single piece of glass. After grinding and polishing across the main lens and segment, only the one or two high-refracting portions remain visible because any portion of the outer support ring which may be left matches the main lens perfectly and appears to be a part of it (Fig. 13). By using this technique, a bifocal and trifocal segment of any desired shape can be prepared, even though its outline is noncircular.

Contact Lenses.—During the early 20th century, a number of opticians attempted to grind and polish very thin shell-like lenses to fit closely over the cornea of the wearer's eye. A suitable fluid is used to fill the space between the eye and the lens, the lens being supported by a thin brim which closely fits and rests against the white part of the eyeball. The purpose of these lenses is either aesthetic, for actors and others who cannot or will not wear ordinary spectacles, or because the cornea has become conical or wrinkled and the presence of the matching fluid under the polished shell restores useful vision to the patient. Ground and polished glass contact-lenses are, of course, very expensive and delicate; in recent years some contact lenses have been molded in plastic material, and then formed by heat and pressure to the exact shape of the wearer's eye.

FRESNEL LENSES

It originally occurred to Le Comte de Buffon in 1748 that a lens could be greatly reduced in weight by dividing the continuous lens surface into a succession of concentric rings as indicated in Fig. 14, the rings being assembled in correct relationship on a flat surface. This suggestion was adopted by Augustin Fresnel in 1820 in the construction of lighthouse lenses *(see* LIGHTHOUSES), which are so large that a single lens of normal type would be too thick and heavy to be constructed. Indeed, it would be almost impossible even today to make a solid glass disk of adequate size for a modern lighthouse, and the weight of such a thick lens would be prohibitive. The sections of a lighthouse lens are separately ground and polished from suitable curved glass bars, and assembled in metal frames to make up the complete lens.

For many purposes, a one-piece molded glass Fresnel lens is found to be very convenient, such as for floodlights, spotlights, railroad and traffic signals and decorative lights in buildings. On shipboard, cylindrical Fresnel lenses are often used in lanterns to increase their visibility. After about 1945 a wide variety of thin Fresnel lenses were molded in plastic materials, the width of the rings being only a few thousandths of an inch. These are mainly used as field lenses with ground-glass screens in cameras and small projectors to increase the brightness of the outer parts of the screen.

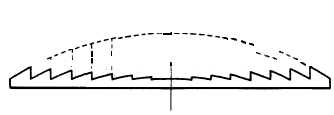


FIG. 14.—CROSS SECTION OF A FRESNEL LENS INDICATING ITS CONSTRUCTION

A close relative of the Fresnel lens is the molded lenticular lens forming the front of an automobile headlamp. Each little rectangular segment of these lenses is carefully designed to focus and deflect a portion of the light either down to the road, or to one side of the car, according to the plans of the designer.

BIBLIOGRAPHY.—An excellent summary of the history of lenses, and the whole subject of lens manufacture, including spectacle lenses, is to be found in F. Twyman's *Prism and Lens Making,* 2nd ed. (London, Boston, 1952). Reference may also be made to R. T. Glazebrook's *Dictionary of Applied Physics,* vol. 4, pp 326–348, "Optical Parts, the Working of" (London, New York, 1923; reprinted Gloucester. Mass., 1950). Other useful references are W. Ewald, *Die Optische Werkstatt* (Berlin, 1930); C. Dévé, *Optical Workshop Principles* (London, Boston, 1943); A. G. Ingalls, ed., *Amateur Telescope Making,* 3 vol. (New York, 1933–53). (R. KE)

LENT, in the Christian Church, the period of fasting preparatory to the festival of Easter. As this fast falls in the early part of the year, it became confused with the season, and gradually Lent, which originally meant spring, was confined to this use.

The length of this fast and the rigour with which it has been observed have varied greatly at different times and in different countries (see FASTING). In the time of Irenaeus the fast before Easter was very short, but very severe; thus some ate nothing for 40 hours between the afternoon of Good Friday and the morning of Easter. This was the only authoritatively prescribed fast known to Tertullian (De *jejunio,* 2. 13, 14; *De oratione,* 18). In Alexandria about the middle of the 3rd century it was already customary to fast during Holy Week; and earlier still the &Iontanists boasted that they observed a two weeks' fast instead of one. Of the Lenten fast, or Quadragesima, the first mention is in the fifth canon of the council of Nicaea (325), and from this time it is frequently referred to, but chiefly as a season of preparation for baptism, of absolution of penitents or of retreat and recollection. In this season fasting played a part, but it was not universally nor rigorously enforced. At Rome. for instance, the whole period of fasting was but three weeks, according to the historian Socrates (*Hist. eccl.* v, 22), these three weeks, in Msgr. Louis Duchesne's opinion. being not continuous but, following the primitive Roman custom, broken by intervals. Gradually, however, the fast as observed in east and west became more rigorously defined. In the east. where after the example of the Church of Antioch the Quadragesima fast had been kept distinct from that of Holy Week, the whole fast came to last for seven weeks, both Saturdays and Sundays (except Holy Saturday) being, however, excluded. Early in the 7th century the fast was made to last 40 days and the cycle of paschal solemnities was extended to the ninth week before Easter by the institution of stational masses for Septuagesima, Sexagesima and Quinquagesima Sundays. The Greek Lent begins on the Monday of Sexagesima. with a week of preparatory fasting, known as the "butter-week"; the actual fast, however, starts on the Monday of Quinquagesima (Esto mihi), this week being known as "the first week of the fast." The period of Lent is still described as "the six weeks of the fast," Holy Week not being reckoned in. The Lenten fast was retained at the Reformation in some of the reformed churches, and is still observed in the Anglican and Lutheran communions. In England a Lenten fast was first ordered to be observed by Earconberht, king of Kent (640–664). In the middle ages, meat, eggs and milk were forbidden in Lent not only by ecclesiastical but by statute law; and this rule was enforced until the reign of William III.

During the religious confusion of the Reformation, the practice of fasting was generally relaxed and it was found necessary to reassert the obligation of keeping Lent and the other periods and days of abstinence by a series of proclamations and statutes. After the Revolution the Lenten laws fell obsolete, though they remained on the statute book till repealed by the Statute Law Revision act 1863. But during the 18th century, though the strict observance of the Lenten fast was generally abandoned, it was still observed and inculcated by the more earnest of the clergy, such as William Law and John Wesley; and the custom of women wearing mourning in Lent, which had been followed by Queen Elizabeth I and her court, survived until well into the 19th century. With the growth of the Oxford Movement in the English Church. the practice of observing Lent was revived; and, though no rules for fasting were authoritatively laid down, the duty of abstinence was generally inculcated by bishops and clergy, either as a discipline or as an exercise in self-denial. For the more "advanced" churches, Lenten practice tends to conform to that of the pre-Reformation Church.

Mid-Lent, or the fourth Sunday in Lent, was long known as

Mothering Sunday, in allusion to the custom for girls in service to be allowed a holiday on that day to visit their parents.

LENTHALL, WILLIAM (1591–1662), English parliamentarian. speaker of the house of commons, second son of William Lenthall. of Lachford. Oxfordshire. was born at Henley-on-Thames in June 1591. He left Oxford without taking a degree in 1609. and was called to the bar of Lincoln's Inn in 1616, becoming a bencher in 1633. He was elected for Woodstock to the parliaments of 1624 and April 1640, and in Nov. 1640 was chosen as speaker of the Long parliament. When on Jan. 4, 1642, the king entered the house of commons to seize five members, Lenthall behaved with great prudence and dignity. Having taken the speaker's chair and looked around in vain to discover the offending members, Charles I turned to Lenthall, and demanded of him "whether any of those persons were in the House. whether he saw any of them and where they were." Lenthall fell on his knees and replied. "May it please your Majesty, I have neither eyes to see nor tongue to speak in this place but as the House is pleased to direct me, whose servant I am here." On the outbreak of the Great Rebellion Lenthall threw in his lot with the parliament.

He carried on his duties as speaker without interruption until 1647, when the struggle for power between parliament and army began. On July 26 a mob invaded the house of commons and obliged it to rescind the ordinance re-establishing the old parliamentary committee of militia; Lenthall was held in the chair by main force and compelled to put to the vote a resolution inviting the king to London. Threats of worse things came to Lenthall's ears. and, taking the mace with him, he left London on July 29 to join the army and Sir Thomas Fairfax. Returning to London with the army, he was installed again by Fairfax in the chair (Aug. 6), and all votes passed during his absence mere annulled. He adhered henceforth to the army party, but with a constant bias in favour of the king. His speakership continued until April 20, 1653, when the Long parliament was summarily expelled. Oliver Crommell directed Col. Thomas Harrison, on the refusal of Lenthall to quit the chair, to pull him out, and Lenthall submitted to the show of force. He mas speaker in the parliament of 1654, but was not re-elected to the chair in the parliament of 1656.

After the fall of Richard Cromwell. the army officers, having determined to recall the Rump parliament, assembled at Lenthall's house at the Rolls (May 6, 1659) to desire him to send out the writs. Lenthall made various excuses for not complying. Nevertheless, upon the officers threatening to summon the parliament without his aid, he led the procession to the parliament house. Lenthall was now restored to the speakership, and was temporarily made keeper of the new great seal (May 14). On Oct. 13 during the struggle between the two sections of the army, under John Lambert and George Monk, Lambert placed soldiers around the house and prevented the members from assembling. Lenthall's coach was stopped as he was entering Palace yard, the mace was seized and he was obliged to return. The army, however, soon returned to their allegiance to the parliament. On Dec. 24 they marched to Lenthall's house and submitted to him as speaker. On the 29th he received the thanks of parliament.

Lenthall now turned his attention to bringing about the Restoration. He had been in communication with Monk for some time, and when Monk entered London with his army Lenthall met him in front of Somerset house. Nevertheless at the Restoration he was included (June 11, 1660) by the house of commons among the 20 persons excepted from the act of indemnity for penalties not extending to life. Rlonk's testimony and intercession saved him, though he was declared incapable of holding any public office in the future. His last public act was a disgraceful one. Unmindful now of the privileges of parliament, he consented to appear as a witness against the regicide Thomas Scot, for words spoken in the house of commons while Lenthall was in the chair. It was probably after this that he was allowed to present himself at court. Lenthall died on Sept. 3, 1662. (R. B. WM.; X.)

LENTICEL, a special organ, which appears as an elongated scar on the surface of the cells of trees. and which makes provision for gaseous interchange between the internal tissues and the external air after the formation of cork. A lenticel is formed by the phellogen dividing and giving rise to a loose tissue of rounded cells through which air can pass to the tissue below. The lenticels of the stem are usually found below the stomata whose function they take up after the latter have been cast off with the epidermis. *See* PLANTS AND PLANT SCIENCE.

LENTIL, the seed of *Lens esculenta* (also known as *Ervum lens),* a small annual of the vetch tribe. The plant varies from 6 to 18 in. in height, and has many long ascending branches. The leaves are alternate, with six pairs of oblong-linear, obtuse, mucronate leaflets. The flowers, two to four in number. are of a pale blue colour, and are borne in the axils of the leaves; they are produced in June or early in July. The pods are about one-half to three-fourths inch long, broadly oblong, slightly inflated. and contain two seeds, the shape of a doubly convex lens, and about one-sixth to three-eighths inch in diameter. There are many cultivated varieties of the plant. differing in size, hairiness and colour of the leaves, flowers and seeds. The last may be more or less compressed in shape, and in colour may vary from yellow or gray to dark brown; they are also sometimes mottled or speckled. Considerable quantities of lentils are imported into the United States, where they are grown to only a limited extent in the Pacific northwest, In English commerce, French and Egyptian lentils are most common. The former are usually sold entire. and are of an ash-gray colour externally and of a yellow tint within; the latter are usually sold like split peas, without the seed coat, and consist of the reddish-yellow cotyledons, which are smaller and rounder than those of the French lentil; the seed coat when present is of a dark brown colour.

The native country of the lentil is not known. It was probably one of the first plants brought under cultivation by mankind. Lentils have been found in the lake dwellings of St. Peter's Island, Lake of Bienne, which are of the Bronze Age. The red pottage of lentils for which Esau sold his birthright (Gen xxv, 34) was apparently made from the red Egyptian lentil. This lentil is cultivated in one or other variety in India, Persia, Syria, Egypt, Nubia and north Africa, and in Europe along the Mediterranean coast and as far north as Germany, the Netherlands and France In Egypt, Syria and other eastern countries the parched seeds are sold in shops, and esteemed the best food to carry on long journeys.

The reddish variety of the lentil *(lentillon d'hiver)* is most esteemed in France on account of the superior flavour of its smaller seeds. It is sown in autumn either with a cereal crop or alone, and is cultivated chiefly in the north and east of France. The large or common variety, *lentille large blonde,* cultivated in Lorraine and at Gallardon (Eure-et-Loir), and largely in Germany, is the most productive. This kind has very small whitish flowers, two or rarely three or a footstalk, and the pods are generally one seeded, the seeds being of a whitish or cream colour, about three-eighths of an inch broad and one-eighth inch thick. A single plant produces from 100 to 150 pods, which are flattened, about three-fourths inch long and one-half inch broad. Another variety, with seeds similar in form and colour to the last, but of much smaller size, is known as the *lentillon de Mars.* It is sown in spring. This variety and the *lentille large* are both sometimes called the *lentille à la reine.* A small variety, *lentille verte du Puy,* cultivated chiefly in the departments of Haute-Loire and Cantal, is also grown as a vegetable and for forage. The Egyptian lentil was introduced into Britain in 1820. It has blue flowers. Another species of lentil, *Ervum monanthos,* is groun in France about Orléans and elsewhere under the name of *jarosse* and *jarande.* It is, according to Vilmorin, one of the best kinds of green food to grow on a poor dry sandy soil; on calcareous soil it does not succeed so nell. It is usually sown in autumn with a little rye or winter oats, at the rate of a hectolitre to a hectare.

Lentils are more especially the food of the poor in all countries where they are grown, and have often been spurned when better food could be obtained

The herbage is highly esteemed as green food for suckling ewes and all kinds of cattle (being said to increase the yield of milk), also for calves and lambs.

LENTULUS, the name of a Roman patrician family of the Cornelian gens. The word *Lentulitas* was coined by Cicero *(Ad*

Fam., iii, 7, 5) to express the attributes of a pronounced aristocrat. The following members of the family deserve mention:

PUBLIUS CORNELIUS LENTULUS, nicknamed SURA, one of the chief figures in the Catilinarian conspiracy. When accused by Sulla (to whom he had been quaestor in 81 B.C.) of having squandered the public money. he refused to render any account, but insolently held out the calf of his leg (*sura*), on which boys were punished when they made mistakes in playing ball. He was praetor in 75, governor of Sicily 74, consul 71. Being expelled from the senate with a number of others for immorality in 70, he later joined Catiline. When Catiline left Rome after Cicero's first speech *In Catilinam,* Lentulus took his place as chief of the conspirators in the city. In conjunction with C. Cornelius Cethegus. he undertook to murder Cicero and set fire to Rome. but the plot failed owing to his indiscretion in communicating it to the ambassadors to the Allobroges, then in Rome. in the hope of securing armed assistance. They betrayed him, and the conspirators were arrested and forced to confess. Lentulus was executed on Dec. 5, 63 B.C.

See Dio Cassius, xxxvii, 30; xlvi, 20; Plutarch, *Cicero,* 17; Sallust, *Catilina;* Cicero, *In Catilinam,* iii, iv; *Pro Sulla,* 2;; also CATILINE.

PUBLIUS CORNELIUS LENTULUS, called SPINTHER from his likeness to an actor of that name, supporter of Pompey. In 63 B.C., as curule aedile, he assisted Cicero in the suppression of the Catilinarian conspiracy. He was praetor in 60. and with Caesar's support got the province of Hispania Citerior in 59 and was consul in 57. He took a leading part in recalling Cicero from exile. From 56–53 Lentulus was governor of the province of Cilicia (with Cyprus) and during that time was commissioned by the senate to restore Ptolemy XI Xuletes to his kingdom (*see* PTOLEMIES). In spite of his indebtedness to Caesar. Lentulus joined the Pompeians on the outbreak of civil war (49). The generosity with which he was treated by Caesar after the capitulation of Corfinium made him hesitate, but he finally decided in favour of Pompey. After Pharsalus. Lentulus escaped to Rhodes. According to Aurelius Victor (*De vir. ill.,* lxxviii, 9, if the reading be correct), he subsequently fell into Caesar's hands and was put to death.

See Caesar, *Bell. Civ.*, i, 15–23; iii. 102; Plutarch, *Pomp.*, 49; Valerius Maximus ix, 14, 4; many letters of Cicero, especially *Ad Fam.*, i, 1–9.

LUCIUS CORNELIUS LENTULUS, surnamed CRUS or CRUSCELLO, member of the anti-Caesarian party. In 61 B.C. he was the chief accuser of P. Clodius (*q.v.*) in the affair of the festival of Bona Dea. When consul (49) he advised the rejection of all peace terms offered by Caesar, and declared that. if the senate did not at once decide upon opposing him by force of arms, he would act upon his own responsibility. He fled from Rome as soon as he heard of Caesar's advance, and crossed over to Greece. After Pharsalus, he made his way to Rhodes (but was refused admission), thence. by way of Cyprus, to Egypt. He landed at Pelusium the day after the murder of Pompey, and was seized and put to death by Ptolemy.

See Caesar, *Bell. Civ.*, i, 4; iii. 104; Plutarch, *Pompey,* 80.

LENZ, JACOB MICHAEL REINHOLD (1751–1792), German poet, was born at Sesswegen, Livonia, the son of the village pastor, on Jan. 12, 1751, and brought up at Dorpat. In 1771 he went to Strasbourg as tutor to two young German noblemen. He fell in love with Friederike Brion, daughter of the pastor of Sesenheim. famous for her attachment to Goethe, and the lyrics (the best of his poems) which he wrote to her, *Die Liebe auf dem Lande,* were long attributed to Goethe, as was for a time his first play, *Der Hofmeister, oder Vorteile der Privaterziehung* (1774). Lenz had undoubted genius, but a nervous temperament, which brought on him repeated attacks of insanity at different times. His bad and vicious manners drove him from Weimar, where he had been well received by the duke in 1776. He led a wandering life from that time though he found at last a small teaching post near Moscow, where he died insane on May 24, 1792.

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LEO, the name of 13 popes.

LEO I. SAINT, called THE GREAT: pope from 440 to 461, was a native of Rome, or, according to the *Liber Pontificalis,* of Volterra in Tuscany. In 429, when the first unmistakable reference to Pope Leo occurs, he was still only a deacon. but already a man of commanding influence; it was at his suggestion, in reference to the Nestorian heresy, that the aged Johannes Cassianus composed the *De Incarnatione Domini* in that year. About 431 Cyril of Alexandria wrote to Leo to prevent the Roman Church from lending any support to the ambitious schemes of Juvenal of Jerusalem. In 440, while Leo was in Gaul. whither he had been sent to settle some differences between Aëtius and another general named Albinus. Pope Sixtus III died. The absent archdeacon was unanimously chosen to succeed him and was consecrated on Sept. 29.

Leo brought to his office a high conception of papal authority. He was a master exponent of the *principatus,* or primacy of jurisdiction. conferred on the Roman Church. The power of the keys was a personal commission granted by Christ to St. Peter alone, and jurisdiction was passed on by St. Peter to the other apostles. In the same way, bishops derived their jurisdictional power from the pope. but the pope alone possessed the plenitude of power. As he reminded the bishop of Thessalonica, "We have entrusted you . . . with our legatine office, in such a way that you have been called to a share of our solicitude. not to possess the plenitude of power." The skill with which he co-ordinated and summarized the doctrine of his predecessors made Leo the classical source on the papal primacy, and his numerous sermons and letters became a favourite quarry for the post-Gregorian canonists.

During the early years of his pontificate. Leo received a growing number of complaints from the clergy of Gaul against the high-handed methods of St. Hilary of Arles who was arrogating to himself primatial rights over his episcopal colleagues. Leo sternly reprimanded him, and the edict of Valentinian III (445) decreed that nothing contrary to ancient usage should be done in Gaul without the authority of the bishop of Rome and that the decree of the Apostolic See should henceforth be law.

In 448, Leo received from Eutyches (*q.v.*), an archimandrite at Constantinople. a report of the revival of the Nestorian heresy in the Eastern capital and subsequently an announcement from Eutyches that he had been deposed. To deal with this matter the emperor convened a general council, which met at Ephesus (449). Leo sent three legates and a letter, later known as the *Tome,* addressed to Flavian, bishop of Constantinople, which expounded the orthodox doctrine of the two natures united in the one person of Christ. Leo's letter was not however read at the council, which, under the domination of Dioscorus, bishop of Alexandria, deposed Flavian and Eusebius. bishop of Dorylaeum. both of them opponents of Eutyches. and ended with scenes of violence. This was the so-called *Latrocinium* or "Robber Synod" (see COUNCIL). When the news reached Leo, he denounced the council, quashed its acts and requested the emperor to summon a new council to meet in Italy.

The new council, which met not in Italy but at Chalcedon in 451, vindicated Leo's doctrine by adopting the Tome as the canon of orthodoxy, but in its 28th canon it referred to an earlier canon in which the see of Constantinople claimed a status equal to that of Rome. This claim, which was based on the fact that Constantinople was the political capital of the empire, was repudiated by Leo. (See COUNCIL.)

Leo's reign coincided with the age of barbarian settlement in western Europe. In 452 Italy was invaded by Attila the Hun, who. after taking Aquileia and ravaging the north. began his march on Rome. But in his camp by the Mincio river he was met by an embassy headed by Leo in person and was persuaded by the pope to turn back, Leo was less successful. however. in saving Rome from the depredations of Gaiseric, the Vandal king. who appeared before the walls in 455. Leo died on Nov. 10, 461. He ranks as a doctor of the western church.

See P. Batiffol, *Le Siège apostolique* (Paris, 1924); A. Fliche and

V. Martin, *Histoire de l'Église,* vol. iv, *by* P. de Labriolle and others (Paris, 1937); T. G. Jalland, *The Life and Times of St. Leo the Great* (London, New York, 1941) and *The Church and the Papacy (ibid.,* 1944); Leo's works, with extensive commentary and appendices, are printed in J. P. Migne, *Patrologia latina,* vol. liv-lvi (Paris, 1846).

LEO II, SAINT, pope from 681 to 683. a Sicilian by birth. was elected *c.* Dec. 681 to succeed St. Agatho but not consecrated until Aug. 682. He wrote in approbation of the decision of the 6th ecumenical council (Constantinople, 680–681) and in condemnation of the Monothelite heresy and of Pope Honorius I (*q.v.*), whom he regarded as one who *profana proditione immaculatam fidem szcbvertere conatus est* ("by unholy betrayal tried to overthrow the immaculate faith"). In the Greek text of the letter to the emperor Constantine IV in which the phrase occurs the milder expression παρεχώρησε *(subwerti permisit,* "allowed to be overthrown") is used; and there are other documents indicating that this formula should be regarded as expressing the true meaning of Leo. It was during Leo's pontificate that the dependence of the see of Ravenna upon that of Rome was settled by imperial edict. He died on July 3. 683.

LEO III, SAINT, pope from 795 to 816, a native of Rome, was elected to succeed Adrian I on Dec. 26, 795, and consecrated next day. His first act was to send to Charlemagne, as *patricius,* the standard of Rome together with the keys of the sepulchre of St. Peter and of the city. On April 25, 799. Leo was attacked while riding in a procession through the city; the object of his assailants, incited by Paschalis and Campulus. nephews of Adrian I. was, by depriving him of his eyes and tongue, to disqualify him for the papal office. This barbarous intention was not executed, but Leo sought the help of Winichis, the Frankish duke of Spoleto. Having vainly requested the presence of Charlemagne in Rome, Leo crossed the Alps to meet him at Paderborn; the precise nature of the discussions which took place is not known, but Leo was safely conducted back to Rome by a Frankish escort in Nov. 799. Charlemagne followed him thither next year and cited his enemies to appear; and on Dec. 23, 800, the pope appeared before the king and purged himself on oath of the charges brought against him. Whatever Leo had lost by this humiliation, he regained by his initiative two days later when, on Christmas day, he placed the imperial crown on Charlemagne's head. Taking advantage of a vacancy in the eastern empire, the pope raised the Frankish king from *patricius* of the Romans to universal emperor and. in so doing, established the legal precedent that the pope alone could confer the imperial crown. It is clear that this move had been prepared in advance, and it is significant that already in a document of April 798 the pope had substituted the regnal years of Charlemagne for those of the eastern emperor in the dating clause. In 809, approached by the theologians of Charlemagne. Leo confirmed the dogmatic correctness of the *Filioque* clause introduced into the Nicene creed, although, in the interests of peace with the Greeks, he urged that the creed should not be chanted in the public liturgy. Leo died in June 816.

LEO IV, SAINT, pope from 847 to 855, a Roman by birth, was consecrated as successor to Sergius II on April 10, 847 His pontificate was chiefly distinguished by his efforts to repair the damage done by the Saracens and to protect the Vatican area from future attacks. He built and fortified the suburb on the right bank of the Tiber known on his account as "the Leonine city." The newly constructed walls were solemnly dedicated on June 27, 852. He held three synods, one of them (in 8j0) distinguished by the presence of the emperor Lothair I's son Louis. who was crowned emperor as Louis II on the occasion. Leo died on July 17, 855.

LEO V, pope for about two months late in the summer of 903, was a native of Ardea. Elected to succeed Benedict IV, he was overthrown by Christophorus. who took his place.

LEO VI, pope in 928, a Roman. was elected to succeed John X (probably in June or slightly earlier) and reigned until his death seven months and a few days later. He confirmed his predecessor's decisions on the Dalmatian hierarchy.

LEO VII, pope from 936 to 939. a Roman, was consecrated successor to John XI in Jan. 936. An extant letter of his to Frederick, archbishop of Mainz, urges the restoration of ecclesiastical discipline in Germany. He died in July 939.

LEO VIII, pope or antipope from 963 to 96j, a Roman by birth, held the lay office of *protoscriniarius* when he was elected to the papal chair at the instance of Otto I, the Great, by the Roman synod which deposed John XII on Dec. 4, 963. In Feb. 964, the emperor having withdrawn from the city, Leo fled and was deposed by a synod presided over by John XII. On the sudden death of John, the people chose Benedict V as his successor; but Otto laid siege to the city and compelled their acceptance of Leo (June 964). It seems that at his nomination he took an oath of fealty to the emperor and that this concession formed the basis of the so-called Ottonian Privilege of 963. Leo died about March 96j.

LEO IX, SAINT (Bruno), pope from 1049 to 1054 was born at Egisheim in Alsace on June 21, 1002; through his father he was related to the emperor Conrad II. He was educated at Toul, where he became canon (1017) and then bishop (1026); he rendered political services to Conrad II and to Henry III (notably in connection with his marriage) and zealously promoted the rule of the order of Cluny. On the death of Damasus II, Bruno, with the concurrence of the emperor and of the Roman delegates in Dec. 1048, was proposed as pope by an assembly at Worms; he stipulated, however, that he should proceed to Rome and be canonically elected by the voice of clergy and people. He arrived in pilgrim garb in Rome, and at his consecration (Feb. 12, 1049) assumed the name of Leo IX. At the Easter synod of 1049 the celibacy of the clergy (down to the rank of subdeacon) was anew enjoined, and Leo pronounced against every kind of simony. The rest of the year was spent in a progress through Italy, Germany and France. After presiding over a Pentecostal synod at Pavia, he joined the emperor Henry III in Saxony and accompanied him to Cologne and to Aachen. In October he held two more synods, one, for the French clergy, at Reims, the other, attended not only by Germans but also by representatives of the French and Italian clergy and of the eastern emperor, at Mainz; at both of these simony and violations of clerical celibacy were again the chief matters treated. Among other synods were those in Rome (at Easter, annually, 1050–53), at Sipontum in the Byzantine south of Italy (April 1050) and at Vercelli, where Berengarius was condemned (Sept. 1050). In 1053, however, leading an armed expedition against the Normans of the south, Leo was defeated on the Fortore river on June 18 and taken captive to Benevento. Returning to Rome in the following March, he died on April 19, 1054.

The first year of Leo's pontificate was an *annus mirabilis* in which the papacy assumed the leadership of the movement for ecclesiastical reform. Leo gave a fresh stimulus to canonists to recover the *jus antiquum* of the church, and the important collection of 74 titles was a result. He brought with him to Rome a group of distinguished men, several of whom, like Humbert of Moyenmoutier and Hildebrand (later Pope Gregory VII), were to be the leaders of the next generation.

See E. Martin, *Saint Lion IX* (Paris, 1904); *A.* Fliche, *La Réforme grégorienne,* vol. i (Louvain, 1924); P. Fournier, "Le Premier Manuel canonique de la réforme du XIe siècle," *Mélanges d'archéologie et d'histoire publiées par l'École française de Rome* vol. xiv *(1894).*

LEO X (Giovanni de' Medici), pope from 1513 to 1521, was the second son of Lorenzo de' Medici, called the Magnificent, and was born at Florence on Dec. 11, 1475. He received the tonsure at the age of seven and was soon loaded with rich benefices and preferments. Innocent VIII named him cardinal-deacon of Sta. Maria in Dominica in March 1489. He received a careful education at Lorenzo's court under Angelo Poliziano (Politian), Giovanni Pico della Mirandola, Marsilio Ficino and Bernardo Dovizio da Bibbiena. From 1489 to 1491 he studied theology and canon law at Pisa. In March 1492 he was formally admitted into the Sacred College and settled in Rome. The death of Lorenzo recalled the 16-year-old cardinal to Florence. He participated in the conclave on the death of Innocent VIII in July 1492 and opposed the election of Cardinal Borgia. He lived with his elder brother Pietro at Florence throughout the agitation of Girolamo Savonarola and the invasion under Charles VIII of France, until

the Medici were expelled in Nov. 1494. Giovanni then traveled in Germany. in the Netherlands and in France. In May 1500 he returned to Rome, where he devoted himself to art and literature. On the death of Pietro de' Medici in 1 jo3 Giovanni became head of his family. On Oct. 1, 1511, he was appointed papal legate of Bologna and the Romagna; and when the Florentine republic declared in favour of the schismatic Pisan council Julius II sent him against Florence at the head of the papal army. Taken prisoner by the French at Ravenna (April 1512), he managed to escape. A bloodless revolution permitted the return of the hledici in Sept. 1512. Though his younger brother Giuliano became the nominal head of the republic, the cardinal was the real ruler. Julius II died in Feb. 1513, and the conclave, after a stormy seven days' session, united on Cardinal de' Medici as the candidate of the younger cardinals (March 11). He was ordained to the priesthood on March 15, consecrated bishop on March 17 and enthroned with the name Leo X on March 19.

Many problems confronted Leo X on his accession. He had to preserve the papal conquests which he had inherited from Alexander VI and Julius II; to minimize foreign influence. whether French, Spanish or German. in Italy; to put an end to the Pisan schism; and to settle the other troubles incident to the French invasion. Other outstanding problems were the restoration of the French church to Catholic unity and the settlement of the wranglings of the German humanists.

As Louis XII of France, in renewed alliance with Venice (March 23, 1513), was attempting to regain the duchy of Milan, the pope, after fruitless endeavours to maintain peace, joined the league of Mechlin on April 5, 1513, with the emperor Maximilian I, Ferdinand of Spain and Henry VIII of England. The French and the Venetians were at first successful, but on June 6 the French were defeated at Novara. The Venetians continued the struggle until October. On Dec. 19 the 8th session of the 5th Lateran council (the 6th session of which Leo had opened in April) ratified the peace with Louis XII and registered the conclusion of the Pisan schism. While the council was planning a crusade and considering the reform of the clergy, a new crisis occurred between the pope and the king of France. Francis I, who succeeded Louis XII on Jan. 1, 151j, was intent on recovering Milan and Naples. Leo formed a new league with the emperor and Ferdinand of Spain, and, to ensure English support, made Thomas Wolsey a cardinal. Francis entered Italy in August and won the battle of Marignan (Sept. 14).

The pope in October signed an agreement binding him to withdraw his troops from Parma and Piacenza, on condition of French protection of the Medici in Florence. He held a secret conference with Francis at Bologna in Dec. 1515. The ostensible subjects under consideration were the establishment of peace between France, Venice and the empire, with a view to an expedition against the Turks, and the ecclesiastical affairs of France.

During these two or three years of incessant intrigue and warfare the Lateran council was seriously hampered. Its three main objects, the peace of Christendom, the crusade and the reform of the church demanded general agreement among the powers, which was lacking. Its most important achievements were the registration at its 11th session (Dec. 19, 1j16) of the abolition of the pragmatic sanction of Bourges (1438) and the confirmation of the concordat between Leo X and Francis I, which was to regulate the relations between the French church and the Holy See until the Revolution. Leo closed the council on March 16, 1517. It had ended the schism, ratified the censorship of books introduced by Alexander VI and imposed tithes for a war against the Turks.

Leo had practised nepotism from the beginning. His cousin Giulio (later Clement VII), was made archbishop of Florence, cardinal and vice-chancellor of the Holy See. Leo had named his younger brother Giuliano and his nephew Lorenzo as Roman patricians; he had placed Lorenzo in charge of Florence; he married Giuliano to Philiberta of Savoy and intended to carve out a kingdom for him in central Italy. After the death of Giuliano in March 1j16, Leo transferred his ambitions to Lorenzo and succeeded in dispossessing Francesco Maria della Rovere of the duchy of Urbino and installing Lorenzo in his place (Aug. 1516). Francesco Maria, however, returned with an army in Jan. 1517. Leo then appealed to Henry VIII of England for a subsidy, in return for which he entered the English league with Spain and the empire against France. The war of Urbino lasted until Sept. 1517 and ended with the triumph of Lorenzo; but it increased brigandage and anarchy in the States of the Church, hindered the preparations for a crusade and wrecked the papal finances. Leo meanwhile took advantage of a plot by certain cardinals to poison him: he executed one cardinal, imprisoned several others and made a radical change in the Sacred College. On July 3, 1517, he published the names of 31 new cardinals, among whom were Lorenzo Campeggio, Giambattista Pallavicini. Adrian of Utrecht, Cajetan (Tommaso de Vio), Cristoforo Numai and Egidio Canisio.

Leo meanwhile was planning a crusade to prevent the advance of Seiim I. A truce was to be proclaimed throughout Christendom; the pope was to be the arbiter of disputes; the emperor and the king of France were to lead the army; England. Spain and Portugal were to furnish the fleet; and the combined forces were to be directed against Constantinople. Papal diplomacy in the interests of peace failed, however: Cardinal Wolsey made England, not the pope. the arbiter between France and the empire; and much of the money collected for the crusade from tithes and indulgences was spent in other ways. In 1519 Hungary concluded a three years' truce with Selim I, but the succeeding sultan, Soliman I, the hlagnificent. renewed the war in June 1521 and captured the citadel of Belgrade. Leo treated the Uniate Greeks with great loyalty and. by Bull of May 18, 1521, forbade Latin clergy to celebrate mass in Greek churches and Latin bishops to ordain Greek clergy. These provisions were later strengthened by Clement VII and by Paul III and went far to settle the chronic disputes between the Latins and Uniate Greeks.

Leo was disturbed throughout his pontificate by heresy and schism. In the dispute between Johann Reuchlin (*q.v.*) and Johann Pfefferkorn, first referred to the pope in Sept. 1513, Leo continually postponed making a decision until the appearance of the *Epistolae obscurorum virorum* (1515–17) had so embittered relations between Rome and the German humanists that at last, in June 1520, he gave his verdict against Reuchlin. Of more consequence was the effect of the extensive grant of indulgences which Leo authorized to secure funds for the crusade and for the rebuilding of St. Peter's at Rome. Against the attendant abuses the Augustinian monk Martin Luther (*q.v.*), on Oct. 31, 1517, published his 95 theses, which were the signal for widespread revolt against the church. More than three years of fruitless negotiation and dispute passed before Leo formally excommunicated Luther by Bull of Jan. 3, 1521, and directed the emperor to take measures against heresy. (It was for his book against Luther on the seven sacraments that Leo conferred on Henry VIII of England the title "Defender of the Faith" by Bull of Oct. 11, 1521.) In Scandinavia, meanwhile, Christian II of Denmark had in 1520 invited Lutheran theologians to Copenhagen and proceeded to abolish the jurisdiction of Rome; but when Charles V put Luther under the ban of the empire, Christian changed his mind and received absolution from Leo's nuncio (1522).

That Leo did not proceed more actively against heresy and schism in northern Europe is partly explained by political complications and by his own preoccupation with schemes of papal and Medicean aggrandizement in Italy. The death of the emperor Maximilian on Jan. 12, 1519, had seriously affected the situation. Leo allowed it to appear at first that he favoured Francis I while really working for the election of some minor German prince. He finally accepted Charles I of Spain as inevitable, and the election of him as Charles V (June 28, 1519) revealed Leo's desertion of his French alliance, a step facilitated by the death of his nephew Lorenzo and his French wife. Leo desired to unite Ferrara, Parma and Piacenza to the States of the Church. An attempt in Jan. 1520 to seize Ferrara failed, and in May 1521 a treaty of alliance against France was signed at Rome between pope and emperor. Milan and Genoa were to be restored as vassals of the empire, and Parma, Piacenza and Ferrara were to be given to the church. Charles took Florence and the Medici family under his protection and promised to punish all enemies of the Catholic faith. Leo

agreed to invest Charles with Naples, to crown him emperor and to aid in a war against Venice. Henry VIII announced his adherence to the league in August. Francis I had already begun war with Charles of Navarre, and in Italy, too. the French made the first hostile movement (June 23. 1521). Leo lived to hear of the capture of Milan from the French and of the occupation by papal troops of the long-coveted provinces (Nov. 1521). He died of a sudden illness at midnight on Dec. 1–2, 1521.

Leo was friendly with King Emmanuel of Portugal on account of the latter's missionary enterprises in Asia and Africa. His concordat with Florence (1516) guaranteed the free election of the clergy in that city. His constitution of March 1, 1519, condemned the king of Spain's claim to refuse the publication of papal bulls. He maintained close relations with Poland because of the Turkish advance and the Polish contest with the Teutonic Knights. His bull of July 1. 1519, which regulated the discipline of the Polish Church. was later transformed into a concordat by Clement VII. Leo showed special favours to the Jews and permitted them to erect a Hebrew printing press at Rome. He approved the formation of the Oratory of Divine Love, a group of pious men at Rome which later became the Theatine Order, and he canonized Francesco di Paola (1519).

Leo X was a patron of learning and made Rome the centre of European culture. While yet a cardinal, he had restored the church of Sta. Maria in Dominica after Raphael's designs; and as pope he built S. Giovanni on the Via Giulia after designs by Jacopo Sansovino and pressed forward the work on St. Peter's and the Vatican under Raphael and Agostino Chigi. His constitution of Nov. 5, 1513, reformed the Roman university. which had been neglected by Julius II; although it never attained to the importance of Padua or Bologna, it nevertheless possessed in 1514 an excellent faculty of 88 professors. Leo called Joannes Lascaris to Rome to give instruction in Greek and established a Greek printing press from which the first Greek book printed in Rome appeared in 1515. He made Raphael custodian of the classical antiquities of Rome and the vicinity. Pietro Bembo, Jacopo Sadoleto and Bernardo Ascolti were papal secretaries. Poets and literati were bishops, or papal scriptors or abbreviators, or in other papal employ. Leo's lavish expenditure exhausted within two years the hard savings of Julius II. To fill the treasury he created new offices and sold them. He sold cardinals' hats. He sold membership in the "Knights of Peter." He borrowed large sums from bankers, curials. princes and Jews.

In spite of his worldliness. Leo was exact in religious observance: but he failed to understand the spiritual needs of his time. He failed entirely in his general policy of expelling foreigners from Italy. of restoring peace throughout Europe and of prosecuting war against the Turks. He failed to recognize the need of reform within the church and the dangers which threatened the papal monarchy. He was zealous in establishing the political power of the Holy See; he made it unquestionably supreme in Italy; he successfully restored the papal power in France; and he secured a prominent place in the history of culture.

BIBLIOGRAPHY.—The life of Leo X mas written shortly after his death by Paolo Giovio, bishop of Nocera, who had known him intimately. Other materials for the biography are to be found in the incomplete *Regesta* ed. by Joseph Cardinal Hergenröther (Freiburg-i.-B., 1884 ff.); in *Il Diario di Leone X dai volumi manoscritti degli archivi Vaticani della S. Sede con note di M. Armellini* (Rome, 1884); and in "Documenti risguardanti Giovanni de' Medici e il pontifice Leone X," appendix to vol. i of the *Archivio storico Italiano* (Florence, 1842).

See R. Aubenas and R. Ricard, *L'Église et la Renaissance* (Paris,, 1951), being vol. xv of A. Fliche and V. Martin, *Histoire de l'Église;* L. Pastor. *History of the Popes,* vol. 7–8, Eng. trans. (London, 1908); M. Creighton, *History of the Papacy,* vol. vi (London, 1901); H. M. Vauphan, *The Medici Popes* (London, 1908); G. B. Picotti, *La Giovinezza di Leone X* (Milan, 1928); E. Rodocanachi, *Le Pontificat de Léon X* (Paris, 1930); D. Gnoli, La *Ronza di Leone X* (Milan, 1938).

(X.)

LEO XI (Alessandro de' Medici) pope in 1605, was born at Florence on June 2, 1535. Having acted as Cosimo de' Medici's ambassador in Rome from 1569, he was made bishop of Pistoia in 1573. archbishop of Florence in 1574 and cardinal in 1583. Elected on April 1, 1605, as successor to Clement VIII, he died on April 27. He was entirely pro-French in sympathy.

LEO XII (Annibale Sermattei della Genga), pope from 1823 to 1829, was born near Spoleto on Xug. 22. 1760. Educated at the Accademia dei Nobili Ecclesiastici at Rome. he was ordained priest in 1783. He shortly became private secretary to Pius VI, who in 1793 created him titular archbishop of Tyre and sent him to Lucerne as nuncio. In 1794 he was transferred to the nunciature at Cologne, and subsequently he was entrusted with missions to the courts of Dresden, Vienna, Munich and Württemberg. When the French annexed the papal states in 1808, he was treated as a state prisoner and lived at the abbey of Wonticelli. On the downfall of Napoleon; the archbishop was sent on a mission to Paris (1814). In 1816 Pius VII created him cardinal and appointed him to the see of Sinigaglia (which he resigned in 1818); and in 1820 he was made vicar general of Rome.

In the conclave of 1823. Della Genga became the candidate of the *Zelanti* and was elected pope on Sept. 28, against the opposition of Austria. He was expected to reverse the conciliatory policy of Pius VII, but, meeting with determined opposition from the powers, his foreign policy began instead to follow the lines laid down by Ercole Consalvi. He negotiated concordats advantageous to the papacy with Hanover (1824) and with the Netherlands (1827); and an agreement with the sultan over Armenia was finally concluded just after his death in 1829. He condemned indifferentism in the encyclical *Ubi primum* (May 5, 1824) and freemasonry in the constitution *Quo graviora mala* (May 13, 1825). After some hesitation lest the king of Spain be offended, formal recognition was granted to the re-organized diocesan arrangements in the now independent Latin-American republics (May 21, 1827). He revived the practice of holding jubilees in 1825, to the disapproval of Metternich. In the papal states, he pursued a repressive policy while endeavouring, not altogether successfully, to re-organize the financial administration. He died on Feb. 10, 1829.

See A. F. Artaud de Montor, *Histoire* du *pape Lion XII,* 2 vol. (Paris, 1843); J. Schmidlin, *Papstgeschichte der neuesten Zeit,* vol. i (Munich, 1933; Fr. trans., Paris, Lyons, 1940).

LEO XIII (Vincenzo Gioacchino Pecci), pope from 1878 to 1903, was born at Carpineto on March 2, 1810. His family was Sienese in origin, and his father, Col. Lodovico Pecci, had served under Napoleon. His mother, Anna Prosperi. is said to have been a descendant of Rienzi and was a member of the third order of St. Francis. He and his elder brother Giuseppe were educated by the Jesuits at Viterbo and in Rome. He was ordained priest on Dec. 31, 1837, and a few weeks later was made apostolic delegate of Benevento. In 1831 he was appointed delegate of Perugia, at that time a centre of antipapal secret societies. There he obtained a reputation as a social and municipal reformer. Appointed nuncio to Brussels in Jan. 1843, he was consecrated archbishop of Damiata in *partibus infidelium* on Feb. 19. During his three years' residence at Brussels he was occupied with the education controversy then raging, and he mediated between the Jesuits and the Catholic University of Louvain. In Jan. 1846 he was made bishop of Perugia, retaining his archiepiscopal rank. On Dec. 19, 1853, Pius IX made him cardinal priest of S. Crisogono. Throughout his 32-year episcopate in Italy, Pecci built and restored many churches, striving to elevate the intellectual as well as the spiritual tone of his clergy and showing in his pastoral letters an unusual regard for learning and for social reform.

His position in Italy was similar to that of F. Dupanloup in France; and, as but a moderate supporter of the policy enunciated in the *Syllabus,* he was not altogether *persona grata* to Pius IX. Yet he was resolute in his protests against the loss of the pope's temporal power in 1870, the confiscation of the property of the religious orders and the law of civil marriage established by the Italian government. In 1877 Pius IX appointed him camerlengo of the Roman Church, thus bringing him back to the Vatican.

The death of Pius IX (Feb. 7, 1878) occasioned the first papal election since the loss of the temporal power. Fearful of interference by the Italian government. the cardinals hastened to come to a decision, and it is not surprising that. at the third ballot on Feb. 20, they chose one so senior as Pecci, although he was almost

unknown outside Italy. He was already almost 68 years old, but once again the man elected almost as *locum tenens* outlived his supporters, and a reign of 25 years permitted Leo XIII to impress indelibly upon the church his own conception of its role in society. Pius IX had subdued the protagonists of liberalism within the church; Leo XIII turned his attention to its supporters outside. There not mere denunciation was required but a positive answer to the moral problems raised by a new age. Theology had to be reconciled with science as faith had once had to be accommodated with reason. Not unnaturally Leo turned for his model to St. Thomas Aquinas. The new policy was outlined in one of the first of a long series of encyclicals, *Aeterni Patris* (Aug. 4, 1879), and developed through the establishment of an academy at Rome bearing the great schoolman's name and through the gift of about £12,000 toward a new edition of the *Summa Theologiae*. Leo was not afraid of the consequences of learning once scholastic discipline had been re-established. On Aug. 18, 1883, the Vatican archives and library were thrown open to research by qualified historians in the belief that the church would not suffer by the publication of documents. Leo was himself a man of literary taste and culture, familiar with the classics. a facile writer of Latin verses as well as of Ciceronian prose and, above all, anxious that the clergy should unite the humanities with their theological studies. He believed firmly in the value of education at all levels and had while at Perugia insisted to Pius IX that only by winning popular support through the establishment of Catholic education and a good Catholic press could the church hope to recover possession of the temporal states. He personally encouraged the study of astronomy and natural science at the Vatican and, in the encyclical *Providentissimus Deus* (Nov. 18, 1893), advocated critical and scholarly biblical studies.

Yet such measures as these constituted a long-term policy. Immediately Leo was confronted with hostile governments imbued with the secular philosophies that he desired so ardently to confound. The anticlerical movement in Germany, known as the *Kulturkampf,* was only one of many such movements aiming to restrict ecclesiastical authority, especially that of the religious orders, and to secularize education. In the main, Leo adopted conciliatory methods, and he achieved some notable successes. The Catholic Centre party in Germany proved the effectiveness of political action in support of the church, and in Nov. 1881 the Prussian government announced its decision to re-appoint an envoy to the Vatican. with which diplomatic relations had been severed in 1874. Bismarck began to see in the Centre party a pussible ally against socialism, and the worst of the anticlerical legislation was repealed in 1886 and in 1887. Similarly in Belgium the Catholics were returned to power by the elections of 1884 and were able to secure the effective resumption of diplomatic relations in 1885. Leo gave his approval to such political action by his characteristic method of issuing encyclicals. *Immortale Dei* (Nov. 1, 1885) still denounced democracy as incompatible with the authority of the church but also insisted that the church did not thus condemn absolutely that form of civil government: with proper safeguards it could be utilized by the church for its work as readily as any other. *Libertas* (June 20, 1888) went farther by asserting that personal freedom, though not private licence. was a legitimate political goal and one! moreover: which could be most successfully pursued through adherence to Catholic Christianity. Thus Leo hoped to reconcile the church with the predominant liberalism of his day.

Outside Italy itself, his task mas perhaps most difficult in France! where the church was identified with the disintegrating royalist cause. Anticlericalism became a hallmark of the Third Republic after 1879: education became almost completely secular at all levels. divorce was widely granted by the state, and civil marriage became compulsory. But Leo was determined to be conciliatory and considered that the first step toward better relations must be a change of heart among the French clergy. In 1892, he appealed to them to offer due allegiance to the republic and to cease their exclusive attachment to the royalists. Unfortunately this appeal was ansmered by only a minority; the *ralliés,* and after Leo's death both France and the papacy gave up the attempt to reach a settlement! so that unmitigated anticlericalism triumphed for a generation.

In Italy alone Leo adopted a different policy. Like his predecessor, he considered that, whatever the other merits of a united Italy, the papacy could not continue to exist as an independent institution without the protection of a temporal power. At the start of his reign he still hoped for its recovery through the combined action of the powers. and it was partly for this reason that he pursued a conciliatory policy. particularly with France. By his refusal to regard the Italian government as anything but a usurper. he won increased respect for papal independence but saw anticlericalism flourish in Italy as a consequence. Leo tempered his policy toward the middle of his reign by allowing Italians to enter municipal. but not national. politics; Italian Catholics responded with enthusiasm. and the embargo upon collective action in a national political party had to be renewed in a letter to the Italian bishops of Jan. 1902.

Elsewhere Leo's diplomatic ways reaped their reward. In perhaps the most vital field of conflict. the secularization of education, the anticlerical trend was reversed in most countries after the early 1880s. Germany. Austria-Hungary, Belgium and the Netherlands all began or expanded the subsidizing of denominational schools. The last decade of the century saw a revival of Catholic strength in Protestant countries, particularly in the United States. One aspect of the general Catholic revival of this period was the endeavour by Leo to promote Christian reunion. He approached both Anglicans and Orthodox, but the encyclical *Satis cognitum* (June 29, 1896) produced no satisfactory results. Its appeal to Anglicans was counteracted when the bull *Apostolicae curae* (Sept. 13, 1896), formulating the decisions of a commission of inquiry. declared that their orders were invalid, and the movement for reunion lapsed. Another aspect was the expansion of missionary activities, and their scope mas impressively illustrated in the exhibition held at Rome in the Jubilee year of 1900.

Leo, however. was more than a diplomat. He had always felt a real concern for the welfare of the lower orders of society and was convinced that the strength of the secular philosophies of his day lay in their almost exclusive monopoly of the study of social questions. Since the 1840s not only intellectuals but also the mass of the populace had been drifting away from the church. The encyclical *Rerum novarum* (May 15, 1891), therefore, while it represented in many respects a sensational departure from traditional policies, was well-timed. In it! though he re-asserted the rights of the family and of private property against the encroachments of the state, Leo went on to say that "labour is not a commodity" and so the state is within its rights in endeavouring to prevent its exploitation as it is in safeguarding property and religion. He claimed that it is everyone's duty to ensure that labour receives its just reward, and he specifically approved of legislation designed to effect this, as well as of trade unions and co-operative organizations. Though it would be too much to say that Leo succeeded in inculcating a new spirit into the higher ranks of Roman Catholic society (all too often employers continued to behave primarily as capitalists and only secondarily as Catholics)! nevertheless at least in some countries the drift of the working classes into irreligion was stemmed. The Catholic parties already existing in Germany and in Belgium were expanded and new ones in other countries were established! all on the principles laid down in *Rerum novarum*. Beside them Christian trade unions were established, and parties and unions together came to exercise great influence in all Catholic countries north of the Alps and the Pyrenees. Circumstances favoured them, as the spread of Marxist ideas over Europe had created alarm! so that any rival to Marxism among the working classes was welcomed in ruling circles.

The achievements of Leo's pontificate contrast markedly with the series of crises suffered by his predecessor. Leo was a much abler man than Pius IX, and under him the church acquired a prestige unknown since the middle ages. Yet his achievements were built upon the foundations laid by Pius, who, though he left the papacy politically weak. had raised its spiritual powers to an unprecedented degree, so that it had no rivals within the church.

As it was the possession of these spiritual powers that enabled Leo to re-establish the papacy's international prestige. so his achievement must not be isolated from Pius IX's. Even so, it remains a vital and necessary one.

Leo died on July 20, 1903, after celebrating his jubilee in St. Peter's the previous March.

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(I F. B.)

LEO I., variously surnamed THRAX, MAGNUS and MAKELLES, emperor of the East, 457–474, was born in Thrace about 400. From his position as military tribune he was raised to the throne by the soldiery and recognized both by senate and clergy; his coronation by the patriarch of Constantinople is said to have been the earliest instance of such a ceremony. Leo owed his elevation mainly to Aspar, the commander of the guards, who was debarred by his Arianism from becoming emperor in his own person, but hoped to exercise a virtual autocracy through his former steward and dependant. But Leo, following the traditions of his predecessor Marcian, set himself to curtail the domination of the great nobles and repeatedly acted in defiance of Aspar. He vigorously suppressed the Eutychian heresy in Egypt, and by exchanging his Germanic bodyguard for Isaurians removed the chief basis of Aspar's power. With the help of his generals Anthemius and Anagastus, he repelled invasions of the Huns into Dacia (466 and 468).

In 467 Leo had Anthemius elected emperor of the West, and in concert with him equipped an armament of more than 1,100 ships and 100,000 men against the pirate empire of the Vandals in Africa. Through the remissness of Leo's brother-in-law Basiliscus, who commanded the expedition, the fleet was surprised by the Vandal king, Genseric, and half of its vessels sunk or burnt (468). This failure was made a pretext by Leo for killing Aspar as a traitor (471), and Aspar's murder served the Goths in turn as an excuse for ravaging Thrace up to the walls of the capital. In 473 the emperor associated with himself his infant grandson, LEO II., who, however, survived him by only a few months. His surnames Magnus (Great) and Makelles (butcher) respectively reflect the attitude of the Orthodox and the Arians towards his religious policy.

See E. Gibbon, *The Decline and Fall of the Roman Empire* (ed. Bury, 1896), iv. 29–37; J. B. Bury, *The Later Roman Empire* (1889), i. 227–233.

LEO **III.** (*c.* 680–740), called THE ISAURIAN, emperor of the East, 717–740. Born about 680 in the Syrian province of Commagene, he rose to distinction in the military service, and under Anastasius II. was invested with the command of the eastern army. In 717 he revolted against the usurper Theodosius III. and, marching upon Constantinople, was elected emperor in his stead. The first year of Leo's reign saw a memorable siege of his capital by the Saracens, who had taken advantage of the civil discord in the Roman empire to bring up a force of 80,000 men to the Bosporus. By his stubborn defence the new ruler wore out the invaders who, after a twelve months' investment, withdrew their forces. An important factor in the victory of the Romans was their use of Greek fire. Having thus preserved the empire from extinction, Leo proceeded to consolidate its administration, which in the previous years of anarchy had become completely disorganized. He secured its frontiers by inviting Slavonic settlers into the depopulated districts and by restoring the army to efficiency; when the Arabs renewed their invasions in 726 and 739 they were decisively beaten on both occasions by the imperial forces.

His civil reforms include the abolition of the system of prepaying taxes which had weighed heavily upon the wealthier proprietors, the elevation of the serfs into a class of free tenants, the remodelling of family and of maritime law. These measures, which were embodied in a new code published in 740, met with some opposition on the part of the nobles and higher clergy. But Leo's most striking legislative reforms dealt with religious matters. After an apparently successful attempt to enforce the baptism of all Jews and Montanists in his realm (722), he issued a series of edicts against the worship of images (726–729). This prohibition of a custom which had undoubtedly given rise to grave abuses seems to have been inspired by a genuine desire to improve public morality, and received the support of the official aristocracy and a section of the clergy. But a majority of the theologians and all the monks opposed these measures with uncompromising hostility, and in the western parts of the empire the people refused to obey the edict. A revolt which broke out in Greece, mainly on religious grounds, was crushed by the imperial fleet (727), and two years later, by deposing the patriarch of Constantinople, Leo suppressed the overt opposition of the capital.

In Italy the defiant attitude of Popes Gregory II. and III. on behalf of image-worship led to a fierce quarrel with the emperor. The former summoned councils in Rome to anathematize and excommunicate the image-breakers (730, 732); Leo retaliated by transferring southern Italy and Greece from the papal diocese to that of the patriarch. The struggle was accompanied by an armed outbreak in the exarchate of Ravenna (726), which Leo finally endeavoured to subdue by means of a large fleet. But the destruction of the armament by a storm decided the issue against him; his south Italian subjects successfully defied his religious edicts, and the province of Ravenna became detached from the empire. In spite of this partial failure Leo must be reckoned as one of the greatest of the later Roman emperors. By his resolute stand against the Saracens he delivered all eastern Europe from a great danger, and by his thorough-going reforms he not only saved the empire from collapse, but invested it with a stability which enabled it to survive all further shocks for a space of five centuries.

See E. Gibbon, *The Decline and Fall of the Roman Empire* (ed. Bury, 1896), v. 185 *seq.*, 251 *seq.* and appendices, vi. 6–12; J. B. Bury, *The Later Roman Empire* (1889), ii. 401–449; K. Schenk, *Kaiser Leo III.* (Halle, 1880), and in *Byzantinische Zeitschrift* (1896), v. 257–301; T. Hodgkin, *Italy and her Invaders* (1892, etc.), bk. vii., chs. 11, 12. *See* also ICONOCLASTS.

LEO **IV.,** called CHAZAR, succeeded his father, Constantine V., as emperor of the East in 775. In 776 he associated his young son, Constantine, with himself in the empire, and suppressed a rising led by his five step-brothers which broke out as a result of this proceeding. Leo was largely under the influence of his wife Irene (*q.v.*), and when he died in 780 he left her as the guardian of his successor, Constantine VI.

LEO V., surnamed THE ARMENIAN, emperor of the East, 813–820, was a distinguished general of Nicephorus I. and Michael I. After rendering good service on behalf of the latter in a war with the Arabs (812), he was summoned in 813 to co-operate in a campaign against the Bulgarians. Taking advantage of the disaffection prevalent among the troops, he left Michael in the lurch at the battle of Versinikia and subsequently led a successful revolution against him. Leo justified his usurpation by repeatedly defeating the Bulgarians who had been contemplating the siege of Constantinople (814–817). By his vigorous measures of repression against the Paulicians and image-worshippers he roused considerable opposition, and after a conspiracy under his friend Michael Psellus had been foiled by the imprisonment of its leader, he was assassinated in the palace chapel on Christmas Eve, 820, by his partisans.

See E. Gibbon, *The Decline and Fall of the Roman Empire* (ed. Bury, 1896), v. 193–195; Bury, *Eastern Roman Empire* (1912), p. 43–76; and *English Historical Review*, XXV. (1910) 276 *sqq.*

LEO **VI.,** surnamed THE WISE and THE PHILOSOPHER, Byzantine emperor, 886–911. He was the son of Eudocia, wife of Basil I., but in fact his father was Michael III. The chief event of his reign was the capture of Thessalonica (904) by Mohammedan pirates (described in *The Capture of Thessalonica* by John Cameniata) under the renegade Leo of Tripolis. In Sicily and Lower Italy the imperial arms were unsuccessful, and the Bulgarian Symeon, who assumed the title of "Czar of the Bulgarians and autocrat of the Romaei" secured the independence of his church by the establishment of a patriarchate. But though Gibbon may be right in calling his surname "absurd," he did lasting work

in reforming the civil administration of the empire. His works include seventeen *Oracula,* in iambic verse, on the destinies of future emperors and patriarchs of Constantinople; thirty-three *Orations,* chiefly on theological subjects (such as church festivals); *Basilica,* the completion of the digest of the laws of Justinian, begun by Basil I., the father of Leo; some epigrams in the Greek *Anthology;* an iambic lament on the melancholy condition of the empire; and some palindromic verses, curiously called *καρκίνο ι* (crabs). The treatise on military tactics, attributed to him, is possibly by Leo III., the Isaurian.

Complete edition in Migne, *Patrologia Graeca,* cvii.; for the literature of individual works *see* C. Krumbacher, *Geschichte der bysantinischen Literatur* (1897). (J. H. F.)

LEO, HEINRICH (1799–1868), German historian, an opponent of Leopold von Ranke and a leading Prussian conservative writer. He was born at Rudolstadt on March 19, 1799, the son of a Lutheran pastor. As a student at Breslau, Jena and Gottingen he was in the extreme revolutionary wing of the *Burschenschaft* (students' association). At Gottingen, however, he became deeply impressed by the writings of Edmund Burke and Albrecht von Haller, and when Karl Sand, a friend of his, murdered the reactionary dramatist August von Kotzebue, he rejected violent radicalism and grew increasingly conservative. He became lecturer and then professor at Berlin and from 1828 to 1878 held a chair at Halle. From 1863 he was a member of the Prussian *Herrenhaus.* He died at Halle on April 24, 1878.

Leo had outstanding ability, penetration and knowledge. A philologist as well as a historian, he used philology in comparative history. He was a pioneer in recognizing the importance of social and geographical factors in the development of a state. His efforts toward the union of the Catholic and Protestant confessions are better understood today than in his own time. But his gifts were marred by a violent and impatient spirit. He despised Ranke and his meticulous methods; but his own careless investigation makes his work antiquated in comparison. Politically, his conception of a greater Germany based on a union of monarchical states and of the Christian confessions was supported by a glorification of war. He worked for religious unity as a political instrument and because he was deeply drawn by Catholicism; but his understanding of Rome was not balanced by understanding of Protestantism. Lord Acton described him as "the most remarkable of all the men who, being partisans where partiality is discredit, failed through the want of discipline."

Leo achieved his greatest immediate effects through newspaper articles in the Halle *Volksblatt fur Stadt und Land* and elsewhere. His first considerable work was *Geschichte der italienischen Staaten,* 5 vol. (1829–32); his most ambitious his *Lehrbuch der Universalgeschichte,* 6 vol. (1839–44). Of interest for his political views is *Studien und Skizzen zu einer Naturlehre des Staates* (1833; new edition by K. Mautz, 1948, with bibliography).

See Lord Acton, *English Historical Review,* vol. i, p. 18 (1886); H. J. Schoeps, *Das andere Preussen,* 2nd ed. (1952).

LEO, LEONARDO (1694–1744), more correctly LIONARDO ORONZO SALVATORE DE LEO, Italian musical composer, was born on Aug. 5, 1694, at S. Vito dei Normanni, near Brindisi. He became a student at the Conservatorio della Pietà dei Turchini at Naples in 1703, and was a pupil first of Provenzale and later of Nicola Fago. His earliest known work was a sacred drama, *L'Infedeltà abbattuta,* performed by his fellow-students in 1712. In 1714 he produced at the court theatre an opera, *Pisistrato,* which was much admired. He held various posts at the royal chapel, and continued to write for the stage, besides teaching at the conservatorio. After adding comic scenes to Gasparini's *Bajazette* in 1722 for performance at Naples, he composed a comic opera *La Mpeca scoperta* in Neapolitan dialect in 1723. His most famous comic opera was *Amor vuol sofferenze* (1739), better known as *La Finta Frascatana,* highly praised by Des Brosses. *L'Olimpiade* (1737) is his most famous serious opera and he wrote also some admirable sacred music. He died on Oct. 31, 1744. Leo was one of the first of the Neapolitan school to obtain a complete mastery over modern harmonic counterpoint. His sacred music is masterly and dignified, logical rather than passionate and free from sentimentality. His serious operas suffer from a coldness and severity of style, but in his comic operas he shows a keen sense of humour. A characteristic example of his sacred music is the *Dixit Dominus* in C, edited by C. V. Stanford and published by Novello. A number of songs from his operas are accessible in modern editions, and his charming little Arietta, written for the harpsichord, is still played by pianists.

LEO (The Lion), in astronomy, the fifth sign of the zodiac (*q.v.*). According to Greek mythology this constellation is the Nemean lion, which, after being killed by Hercules, was raised to the heavens by Jupiter in honour of Hercules. It contains the first-magnitude star Regulus, approximately 50 light-years from the sun. The swarm of November meteors known as the Leonids appears to come from the region of this constellation. The spectacular displays produced by the Leonids in 1799, 1833 and 1866 are famous in history, but the showers are now of very low activity. *See* METEOR: *Shower Meteors and Cometary Associations.*

LEO AFRICANUS (*c.* 1485–*c.* 1554), the Latinized name by which the Arab traveler and scholar, AL-HASAN IBN MUHAMMAD AL-WAZZAN AL-ZAIYATI (or AL-FASI), is usually known in Europe. Born at Granada, Spain, he was educated at Fès and as a young man traveled widely on commercial and diplomatic missions in the north African states. While in Egypt in 1516–17 he ascended the Nile valley to Aswan. There is less certainty, however, that he ever visited central Africa, Arabia, Istanbul, Armenia or Tatary, as has been claimed. During his return by sea from Egypt he was captured by pirates and presented as a slave to Pope Leo X who, after keeping him prisoner for a year, assigned him a pension and, having persuaded him to profess the Christian faith, stood sponsor at his baptism in 1520 and gave him his own names, Johannes and Leo. The new convert lived in learned society in Italy, acquired Latin and Italian, and taught Arabic. Impelled perhaps by homesickness, he returned to Africa sometime before 1530 and died a Moslem at Tunis, where all trace of him ceases after 1554.

In Rome, in 1526, Leo Africanus completed his greatest work, the *Descrittione dell'Africa,* a work derived possibly from notes which he had taken in the course of his travels, or from a version which he had previously composed in Arabic. From the Renaissance until the 19th century the *Descrittione dell'Africa* remained a principal source in Europe for the knowledge of Islam, and is still much cited by historians and geographers of Africa. Composed of nine books, book vii describes "Terra Nigra," the then unknown regions south of the Sahara; book viii covers Egypt; book ix deals with the history, geography, animals and plants of places mentioned in the other eight books. The work was first published by G. B. Ramusio as vol. i of his *Navigazioni e viaggi* (1550). An English translation, based on a Latin version by J. Florianus, *J. Leonis Africani de totius Africae descriptione* (1556) was made at the suggestion of Richard Hakluyt: J. Pory, *Historie of Africa* (1600), edited by R. Brown (1896). A French translation, A. Epaulard, *Description de l'Afrique* (1956) uses a hitherto unrecorded Italian version from which G. B. Ramusio's edition was probably derived. Other works written by or ascribed to Leo are the Arabic, and possibly Hebrew, parts of a polygot vocabulary (1524), and *Libellus de viris quibusdam illustribus apud Arabes* (1527), edited by J. H. Hottinger (1664), and edited by J. A. Fabricius (1718), containing lives of learned Arabs and Jews and doubtfully attributed to Leo.

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LEOBEN, a town in Styria (Steiermark), Austria, on the Mur river, 26 mi. N.N.W. from Graz. Pop. (1951) 35,653. In its mountainous setting and with its medieval and other buildings of interest, it became a tourist centre as well as a mining town. The principal features of Leoben include the town hall, the church of Maria am Waasen (12th century, rebuilt 15th) with brilliant Gothic stained glass, the Adler Hof with a Renaissance gateway (1550) and a monument commemorating the peace treaty with Napoleon (1797). Leoben is also a centre of the upper Styrian

lignite workings and has an iron industry and trade and a well-known academy of mining and other technical schools. The fountain figure in the market place is a miner. The town is situated on international motor routes and has good rail connections.

LEOCHARES, an Athenian sculptor, worked on the Mausoleum at Halicarnassus about 350 B.C. He executed statues of the family of Philip of Macedon in gold and ivory, which were set up by that king in the Philippeum at Olympia about 338 B.C. With Lysippus he made a group in bronze at Delphi representing a lion hunt of Alexander. The base of this with an inscription has been found, as have others with his name, in Athens. There are records of other statues by Leochares of Zeus, Apollo, Ares, Demos and Isocrates. The statuette in the Vatican, representing Ganymede being carried away by an eagle, corresponds with Pliny's description of a group by Leochares. The original of the "Apollo Belvedere" has been attributed to Leochares by A. Furtwangler and others; the Demeter of Cnidus by B. Ashmole; and a head of Alexander from the Acropolis by Ashmole and E. Buschor.

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LEOFRIC (d. 1057) earl of Mercia, was a son of Leofwine, earl of Mercia, and became earl at some date previous to 1032. On the death of King Canute in 1035 he supported the claim of his son Harold to the throne against that of Hardicanute; and during the quarrel between Edward the Confessor and Earl Godwine in 1051 he played the part of a mediator. Through his efforts civil war was averted, and in accordance with his advice the settlement of the dispute was referred to the witan. When he became earl of Mercia his direct rule seems to have been confined to Cheshire, Staffordshire, Shropshire and the borders of north Wales, but afterward he extended the area of his earldom. As Chester was his principal residence and the seat of his government, he is sometimes called earl of Chester. Leofric died at Bromley in Staffordshire on Aug. 31, 1057. His wife was Godgifu, famous in legend as Lady Godiva (*q.v.*).

LEOMINSTER, a market town and municipal borough, in the Leominster parliamentary division of Herefordshire, Eng., 13 mi. N. of Hereford by road. Pop. (1961) 6,403.

It still retains some old timbered houses. The parish church, a former priory church of mixed architecture aith a Norman nave and fine window tracery, was restored in 1866 and enlarged in 1879. The old town hall or Butter Cross, an example of timberwork of 1633. was re-erected in the grounds of the Grange. Merewald, king of Mercia, is said to have founded a religious house in Leominster about 660, and a nunnery existed there until the Conquest, when the place became a royal demesne. It was granted by Henry I to the monks of Reading under whose protection the town grew up. In 1539 it reverted to the crown; and in 1554 the town was incorporated. Leominster was famous for wool from the 13th to the 18th century. Fairs were granted at various times and today there are cattle shows in May and October as well as autumn sales of ewes and lambs. Trade is chiefly in agricultural produce and livestock, Leominster being the centre of a large farming area rich in orchards. Agricultural implements, cider, beer, gloves and clothing accessories are manufactured.

LEOMINSTER, a city of Worcester county in north central Massachusetts, U.S., on the Nashua river 45 mi. N.W. of Boston. Incorporated in 1740, it was the site of a comb factory (1775) which subsequently became the leading economic activity. Early in the 20th century the industry shifted to producing plastic combs. plastic articles and machinery for the plastics industry. Three-fourths of Leominster's working population is engaged in manufacturing, two-thirds of these being in the plastics trade. Textile products, furniture and paper products are other items of manufacture. In the 20th century substantial numbers of people of Canadian-French and Italian background joined the native Yankee population. Leominster's best-known native son is probably John Chapman (*q.v.*), known as "Johnny Appleseed." For comparative population figures *see* table in MASSACHUSETTS: *Population* (M. H. Co.)

LEON OF MODENA (1571–1648), Jewish scholar, was born in Venice, Italy, on April 23, 1571, of a French family which had migrated to Italy after the expulsion of the Jews from France. One of Leon's most effective works was his attack on the Cabala (*Ari Nohem,* first published in 1840), in which he demonstrated that the *Zohar,* the "Bible of the Cabalists" (*see* CABALA), was a modern composition. (*See* LEÓN, MOSES BEN SHEM-TOB DE.) His *Historia dei riti ebraici* (1637) was widely read by Christians, being translated into various languages including English (1650). Leon died at Venice on March 24, 1648.

See H. Graetz, *History of the Jews,* Eng. trans., vol. v, ch. 3 (1956); A. Geiger, *Leon de Modena* (1856).

LEÓN, LUIS PONCE DE (1527–1591), Spanish poet and mystic, was born at Belmonte de Cuenca, entered the University of Salamanca at the age of 14, and in 1544 joined the Augustinian order. In 1561 he obtained a theological chair at Salamanca, to which in 1571 was added that of sacred literature. He was denounced to the Inquisition for translating the book of Canticles, and for criticizing the text of the Vulgate. He was consequently imprisoned at Valladolid from March 1572 until Dec. 1576; but he was released uith an admonition. He returned to Salamanca as professor of Biblical exegesis, and was again reported to the Inquisition in 1582, but without result. In 1583–85 he published the three books of his mystic treatise, *Los Nombres de Cristo,* written in prison. *La Perfecta Casada* (1583) is a treatise for the use of a lady newly married. Ten days before his death, at Madrigal (Xug. 23, 1591), he was elected vicar general of the Augustinian order. His poems were not issued till 1631.

The best edition of Luis de Leon's works is that of Merino, 6 vol (1804–16); the reprint (1885) by C Muñoz Saenz is incorrect. The text of *La Perfecta Casada* has been well edited by Elizabeth Wallace (1903) and *Los Nombres de Cristo* by F. de Onís, 3 vol. (1914–22).

LEÓN, MOSES BEN SHEM-TOB DE (*c.* 1250–1305), Jewish scholar, a prolific, brilliant writer on subjects mystical and philosophic, was born in León, Spain, about 12 50. His fame is due to his alleged authorship of the *Zohar (see* CABALA), a Cabalistic commentary to the Pentateuch in quaint Aramaic, the classic work of Jewish mysticism. De León ascribed it to Rabbi Simon ben Yohai, a and-century saint. Skeptics labeled it a forgery, his own handiwork; others believed that he composed it by the magic power of the Holy Kame; the orthodox generally accepted de León's claim for its ancient authorship. Scholars are fairly agreed that the *Zohar* is in part an original work of genius, in part a complex compilation of diverse writings, reflecting various mystical conceptions of many ages with some superstitious incongruities. De León, therefore, was editor as well as contributor to the great classic of religious mysticism. He died at Arévalo in 1305.

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LEÓN (LEÓN DE LOS ALDAMAS), a city of the state of Guanajuato, Mexico, 259 mi. N.W. of the federal capital and 30 mi. N.W. of the city of Guanajuato. Pop. (1950) 122.663; (1958 est.) 148,081. The Mexican National railways connects it with the national capital and other prominent cities of the republic. León stands in a fertile plain on the banks of the Turbio, a tributary of the Rio Grande de Lerma, at an elevation of 6,200 ft. above sea level and in the midst of attractive surroundings. The country about León is considered one of the richest cereal-producing districts of Mexico. The city has been subject to disastrous floods, sometimes leading to loss of life as well as considerable damage to all classes of property. León is now protected by a large dam. It has a modern airport and excellent air connections. It manufactures saddlery and other leather work, gold and silver embroideries, cotton and woolen goods, especially *rebozos* (long shawls), soap and cutlery. There are also tanneries and flour mills. The city has a considerable trade in wheat and flour. The first settlement of León occurred in 1552, but its formal foundation was in 1576. It became a city in 1836. (J. A. Cw.)

LEÓN, a department of western Nicaragua on the Pacific ocean. is bounded east by Lake Managua. Pop. (1959 est.) 164,-508; area 2,355 sq.mi. With level land, fertile soils, good dis-

tribution of precipitation and good transportation, the department is especially important in producing corn. cotton, sugar, sesame, rice, tobacco, vegetables, fruits and cheese. Two of Nicaragua's most productive gold mines (La India and El Linon) are in León. The capital of the department is the classical colonial city of León (*q.v.*). (C F. J.)

LEÓN, the second largest city of Nicaragua and capital of the department of the same name, is 52 mi. N.W. of Managua, and connected with it and other cities by the Pacific railway and a paved road. Pop. (1950) 30,544.

León, one of the oldest cities of Central America is the centre of an important agricultural and commercial region. Cotton, sugar and rice are the principal crops. Manufactured products include processed cotton, cigars, shoes and saddlery. Cattle are also raised for export

Leon's history is closely interwoven with that of the country. The city was first founded on the edge of Lake Managua by Francisco Hernández de Cordoba in 1524, but after an earthquake there. was moved in 1610 to the site of the old Indian capital of Sutiaba, an important Indian shrine. León was the capital of the Spanish province and of the Republic of Nicaragua until 1855, although its great commercial rival, Granada. on Lake Nicaragua, 88 mi. to the southwest, long disputed the honour. The rivalry brought on civil wars that resulted in the coming of William Walker (*q.v.*), the U.S. filibusterer who was expelled in 1857. Managua was established between the two as a compromise capital. León's streets and private houses, mostly one-storied and nith fine gardens, are picturesquely Spanish. Historic buildings include the 18th-century cathedral and the church in the old Indian section of Sutiaba.

León has been long noted as an intellectual centre of Nicaragua. In 1952 the University of León (founded in 1812) became part of the National University of Nicaragua along with the Universities of Managua and Granada. Ruben Dario, one of the greatest Spanish poets, lived and was educated in León. (M. F.-G.)

LEÓN, the name of a modern province and of an ancient kingdom, captaincy general and province in northwestern Spain. The modern province, founded in 1833, is bounded on the north by Oviedo, northeast by Santander, east by Palencia, south by Valladolid and Zamora and west by Orense and Lugo. Pop. (1950) 551,072. Area 5.937 sq mi. León belongs partly to the river system of the Miño (see SPAIN), partly to that of the Duero or Douro (*q.v.*), these being separated by the Montañas de León, which extend in a continuous wall (with passes at Manzanal and Poncebadon) from north to southwest.

At the time of the Roman conquest, the province was inhabited by the Vettones and Callaici. Among the Christian kingdoms which arose in Spain as the Moorish invasion of the 8th century receded, León was one of the oldest. The title of king of León was first assumed by Ordoño in 913. Ferdinand I (the Great) of Castile united the drowns of Castile and León in the 11th century; the two were again separated in the 12th, until a final union took place (1230) in the person of St. Ferdinand. The Leonese belong partly to the Castilian section of the Spaniards, partly to the northwestern section which includes the Galicians and Asturians. Near Astorga there dwell a curious people, the Maragatos, sometimes considered to be a remnant of the original Celtiberian inhabitants. As a rule the Maragatos earn their living as muleteers or carriers; they wear a distinctive costume, mix as little as possible with their neighbours and do not marry outside their own group.

To the northwest of the Montañas de León is the richly wooded pastoral and highland district known as the Vierzo, which in its louer valleys produces grain, fruit and wine in abundance. The Tierra de Campos in the west of the province is fairly productive. but in need of irrigation. The uhole province is sparsely peopled. Apart from agriculture, stock raising and mining, its commerce and industries are unimportant. Cattle, mules, butter, leather, coal and iron are exported. The hills of León were worked for gold in the time of the Romans; iron is still obtained, and coal mining developed considerably toward the close of the 19th century. The only towns uith more than 5,000 inhabitants in 1940 were León (*q.v.*), Astorga (14,523), Ponferrada (7,668) and La Bañeza (5,935). The railway from Madrid to Corunna passes through the province, and there are branch lines. The province was occupied by Franco's insurgents early in the civil war of 1936–39.

LEÓN, an episcopal see and the capital of the Spanish province of León, situated on a hill 2.631 ft. above sea level, in the angle made by the Torio and Bernesga, streams which unite on the south, and form the river León, a tributary of the Esla. Population (1950) 59,549. León is on the main railway from Madrid to Oviedo, and is connected with Astorga by a branch line. León (Arab. *Liyun*) owes its name to the Legio Septima Gemina of Galba, which, under the later emperors, had its headquarters there. About 540 León fell into the hands of the Gothic king Leovigild, and in 717 it capitulated to the Moors. Retaken about 742, it ultimately. in the beginning of the 10th century, became the capital of the kingdom of León (see SPAIN: *History*). About 996 it was taken by Almansur, but on his death soon afterward it reverted to the Spaniards. It was the seat of several ecclesiastical councils between 1012 and 1288.

The cathedral, founded in 1199 and finished only at the close of the 14th century, is built of a warm cream-coloured stone, and is remarkable for simplicity, lightness and strength. It is one of the finest examples of Spanish Gothic, smaller. indeed. than the cathedrals of Burgos and Toledo, but exquisite in design and workmanship. The chapter library contains some valuable manuscripts. The collegiate church of San Isidoro was founded by Ferdinand I of Castile in 1063 and consecrated in 1149. The church contains some fine plate, including the shrine of St. Isidore of Seville and a silver processional cross dating from the 16th century, which is one of the most beautiful in the country. The convent and church of San Marcos, founded by Charles V in 1537, and consecrated in 1541, are Renaissance in style. Kationalist forces captured Leon in the civil war of 1936–39.

LEONARD0 DA VINCI (1452–1519), Florentine artist and scientist, was born at Vinci near Florence on April 15, 1452. The legend of his universality. with which his fame is primarily linked in the popular view, emanated from Leonardo himself, who propounded it in a letter of self-commendation written as a young man to Ludovico Sforza, the tyrant of Milan. This point of view, together with the complementary. and (to the 20th century) equally justifiable, one—that the variety of Leonardo's interests, together with his perfectionism, seriously limited the extent of his achievement in any one of them—is already adumbrated in the earliest written accounts of his career (those of Paolo Giovio, Antonio Billi and the so-called Anonimo Gaddiano), as well as in Giorgio Vasari's Lives (1550 and 1568), which has influenced all later writers in the field. Leonardo's surviving norks consist primarily of a few paintings together with a large quantity of drawings. scientific diagrams and notes on diverse subjects. After an account of his career, it is proposed to consider his work under the following headings: paintings, sculpture, and drawings and notebooks.

Career.—The exact date—April 15, 1452—of Leonardo's birth was not discovered until about the year 1939, when it was published by Emil Moller. Leonardo's parents, who were never man and wife, were one Piero da Vinci. a young man of 23 at the time of Leonardo's birth, and a certain Caterina. Piero, who was notary to the signoria of Florence from 1469, made the first of his four marriages in the year of Leonardo's birth and subsequently raised a large legitimate family. Leonardo's mother also was married by 1457. Piero acknowledged Leonardo from the first as his son (none of Piero's legitimate children was born until after Leonardo grew up) and brought him up, partly at Vinci, the town of his birth. and partly in Florence.

Concerning his apprenticeship. it should be pointed out that there is no sure authority earlier than Vasari (1550) for his having been Andrea del Verrocchio's pupil. An anonymous denunciation of 1476, in which Leonardo and three other men were accused of frequenting a notorious boy prostitute, states merely that Leonardo was at that time living in Verrocchio's house. But his apprenticeship would have been long since over as he was then

24 years of age and had been admitted a member of the painters' guild at Florence in 1472. Even the existence of a picture (the "Baptism of Christ," now in the Uffizi gallery, Florence). attributable to Verrocchio and Leonardo in collaboration (see below), constitutes no proof of apprenticeship. Nevertheless, these two factors. together with the markedly Verrocchiesque quality of Leonardo's earliest paintings and drawings, do furnish strong circumstantial evidence in favour of the accuracy of Vasari's statement. Verrocchio was a sculptor and goldsmith as well as a painter, and it is therefore reasonable to suppose that Leonardo would have received training in all three arts! and not merely in painting.

However, it was primarily as a military engineer, for which there is no evidence that Leonardo ever received any systematic training, that he offered his services to Ludovico Sforza (I1 Moro, "the Moor") in the letter already mentioned. This is an undated draft: perhaps not in Leonardo's handwriting but acceptable as of his composition, preserved among his papers in the *Codice* Atlantico. In it, besides offering to construct field bridges, mortars and other engines of his own invention, as well as paint pictures and work in architecture, Leonardo specifies that he will undertake to make the bronze equestrian statue of Ludovico's father, Francesco Sforza. Although the precise object and date of Leonardo's move to Milan are unknown, two later draft letters (*Codice Atlantico* folios 323a and b) suggest that he may have been invited there by I1 hloro specifically to construct the monument. The Anonimo Gaddiano's version is that Leonardo had received some patronage from Lorenzo the Magnificent in Florence. who sent him to Milan to present a lyre to Il Moro, Leonardo being then aged 30. This would make the date 1482.. Leonardo can be shown to have been in Florence as late as Sept. 1481, but may well have arrived in Milan before the end of that year. Otherwise, he is first recorded there in April 1483 (the date, 1494, given by Vasari for the move is one of the wildest of the demonstrable errors in his biography). He remained at Milan until I1 Moro's fall in 1499.

This period, from around the 30th year of Leonardo's life until nearly his 50th, marked the crucial stage of his formation and of his development, since it gave him the opportunity of shining in whatever field took his fancy. At I1 Moro's court, he was in fact engaged on tasks as diverse as projects for architectural work at the cathedrals of Milan and Pavia, decorative as well as architectural work at the Castello in Milan, and the organizing of court pageants on special occasions. He also painted the portraits of I1 Moro and his court as well as the "Last Supper" at Sta. Maria delle Grazie. In addition, he completed the full-scale model of the gigantic horse for Francesco Sforza's tomb, engaged in military engineering, taught himself Latin and carried out extensive anatomical and other researches.

In Sept. 1499 the dissatisfied Milanese subjects of Il Moro took advantage of his temporary absence to offer the city to the king of France, Louis XII, who had been laying claim to it. On Oct. 6 Louis entered Milan. The French forces in the city behaved after the manner of occupying troops, one of their exploits being to use as a target for their arrows Leonardo's colossal clay model for the Sforza monument, which had been finished in 1493 but never cast in bronze. What may have been the mold for the casting rather than the remains of the model itself, as is sometimes stated, may have been sent to Ferrara soon afterward. In any case, nothing remains of the great model. Meanwhile, late in 1499, or at the beginning of 1500, Leonardo left Milan and returned to Florence. On his way he visited Mantua, where he drew Isabella d'Este, and also Venice.

Between July 1502 and March 1503 Leonardo was in the service of Cesare Borgia as architect and engineer general on his campaign in central Italy (during this time he met Macchiavelli, with whom he became intimate later). On his return to Florence he embarked on the two most ambitious undertakings of his career, one scientific, the other artistic. The first of these was a scheme for diverting the course of the Arno river and rendering it navigable to Florence. The second was the painting of a battle piece, in competition with the young Michelangelo. in the great room of the seat of the Florentine republic, the Palazzo Vecchio.

It was doubtless the failure of both these undertakings which induced Leonardo to leave Florence in 1j06 and return to Milan, still at that time under French rule. Initially, he was given only three months leave of absence by the signoria of Florence, but it seems clear that he had no intention of returning. He lost no time in ingratiating himself with the French at the highest level, and his first plea for a prolongation of his leave of absence was supported by the French governor, Charles d'Amboise. A second extension was granted on the strength of a personal letter from Louis XII to the signoria. Louis had seen a painting by Leonardo which had been sent to France and had determined to get him into his employ to paint for him "certain little panel pictures of Our Lady, and other things as the fancy shall take me; and perhaps I shall cause him also to make my own portrait." When, in the autumn of 1507, Leonardo was obliged to return to Florence for a short time on private business, a further letter from the king, who had now arrived in Milan, to the signoria, asking them to expedite Leonardo's affairs, referred to him as "nostre peintre et ingénieur ordinaire." By this time, the signoria were evidently resigned to the probability that Leonardo would never finish the battle piece.

The only large-scale undertaking during Leonardo's second Milanese period was a project for a mausoleum for Marshal Trivulzio, an Italian condottiere in the service of the French, and of this, as of so many of Leonardo's projects, nothing came. For the rest of the time he painted some panel pictures, designed the setting for masques and codified and arranged his notes on many scientific subjects.

It was doubtless again political events — the abandonment of Lombardy by the French in 1512 and re-establishment of the Sforza dynasty — which induced Leonardo to leave it for the second time, though on this occasion he took longer to make a decision. But in Sept. 1513 he left Milan for Rome, where he was installed in the Vatican under the patronage of Giuliano de' Medici, brother of the newly elected pope, Leo X. Vasari has a vivid portrait of Leonardo at this time, indulging in weird scientific experiments and evidently leading a restless and unhappy life. The presence in Rome of Michelangelo and of Raphael, both many years his junior and at the peak of their fame, would have removed any wish Leonardo may still have entertained to undertake further work of importance in the field of the visual arts, and when, in March 1515, his patron died he had every inducement to leave Rome and seek other employment. This he ultimately found, for the second time, with the French. The new king, Francis I. was determined to lure to his court as many distinguished Italian artists as he could. The date of Leonardo's departure from Rome is not known. He is first recorded in the spring of 1517, at Cloux, near Amboise. Here, until his death on May 2, 1519, Leonardo lived as "premier peintre et ingénieur et architecte du roi" in much the same way as he always had, namely organizing court masques on occasion, writing scientific notes, perhaps painting a little and working on projects for a variety of undertakings (including canalization) without greatly caring whether or not they were carried out. His prestige, which the evident glamour of his personality had always fostered, evidently remained extremely high at the French court and later contributed to Vasari's fable, now discredited, of Leonardo's having died in the arms of the king.

Paintings. — The scarcity of Leonardo's paintings, together with the eagerness of collectors in all ages to possess them, has helped to obscure the distinction between the genuine and the false, and despite much research, some uncertainty remains in a few instances. The existence of a large body of undoubtedly genuine drawings by Leonardo (see below) has constituted the principal means of authenticating the paintings. A drawing by Leonardo of a sleeve, for instance, which is in the library of Christ Church, Oxford, is undeniably a preliminary study for part of the angel of the Annunciation in a painting now in the Uffizi gallery, Florence. This picture is the most primitive in style of those attributable to Leonardo and therefore probably the earliest.

Tno other paintings for which no clearly authentic drawings survive may be vouched for as Leonardo's on the strength of many resemblances to the latter picture. They are a small "Madonna

and Child" (with a carnation) now in the Munich gallery and a small "Head of a Woman" (Liechtenstein collection). The fact that the latter work contains juniper leaves (*ginepro* in Italian) prominently displayed both within the picture and on the back of it has led to the plausible suggestion that the sitter is Ginevra de' Benci—who, according to both the Anonimo Gaddiano and Vasari, was portrayed by Leonardo—since such a pun on her name would be ordinary Renaissance usage. The lady is known to have married in 1474, which would be a plausible date of origin for the picture and an approximate date for the other two. These three paintings are in general in the traditional Florentine style of the later quattrocento, and show in particular many points of resemblance with the style of Verrocchio. (Participation by the young Leonardo has also been claimed in respect of other pictures in a Verrocchiesque idiom, notably an "Annunciation" in the Louvre, the so-called "Dreyfus Madonna" in the Kress collection and an unfinished "Nativity" acquired by the Detroit Institute of Art in 1 9 7 Certain features! however, such as the interest in curling hair and in flowers and leaves. which are common to the Uffizi, Munich and Liechtenstein pictures, already foreshadow the mature Leonardo. Another feature, the fantastic mountains in the background of the Uffizi "Annunciation" and of the Xlunich Madonna, furnishes a link with the next work to be considered, namely Leonardo's share in Verrocchio's painting of the "Baptism of Christ" (Uffizi, Florence).

This comes from the church of S. Salvi at Florence and it is probably to this picture that a very early printed source, Francesco Albertini's *Memoriale* of 1510, refers when it speaks of "an angel by Leonardo da Vinci" as being among the pictures in that church. For the angel on the left of this picture was mentioned as an interpolation of Leonardo's by Vasari, who goes on to add that Verrocchio was so mortified that his young pupil's work so evidently surpassed his own that he never painted again. The latter part of the tale has long been recognized as a characteristic Vasarian embroidery, but his placing of the context of the incident into Leonardo's extreme youth has continued to be followed. Nevertheless. the evidence of the picture itself does not support this, for the angel on the left is clearly recognizable as Leonardo's work, and as rather more advanced than anything in the other early paintings already discussed. But the landscape background of fantastic mountains, of which Vasari says nothing, is not only patently also Leonardo's work, but already in his mature style and anticipating the comparable feature in the "Mona Lisa." Since it is known that Leonardo was living in Verrocchio's house in 1476, four years after he became a master: it would be logical to suppose that the "Baptism" represented a collaboration, dating perhaps from that period. rather than the result of the master-pupil relationship of the earlier stage.

Two more small Rladonnas—the so-called "Madonna Benois" and "Madonna Litta" (both in the Hermitage, Leningrad)—connect with autograph drawings roughly datable to the mid- or later 1470s (it is possible that they are the two Madonnas which Leonardo in a note says he started at the end of 1478). Of these, the "Madonna Litta" is much repainted and unimportant. The "Madonna Benois" is the earliest portrayal by Leonardo of the Madonna seated with the Child in her lap, a theme which he was often to elaborate later.

Two contracts for pictures are recorded dating from Leonardo's first Florentine period. The first. of Jan. 1478. was for an altarpiece of unspecified subject for the chapel of S. Bernardo in the Palazzo Vecchio. The second, of March 1481, was for a painting, also of unspecified subject, for the high altar of the monastery of S. Donato a Scopeto, outside the walls of Florence. Neither of these contracts was honoured. The first, which had already been accepted, and with equally negative results, by Piero Pollaiuolo. was given, after Leonardo's default, to Domenico Ghirlandajo, who in his turn failed to honour it. It has been suggested that the "Virgin of the Rocks," now in the Louvre, was painted by Leonardo in connection with the Palazzo Vecchio contract, but in that case. since the picture is finished, most unusual for Leonnrdo, it would be necessary to bring to light some very unusual circumstances to explain why it was never delivered. In the case of the S. Donato a Scopeto contract, an altarpiece by Filippino Lippi, which was ultimately delivered, is of the same size and subject—the "Adoration of the Kings[x]—as an unfinished picture in the Uffizi, recognizable by means of numerous connected drawings as Leonardo's, and in consequence it is universally assumed that the latter work was started in connection with this contract. Even in its unfinished state the picture is onc of the most marvelous of all Leonardo's works. No photographic reproduction of the whole picture can convey the extraordinary fascination exerted by the original, though detailed photographs on a large scale can give some idea of the wealth of fantasy and imagination which had been lavished on individual portions.

A smaller picture—of St. Jerome in prayer before a crucifix—is usually linked with the Uffizi "Adoration." It is said to have been discovered in two pieces on two separate occasions by Cardinal Fesch, Napoleon's uncle, and is now in the Vatican gallery. It has neither documentation nor connected drawings to authenticate it as Leonardo's work, but it nevertheless represents to so high a degree the quintessence of the master that it has never in fact been doubted. Its obvious resemblance to the "Adoration" is partly accidental (both pictures are in a similar state of incompleteness) but also partly real (St. Jerome is comparable with several of the old men in the Uffizi picture); and the picture is therefore unlikely to have been painted very many years on either side of 1481.

In 1483 Leonardo and two Milanese artists, Evangelista and Ambrogio de Predis, were commissioned to supply pictures to be inserted, probably on an upper tier, into an existing carved altarpiece, and also to paint or gild parts of the latter. The whole was to adorn the chapel of the confraternity of the Immaculate Conception in the church of S. Francesco Grande at Milan. The pictures in question are the "Virgin of the Rocks" and two angels. All three pictures are now in the National gallery, London, and can be proved to have come from the chapel in question. Formerly, it was supposed that another version of the "Virgin of the Rocks" (the one which is now in the Louvre and whose history before the year 1625 is totally unknown) was Leonardo's contribution to the confraternity's contract and that the London picture was painted by his pupils and substituted for it at a certain stage.

However, re-examination of the copious contemporary documentation by Martin Davies (published in the catalogue of the Earlier Italian schools in the National gallery, 1951) has shown the virtual impossibility of this interpretation. The confraternity's contract became the subject of a lawsuit concerning delay in delivering the pictures and alleged inadequacy of the remuneration. It was not settled until 1506, and the wording of the settlement establishes with absolute certainty that no substitution had then taken place. As a *substitution after that date is in the highest degree improbable: it must be concluded that the Louvre picture was never connected with the confraternity's contract. It would presumably have been painted earlier, in Florence. At least one very famous and beautiful drawing by Leonardo (at Turin) connects with it and not with the London version, and despite the absence of documentation. its status as an authentic and major work of Leonardo cannot be doubted. One of the most important consequences of the re-examination of the documents connected with the confraternity's contract is that a statement, in which both Leonardo and the Predis brothers say that. the central picture of the Virgin and Child was painted by Leonardo himself, must refer to the London version of the "Virgin of the Rocks" and not to that in the Louvre, and constitutes proof of its autography at the highest level. The two panels of angels would thus be the work of Ambrogio or Evangelista de Predis, or both. The London pictyre is clearly morc advanced in style than that in the Louvre—accessories such as flowers have been reduced in number and the contrasts of light and shade strengthened. Both these tendencies mark a stage away from the style of the *quattrocento* toward that of the High Renaissance. though both pictures in their differing degrees may be regarded as transitional in that progress. Like almost all Leonardo's major works, the National gallery picture is unfinished.

Four surviving portraits, probably dating from Leonardo's first Milanese period, bring up the question of authenticity in an acute form, since no autograph drawings survive connected with any of them. The first of these, an unfinished portrait in the Biblioteca Ambrosiana at Milan, called "A Musician," is so similar to the angel in the London "Virgin of the Rocks," both as regards the curling hair and the play of light and shade on the face, that Leonardo's authorship can be accepted without difficulty.

In the second portrait—the so-called "Lady with an Ermine" at Cracow—the chief indication is the treatment of the animal itself, with its wonderfully alert expression. Apart from Leonardo, the only painter interested in such things at this time was Piero di Cosimo, and he can be excluded as author for other reasons. Since the Greek for ermine is *galéē* (γαλέη), it has. moreover, been reasonably suggested that the surprising inclusion of this feature in the portrait constitutes another of those puns on the sitter's name, as in the case of Ginevra de' Benci. and that the sitter is Cecilia Gallerani, who became Il Moro's mistress in 1481 and who is known from two separate contemporary documents to have been portrayed by Leonardo. The fact that the ermine is an emblem of chastity might render its suitability to the present context questionable, though parallel instances could be indicated. Cecil Gould's belief is that the sitter in the Cracow portrait is the same as that in the celebrated profile in the Ambrosiana. which was long called "Beatrice d'Este, by Leonardo da Vinci." The identification with Beatrice has been generally discredited, but even if the sitter were Cecilia it would still not prove Leonardo's authorship, which is always likely to remain in doubt! since the painting is not like any certain work of Leonardo. However, it is incomparably superior in quality to all the works of all his known pupils. Finally, in the case of "La Belle Ferronniere" in the Louvre, the identity of sitter and artist alike have long been disputed, but for the latter the name of Leonardo seems more reasonable than that of the most favoured alternative candidate, namely his pupil. Giovanni Boltraffio.

Besides these easel pictures, there are two wall paintings dating from the first Milanese period. One of these; the decoration (documented as finished in 1498) of the Sala delle Asse in the Castello Sforzesco at Milan. was subsequently painted over and was not uncovered until 1901, when it was entirely repainted. Much or all of this repaint has since been removed. Though never a work of the first importance, it may be regarded as an illustration of Leonardo's habit of introducing into an artistic undertaking one of the scientific games with which he amused himself—in this case, the endless intricately knotted cord (of which some early engravings were made), here combined with an almost equally intricate pattern of *trompe-l'oeil* branches and foliage, which covers the ceiling and springs from trunks painted on the side walls.

The other wall painting was the "Last Supper." This was done to the order of Il Moro in the refectory of the monastery of Sta. Maria delle Grazie. It is not known when Leonardo started it. He had almost finished it in 1497, but if Vasari is to be believed, he never quite did so. He also painted the portraits of Il Moro and his family as spectators in G. D. hlontorfano's fresco of the "Crucifixion" on the wall facing the "Last Supper." The story of the latter's ruin (owing to the failure of Leonardo's patent technique evolved in order to permit him to work at his leisure) is part of its legend: The painting was noted as decaying as early as 1517 and pronounced by Vasari (in his life of Garofalo) as "merely a mass of blots" in 1566. Repeated restorations followed, and, although the one carried out after World War II was claimed to have revealed some of Leonardo's own work, it is primarily to the design and to its suitability to its setting that the painting owes such qualities as it still retains. Otherwise it is best studied in old copies or in Raffaello Morghen's engraving. With an effort (and particularly after a study of Leonardo's magnificent drawings of the heads of individual apostles) it is still possible to understand the place of Leonardo's "Last Supper" not only as the first great manifestation of the High Renaissance style but as nothing less than the standard and definitive representation of the subject. For once, Leonardo's native fantasy was completely held in check and pictorial accessories reduced to the minimum so as not to distract from the drama of the scene.

The repeated attempts of Isabella d'Este. following her meeting with Leonardo at Mantua early in 1500, to induce him to paint a picture for her had as one result a series of letters, fortunately preserved, in which her agent in Florence, Fra Pietro da Nuvolaria, describes Leonardo's activities after his return there. In the first of these (April 3. 1501), Leonardo is described as having executed a cartoon of the Madonna and Child and St. Anne with a lamb. In the second. dated the next day, Leonardo is said to be working on a small picture for Robertet. the favourite of the French king. In both letters, Leonardo is described as leading a restless life and as being more interested in mathematics than in painting. Both the cartoon and the picture are described by Fra Pietro in considerable detail, and from this there can be no doubt that the picture for Robertet was the so-called "Madonna with the Yarn-Winder," one version of which is now in the collection of the duke of Buccleuch. This is a close-knit composition in the High Renaissance manner of the type which Raphael was to develop soon afterward and with a background of fantastic mountains, as in many of Leonardo's other pictures. The cartoon mentioned by Fra Pietro may have been that for the painting now in the Louvre, or it may have been a separate composition. In either case, it cannot be identical with the cartoon which has belonged to the Royal academy in London since the 18th century, since the latter work contains no iamb. The fact that the relation of the Virgin to the Child is uorked out in the academy cartoon in a similar nay to the "Yarn-Winder Madonna" suggests that there was probably no great interval of time between the two. On the whole, it is most probable that the academy cartoon was done just before Leonardo left Milan. Though less developed than the final version of the design, as seen in the Louvre painting, it has enormous importance as being an undoubted original, almost finished and in a good state of preservation.

The greatest undertaking in painting during Leonardo's second Florentine period, and indeed in the whole of his career, was the commission to paint a huge battle scene in the council chamber of the Florentine republic in the Palazzo Vecchio. His subject, the battle of Anghiari, was a cavalry engagement which had been fought in 1440 and ended in a victory for the Florentine and papal forces over the Milanese. The complementary painting. by Michelangelo. was to have been of the battle of Cascina. Neither was ever carried to more than the preliminary stages, Leonardo's probably because of the failure of yet another of his patent techniques (this time a kind of encaustic), Michelangelo's because the pope (Julius II) monopolized his time. Leonardo had begun his cartoon by the spring of 1504, had started to paint on the wall by April 1505 and had probably abandoned the undertaking forever by the end of that year. The portion which he executed was destroyed or covered up when the hall was frescoed by Vasari in the middle of the 16th century. The cartoon was cut up and the pieces lost or destroyed. A contemporary copy (belonging to the Uffizi) and a contemporary engraving (by Zacchia) exist of the portion of the painting which was carried out, together with a number of action sketches by Leonardo for skirmishes, and some single heads of fighters. From this varied material it is possible to obtain some idea of Leonardo's intentions. It is clear that he had realized the possibilities of conveying an impression of movement by means of closely welded units, depicted diagonally in space. This was later to be one of the principles of baroque art, and Leonardo, in this as in other works, was thus one of its forbears. The influence of his design can in fact be traced through the battle scenes of Giulio Romano, Titian and Rubens to the 19th century. It was, in a sense: the first modern battle picture.

At least two other pictures executed by Leonardo during the second Florentine period have likewise been lost. The first was a "Leda." Like other of Leonardo's paintings this was worked on at different times and at least two distinct versions evolved. In the first. which is datable to the "Battle of Anghiari" period, on the strength of a sheet of sketches containing designs for both, Leda is shown with her right knee to the ground. Leonardo him-

self may not have carried this design beyond the cartoon stage at the most. A painted copy, however, from Schloss Neuwied, is in the Munich gallery. The second version, of a standing Leda, seems to have been the final one, and many copies of it were made. It must have reached at least the cartoon stage by the time Leonardo left Florence in 1506, as there is a sketch of it by Raphael. The painted version was probably finished during Leonardo's second residence in Milan and was last recorded, in the 17th century, in the French royal collection. It would have been unique among Leonardo's pictures as being a pagan subject showing a female nude. Various plant drawings which survive and connect with it suggest that the basic idea of the picture was a kind of allegory of the generative processes of nature.

The second picture was of the head of an angel. Various copies exist, and there is a drawing datable to the second Florentine period by studies for the "Battle of Anghiari" on the same sheet. Vasari says the picture belonged in his day to Duke Cosimo de' Medici. He describes it as representing "the head of an angel, who raises one arm in the air, which, coming forward, is foreshortened from the shoulder to the elbow . . . and with the other raises the hand to the breast."

After these failures and lost works it is agreeable to record one surviving masterpiece dating from this time, namely the "Mona Lisa." This must have been painted in Florence. as Raphael sketched it and borrowed the pose in pictures of his own dating from that time. But the documentation is unsatisfactory. There is no reliable evidence of how the picture entered the French royal collection, and even the identification of the existing picture with Vasari's description of Leonardo's portrait of Mona Lisa can be questioned, though it is probably correct. Though the picture's legend and associations (particularly as embodied in Walter Pater's celebrated essay) have become almost as integral a part of it as its inherent qualities, the latter are nevertheless of great importance. The work constituted a landmark in the development of portraiture, particularly in respect to the ease and relaxation which the half-length pose is shown capable of demonstrating and to the contribution of the hands to the expression of the sitter's character. *(See* also PORTRAIT *PAIKTIKG: Renaissance.)*

The remaining two paintings—the "St. John" and "Madonna with St. Anne" (both in the Louvre)—have, unlike the "Mona Lisa," preliminary drawings associated with them. Those for the "hladonna with St. Anne" are famous; in the case of the "St. John" it is a question of outline sketches for the hands in the *Codice Atlantico.* Leonardo seems to have been working on some stage of both pictures during his second residence in Milan, and both are usually identified with two of the three pictures shown to the cardinal of Aragon by Leonardo in France in 1517. Both would subsequently have left France—the "Madonna with St. Anne" was found in Italy by Cardinal Richelieu, while the "St. John" was exchanged by Louis XIII with Charles I and bought by Cardinal Mazarin at the commonwealth sale after Charles's execution. The "St. John" seems to have developed from the earlier painting of the pointing angel (another version of the subject: also in the Louvre and long attributed to Leonardo himself without foundation, was changed into a Bacchus in the 17th century). The strange, hermaphrodite figure is typical of all that has long been least popular in Leonardo's art, perhaps because its mysterious smile and pointing hand were repeatedly copied and parodied by Leonardo's Milanese followers! such as Bernardino Luini, Giovanni Boltraffio. Cesare da Sesto, hlarco d'Oggiono and Francesco Melzi. In the picture's present state, no reasoned assessment of its quality is possible as it is so dark as to be almost invisible. The "hladonna with St. Anne" has already been mentioned in connection with the earlier cartoon of the same subject. Though it has been claimed, inconclusively, that Leonardo may have been assisted by pupils in the painting of the figures, it remains in many ways the most typical, the most haunting and the most imaginative of all his paintings. Like so many of them, it is unfinished. *(See* also PAINTING: *Rise of European Schools.)*

Sculpture.— The surviving traces of Leonardo's activity as a sculptor are far more fragmentary than those of his work as painter. There is, in fact, no single work of sculpture which can be proved to be from his own hand. His greatest undertaking in this field—the Sforza monument—disappeared. leaving practically no trace. A series of drawings which were formerly considered to be studies for it have long since been reidentified as belonging to a later and more shadowy project, the tomb of Marshal Trivulzio. It is generally assumed that Leonardo's first project for the Sforza monument envisaged a rearing horse, and that he changed it to a walking one owing to the practical difficulties involved. This seems the most likely view, but the evidence for it is of the most fragmentary kind. As to the Trivulzio monument, the only indication that the project was entertained is a specification for it by Leonardo himself. There is no evidence that any work was ever done except on paper, and even the magnificent series of autograph drawings associable with it have a markedly academic appearance.

Surviving sculptures which have been attributed to Leonardo include a terracotta group of the Virgin and Child in the Victoria and Albert museum, London, which is more probably the nork of Antonio Rossellino. Two small bronze horses (Budapest and English private collections. the former with a rider) are very close indeed in design to several of Leonardo's drawings associated with the "Battle of Anghiari." and are presumably cast from models made in his immediate circle. Most important of all are the three figures of St. John the Baptist with the Levite and the Pharisee, by G. F. Rusticci, above the north door of the baptistery at Florence. These were placed in position in 1511. In 1507–08 Leonardo had lodged in Rusticci's house in Florence on his return there on private business and had. according to Vasari, given him all assistance with the figures short of actually executing them himself. Their extraordinary excellence is therefore some indication of Leonardo's potentialities as sculptor.

Drawings and **Notebooks.**—Leonardo da Vinci's papers were bequeathed to his young friend and pupil. Francesco Melzi. nho lived until 1570. Before the end of the 16th century. most of them had passed to the possession of the sculptor, Pompeo Leoni, who took it on himself to attempt some rearrangement of them by binding the notes and drawings of scientific subjects into one large volume and the drawings of artistic interest into another. To do this it was sometimes necessary to cut sketches of artistic interest from sheets whose contents were mainly scientific, but in these cases Leoni carefully repaired the sheets he had mutilated. The first of these volumes. the so-called *Codice Atlantico,* was bequeathed in 1637 to the Biblioteca Ambrosiana at Milan, where it remains. The second volume. after various vicissitudes. passed into the collection of the kings of England and is now at Windsor. In the 19th century the drawings numbering about 600. were removed from Leoni's binding and have since been preserved in separate mounts, with the exception of the anatomical notes and drawings which have been rebound separately. A series of 12 small notebooks. most of which were bequeathed to the Ambrosiana at the same time as the *Codice Atlantico,* were looted with it by Napoleon's forces in 1796, but unlike it nere never restored to Italy. They are now in the Institut de France, and are referred to by letters—alphabetically. A to M.

These events explain why the great majority of Leonardo's drawings of artistic subjects are in one collection. Nevertheless. it must be assumed that a number would have left Leonardo's possession before his death and therefore would never have come into Leoni's hands. and it is a fact that the relatively few drawings which are not at Windsor are nearly all datable to the earlier period of Leonardo's career. These are now divided betneen various collections. the main ones being the British museum. the Uffizi, the Louvre and the Accademia in Venice. Such notebooks as are not in the Institut de France are likewise dispersed. Three are in the library of the Victoria and Albert museum, others are in the British museum and at Holkham, Turin and the Castello Sforzesco at Milan. (A full list of the manuscripts is printed in J. P. Richter, *The Literary Works of Leonardo da Vinci,* 2nd ed.. vol. ii, pp. 400–401, 1939)

The importance of the Windsor drawings lies not merely in their number and in their quality, but aiso in the fact that. as their provenance from Leonardo's possession is undoubted. they con-

stitute the touchstone of authenticity for all the other drawings, as well as for the undocumented paintings, as has been shown.

In the last resort, it is on his drawings that Leonardo's claim to be considered one of the greatest of artists must chiefly rest. The importance of his paintings in the history of art is fully capable of proof in terms of their lasting influence on his successors, but their full merits can no longer be appreciated, since many are lost and others ruined or unfinished or darkened with time. With the drawings, on the other hand, no allowance need be made. An enormous quantity exist in good preservation and display a variety of range and a level of accomplishment that have never been approached by another artist. Leonardo used all media—pen and ink, metal points and red and black chalk—and is credited with the invention of pastel. His subjects comprised nearly the whole range of nature—studies of men and women, horses, dogs, trees, flowers, fruit and moving water, also fantastic monsters, caricatures, emblematic drawings, designs for pageants and anatomical, architectural and mechanical diagrams and maps. His characteristic technique included the famous left-handed hatching which in later life tended to be superseded by a system of shading apparently derived from engraving, with curved lines following the outlines of the form, parallel with each other and sometimes cross-hatched to give a greater effect of density.

Among the drawings which were not preparatory studies for paintings, a series of "Deluges" at Windsor call for special mention. They are undated but clearly from a late period of Leonardo's career. They represent aspects of a fantastic vision of a cataclysm and are without parallel in western art. The caricatures constitute another important class of unconnected drawings. All his life, Leonardo was fascinated by supreme ugliness as the complement of supreme beauty, and his most characteristic "doodles" are juxtaposed profiles of beautiful youth and toothless age.

The notebooks (written in Leonardo's famous, left-handed "mirror script," from right to left) illustrate the development of his varied interests and constitute the evidence for his achievement as a scientist. In this connection, two facts are of pre-eminent importance. First, with a few unimportant exceptions, all the (very voluminous) notes date from about the last 30 years of Leonardo's life. Secondly, the bulk of their contents, like the bulk of the drawings, was not published until the 19th century. Although it is possible that some of Leonardo's scientific notes dating from a relatively early stage may have been lost, the quantity is unlikely to have been considerable. Everything, on the other hand, points to the conclusion that serious scientific interests started relatively late in Leonardo's life and that they increased with the years. As a consequence of the second point, Leonardo's scientific researches may be said to constitute a backwater in the history of science. As most of them were unknown to the majority of his successors, their influence would have been very limited.

Leonardo's notes give evidence that he intended to write connected treatises on a number of different branches of science, but though he started rearranging his notes to this end and finished, according to Luca Pacioli, a book "on the depiction and movements of men," no finished book by him survives. He collaborated with Pacioli on the latter's *Divina Proportione* and illustrated the 1509 edition, but most of his own writings are in the form of disconnected paragraphs embodying the results of his original, and astonishingly acute, observations. Frequently, he sets himself hypothetical problems in order to have the pleasure of answering them, and frequently the delight in ingenuity for its own sake leads him to design fascinating contraptions which could never have worked at the time. Thus, he projected diving bells, underground canals in town planning and every sort of military gadget, including chariots with varieties of revolving knives on the axles. The eternal small boy in him led him on one occasion (manuscript B, folio 11, r) to give detailed, and perfectly serious, instructions for making and launching stinkbombs. He devoted prolonged thought to the subject of flying machines (also experimenting, without success, in this field) and made detailed observations relating to geology, geography, astronomy and botany. In architecture his notes comprise not only the ideal—countless variations on the favourite architectural preoccupation of the Renaissance, the centralized church. or plans for a model city—but also practical scientific notes on stresses of arches, walls and columns. One of his most ingenious architectural devices—the multiple staircase around a common core, whereby different individuals or parties could ascend or descend at the same time without being aware of each other—was executed, soon after his death, at Chambord and therefore presumably derives from his ideas.

Of all Leonardo's many scientific studies, three in particular stand out for the amount of time and attention he paid them, namely anatomy, light and shade and the movement of water. In these fields and in his other notes Leonardo's great distinction is the truly scientific nature of his method. Unlike most of his predecessors and contemporaries he takes nothing on trust and has faith only in his own observations and experiments. If he quotes a classical authority it is often merely to disprove him from his own researches. At the same time, his main scientific studies tend to be interrelated with his artistic interests. His studies of both anatomy and light and shade seem initially to have developed from his practice as an artist, and his ultimate discoveries in these fields were intended to be embodied both in scientific treatises and in his projected treatise on painting. As regards anatomy (in connection with which Leonardo claimed to have dissected "more than 30 bodies"), he specifies that skill in being able to draw one's dissections as one proceeds is an essential element of success and one not possessed by everyone. (His own anatomical drawings are sometimes of extraordinary beauty and nearly always of extraordinary precision.)

It is agreed that Leonardo's anatomical researches and those of Marcantonio della Torre, a celebrated anatomist with whom he collaborated for a time, were in advance of all contemporary work of the same kind and scientifically the equal of anything that appeared until well into the 17th century; further, that Leonardo was well on the way to discovering the principle of the circulation of the blood and only failed to take the final steps in this direction. A claim often made on his behalf, that he anticipated the Copernican discovery of heliocentricity, is probably without justification.

Leonardo's astonishing skill at drawing, again, is the aspect most interesting to the modern world of his lifelong study of the movement of water, since his drawing of its eddies and bubbles remained a unique record until the coming of slow-motion photography. Here again, science and art tend to flow into each other. The practical application of his studies was attempted by Leonardo in his various projects for canals. But in one of his most illuminating notes (Windsor, no. 12,579 r) he compares the motion of water with the curls in human hair, and though he attempts a scientific justification for this it needed the eye of an artist to notice the analogy in the first place. Finally, his famous "Deluge" drawings show the transposition into pure fantasy and pure art of years of study of water from a scientific point of view.

Leonardo's notes on painting, which incorporate among other things his discoveries in the science of light and shade, stand out among his writings in two respects. First, after Leonardo's death, attempts were made as early as the 16th century to reduce them to order and prepare them for publication. The earliest and fullest of these compilations, the *Codex Urbinas,* drew on autograph notes, most of which have since been lost, and reads more connectedly than any of Leonardo's other writings. Secondly, a shorter compilation of the kind was published in Paris as early as 1651 (with illustrations by Nicolas Poussin) and was thus able to exert influence denied, through lack of publication, to the bulk of his writings. Though some of the book—such as the plea for painting as an intellectual and scientific activity rather than a mechanical one—is of ephemeral interest, it contains much of permanent value. Leonardo's basic point of view. as always, is empirical. The practice of painting must rest on the study of nature, but, as always with him, science and fantasy interact in the strangest ways. The action of light is scientifically demonstrated in innumerable diagrams. but the student is also enjoined to study pictures in the fire, whereby his imagination may be stimulated in an infinite variety of ways. Certain of Leonardo's

imaginative ideas for paintings—such as his fantastic descriptions of night-pieces, with the figures lit up by flames—were not exemplified until the 17th century, while his scientific observation that shadows cast by the sun on a white wall are not black or grey but blue was later regarded as one of the fundamental discoveries of the Impressionists.

Among the most influential of Leonardo's ideas is his theory of appropriateness in a picture. A king should look like a king, and a figure's gestures clearly express his thoughts (Leonardo even recommended the study of deaf mutes in this connection). This was the aspect of his teaching which had the greatest effect on 17th-century France, while Leonardo's embodiment of it in his own work, notably the "Last Supper." exerted enormous influence on High Renaissance painting, as constituting one of the keynotes of the grand manner. In this, Leonardo, who had none of the romantic feeling for antiquity otherwise prevalent among his contemporaries, seems to have recognized the practical assistance which antique art could provide.

If the development of the grand manner was the most important respect in which Leonardo da Vinci influenced the course of art in his own time, it also represented only a small part of him. A vast proportion of his life's work remained unknown until modern times, and even that was but a fraction of what it might have been. Nevertheless, the contradictions and anomalies of his nature—the modernity of so much of his outlook. combined with the instances of almost medieval fantasy and general love of the grotesque, the emphasis on the value of experience and practice contrasted with his own striking failure in so many practical matters, and the sudden and unpredictable transitions from one to another of his innumerable interests—make up a personality which continues to fascinate precisely because it continues to baffle. To the 20th century, moreover, Leonardo's habit of leaving unfinished. merely through dissatisfaction, work that seemed miraculous to everyone else may well appear as a neurosis evocative of sympathy. The astonishing combination that he was of the infinitely curious and the infinitely inventive could not have flourished before the Renaissance but it then was already too late. Already, the ascertainable total of human knowledge and human experience exceeded the compass of one human intellect. The tragic disparity between what Leonardo so clearly was and the fragmentary nature of his surviving achievement might have been treated by the Greeks as an epic of the punishment by the gods of presumption and, like the Faust legend with which Leonardo's destiny, viewed in this light! has so much in common, has maintained its power to fire the imagination of modern man.

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LEONARDO OF PISA (LEONARDO FIBONACCI) (*c.* 1170–1230), Italian mathematician, was born in Pisa and brought up in Bougie, Alg., where his father was customs inspector. In his youth he traveled as a tradesman around the Mediterranean and then settled in Pisa. Leonardo is the outstanding European mathematician of the medieval period, but little is known about his life except for incidental remarks in his works. Most famous among these is the *Liber abaci,* composed in two versions, 1202 and 1228. It became the prototype of later Italian arithmetics and was instrumental in introducing Arabic numerals into Europe. The *Practica geometriae,* also a highly important work, was completed around 1220. Three minor works, *Liber quadratorum, Flos* and a letter to the philosopher Theodorus. deal with problems proposed by John of Palermo and solved by Leonardo in a tournament before the emperor Frederick II; they show an unusual originality and mathematical ability.

His works were edited by B. Boncompagni, *Scritti di Leonardo Pisano,* 2 vol. (1857–62). (O. OE.; X.)

LEONCAVALLO, RUGGIERO (1858–1919), Italian operatic composer, was born at Naples. He received his musical education at the conservatoire, and for many years led a wandering life, supporting himself by playing at café concerts. while he attempted to obtain the production of more than one opera. His *Pagliacci* was at length performed at Milan in 1892 with immediate success. but neither his *Medici* (produced at Milan, 1892) nor *Chatterton* (1896), the libretto of which was adapted from De Vigny's tragedy, obtained any favour. *La Bohème,* performed in 1897 at Venice, was well received, though it suffered by comparison with the more famous work on the same subject by Puccini.

Zaza was produced in 1900 and *Der Roland* in 1904. In all these operas he was his own librettist. None of the more ambitious works was very successful. Leoncavallo is undoubtedly seen at his best in *Pagliacci* and in *Zaza,* shorter works, in which his gift for the theatre stood him well. He died at Montecatini on Aug. 9, 1919.

LEONIDAS, king of Sparta. the 17th of the Agiad line. He succeeded, probably in 489 or 488 B.C., his half brother Cleomenes, whose daughter Gorgo he married. In 480 he was sent with about 7,000 men to hold the pass of Thermopylae against the army of Xerxes. It seems that the ephors supported the scheme half heartedly, their policy being to concentrate the Greek forces at the isthmus.

Leonidas repulsed the frontal attacks of the Persians, but when the Malian Ephialtes led the Persian general Hydarnes by a mountain track to the rear of the Greeks, he divided his army, himself remaining in the pass with 300 Spartiates, 700 Thespians and 400 Thebans. Perhaps he hoped to surround Hydarnes' force. If so, the movement failed. and the little Greek army, attacked from both sides, was cut down to a man save the Thebans, who are said to have surrendered. Leonidas fell in the thickest of the fight; his head was afterward cut off by Xerxes' order and his body crucified.

Our knowledge of the circumstances is too slight to enable us to judge of Leonidas' strategy. but his heroism and devotion secured him an almost unique place in the imagination not only of his own but also of succeeding times.

LEONINE VERSE, the name given to a medieval form of hexameter and pentameter verses in which the syllables preceding the middle of the line rhyme with the final syllables. It was employed during the period of transition from the ancient to the modern form of verse and may be traced to the Roman poets, examples of leonine verse appearing in the *Epistles* of Ovid, The origin of the term is in dispute, but it is probably from a medieval poet named Leo or Leonius who wrote verse in this form. It has often been associated with doggerel. The medieval form is extremely rare in English poetry, but any use of internal rhyme is sometimes referred to as leonine. Internal rhyme in English verse tends to syncopate the rhythm and become monotonous. This is true of Tennyson's "The Revenge: a Ballad of the Fleet," which makes extensive though not consistent use of rhyme at the caesura and termination in a variable stanza of anapaestic metre:

> And the stately Spanish men to their flagship bore him then,
> Where they laid him by the mast, old Sir Richard caught at last,
> And they praised him to his face with their courtly foreign grace . . .

A similar feat of internal rhyming may be found in Poe's eight-stress trochaic tour de force "The Raven." and a more expert one in Shelley's iambic-anapaestic "The Cloud." (G. W. A.)

LEONTIASIS OSSEA, a rare disease characterized by a bilateral. symmetrical overgrowth of the bones of the face and skull, producing a lionlike facial expression. *See* ACROMEGALY.

LEONTINI (mod. LENTINI), ancient tonn. southeast Sicily, 22 mi N.N W. of Syracuse direct, founded by Chalcidians from Naxos in 729 B.C. The site, originally held by the Sicels, nas seized by the Greeks because of its command of the fertile plain on the north. It nas reduced to subjection in 498 B C by Hippocrates of Gela. and in 476 Hieron of Syracuse established there the inhabitants of Catana and Naxos. Later on Leontini regained its independence. It was mainly the eloquence of Gorgias (q v) of Leontini nhich led to the abortive Athenian expedition of 427.

In 422 Syracuse supported the oligarchs against the people and received them as citizens, Leontini itself being forsaken. The exiles of Leontini then joined the envoys of Segesta in persuading Athens to undertake the great expedition of 415. After its failure, Leontini became subject to Syracuse once more. It was finally stormed by M. Claudius Marcellus in 214 B.C. It was destroyed by the Saracens A.D. 848, and almost totally ruined by the earthquake of 1698. The ancient city is described by Polybius as lying in a bottom between two hills, and facing north. On the west side of this bottom ran a river with a row of houses on its west bank under the hill. At each end was a gate, the northern leading to the plain, the southern, at the upper end, to Syracuse. There was an acropolis on each side of the valley, lying between precipitous hills with flat tops, over which buildings had extended. The eastern hill still has considerable remains of a strongly fortified medieval castle (the Castellaccio).

LEONTIUS OF BYZANTIUM (*d. c.* 545), also called HIEROSOLYMITANUS (as a monk of Jerusalem) and SCHOLASTICUS (probably as having been trained as a lawyer, though he also introduced Aristotelian distinctions into theology and so is one of the forerunners of medieval scholasticism), anti-Monophysite theologian, whose thought, though developed in controversy, remains of positive significance. His principal work, Libri III contra Nestorianos et Eutychianos, develops the idea of enhypostasia, the intimate union of human nature and divine person in Christ, important in the controversies of the age of Justinian and in later orthodox theology. Little is known of Leontius' life besides his participation in a conference of Chalcedonians (Greek Orthodox) and Monophysites at Constantinople in 531. He wrote against the leading Monophysite (see MONOPHYSITES) Severus of Antioch, Solutio argumentorum Severi (though his own ideas combined the Monophysite emphasis on the unity of Christ with the doctrine of two natures laid down at the Council of Chalcedon in 451), and against the opposite heresy, Tractatus *adversus* Nestorianos. The compendious De *sectis* is by a later hand, but perhaps based on his notes.

Leontius' collected works are found in J. P. Migne, Patrologia Graeca, vol. lxxxvi, cols. 1185–2016.

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LEOPARD, PARD or PANTHER (Panthera *pardus*), the largest spotted cat of the old world, except, perhaps, the snow leopard or ounce (*q.v.*). Leopards are characterized by the rosette-like form of the black spots on the body, and by the absence of a central spot from each rosette. They vary considerably in size, but the usual length is from 6 to 7½ ft. inclusive of the tail. The ground colour of the fur may be any shade between pale fawn and rufous buff; perfectly black (*melanistic*) mutants are not uncommon. In habit the leopard is ferocious, bloodthirsty and cunning. Its movements are quick and graceful. It obtains its prey either by springing upon it from an ambush (frequently the bough of a tree), or by a stealthy stalk.

It will eat any animal it can overcome, being especially fond of dogs. The geographical range of this animal embraces Africa and Asia from Palestine to China, Manchuria and Java. In the Pleistocene epoch it inhabited Europe. The name leopard was originally applied to an imaginary animal, supposed to be a hybrid between lion and panther, and was later transferred to the latter animal. See CARNIVORA.

LEOPARDI, ALESSANDRO (fl. *c.* 1500), Venetian sculptor, goldsmith and architect, is famous chiefly as a worker in bronze. First mentioned in 1482, he was exiled from Venice in 1487, established himself at the court of Ferrara but was recalled the following year to cast the bronze equestrian statue of Colleoni, left unfinished at Verrocchio's death. He designed the very high and elaborate base for this group, signing the statue on the saddle girth, thereby becoming known as "Alessandro del Cavallo." He worked with Antonio Lombardo on the bronze tomb of Bishop Zeno in St. Mark's and possibly also collaborated with him and with Tullio Lombardo on the Vendramin tomb in SS. Giovanni e Paolo. From 1501 to 1505 he worked on the bronze bases for the flagstaffs in the piazza of St. Mark's, which are richly decorated with antique motifs. In architecture his outstanding achievement was the church of Sta. Giustina at Padua. (*MN. L.*)

LEOPARDI, GIACOMO (1798–1837), one of the greatest of Italian poets, was born at Recanati, near Ancona, on June 29, 1798, of a noble family. All the circumstances of his upbringing conspired to foster his precocious and sensitive genius at the expense of his health. Lacking any intelligent sympathy from his parents or any companionship save that of his brothers and sister, the sickly, deformed boy spent his days in his father's extensive library, learning Latin with little help and Greek and modern languages with none. By the end of 1814 he had already written two tragedies, many Italian poems, some erudite studies on Latin and Greek literature and a history of astronomy. But his weak constitution was permanently ruined.

He began to show his poetic powers with his *Appressamento della morte* (1816), a visionary work in terza *rima* modeled on Petrarch and Dante, but inspired by a genuine feeling of despair at the (imagined) approach of death. The young man was not yet a pessimist—he was on the contrary eager for life and love. In 1817, however, he fell seriously in love with his cousin Gertrude Cassi, already married and a mother, whom he made the subject of his journal Diario d'amore and of his elegy "Il primo amore." Next in 1818, a young girl of his father's household, Teresa Fattorini, for whom he felt a tender affection and about whom he was later to write his immortal song "A Silvia," died of consumption. These two experiences led him to regard all the hopes of youth as empty and deceptive illusions.

Leopardi's love of learning and of glory remained, however, and for a time he found comfort in correspondence with the scholar and patriot Pietro Giordani, who praised his works and urged him to escape from Recanati. At last his father allowed him to spend a few months in Rome (1822–23), but even there he found little satisfaction and no employment. After another two miserable years in Recanati, brightened only by the publication of a collection of his poems under the title Canzoni (1824), Leopardi went in 1825 to Milan and then to Bologna. He returned to Recanati late in 1826, but set off again to Bologna, Pisa and Florence in 1827. His *Versi*, an enlarged collection of his poems, appeared in 1826, and his chief prose work, Operette morali, consisting mainly of dialogues and containing an exposition of his philosophy of despair, in 1827. His literary earnings and his meagre allowance from his father being insufficient to support him, he returned again to Recanati in Nov. 1828. In April 1830, however, he was able to leave for Florence, where his friends raised a subscription so that he could publish a fuller collection of his poems. This was the first edition to be entitled *Canti* (1831). In Florence he met Fanny Targioni-Tozzetti, who inspired some of his saddest songs, and formed a friendship with a young Neapolitan Antonio Ranieri, who was to be his companion for the rest of his life. After a short stay in Rome (1831–32), followed by a return to Florence, Leopardi settled in Naples in 1833. There he worked on *I paralipomeni della Batracomiomachia* (a satire in ottava *rima* on the Neapolitan revolution of 1820), authorized the second edition of his *Canti* (1835) and wrote "La Ginestra" (1836), the longest of the poems included with the *Canti* in Ranieri's collected edition of Leopardi's works (1845). Leopardi died in Naples on June 14, 1837.

Works.—Leopardi was a great scholar and a great, if bitter, philosopher. His works of scholarship—notably his commentary on Petrarch's Canzoniere and his remarks on Italian literature—and his philosophical writings—*Operette morali*, Pensieri (edited by Ranieri, 1845) and Zibaldone (a long book of memoranda including critical and biographical notes first published in 7 vol., 1898–1900)—place him among the great writers of the 19th century, but his poems give him a claim to absolute greatness.

All Leopardi's poetical work, except the verse written before

1818 (which he himself rejected), I *paralipomeni* (of no great merit) and numerous translations, is included in the posthumous edition of the *Canti*. These contain 38 original poems, the longest of 300 lines, the shortest of 15. The first poems are patriotic in theme and eloquent rather than lyrical (the ode "All' Italia" is extremely popular in Italy). Then follows "Bruto minore," in which the poet identifies himself with Brutus and in words of utter despair defies the gods who did not take the side of freedom. In his "Ultimo canto di Saffo" he complains of the deformity which bars him from love. His lyrical genius, however, shines forth at its best in a series of five poems that had appeared in the early collections of his verse under the title "Idillii." One of these, "L'infinito," an inspiring meditation on infinity, is one of the finest achievements of lyric poetry; another, "La sera del dì di festa," on the transience of pleasure, describes movingly the sadness of a Sunday night when the holiday is over and everyone thinks of the next morning's toil.

"A Silvia," "Le ricordanze," "La quiete dopo la tempesta," "Il sabato del villaggio" and "Il passero solitario" (all written in 1828–29) can be counted with "L'infinito" as Leopardi's best poems. The profound sadness of their meaning in no way detracts from the charm of their portrayal of delicate things, the diction is simple and powerful, and the effortless musicality of the verse justifies their being called *canti* ("songs"). The first of these poems commemorated Teresa Fattorini, whose joyful singing used to delight the young Leopardi; the second evokes his childhood and contrasts his former hopes with his present misery; the third and fourth depict village life in the calm after the storm and on the eve of a festival; and the fifth is about a sparrow singing by itself on a fine spring day. They all end sadly but with a sadness that comes from the heart rather than from the cold reasoning of the mind.

In all the poems that Leopardi wrote after these the reasoning of the philosopher prevails over the poet's feelings. Though some have fine passages (especially "Canto notturno" and "Amore e morte"), they are marred by an excess of argument. "La Ginestra," Leopardi's last great poem, has often been called his masterpiece! but is more important for the new opening that it shows in his philosophical system of pessimism and despair and for its message of universal brotherhood than for any specifically poetical quality.

Leopardi's reputation at first suffered, in the English-speaking world from a moralistic prejudice against his discouraging philosophy (*see* W. E. Gladstone, "Giacomo Leopardi," *Gleanings of Past Years*, vol. ii, 1879). Later British and American critics came to give him his due as a poet.

There is a critical edition of Leopardi's works by F. Flora, 5 vol. (1937–49). This includes his letters (second in beauty only to the poems), of which there is a separate edition by F. Moroncini and G. Ferretti, 3 vol. (1934–41). For English versions of the *Canti*, see *The Poems of Leopardi*, with Italian text and translation by G. L. Bickersteth (1923); *Translations From Leopardi*, by R. C. Trevelyan (1941); and *Poems From Giacomo Leopardi*, by J. Heath-Stubbs (1946).

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(F. DI.)

LEOPOLD I (1640–1705), Roman emperor, second son of the emperor Ferdinand III and his first wife Maria Anna, daughter of Philip III of Spain, was born on June 9, 1640. Leopold was intended for the church, but the death of his elder brother, the German king Ferdinand IV, in July 1654, made him his father's heir. He was chosen king of Hungary in 1655 and king of Bohemia in 1656; and in July 1658, more than a year after his father's death, he was elected emperor at Frankfurt. For nearly the whole 47 years of his reign Leopold was pitted against Louis XIV of France. The emperor was a man of peace, and never directed his armies in person, but the empire was at war for the greater part of his reign. He was the ally of Poland against Charles X of Sweden until the peace of Oliva (1660). A war against Turkey was brought to a close by the victory of the imperial general Raimondo, count of Montecuccoli, at St. Gotthard abbey, followed by a 20-years truce. The first war with France (1672–78) was concluded by the treaty of Nijmegen (1679). The empire was again in a state of war with France in 1682–84, and in 1689 Leopold joined the Grand Alliance against Louis XIV. (*See* GRAND ALLIANCE, WAR OF THE.) Peace was concluded at Ryswick in 1697, though Leopold did not come to terms until some months later. After four years of peace the empire was involved in the War of the Spanish Succession (*q.v.*). The great victory of Blenheim had been won before Leopold died on May 5, 1705. During this reign some important changes were made in the constitution of the empire. In 1663 the imperial diet entered upon the last stage of its existence and became a body permanently in session at Regensburg; in 1692 the duke of Hanover, Ernest Augustus, was made the ninth member of the electoral college; and in Nov. 1700 Leopold, in need of help for the impending war with France, granted the title of king in Prussia to the elector Frederick III of Brandenburg. The net result of these and similar changes was to weaken the authority of the emperor over the members of the empire and to compel him to rely more and more upon his position as ruler of the Austrian archduchies and of Hungary and Bohemia, and Leopold was the first who really appears to have appreciated this altered state of affairs and to have acted in accordance therewith.

Leopold was married first, in 1666, to the infanta Margaret Theresa (1651–73); then, in 1673, to Claudia Felicitas of Tirol (1653–76); finally, in 1676, to Eleanor of Pfalz-Neuburg (1655–1720), mother of his two imperial successors.

Leopold's letters to Marco d'Aviano from 1680 to 1699 were edited by O. Klopp and published at Graz in 1888. Other letters are found in the *Fontes rerum Austriacarum*, Bande 56 and 57 (Vienna, 1903–04). *See* also A. F. Pribram, *Zur Wahl Leopolds I* (Vienna, 1888); K. T. von Heigel, *Neue Beiträge zur Charakteristik Leopolds I* (Munich, 1890); H. F. Schwarz, *The Imperial Privy Council in the Seventeenth Century* (Cambridge, Mass., London, 1943).

LEOPOLD II (1747–1792), Roman emperor and grand duke of Tuscany (as Leopold I), son of the empress Maria Theresa and her husband Francis I, was born in Vienna on May 5, 1747. As a third son, he was at first destined for the priesthood. The death of his brother Charles in 1761, however, placed him second in the line of succession. He married the infanta Maria Louisa, daughter of Charles III of Spain, in 1764; she was to bear him 16 children. He became grand duke of Tuscany on the death of his father in 1765. Leopold made Tuscany a model state of "enlightened despotism." He regarded himself as "only the delegate and servant of his people." He lived modestly, published exact accounts of the public finances and supervised every detail of the administration. He also gave Tuscany the most pervasive and skilful secret police in Europe. In Feb. 1790 the death of his elder brother Joseph II made him head of the house of Habsburg. Joseph had brought the imperial dominions to the verge of disaster both at home and abroad. Leopold II saved them by his skill and readiness to compromise. His policy was "peace and friendship without, and tactful government within." Joseph II had made an alliance with Russia against Turkey and was himself threatened by a Prussian alliance with Turkey. Leopold abandoned the Russian alliance and made the convention of Reichenbach with Prussia (July 27, 1790). This convention paved the way for many years of Austro-Prussian co-operation. In the following year Leopold also concluded peace with Turkey. In Oct. 1790 he was crowned Holy Roman emperor at Frankfurt, with Prussian backing.

Leopold found most of his dominions, particularly Hungary and the Netherlands, in rebellion. In the latter he restored the traditional rights of the provinces but was compelled also to send forces to re-establish order, without complete success. In Hungary he revived the diet, which Joseph II had suppressed, and acknowledged the Pragmatic Sanction. His concessions in other lands were less serious. Though he allowed the diets to meet, he gave them no real power, and he preserved most of Joseph II's agrarian reforms. One gesture had much interest for the future. He threatened Hungary with a Serb rising if compromise failed and founded a chair of Czech at Prague university as a further warning to the Hungarians.

Leopold had at first welcomed the French Revolution. It would put an end to "many injustices, wars, disputes, and upheavals."

He was, however, pressed by the French émigrés and by some of his own ministers to save his sister Marie Antoinette, queen of France. and her husband Louis XVI. After the failure of their flight to Varennes, he appealed to the rulers of Europe to join him in protecting the French royal family, and on Aug. 27, 1791, he and Frederick William II of Prussia issued the declaration of Pillnitz, promising to intervene in France if all other courts would co-operate with them. Leopold did not expect to get this co-operation; and when Louis XVI accepted the French constitution in September, Leopold "hailed this with joy" and broke with the émigrés. He believed that war with France could be avoided. His policy was never tested. He died suddenly on March 1, 1792.

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LEOPOLD I (1790–1865), king of the Belgians, fourth son of Francis, duke of Saxe-Coburg-Saalfeld. and uncle of Queen Victoria of England. was born at Coburg on Dec. 18, 1790. At the age of 18 he entered the military service of Russia, and accompanied the emperor Alexander to Erfurt as a member of his staff. He was required by Napoleon to quit the Russian army, and spent several years in travelling. But he took part in the whole of the campaign of 1813–14, distinguishing himself in the battles of Leipzig. Liitzen and Bautzen. He entered Paris with the allied sovereigns and accompanied them to England. He married in May 1816 Charlotte, only child of George, prince regent, afterward George IV. heiress presumptive to the British throne. After the death of the princess in 1817 he continued to reside in England. In 1830 he declined the crown of Greece, but was in the following year elected king of the Belgians (June 4, 1831). He accepted, after assuring himself of the support of the great powers. On July 21 he made his entry into Brussels and took the oath to observe the constitution.

During the first eight years of his reign he was confronted with the resolute hostility of King William I of Holland, and it was not until 1839 that the differences between the two states. which until the revolution of 1830 had formed the kingdom of the Netherlands, were finally settled by the treaty of the Twenty-Four Articles (see BELGIUM: *History*).

From this date until his death, King Leopold spent all his energies in the wise administration of the affairs of the newly formed kingdom. In 1848 the throne of Belgium stood unshaken amidst the revolutions which marked that year in almost every European country. On Aug. 8, 1832, Leopold married, as his second wife, Louise of Orléans, daughter of Louis Philippe, king of the French. Their children were Leopold, afterward king of the Belgians; Philip, count of Flanders; and Marie Charlotte, who married Maximilian of Austria, emperor of Mexico. Leopold I died at Laeken on Dec. 10, 1865.

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LEOPOLD II (LÉOPOLD LOUIS PHILIPPE MARIE VICTOR) (1835–1909), king of the Belgians, eldest son of Leopold I by his second wife Louise of Orléans, was born in Brussels on April 9, 1835. Created duke of Brabant in 1846, he was commissioned as a sublieutenant in the grenadier regiment. He married Marie Henriette (1836–1902), daughter of the archduke Joseph of Austria, in 1853. On Dec. 10, 1865, he succeeded his father as king.

Throughout the Eranco-German War (1870–71) the neutrality of Belgium, stipulated in the treaties of 1831, was maintained with the help of British diplomacy. New conventions between Great Britain and the belligerents made it clear that any violation of the Belgian frontier would be regarded as a *casus belli*. Leopold however, remained anxious to strengthen his country's defenses. the more so as the danger of European war seemed to be increasing in the latter years of his reign. The fortification of Liège, Namur and Antwerp bore witness to this preoccupation; and on the eve of the king's death parliament resolved to make military service compulsory. The most notable event of Leopold's career, meanwhile, was the establishment of the Congo Free State (*see* BELGIAN CONGO). He gave the first impulse to the development of the idea by founding the Association Internationale Africaine in 1876 and by engaging H. M. Stanley (*q.v.*) in 1878 to undertake a survey of the Congo basin. Leopold became sovereign of the vast new territory in 1885; but his exploitation of it was subjected to acutely hostile criticism, and in 1908 it became a Belgian colony.

Leopold died at Laeken on Dec. 17, 1909, and was succeeded by his nephew Albert (see ALBERT I), the surviving son of his brother Philip. count of Flanders. (E. CA.)

LEOPOLD III (1901–), king of the Belgians, was born on Nov. 3, 1901, the son of Albert I (*q.v.*), whom he succeeded on Feb. 17, 1934. He married on Nov. 10, 1926. Princess Astrid of Sweden (1905–35); and of this marriage mere born Princess Josephine Charlotte (Oct. 11, 1927), Prince Baudouin (Sept. 7, 1930) and Prince Albert (June 6, 1934). During German occupation of Belgium in World War II, Leopold was taken prisoner. When the Allies liberated Belgium, parliament in Sept. 1944 named Leopold's brother, Prince Charles, regent of the realm until the king should return. After his return from exile in July 1950 Leopold agreed to relinquish the royal prerogatives to Prince Baudouin, who took power on Aug. 11, 1950. He abdicated in favour of the prince. who ascended the throne on July 17, 1951.

LEOPOLD II (1797–1870), of Habsburg-Lorraine, grand duke of Tuscany, was born on Oct. 3, 1797, the son of the grand duke Ferdinand III, whom he succeeded in 1824. During the first 20 years of his reign he devoted himself to the internal development of the state. He was the mildest and least reactionary of all the Italian despots of the day; he allowed liberty to the press and permitted political exiles from other states to dwell in Tuscany undisturbed.

The times, however, were moving in another direction; for the events in the reign of Leopold II which led to his forced abdication and to the union of Tuscany with Italy see TUSCANY: The *Habsburg* Restoration.

Having been expelled from Florence, the grand duke and his family departed for Bologna, undisturbed. on April 27, 1859, and after an interregnum Tuscany was incorporated in the kingdom of Italy. On July 21 Leopold abdicated in favour of his son Ferdinand IV, who never reigned, but issued a protest from Dresden (Blarch 26. 1860). Leopold II died in Rome on Jan. 29, 1870.

LEOTYCHIDES, Spartan king, of the Eurypontid family, in 491 B.C. succeeded Demaratus (*q.v.*), whose title to the throne he had with Cleomenes' aid successfully challenged. He took part in Cleomenes' second expedition to Aegina, on which ten hostages were seized and handed over to the Athenians for safe custody: for this he narrowly escaped being surrendered to the Aeginetans after Cleomenes' death. In the spring of 479 he commanded the Greek fleet of 110 ships, first at Aegina and afterward at Delos. In August he attacked the Persian position at Mycale on the coast of Asia Minor opposite Samos, defeated the army and annihilated the fleet which was drawn up on the shore. Soon afterward he sailed home with the Peloponnesians, leaving the Athenians to prosecute the siege of Sestos. In 476 he led an army to Thessaly to punish the Aleuadae for helping the Persians and to strengthen Spartan influence in northern Greece, but was bribed to withdraw. For this he was tried at Sparta, and

fled to the temple of Athena Alea at Tegea. Sentence of exile was passed: his house was razed and his grandson Archidamus II ascended the throne (Herod., vi. 65–87, ix. 90–114; Thucydides, i, 89; Pausanias, iii. 9–10; Plutarch, *De malignitate Herodoti,* 21, p. 859 D; Diodorus, xi, 34–37). The chronology of his reign and death is somewhat obscure.

Leotychides died probably in 469.

LEOVIGILD or LÖWENHELD (d. 586). restorer of the Visigothic kingdom, king in 568, ruled until 572 over the part of this kingdom which lay to the south of the Pyrenees when his brother Luiva, or Leova, who governed the small part to the north. died and he became sole king. Menaced externally by the Byzantines and Suevi and internally by the dissensions between the orthodox Christians and Arians, Leovigild began by attacking the Byzantines, whom he defeated; he chastised the Suevi and took Cordova, capturing before the end of his reign their whole kingdom. Having given peace to his people, he made Toledo his capital. and associated in his rule his two sons Recared and Hermenegild. Leovigild was an Arian, the last of the Visigothic kings to hold that creed. Hermenegild. however, had been converted to the orthodox faith and be headed a formidable insurrection of the Byzantines and orthodox Christians; defeated and captured, he refused to give up his faith and was executed in 585. He was canonized, at the request of Philip II of Spain, by Pope Sixtus V. Leovigild died at Toledo on April 21, 586.

LEPANTO, THE BATTLE OF. The battle of Lepanto was fought on Oct. 7, 1571, between the forces of the Christian league and Turkey. The league had been formed mainly by the efforts of Pope Pius V to whom Venice had appealed against the constant depredations of the Turk, ending in their seizure of Cyprus; and its naval forces were supplied mainly by Venice and Spain—the former having Barbarigo and Veniero as their principal admirals, the latter the marquis of Santa Cruz; there was also a small squadron from the papal states, commanded by Colonna, and a Genoese squadron under Giovanni Andrea Doria. The total Christian force was more than 300 ships, including 6 galleasses and about 208 galleys. The supreme command was given to Don John of Austria. The allies concentrated at Messina, the Turk making no attempt to intercept a Venetian squadron which had to join them from the eastern Mediterranean. Thence they proceeded to the Gulf of Lepanto where the Turkish force from the Aegean awaited them. The Turks, 300 strong. including more than 250 galleys, were drawn up just inside the gulf, stretching nearly from shore to shore. The commander in chief, Ali Pasha, was in the centre, and the right and left were commanded by Mohammed Sirocco and Uluch Ali, respectively. The allies had to deploy round the headland on the northern side of the gulf and then. the galleasses leading, descended in line abreast on the Turk. On the two flanks they were not immediately successful. Barbarigo, on the left, came under the full fire of the Turks as he deployed, while Uluch Ali completely outmanoeuvred the Christian right. Pretending to outflank his foe. he induced Andrea Doria to part company with his centre and broke through the gap so created, the situation only being saved by the foresight of Santa Cruz with the reserve squadron. In the centre, however, the Christians achieved great success. Ali Pasha's galley was captured and his squadron utterly, beaten. Panic spread to the other Turkish squadrons, and the greater part of their fleet was taken or destroyed. Uluch Ali alone escaping with some of his ships. The battle is remarkable in two ways. First, as the last great battle in which both sides used oar-propelled vessels; secondly, for its enormous casualties, reckoned at various figures. The Christians had about 8,000 men killed and double that number wounded, while the Turks had about 25,000 killed and an unknown number wounded. Further, about 15,000 Christians in the Turkish galleys were liberated from slavery. (G.A.R.C.; J.G.B.)

LEPIDOLITE or LITHIA MICA: *see* MICA.

LEPIDOPTERA, the order of insects including the moths and butterflies, with their larvae, the caterpillars. They have a complete metamorphosis: the earlier stages (active larvae, caterpillars) have no external trace of wings or reproductive structures; the penultimate stage (inactive pupa, chrysalis) has external rudimentary wings; the active adult practically always has imbricated scales on the wings, spirally coiled sucking mouth structures. one upper spur (modified into a cleaning brush) on the foreleg. a terminal pair of spurs on the middle and two pairs on the hind legs. Except ior the Antarctic, lepidopterans are world-wide and very numerous. *See* BUTTERFLY AND MOTH.

LEPIDUS, the name of a Roman patrician family in the Aemilian gens. of which the following were the most notable members:

1. MARCUS AEMILIUS LEPIDUS who was one of the ambassadors to Greece. Syria and Egypt in 200 B C., when he delivered the Roman ultimatum to Philip V of Macedon. He was consul in 187 and 175, censor in 1i9 (reforming the Comitia Centuriata), *pontifex maximus* from 180 onward and *princeps senatus* from 179 to 152. He fought against the Ligurians. constructed the Via Aemilia from Ariminum to Placentia and led colonies to Mutina (Modena) and Parma.

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2. MARCCS AEMILIUS LEPIDUS, father of the triumvir. In the civil wars he sided with Sulla. Afterward he became leader of the popular party and with the help of Pompey was elected consul for 78 B.C., in spite of the opposition of Sulla. On Sulla's death, Lepidus tried to upset the Sullan constitution, proposing the renewal of cheap corn, the recall of exiles, the restoration of confiscated lands and, ultimately, the re-establishment of tribunician power. To carry out his program and obtain a second consulship, he raised forces in Etruria and Cisalpine Gaul. When declared a public enemy (early in 77), he marched on Rome but was repelled by Q. Lutatius Catulus at the Pons Mulvius (Milvian bridge) and defeated by Pompey in Etruria. He sailed to Sardinia, where he soon died; his followers joined Sertorius in Spain. Lepidus was too small a man to carry through a counter-revolution.

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3. MARCUS AEMILIUS LEPIDUS, the triumvir. He joined the party of Julius Caesar in the civil wars, was consul in 46 B.C. and Caesar's *magister equitum* 45 and 44. When Caesar was murdered, Lepidus, as commander of the only army near Rome, became important. He sided with Antony when civil war broke out. Antony, after his defeat at Mutina, joined Lepidus in Gaul; and in the autumn of 43 Octavian effected an arrangement with Antony and Lepidus, and their triumvirate was organized at Bononia. Lepidus was consul again in 42, but Antony and Octavian soon reduced him to an inferior position. His provinces of Gaul and Spain were taken from him and his inclusion in the renewed triumvirate in 37 was only formal. In 36, in the campaign against Sextus Pompeius, he attempted to raise Sicily against Octavian, but his soldiers betrayed him. He was allowed to remain *pontifex maximus* but had to retire into private life. He died in 13 (or 12) B.C.

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(X.; H. H. SD.)

LE PLAY, (PIERRE GUILLAUME) FRÉDÉRIC (1806–1882), French mining engineer and sociologist, whose chief contribution was a discovery of the important relations between family type and the rest of society. Born at La Rivière St. Sauveur, Calvados, on April 11, 1806, the son of a customs official, he was educated at the École Polytechnique at Paris and entered the state department of mines. In 1840 he was made engineer in chief and professor of metallurgy at the School of Mines, where he became inspector in 1848.

Between 1835 and 1851 Le Play studied mining all over Europe. He reorganized the coal mines in the Ural mountains for the Russian government and became Europe's most influential mining engineer, meanwhile devoting spare time to sociological field studies. Depressed by the constant revolutions in France and challenged by the wide acceptance of what he thought were er-

roneous ideas in Rousseau's *Social Contract,* he gave up mining for sociology by 1855. His friends forced him into politics and he became senator in 1867.

He sought on the basis of his sociological studies to persuade Napoleon III and his court to re-create and preserve the French family system. He suggested the adoption of a stem family system which kept the main branch intact on the undivided homestead while other members entered industry, city life and government. His scientific studies and persuasion were of no avail so he abandoned politics after 1870 and devoted his life to study of sociology, to scientific writing and to educating leading people through information meetings of French intellectuals at his house. This he continued until his death in Paris, April 5, 1882.

In his studies of society he began with the family and industry and moved up to theories of the relations between the worker and industry, the people and the leaders and the best functions of government. His tool was a family budget which, after recounting income and its sources, expenses and their uses, covered the work and moral attitudes and the relations between worker, employer, government and society.

Le Play's first sociological publication of importance was *La Réforme sociale en France* (2 vol., 1864; 7th ed., 3 vol., 1887), although he had been honoured for the earliest and abridged edition of *Les Ouvriers européens* in 1855 (2nd ed. in 6 vol., 1879). His last work was *La Constitution essentzelle de l'humanité.*

Le Play evolved a theory of the cyclical changes in society with increases or decreases of family morale, contrary to the evolutionary ideas of continued progress by men such as Auguste Comte, Herbert Spencer and Émile Durkheim which were most popular in Europe during the 19th century. Thus Le Play, who predicted the future weakness of France and western society prior to any other thinker, was not widely accepted in his time. Even the Le Play School of Sociology, which was founded around the Société internationale des études pratiques d'Economie sociale and which published a series of studies called *Ouvriers des deux mondcs* did not keep his cyclical ideas but emasculated them into an evolutionary progressivism under the leadership of Edmond Demolins, Robert Pinot and Paul de Rousiers.

After the French collapse of 1940, the eyes of intellectual France again turned to him, and most of his sociological writings were republished. (C. C. Z)

LEPROSY (HANSEN'S DISEASE) is a chronic, mildly communicable disease of man which varies greatly in prevalence in different parts of the world. It is caused by *Mycobacterium leprae,* an acid-fast micro-organism.

Incidence and Distribution. — The Bible contains several references to the disease. Much controversy exists concerning historic leprosy because undoubtedly many skin diseases were erroneously designated as leprosy. In the middle ages it was prevalent in Europe, and many special hospitals or lazarettos were provided to care for the victims. In modern times leprosy has been widely but unequally distributed, the incidence being as high as 10% of the population in certain areas of Africa, and almost negligible as a public health problem in areas of western Europe and North America. The disease is largely tropical and subtropical, being confined, for the most part, to the warmer parts of the world and to the darker-skinned races, particularly where inadequate nutrition and sanitation exist. In the 19th century, however, the Scandinavian peninsula experienced a fairly extensive outbreak, especially in Norway, but by the mid-20th century the disease had practically disappeared., Iceland had been a focus of leprosy for a long time but its prevalence there was also rapidly declining. In the British Isles nearly all cases had been imported from tropical areas either in the incubation stage or as clinical cases. In modern times the prevalence of leprosy has declined in nearly every country in which scientific medicine is practiced.

In China, Korea, India and Africa, the public health control of the disease is most difficult. In South America, the incidence ranges from almost no cases in Chile to tens of thousands in Brazil. In Central America the number of lepers is relatively large—several thousands occurring in Mexico, but fewer in the other countries. In most islands of the Pacific the incidence is high, but is declining. In Hawaii, in 1947, approximately 400 cases in a population of about 500,000 were in isolation. In 1900, approximately four times as many cases of leprosy were reported on the islands. In the United States conditions favourable to the propagation of the disease exist only in states bordering the Gulf of Mexico. Although only 800 to 1,000 cases of leprosy were known in the United States early in the second half of the 20th century, an estimated 1,000 to 2,000 additional cases were unrecognized.

Aetiology.—*Mycobacterium leprae* is an acid-fast microscopic organism from 5.0 to 7.0 μ in length. It is one of the few remaining pathogenic bacteria which has resisted all attempts to be cultivated *in vitro.* Furthermore, no experimental animal host has been observed to be susceptible to the infection. Nevertheless, numerous investigators have reported the successful cultivation of *Mycobacterium leprae in vitro,* as well as experimental reproduction of the disease in monkeys, but such reports have not withstood critical evaluation. Many unsuccessful attempts have been made to transmit the infection to humans with inoculum containing *Mycobacterium leprae.* The infectious agent is often referred to as Hansen's bacillus because G. Armauer Hansen, in 1874, first described the organism he had seen in tissues of patients. Laboratory research on human leprosy has been supplemented with studies on a disease of rats and mice designated murine leprosy (Stefansky's disease) because its characteristics are biologically similar to the human infection.

Mode of Transmission. — The exact means by which leprosy is transmitted from man to man is unknown. Epidemiologic studies indicate that it is chiefly a familial disease spread by direct contact and that no intermediate host is essential to transmission. It is not inherited, as originally believed. Children before the age of puberty are more susceptible than adults. Infection of a nonleprous marital partner by a leprous mate does not often occur. The early appearance of lesions in the nose and in the skin, particularly on the exposed parts of the body, suggests these portals to be channels of infection. Insect transmission has not been proved. Long continuous or repeated exposures to a patient with leprosy is required for successful transmission. Poor nutrition, filth and squalor are relevant factors in the spread of the disease.

Clinical Manifestations.—The incubation period of leprosy is long but varies greatly. Cases are known to develop in from one to two years after exposure, and on the other hand, from 15 to 20 years may elapse between exposure and appearance of clinical symptoms. The disease progresses slowly and the signs and symptoms vary greatly in severity. In many cases, only a few superficial lesions develop which may persist without change or gradually disappear. Subclinical or inapparent infections undoubtedly occur in individuals living in endemic areas.

Although, in 1948, the Fifth International Congress for Leprosy recognized the three following types of leprosy, (1) lepromatous, (2) tuberculoid and (3) intermediate, a former classification into (1) neural and (2) cutaneous or lepromatous leprosy lends itself to a better description of the disease The neural or nerve form includes cases in which the primary lesions develop in the nervous system The type is considered to be noninfectious and is incorporated into the tuberculoid form. It may lead to marked deformities of the extremities, such as "claw hands," and to extensive ulceration. The chief clinical manifestations are skin discoloration, loss of sensation and atrophy. The cutaneous or lepromatous form, which contains large numbers of leprosy bacilli, is recognized as infectious and is characterized by thickening of the skin and the formation of nodules. The type is usually progressive and causes in some patients marked disfigurement of the countenance, such as the heralded "leonine" facies. Not infrequently the neural and cutaneous forms occur in the same patient and are designated as the mixed form.

Leprosy may impair vision and sometimes causes blindness. Ulceration of the nose is common with the destruction of tissue and disfigurement. The disease may attack structures of the throat and cause a pronounced change of the voice. Involvement of the vocal cords sometimes leads to obstruction which necessitates surgical interference. In general, the span of life of the average neural or tuberculoid case is not shortened and death is caused by complications or an intercurrent infection. The average length of life of the patient with the lepromatus type is approximately ten years, after the disease is diagnosed.

Treatment. — Infectious cases of leprosy should be isolated, provided with good medical care, and given an adequate caloric and high vitamin diet. Many drugs have been used in the treatment of leprosy, but only two types of therapeutic agents are considered to be effective. Chaulmoogra oil and its derivatives have been used extensively since mediaeval times, but since 1914 many controlled observations have been carried out and many leprologists question its value. A second group

of drugs, designated sulfones, are derived from a parent compound, diaminodiphenylsulfone. It includes promin, diasone, promizol and several other compounds, which are employed in many leprous areas throughout the world. Promin is reported to be the most effective and the least toxic and far superior to chaulmoogra oil. Treatment with sulfones must be continued for several years to arrest the disease. Antibiotics, such as streptomycin, are useful drugs particularly when employed with sulfones to eliminate secondary infections which affect the healing of lepromatus ulcers. Recurrences under therapy are not infrequent, and investigators continue to look for more effective compounds. Observations must be continued for a long period of time to determine the exact value of sulfones in leprosy because numerous cases recover with only symptomatic treatment. Surgery intervention is often employed to alleviate disfigurement and to eliminate symptoms amenable to surgical techniques.

Control **Measures.**—Methods for the control of leprosy vary according to circumstances and public health laws. In general, the prevention of leprosy is effected by removing the patient from the environment in which he may be a menace. He may be segregated in his home or in a leprosarium. In countries in which the disease is most prevalent, out-paticnt clinics are established for administration of drugs and for education in the prevention of the disease. In those countries in which the disease is less prevalent, yet constitutes a public health problem, various types of leprosaria are provided for cases considered to be contagious. Infants should be segregated from leprous patients at birth inasmuch as they are particularly susceptible to the infection at that age. Procreation should be discouraged among lepers because of the danger to children and because pregnancy in leprous women often activates the disease. Control measures are unnecessary in areas in which the natural spread of disease does not occur. The results of efforts to control leprosy have by no means been brilliant. The United States public health service considers the disease to be arrested in a patient in whom *Mycobacterium leprae* cannot be detected b~ defined bacteriological examination for a period of at least six months.

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LEBSIUS, KARL RICHARD (1810–1884), German Egyptologist, was born at Naumburg-am-Saale on Dec. 23, 1810. He studied at Leipzig, and at Gottingen, where, under the influence of Otfried Muller, he finally decided to devote himself to the archaeological side of philology. After graduating doctor in Berlin in 1833, he went to Paris, where he mas commissioned by the duc de Luynes to collect material from the Greek and Latin writers for his work on the weapons of the ancients. In 1834 he took the Volney prize with his *Paläographie als Mittel der Sprachforschung.* Befriended by Bunsen and Humboldt, Lepsius took up Egyptological studies, which, since the death of Champollion in 1832, had attracted no scholar of eminence and weight. After four years spent in studying the Egyptian collections of Italy, Holland and England, he returned to Germany, where Humboldt and Bunsen secured for his projected visit to Egypt the status of a scientific expedition with royal support. For three years Lepsius and his party explored the region from the Sudan above Khartum to the Syrian coast. At the end of 1845 they returned home, bringing with them casts, drawings and squeezes of inscriptions and scenes, maps and plans collected with the utmost thoroughness, as well as antiquities and papyri.

In 1846 Lepsius received a chair in Berlin University. In 1859 the 12 volumes of his vast *Denkmäler aus Ägypten und Äthiopien* were finished, supplemented later by a *text* prepared from the note-books of the expedition; they comprise its entire archaeological, palaeographical and historical results. In 1866 Lepsius again went to Egypt, and discovered the famous Decree of Tanis or Table of Canopus, an inscription of the same character as the Rosetta Stone, in hieroglyphic, demotic and Greek. In 1873 he was appointed keeper of the Royal Library, Berlin, which, like the Berlin Museum, owes much to his care. He died at Berlin on July 10, 1884. Besides the colossal *Denkmäler* and other publications of texts such as the *Todtenbuch der Agypter (Book of the Dead,* 1842) his other works, amongst which may be specially named his *Königsbuch der Ägypter* (1858) and *Chronologie der Ägypter* (1849), retain permanent value.

See EGYPT: *Archaeology.*

See Georg Ebers, *Richard Lepsius* (1887).

LEPTIS, the name of two towns in ancient Africa. The first, Leptis Magna (Λεπτιμαγνα), the modern Lebda, was in Tripolitana between Tripolis and Mesrata, at the mouth of the Cinyps; the second, Leptis Parva (Λέπτις ἡ μικρά), known also as Leptiminus or Leptis minor, the modern Lamta, was a small harbour of Byzacena between Ruspina (Monastir) and Thapsus (Dimas).

1. LEPTIS MAGNA was one of the oldest and most flourishing of the Phoenician emporia established on the coasts of the greater Syrtis, the chief commercial entrepôt for the interior of the African continent. It was founded by the Sidonians who were joined later by the people of Tyre. Herodotus enlarges on the fertility of its territory. It was tributary to Carthage to which it paid a contribution of a talent a day. After the Second Punic War Massinissa made himself master of it. During the Jugurthine War it appealed for protection to Rome Though captured and plundered by Juba, it maintained its allegiance to Rome, supported the senatorial cause, received Cato the younger with the remains of the Pompeian forces after Pharsalus in 48 B.C. After his victory Julius Caesar imposed upon it an annual contribution of 300,000 measures of oil Nevertheless, it preserved its position as a free city governed by its own magistrates. It received the title of *municipium* and was subsequently made a *colonia* by Trajan while under Nerva the coast-road from Tacape (Gabes) to Leptis was constructed. Septimius Severus, who was born there, beautified the place and conferred upon it the *Ius Italicum* and the place as it stands is his creation. The ruins of Leptis are among the most imposing Roman remains in North Africa, and have been excavated in part by the Italians since 1911. The city walls have only been traced in a few places on the west, where what is visible is comparatively late; while on the north, towards the sea, there were no walls at all, so that the fresh breezes could, as at Oea (Tripoli) have access to the town. The ancient harbour, with its quays (well preserved and of several types) round a large basin, lay at the mouth of the small stream known as Wady Lebda; on the western promontory a breakwater supported a lighthouse; on the eastern stood a tower and a temple

Before the recent excavations, the most prominent ruins in the town were attributed to the Imperial palace, but they have turned out to be the forum, surrounded by a peristyle with an inscription of Septimius Severus: on the east of the open space is a large basilica, some 300 ft. long and 125 wide, with an apse at each end with finely carved pilasters. To the south-west three arches faced the entrance to a monumental street running north-east, past the forum, to the coast, and to the south is a large mass of concrete with niches, perhaps a *nymphaeum* or monumental fountain.

To the north are streets on a more or less regular plan, and a theatre, another *nymphaeum* of the period of Severus, and a church of the Byzantine period. The *thermae* (baths) which lie to the south of the forum, were completed in A.D. 127. They are

extremely well preserved. and their plan is interesting and well thought out: a large number of statues were found in them. To the south of them again is a large group of cisterns: while a road led from the northwest angle of the baths to a four-way arch. or Janus. which is of the time of Severus and probably belonged to the city walls of the imperial period. Some way off to the east. along the shore, is a large circus and the site of the amphitheatre is close by.

The coins of Leptis Magna. like the majority of the emporia in the neighbourhood, present a series from the Punic period. They are of bronze with the legend לפקי (*Lepqi*).

See J. Toutain, "Le Limes Tripolitanus en Tripolitaine," in *Bulletin archéologique du comité des travaux historiques* (1905); P. Romanelli, *Leptis Magna* (1926); R. Bartoccini, *Guida di Lepcis* (1927).

2. LEPTIS PARVA (Lamta), 10 mi. from Monastir (which is often confused by modern writers with Leptis Magna in their interpretations of ancient texts) and 24 mi. S.W. of Hadrumetum (Sousse). A French engineer, A. Daux. discovered a probable line of ramparts. Like Hadrumetum. Leptis Parva declared for Rome after the last Punic War. Also after the fall of Carthage in 146 it preserved its autonomy. Julius Caesar made it the base of his operations before the battle of Thapsus in 46. Under the empire Leptis Parva became extremely prosperous; its bishops appeared in the African councils from 258 onward. In Justinian's reorganization of Africa Leptis Parva was with Capsa one of the two residences of the *Dux Byzacenae*. The ruins extend along the seacoast to the northwest of Lamta; the remains of docks, the amphitheatre. cisterns and a Byzantine fort can be distinguished; a Christian cemetery has furnished tombs adorned with curious mosaics.

See *Bulletin de la Soc. archéol. de Sousse,* plan of the ruins of Lamta and references (190;).

LEPTOSPIROSIS (WEIL'S DISEASE. CANICOLA FEVER, MUD FEVER. PEA PICKER'S DISEASE. SWINEHERD'S DISEASE) is a specific, infectious and contagious disease of animals. occasionally communicable to man. caused by a pathogenic spirochete of the genus *Leptospira.* Such diseases of animals that are communicable among animals and occasionally to human beings are called zoonoses. In 1886, A. Weil described the first cases of leptospirosis and the classic disease caused by *Leptospiru icterohaemorrhagiae.* R. Inada and his associates successfully infected guinea pigs, demonstrated the organism and identified it as a spirochete. H. Noguchi in 1917 named the organism *Leptospira.*

Causative Organism and Transmission.— The leptospire is a long, very thin organism from 3 to 40 μ in length and-about 0.1 μ wide. Microscopically. hooks can be seen at each end, and the organism moves by a characteristic spinning motion. Electron photomicrographs reveal a coiled spiral flagellum.

The reservoir of leptospires includes rodents and certain domestic animals. These animals excrete live, fully virulent organisms in their urine and contaminate the environment. Outside the animal body. leptospires can live for several weeks in fresh water. Thus infection takes place by direct contact with urine of infected animals or by indirect contact with contaminated food or water. Leptospires can readily penetrate mucous membranes but probably cannot gain entrance to the body through intact skin. A scratch or abrasion as well as the nasal mucosa and eye are excellent portals of entry; thus it is not surprising that the origin of many infections can be traced to wading, swimming or other contact with water containing virulent leptospires. The density of the leptospiral population in any given area is directly proportional to the number of animal carriers in the area. The incidence in man depends upon the opportunity for exposure by swimming, harvest of rice. contact with animals. etc.

The principal hosts among the animal species are rats, mice, voles, swine, cattle. dogs, opossums, mongooses and horsds. The rat, once infected, shows no evidence of disease but sheds millions of leptopires in its urine during its lifetime. On the other hand, the horse. which shows no immediate evidence of disease. sheds the organism only for a short period, usually one to three months. Man rarely voids urine containing leptospires. primarily because of the acidity of human urine. Leptospires cannot survive in an acid or brackish medium.

Symptoms and Diagnosis.— Clinical evidence of disease in man varies depending upon the infecting type of leptospire. Leptospirosis, therefore, is a series of separate diseases, each with its separate and distinct clinical features, rather than one entity as described by Weil. Usually after an incubation period of about a week. fever. weakness. pains in the legs, back and abdominal muscles are noted. Nausea, vomiting and diarrhea are not uncommon. One characteristic symptom is congestion of the conjunctival blood vessels around the corneas of the eyes. Jaundice may or may not occur after the first week of illness. The death rate is approximately 30% of the severely ill and jaundiced patients.

The symptoms of leptospirosis in cattle vary from a mild, almost inapparent infection to one of acute fulminating disease terminating in death. The principal symptoms are fever, loss of appetite, diarrhea, depression, cessation of milk flow, blood in urine and loss of weight. Frequently abortion is the first and only sign of disease.

In swine the disease is characterized by fever. bloody urine, loss of appetite, anemia and jaundice. Abortions occur frequently, and baby pigs commonly die. Inapparent cases occur, but leptospires can be isolated from the urine of these animals.

Canine leptospirosis exhibits an extremely variable clinical picture. Many mild or inapparent cases occur. Generally fever, depression. loss of appetite, bloody diarrhea and conjunctival congestion ate seen. with occasional uremia and jaundice.

The infected horse rarely exhibits more than a transient rise in temperature. but late symptoms include recurrent iridocyclitis (moon blindness or periodic ophthalmia).

Confirmation of a clinical diagnosis may be obtained in the laboratory, utilizing bacteriological and serological methods.

Treatment.— The broad-spectrum antibiotics have not proved of value for treatment of leptospirosis in man. Aureomycin. streptomycin and tetracycline are beneficial in the treatment of canine leptospirosis in the acute phase, as well as for the elimination of carriers. (R. H. YR.)

LE PUY or LE PUY EX VELAY, a town of southeastern France, capital of the *département* of Haute-Loire, 90 mi. S.W. of Lyons on the Paris-Lyon railway. Pop. (1954) 19.636. Toward the end of the 4th or beginning of the 5th century Le Puy became the capital of the Vellavi. at which period the bishopric, originally at Revession (later St. Paulien) was transferred hither. Gregory of Tours speaks of it by the name of Anicium, because a chapel "ad Deum" had been built on the mountain. whence the name of Mt. Adidon (or Anis), which it still retains. In the 10th century it was called Podium Sanctae Mariae, whence Le Puy. The city rises in the form of an amphitheatre from a height of 2,050 ft. above sea level upon Mont Anis. Narrow. steep streets ascend from the new town in the valley of the Dolézon to the old feudal and ecclesiastical town. Mt. Corneille, 433 ft. above the Place de Breuil (in the lower town), is a steep rock of volcanic breccia. from which is a good view of the town and the adjacent volcanic mountains. The Romanesque cathedral of Notre-Dame (early 12th century) has a particoloured façade of white sandstone and black volcanic breccia.

Le Puy possesses remains of its old line of fortifications, among them a machicolated tower and a few medieval houses. In front of the hospital there is a fine medieval porch under which a street passes. The museum, named after Charles Crozatier, contains antiquities, engravings, a collection of lace and ethnographical and natural history collections. The church of St. Michel d'Aiguilhe, beside the gate of the town, stands on an isolated rock and is reached by a staircase of 271 steps; it dates from the end of the 10th century and its chancel is still older. The steeple is of the same type as that of the cathedral. Three miles from Le Puy are the ruins of the Château de Polignac, one of the most important feudal strongholds of France. Le Pup is the seat of a bishopric under the archbishop of Bourges, a prefect and a court of assizes; it has tribunals of first instance and of commerce, a board of trade arbitrators and a chamber of commerce. The principal manufacture is that of lace and guipure.

LERDO DE TEJADA, SEBASTIÁN (1825–1889), president of Mexico from 1872 to 1877. was born in Jalapa, Veracruz, April 25. 1825. After becoming professor and rector of the College of San Ildefonso in Mexico City, he entered politics as a liberal in the reform movement of the 1850s which vas eventually identified with the career of Benito Juárez (*q.v.*). In 1861 he joined Juárez' cabinet and during the European Intervention (1861–1867) loyally followed Juárez in all his wanderings, serving him as minister of foreign relations and virtual prime minister.

Appointed president of the supreme court and *de facto* vice-president of Mexico in 1867, Lerdo succeeded to the presidency on the death of Juárez in 1872. Thereafter his popularity steadily declined, partly because he made little effort to organize his own political machine and allowed opposition newspapers extensive freedom. The Roman Catholic Church opposed him for his connection with the anticlerical reforms of Juárez, while progressives fretted because he undertook few public works and local leaders resented his highly centralized government. After putting down several revolts, he managed to secure re-election in 1876, but another uprising under Gen. Porfirio Díaz forced him into exile in Feb. 1877. He fled to the United States and died in New York in 1889. (D. M. PR.)

LÉRIDA, a province of northern Spain, formed in 1833 of districts previously included in the ancient province of Catalonia, and bounded N. by France and Andorra, E. by Gerona and Barcelona, S. by Tarragona and W. by Saragossa and Huesca. Pop. (1960 est.) 351,556; area 4,644 sq.mi. The northern half of Lérida belongs entirely to the Mediterranean or eastern section of the Pyrenees, and comprises some of the finest scenery in the whole chain, including the valleys of Aran and La Cerdaña, and large tracts of forest. It is watered by many rivers, the largest of which is the Segre, a left-hand tributary of the Ebro. Lérida is traversed by the main railway from Barcelona to Saragossa. and by a line from Tarragona to the city of Lérida. In 1904 the Spanish government agreed with Franceto carry another line to the mouth of an international tunnel through the Pyrenees, and this was inaugurated in 1928. Insurgents occupied the province in the spring of 1938 There is a thriving trade in wine, oil, wool, timber, cattle, mules, horses and sheep, but agriculture is far less prosperous than in the maritime provinces. Lérida (*q.v.*) is the capital and the only town besides Tárrega ([1950] mun.. 6,987) and Balaguer ([1950] mun.. 6,543) with more than 5.000 inhabitants. Seo de Urgel, near the headwaters of the Segre, is an episcopal see, with a close historical connection with Andorra (*q.v.*).

LÉRIDA, capital of the Spanish province of Lérida, on the river Segre and the Barcelona-Saragossa and Lérida-Tarragona railways. Pop. (1960 est.) mun.. 66.547. Lérida is the *Ilerda* of the Romans, and was the capital of the people whom they called *Ilerdenses* (Pliny) or *Ilergetes* (Ptolemy). By situation the key of Catalonia and Aragon, it was from a very early period an important military station.

In the Punic Wars Lérida sided with the Carthaginians and suffered much from the Romans. There Hanno was defeated by Scipio in 216 B.C., and there Caesar struggled with Pompey's generals. Afranius and Petreius in the first year of the civil war (49 B.C.). It was already a *municipium* in the time of Augustus. and enjoyed great prosperity under later emperors. Under the Visigoths it became an episcopal see. Under the Moors *Lareda* became one of the principal cities of the province of Saragossa; it became tributary to the Franks in 793, but was reconquered in 797. In 1149 it fell into the hands of Ramon Berenguer IV. In modern times it has come through numerous sieges. having been taken by the French in 1707 and again in 1810. Its fall to the Nationalists in April 1938 greatly weakened the government's position. The older parts of the city, on the right bank of the river, are a maze of narrow streets, surrounded by ruined walls and a moat, and commanded by the ancient citadel. On the left bank are the modern suburbs, well laid out and connected with the older city by fine bridges. The old cathedral, last used for public worship in 1707, is a very interesting late Romanesque building, with Gothic and Mauresque additions. The Romanesque town hall, founded in the 13th century, has been several times restored. Leather, paper, glass, silk, linen and cloth are manufactured.

LERMONTOV, MIKHAIL YUREVTCH (1814–1841), Russian poet and novelist, often styled the poet of the Caucasus, was born in Moscow on Oct. 3, 1814, of Scottish descent, but belonged to a respectable family of the Tula government, and was brought up in the village of Tarkhanui (in the Penza government). From the academic gymnasium in Moscow Lermontov passed in 1830 to the university, but there his career was cut short for insubordination. From 1832 to 1834 he attended the school of cadets at St. Petersburg, and became an officer in the Guards. To his own and the nation's anger at the loss of Pushkin (1837) the young soldier gave vent in a passionate poem *(On the Death of the Poet),* addressed to the tsar. Lermontov was forthwith arrested, court-martialled, expelled from the Guards, and sent off to the Caucasus to a line regiment. He had been in the Caucasus with his grandmother as a boy of ten, and he found himself at home by reason of yet deeper sympathies than those of childish recollection. His exile lasted only a year, however. He was in St. Petersburg in 1838 and 1839, and in the latter year wrote the work, *A Hero of Our Time* (Eng. trans. by R. I. Lipmann, 1886, and by J. S. Phillimore, *A Hero of Nowadays,* 1920). He had fought more than one duel, and in 1841 quarrelled with his old schoolfellow, Martynov. The rivals met near Piatigorsk, on July 15 (O.S.) and Lermontov was killed.

Lermontov published only one small collection of poems in 1840. Three volumes, much mutilated by the censor, were issued in 1842 by Glazunov; and full editions of his works were published in 1860 and 1863. To Bodenstedt's German translation of his poems (*Michail Lermontov's poetischer Nachlass,* 1842, 2 vols.) which indeed was the first satisfactory collection, he is indebted for a wide reputation outside Russia as one of the greatest Russian romantic poets. English translations of some of his poems are to be found in C. T. Wilson's *Russian Lyrics* (1887) and in J. Pollen's *Rhymes from the Russian* (1891). Among his best-known poems are "Ismail-Bey," "Hadji Abrek," "Valerik," "The Novice" and, remarkable as an imitation of the old Russian ballad, "The song of the tsar Ivan Vasilivitch, his young body-guard, and the bold merchant Kalashnikov."

See Taillandier, "Le Poète du Caucase," in *Revue des deux Mondes* (Feb. 1855), reprinted in *Allemagne et Russie* (1856); Duduishkin's "Materials for the Biography of Lermontov," prefixed to the 1863 edition of his works; E. Duchesne, *Michel Zourievitch Lermontov, sa vie et ses oeuvres* (1910); *The Demon,* translated *by* A. C. Stephen (1875) and by E. Richter (1910).

LEROUX, PIERRE (1797–1871), French philosopher and economist who combined socialism with a form of pantheism, was born at Bercy near Paris on April 17, 1797, the son of an artisan. His education was interrupted at his father's death, and he worked for a time as a mason and later as a compositor to support his mother and family. In 1824, together with Paul François Dubois, he founded a newspaper, *Le Globe.* Early in 1831 he made this newspaper the organ of the Saint-Simonian sect *(see* SAINT-SIMON, CLAUDE HENRI DE ROUVROY, COMTE DE), of which he had become an enthusiastic member, but in the following November he seceded from the Saint-Simonians when Barthélemy Prosper Enfantin advocated free love. After founding *La Revue encyclopkdique,* he established *L'Encyclopédie nouvelle* with Jean Reynaud, of which only eight volumes appeared (1838–41). His treatise De *l'Humanitk,* which contains the fullest exposition of his system, appeared in 1840. Together with George Sand he established *La Revue indkpendante* in 1841. He then formed a printing association at Boussac, Creuse, and founded *La Revue sociale* (1843). Elected mayor of Boussac and a member of the constituent assembly in Paris after the revolution of Feb. 1848, he was in 1849 elected to the legislative assembly, where he sided with the extreme socialists. He withdrew to London after the *coup d'état* of 1851, but later settled with his family in Jersey, where he pursued agricultural experiments. After moving to Lausanne, he returned to Paris on the amnesty of 1869. He died in Paris on April 11, 1871, during the Commune.

Leroux's philosophy was composed of heterogeneous elements. His belief in the power of number was like that of Pythagoras, and the triad, or group of three, played an important part in the de-

velopment of his philosophico-socialist ideas. Man is sensation, sentiment or intellect, and sometimes all three at once. Social harmony results from this triad, which is also discernible in God (power, love and intelligence). Leroux was a vigorous critic of modern society, in which "the millionaires and the capitalists are the nobles of our time"; of the wage system, as allotting to the workers less than half of the revenue from their labour; of the family. in its effect on society; and of property. He was a feminist and a "revolutionary pacifist" whose ideal was a progressive and religious democracy: "We gravitate toward God," he wrote.

In *Sept discours sur la situation actuelle de la société et de l'esprit humain* (1841), Leroux wrote that the role of society "is to give to all its members, to each according to his needs, his capacity and his works, the enjoyment of the product of the common labour, whether such labour be an idea, a work of art or material prosperity." Although he was not the first to use the term "socialist," he was the first to analyze the concept, in an article "De l'Individualisme et du Socialisme" which appeared in *La Revue encyclopédique* in 1834.

See P. F. Thomas, *Pierre Leroux, sa vie, son oeuvre, sa doctrine* (1904); *E.* Dolléans, *Histoire du mouvenzent ouvrier 1830–71* (1936).

LERROUX, ALEJANDRO (1864–1949), Spanish statesman, was born at La Rambla (Cordoba) in 1864. In 1898 he went to Barcelona, where he practised as a barrister. He became leader of the advanced republicans, and in 1901 was elected to the *cortes*. His republican views led to his exile in 1907; when he fled to the Argentine. He played a big part in bringing the republic into existence, and in 1931 became its first foreign minister. He was prime minister from 1933 to Aug. 1934, and from Oct. 1934 until 1935. In Oct. 1934 he announced the abolition of the autonomous rights granted to Catalonia in 1931. He died June 27, 1949, in Madrid, Spain.

LERWICK, the only small burgh of County Shetland (Shetland Islands). Scot., and the most northerly town in the British Isles. Pop. (1961) 5,906. It is on Bressay sound, a natural harbour on the east coast of the island called Mainland, 98 mi. N.N.E. of Kirkwall, in Orkney, and 210 mi. from Leith by steamer. The town dates from the beginning of the 17th century, and the older part consists of a flagged causeway, called Commercial street, in which the gable ends of several of the quaint-looking houses stand, and so narrow in places as not to allow two vehicles to pass each other. At right angles to this street, lanes ascend the hillside to Hillhead, where are the more modern houses and buildings. At the North End (the area north of Commercial street) is Fort Charlotte, erected by Oliver Cromwell, repaired by Charles II, destroyed later by the Dutch and altered by George III, after whose queen it was named. It is now used as a coast guard station and offices of several organizations. The Anderson Educational institute, at the South End. was built in 1862 by Arthur Anderson, a native, who also presented a home for seamens' widows. The town hall (1881) contains stained-glass windows which are a gift of the burghers of Amsterdam and Hamburg. Lerwick's main industries are agriculture, white fishing and the making of Shetland knitwear. The herring fishing has declined since World War II. There is also a G.P.O. repeater station. The "Up Helly A' " mumming festival, held on the last Tuesday in January, is of ancient origin: linked with the period of Norse occupation; it is a brilliant spectacle of flaming torches, processions and revelry.

LE SAGE, ALAIN RENÉ (1668–1747), French novelist and dramatist. was born at Sarzeau in Brittany. on May 8. 1668. He went to school with the Jesuits at Vannes and was called to the bar in Paris in 1692. In 1694 he turned to literature. He found a valuable patron in the abbé de Lyonne. who gave him an annuity of 600 livres and recommended him to exchange the classics for Spanish literature, of which he was himself a student and collector. Le Sage began by translating plays from Rojas and Lope de Vega. He was nearly 40 before he obtained anything like decided success. But in 1707 his truculent farce of *Crispin rival de son maître* was acted with great applause: and *Le Diable boiteux* was published. Notwithstanding the success of *Crispin*, the actors did not like Le Sage and refused a small piece of his called *Les Étrennes* (1707). He thereupon altered it into *Turcaret*, his theatrical masterpiece, and one of the best comedies in French 18th-century literature. This appeared in 1709.

The first two parts of *L'Histoire de Gil Blas de Santillane* appeared in 1715. Strange to say, it was not so popular as *Le Diable boiteux*. Le Sage did not bring out the third part till 1724, nor the fourth till 1735. Notwithstanding the great merit and success of *Turcaret* and *Crispin*, the Théâtre Français did not welcome him, and in the year of the publication of *Gil Blas* he began to write for the Théâtre de la Foire—the comic opera held in booths at festival time. According to one computation he produced, either alone or with others, about a hundred pieces, varying from strings of songs with no regular dialogues to comediettas only distinguished from regular plays by the introduction of music. He was also industrious in prose fiction.

Besides finishing *Gil Blas* he translated the *Orlando innamorato* (1721), rearranged *Guzman d'Alfarache* (1732), produced the *Vie et aventures de M. de Beauchesne* (1732), which resembles certain works of Defoe, and published two more or less original novels, *Estevanille Gonzales* (1734) and *Le Bacheliev de Salamanque* (1736). Le Sage was also the author of *La Valise trouvée*, a collection of imaginery letters, and of some minor pieces, of which *Une journée des parques* is the most remarkable. At Boulogne Le Sage spent the last seven years of his life, dying on Nov. 17, 1747.

His last work, *Mélange amusnnt de saillies d'esprit et de traits historiques des plus frappants*, had appeared in 1743.

His Place in Literature

Le Sage is an important figure in European literature. His work may be. divided into three parts. The first contains his Théâtre de la Foire and his few miscellaneous writings, the second his two remarkable plays *Crispin* and *Turcaret* and the third his prose fictions. In the first two he swims within the general literary current in France; he can and must be compared with others of his own nation. But in the third he emerges altogether from merely national comparison. He formed no school in France; he followed no French models. His work is a parenthesis in the general development of the French novel. His literary ancestors are Spaniards, his literary contemporaries and successors are Englishmen.

In mere form Le Sage is not original. He does little more than adopt that of the Spanish picaroon romance of the 16th and 17th centuries. Often, too, he prefers merely to rearrange and adapt existing work, and still oftener to give himself a kind of start by adopting the work of a preceding writer as a basis. But he never, in any work that pretends to originality at all, is guilty of anything that can fairly be called plagiarism. He is, on the contrary, fond of suggesting indebtedness when he is really dealing with his own funds. Thus the *Diable boiteux* borrows the title, and for a chapter or two the plan and almost the words, of the *Diablo cojuelo* of Luis Velez de Guevara. But after a few pages Le Sage leaves his predecessor alone. Even the plan of the Spanish original is entirely discarded, and the incidents, the episodes, the style, are as independent as if such a book as the *Diablo cojuelo* had never existed.

And the case of *Gil Blas* is still more remarkable. It was at first alleged that Le Sage had borrowed it from the *Marcos de Obregon* of Vincent Espinel; but though this book furnished Le Sage with separate incidents and hints for more than one of his books, *Gil Blas* as a whole is not in the least indebted to it. Afterward Father Isla asserted that *Gil Blas* was a mere translation from an actual Spanish book—an assertion at once incapable of proof and disproof, inasmuch as there is no trace whatever of any such book.

Le Sage has not only the characteristic, which Homer and Shakespeare have, of absolute truth to human nature as distinguished from truth to this or that national character, but he has also what has been called the quality of detachment. He never takes sides with his characters as Fielding (whose master, with Cervantes, he certainly was) sometimes does. Asmodeus and Don Cleofas, Gil Blas and the archbishop and D. Sangrado are produced by him with exactly the same impartiality of attitude. Except that he

brought into novel writing this highest quality of artistic truth, it perhaps cannot be said that Le Sage did much to advance prose fiction in itself. But in individual excellence his works have few rivals.

Nor should it be forgotten, as it sometimes is, that Le Sage was a great master of French style, the greatest unquestionably between the classics of the 17th century and the classics of the 18th.

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LESBIANISM is a term popularly used to connote female homosexuality, since it was in the Aegean island of Lesbos that the Greek poetess Sappho, in the earlier half of the 6th century B.C., made herself the leader of a group of women whose mutual relations were characterized by strong homosexual feeling.

Homosexual attraction among females is not by any means always associated with homosexual practices. These practices, where they occur, include various activities such as tribadism (a form of masturbation; from Greek *tribein*, "to rub"), which is the commonest method; mouth-genital contact; and the use of a phallus (extremely rare).

Homosexual practices are believed to occur much less widely among women than among men and seem never to have been thought to constitute so grave a danger to society. There have in fact been only very few cases of violation or seduction of children by women and it is most unusual for homosexual practices between consenting adult women to occur in public places.

Biblical references to female homosexuality are to be found both in the Old and in the New Testament; for the latter, *see* Rom. i, 26. The Jews, while strongly disapproving of it, seem to have considered it less of a moral or social evil than male homosexuality. Some Christian penitentials of the middle ages take cognizance of it.

Richard Krafft-Ebing discusses the subject at some length in his *Psychopathia Sexualis,* where he says that the basis for inversion is the same in both sexes. He states that it is apparently infrequent in women (though it is difficult to gain the confidence of women with sexual perversion) and that it does not make a woman impotent as it does a man. Woman, he considers, whether sexually inverted or not, is by nature not so sensual or so aggressive in pursuit of her sexual needs as man. His view that homosexuality per se leads to neurasthenia in women is not supported by modern psychiatric opinion.

Krafft-Ebing remarks that neither female nor male homosexuals necessarily betray their anomaly by external appearances; nor do female inverts invariably show masculine mental characteristics. However, in the form which he terms "viraginity" and which he regards as analogous to "effemination" in the male, the woman assumes the masculine role in her life generally (in dreams and in ideas as well as in homosexual function); and he speaks of "viragins" who have excelled by virtue of genius and in brave and noble deeds. He considers that the majority of female homosexuals are produced by "cultivation" rather than by innate impulse; but modern medical opinion would not regard this as proved. Krafft-Ebing cites A. J. B. Parent-Duchbtelet's book *De la prostitution dans la ville de Paris* (18*j7*) to the effect that certain types of prostitute who are markedly sensual indulge in Lesbian practices because they are unsatisfied by intercourse with perverse or impotent men

Female homosexual practices carried on in private between consenting adults have never constituted a legal offense in secular courts in Great Britain.

The report on *Honzosexuality and Prostitution* prepared by a special committee of the British Medical association (1955) states that there was little evidence of female homosexuality in the women's forces during World War II, even where women were deprived of male company for considerable periods; but that it sometimes constitutes a problem in prisons, in approved schools and in remand homes. The report further states that there is no evidence of any relationship between homosexuality and the reproductive complex and that when homosexual women marry and have children no special physical or mental disturbance seems to result during pregnancy, childbirth or the puerperium; but that conscious or unconscious homosexuality is recognized as one of the causes of frigidity in wives. While female homosexuals seem to have no greater predisposition to neurosis or to psychosis than the average person, many homosexual relationships end in disaster because of social pressure or of jealousy. On the other hand such friendships have also played a constructive part in the lives of both partners and have occurred between women of outstanding ability.

Female homosexuality as a form of organized vice exists to some extent in most large cities, but the seduction of children, as has been said, or even of young girls by women is relatively rare.

Lesbianism has occasionally been practised by small groups of women as a "cult." *See* also HOMOSEXUALITY; SEXUAL DEVIATIONS. (D. M. OM.)

LESBOS (MYTILENE), an island and a department of Greece in the Aegean sea, seven to ten miles from the coast of Mysia and north of the Gulf of Smyrna. The island was formerly a sanjak in the archipelago vilayet of Turkey and annexed in 1912 to Greece. Population of the island (1951) 126,924; area 623 sqmi. The department has an area of 824 sq mi. and a population (1961) of 140,144. Lesbos is roughly triangular; the three points are Argennum on the northeast. Sigrium (Sigri) on the west and Malea (Maria) on the southeast. It is divided into three districts, Mytilene or Kastro in the east. Molyvo in the north and Calloni in the west. The Euripus Pyrrhaeus (Calloni) is a deep gulf on the southnest betneen Sigrium and Malea with a small port at Sigri; the gulf of Hiera (Yero) or Olivieri (from its surroundings) lies behind Mytilene tonn Both have difficult entrances (Yero, however, is of naval value), and commerce is concentrated at the small safe harbour of Mytilene. The surface is rugged, the highest point Lesbos (Mount Olympus) being 3,173 ft. The country is however very fertile in wine, oil and grain. Its chief produce and principal export is olives. Soap, skins and valonea are also prepared, mules and cattle are bred, the sardine fishery is important, and antimony, marble and coal are found. The island has suffered from periodical earthquakes. There is a telegraph on the island and a cable to the mainland and to Greece.

The chief town, Mytilene, pop. (1951) 25,518, was originally built on an island close to the eastern coast: afterward it was joined to Lesbos by a causeway, and the city spread along the coast. There was a harbour on each side of the island; the southern forms the medieval and modern port. The island is now occupied only by the ruined medieval fortress. There are now 14 mosques and 7 churches, including a cathedral. Besides the five cities which gave the island the name of Pentapolis (Mytilene, Methymna, Antissa, Eresus, Pyrrha), there was a town called Arisba, perhaps Palaikastro, northeast of Calloni, destroyed by an earthquake in the time of Herodotus. Pyrrha (also Palaikastro) lay southeast of Calloni. Antissa on the north coast near Sigri was destroyed by the Romans in 168 B.C. Eresus was on the south coast near Sigri.

Methymna on the north, on the site of Molyvo, is still the second city of the island. Town walls and other buildings are on all these sites.

History.—The position of Lesbos near the old trade route of the Hellespont marks it as an important site at all times. Greek tradition represented it as inhabited by aboriginal Pelasgi and immigrant Ionians. In historic times it mas peopled by Aeolians who claimed to have migrated about 1050 B.C. from Boeotia; its nobles traced their pedigree to Agamemnon who conquered it in the Trojan War. Lesbos was the most prominent Aeolian settlement. Its commercial activity is attested by colonies in Thrace and the Troad, and by participation in the settlement of Naucratis in Egypt; it was by its good harbour that Mytilene became the political capital. The climax of its prosperity was about 600 B.C., when Pittacus, appointed as *aesymnetes* (dictator), by his wise administration and legislation won a place among the Seven Sages of Greece. The lyric poetry of Greece owed much to

Lesbians of the 7th century, the musician Terpander and the dithyrambist Arion, and culminated under Pittacus' contemporaries Alcaeus and Sappho (*qq.v.*). Other distinguished Lesbians were the cyclic poet Lesches, the historian Hellanicus and the philosophers Theophrastus and Cratippus. In the 6th century the island declined. through protracted struggle with Athens for Sigeum on the Hellespont. and a naval defeat by Polycrates of Samos. The Lesbians readily submitted to Persia after the fall of Croesus of Lydia, and although hatred of their tyrant Coës, a Persian protégé, drove them into the Ionic revolt (499–493), they displayed poor spirit at the decisive battle of Lade. In the 5th century Lesbos long remained a privileged member of the Delian League (*q.v.*), with full self-administration, and the sole obligation of assisting Athens with a naval contingent. Nevertheless, early in the Peloponnesian War the oligarchy of Mytilene forced on a revolt, which was ended after a two years' siege of that town (429–427). The Athenians recalled their hasty resolve on a wholesale execution, but killed the ringleaders: confiscated the land and established a garrison. Thereafter Lesbos was repeatedly attacked by the Peloponnesians, and in 405 Mytilene witnessed a naval battle between Callicratidas and Conon. In 389 most of the island was recovered for the Athenians by Thrasybulus; in 377 it joined the Second Delian League, and remained throughout a loyal member, although its democracy was for a while supplanted by a tyranny. In 334 Lesbos served as a base for the Persian admiral Memnon against Alexander the Great; for Perseus against Rome in the Third Macedonian War; and for Mithradates VI. of Pontus in 88 B.C. Mytilene, nevertheless, was raised by Pompey to the status of a free city, thanks no doubt to his confidant Theophanes, a native of it.

Antissa, Eresus and Pyrrha possess no separate history. Methymna in the 5th and 4th centuries sometimes was a rival of Mytilene. During the Byzantine age the island flourished. In 1091 it fell to the Seljuks; in the next century repeatedly to the Venetians; in 1224 it was recovered by the Byzantine emperors, who in 1354 gave it to the Genoese family Gattilusio. Prospering under them Mytilene passed in 1462 under Turkish control, and had an uneventful history till its annexation to Greece. in 1912.

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LESCHETIZSKY, THEODOR (1830–1915), Polish pianist and teacher, was born at Lancut, then in Austrian Poland, on June 22, 1830. He was a pupil of Czerny, and had a wide reputation as a pianist. He taught for some years (1864–78) at the St. Petersburg Conservatorium. His fame, however, chiefly rests upon his establishment of the Leschetizsky school of pianoforte playing at Vienna which earned a world-wide reputation for the soundness of its methods and the number of eminent artists whom it produced. Among his pupils may be mentioned Paderewski, Mark Hambourg and Moiseiwitsch. Leschetizsky died at Dresden on Nov. 14, 1915.

His second wife Annette Essipoff (1880–92) was one of his most distinguished pupils.

See A. Hullah, *Theodor Leschetizsky* (1906), and E. Newcombe, *Leschetizky as I knew him* (New York and London, 1921).

LESDIGUIERES, FRANÇOIS DE BONNE, DUC DE (1543–1626), constable of France, was born at Saint-Bonnet de Champsaur, on April 1, 1543. He was educated at Avignon under a Protestant tutor, and had begun the study of law in Paris when he enlisted as an archer. He joined the Huguenot troops in Dauphiné, and distinguished himself in mountain warfare. In 1575 he became the acknowledged leader of the Huguenot resistance in the district with the title of commandant general, confirmed in 1577 by Marshal Damville, by Condé in 1580, and by Henry of Navarre in 1582. He seized Gap by a lucky night attack on Jan. 3, 1577, re-established the rcformcd religion there, and fortified the town. He refused to acquiesce in the treaty of Poitiers (1578) which involved the surrender of Gap, and after two years of fighting secured better terms for the province. Nevertheless in 1580 he was compelled to hand the place over to Mayenne and to see the fortifications dismantled.

He took up arms for Henry IV. in 1585, capturing Chorges, Embrun, Châteauroux and other places, and after the truce of 1588–1589 secured the complete submission of Dauphiné. In 1590 he beat down the resistance of Grenoble, and was now able to threaten the leaguers and to support the governor of Provence against the raids of Charles Emmanuel I. of Savoy. He defeated the Savoyards at Esparron in April 1591, and in 1592 began the reconquest of the marquessate of Saluzzo which had been seized by Charles Emmanuel. After his defeat of the Spanish allies of Savoy at Salebertrano in June 1593 there was a truce, during which Lesdiguières was occupied in maintaining the royal authority against Eperon in Provence. The war with Savoy proceeded intermittently until 1601. Henry IV. made him a marshal of France in 1609.

Lesdiguieres took no part in the intrigues which disturbed the minority of Louis XIII., and he moderated the political claims made by his co-religionists under the terms of the Edict of Nantes. In 1622 he formally abjured the Protestant faith; he now became constable of France, and received the order of the Saint Esprit. He had long since lost the confidence of the Huguenots, but he nevertheless helped the Vaudois against the duke of Savoy. His last campaign, fought in alliance with Savoy to drive the Spaniards from the Valtelline, was the least cuccessful of his enterprises. He died of fever at Valence on Sept. 21, 1626.

The life of the Huguenot captain has been written in detail by Ch. Dufuyard, *Le Connétable de Lesdiguières* (Paris, 1892). His first biographer was his secretary Louis Videl, *Histoire de la vie du connestable de Lesdiguidres* (Paris, 1638). Much of his official correspondence, with an admirable slcetch of his life, is contained in *Actes et correspondance du connétable* de *Lesdiguières,* edited by Comte Douglas and J. Roman in *Documents historiques inédits pour servir à l'histoire de Dauphine'* (Grennble, 1878). Other letters are in the *Lettres et me'moires* (Paris, 1647) of Duplessis-Mornay.

LESGHIANS or **LESGHIS,** the collective name for a number of tribes who, with their kinsfolk the Chechenzes, have inhabited Daghestan from time immemorial. They spread southward into the Transcaucasian circles Kuba, Shemakha, Nukha, and Sakatali. They are mentioned as Lēchai by Strabo and Plutarch along with the Gēlai (perhaps the modern Galgai, a Chechenzian tribe), and their name occurs frequently in the chronicles of the Georgians, whose territory was exposed to their raids for centuries, until, on the surrender (1859) to Russia of the Chechenzian chieftain Shamil, they became Russian subjects. The most important of the Lesghian tribes are the Avars (*q.v.*), the Kasimukhians or Lakians, the Darghis and the Kurins or Lesghians proper. Komarov (ethnological map of Daghestan) gives the total number of the tribes as 27, all speaking distinct dialects. The Lesghians are tall, powerfully built, and their hybrid descent is suggested by the range of colouring, some of the tribes exhibiting quite fair, others quite dark individuals. In some there is an obvious mongoloid strain. They live a semi-savage life on their mountain slopes, mainly by hunting and stock-breeding. They are for'the most part fanatical Mohammedans.

LESKOV, NIKOLAI SEMENOVICH (1831–1895), Russian novelist, was born at Orel on Feb. 16, 1831, became estate-agent to an Englishman who managed the estates of the Counts Perovsky, and in this way learned to know Russian village life. About 1862 he settled in St. Petersburg, where he spent most of the rest of his life. His first important novel, issued in 1864, under the pseudonym of Stebnitski, *The* ***Blind*** *Alley,* was fiercely criticized by the radicals, as was his *Ostrovityane* (The Islanders). In a long series of tales and novels, he shows, says Prince Mirsky, "a greater and fuller knowledge of the Russian character and an infinitely wider range of observation than any other Russian novelist; he knows all classes, from the very highest to the very outcasts—vagabonds, convicts, tramps." Some of his shorter tales, tragic or humorous, are masterpieces of narrative. Leskov is best known in Western Europe by translations of his *Soboryane* (1872; Eng. trans. by I. Hapgood, *Cathedral Folk,* 1924), which contains some excellent types, but is hardly characteristic of the bulk of his work. The directness and simplicity of Leskov's

stories and their orthodox and anti-revolutionary tendency account for the delay in the appreciation of them from the purely literary point of view in spite of the wide circulation of his novels during his life-time. He was for a short time a civil servant, but in spite of the accusation of reactionary views by his contemporaries, did not find himself in agreement with the government, and resigned. He died in St. Petersburg, on March 5, 1895.

Leskov's works appeared in a collected edition (12 vols., 1897). Other works of his are a novel: *The Enchanted Wanderer* (1873), Eng. trans. **A.** G. Paschkoff, 1926; and **a** collection of short stories, *The Sentry* (Eng. trans., 1922).

LESLEY, JOHN (1527–1596), Scottish bishop and historian, natural son of Gavin Lesley, rector of Kingussie, was educated at the University of Aberdeen. In June 1546 he was made an acolyte in the cathedral church of Aberdeen, of which he was afterwards appointed a canon and prebendary. He also studied at Poitiers, at Toulouse and at Paris, where he was made doctor of laws in 1553. In 1558 he took orders and was appointed Official of Aberdeen, and inducted into the parsonage and prebend of Oyne. At the Reformation Lesley became a champion of Catholicism. He was present at the disputation held in Edinburgh in 1561, when Knox and Willox were his antagonists. He was one of the commissioners sent the same year to bring over the young Queen Mary to take the government of Scotland. He returned in her train, and received the bishopric of Ross and other preferments. He was one of the 16 commissioners appointed to revise the laws of Scotland.

The bishop was one of the most steadfast friends of Queen Mary. He was one of the commissioners at the conference at York in 1568, and he appeared as her ambassador at the court of Elizabeth. He projected a marriage for her with the duke of Norfolk, which ended in the execution of that nobleman. For this he was imprisoned in the Tower of London. During his confinement he collected materials for his history of Scotland, by which his name is now chiefly known.

In 1573 he was liberated from prison, but was banished from England. For two years he attempted unsuccessfully to obtain the assistance of Continental princes in favour of Queen Mary. While at Rome in 1578 he published his Latin history *De Origine, Moribus, et Rebus Gestis Scotorunc.* In 1579 he went to France, and was made suffragan and vicar-general of the archbishopric of Rouen. In 1593 he was made bishop of Coutances in Normandy, and had licence to hold the bishopric of Ross till he should obtain peaceable possession of the former see. He retired to an Augustinian monastery near Brussels, where he died on May 31, 1596.

The chief works of Lesley are as follows: *A Defence of the Honour of . . . Marie, Queene of Scotland, by Eusebius Dicaeophile* (1569), reprinted, with alterations, at Liége in 1571, under the title, *A Treatise concerning the Defence of the Honour of Marie, Queene of Scotland, made by Morgan Philippes, Bachelar of Divinitie; Piae afflicti animi consolationes, ad Mariam Scot. Reg.* (Paris, 1574); *De origine, moribus et rebus gestis Scotorum libri decem* (Rome, 1578; reissued 1675); *De illustrium feminarum in republica administranda authoritate libellus* (Reims, 1580; a Latin version of a tract on "The Lawfulness of the Regiment of Women:" *cf.* Knox's pamphlet); *De titulo et iure Mariae Scot. Reg., quo regni Angliae successionem sibi iuste vindicat* (Reims, 1580; translated in 1584). The history of Scotland from 1436 to 1561 owes much, in its earlier chapters, to the accounts of Hector Boece (*q.v.*) and John Major (*q.v.*). In the later sections he gives an independent account (from the Catholic point of view) which is a valuable supplement and a corrective in many details, to the works of Buchanan and Knox.

A Scots version of the history was written in 1596 by James Dalrymple of the Scottish Cloister at Regensburg. It has been printed for the Scottish Text Society (2 vols., 1888–95). A slight sketch by Lesley of Scottish history from 1562 to 1571 has been translated by Forbes-Leith in his *Narrative of Scottish Catholics* (1885), from the original ms. now in the Vatican.

LESLEY, J. PETER (1819–1903), American geologist, was born in Philadelphia Sept. 17, 1819. He was educated for the ministry at the University of Pennsylvania, where he graduated in 1838. Sub-assistant on the first geological survey of Pennsylvania under Professor H. D. Rogers, he was afterwards engaged in a special examination of the coal regions. On the termination of the survey in 1841, he renewed his theological studies at Princeton seminary, at the same time giving his leisure to assisting Professor Rogers in preparing the final report and map of Pennsylvania. He was licensed to preach in 1843; paid a visit to Europe, and entered on a short course of study at the University of Halle. Returning to America, he worked two years for the American Tract Society. At the close of 1847 he again joined Professor Rogers in preparing geological maps and sections at Boston. In 1851 he left the ministry and entered into practice as a consulting geologist. In the course of his work he made elaborate surveys of the Cape Breton coal-field, and other coal and iron regions. From 1855 to 1859 he was secretary of the American Iron Association; for 27 years (1858–85) he was secretary and librarian of the American Philosophical Society; from 1872–78 he was professor of geology and dean of the faculty of science in the University of Pennsylvania, and from 1874–93 he was in charge of the second geological survey of the State. He then retired to Milton, Mass., where he died June 1, 1903. He published *Manual of Coal and its Topography* (1856); *The Iron Manufacturer's Guide to the Furnaces, Forges and Rolling Mills of the United States* (1859).

See memoir by Sir *A.* Geikie in *Quart. Journ. Geol. Soc.* (May 1904); and memoir (with portrait) by B. S. Lyman, printed in advance with portrait, and afterwards in abstract only in *Trans. Amer. Inst. Mining Engzneers,* xxxiv. (1904), p. 726.

LESLIE, CHARLES ROBERT (1794–1859), U.S.-English subject painter known for his portrayals of literary figures, was born in London on Oct. 19. 1794. His parents were American, and when he was five years of age he returned with them to Philadelphia. Pa., where their son was educated and afterward apprenticed to a bookseller. Desiring to study art, however, he left for London in 1811 and was admitted as a student of the Royal Academy. where he won two silver medals. His earliest important subject depicted Saul and the witch of Endor; but he soon discovered his true aptitude and became a painter of cabinet pictures, dealing with scenes from the great masters of fiction, from Shakespeare, Cervantes, Addison, Molière, Swift, Sterne, Fielding and Smollett. In 1821 Leslie was elected associate of the Royal Academy, and in 1826 academician. In 1833 he left for America to teach drawing at West Point. but after six months returned to England. He died on May j, 1859.

Leslie also wrote a *Life* of his friend Constable (1843) and a *Handbook for Young Painters,* embodying the substance of his lectures as professor of painting to the Royal Academy. in 1855. In 1860 Tom Taylor edited his *Autobiography and Letters.*

LESLIE, DAVID: *see* NEWARK, DAVID LESLIE, LORD.

LESLIE, SIR JOHN (1766–1832), Scottish mathematician and physicist, whose main contributions to physics were on radiation, was born at Largo. Fifeshire, on April 10, 1766, and was educated at the University of St. Andrews. In 1805 he was elected to succeed John Playfair in the chair of mathematics at Edinburgh, and in 1819 succeeded Playfair as professor of natural philosophy. He wrote *An Experimental Enquiry Into the Nature and Properties of Heat* (1804). He compared the emissive, absorptive and reflecting powers of various substances to radiant heat. This work was carried out with the help of his "differential thermometer" and a "Leslie cube." The substances tested were made to cover a face of the cube or the bulb of a differential thermometer. He used the latter instrument in a great variety of investigations, connected especially with photometry, hygroscopy and the temperature of space. He also performed pioneer research on capillary action (*see* SURFACE TENSION). In 1820 he was elected a corresponding member of the Institute of France and was knighted in 1832. He was a prominent contributor to the fourth and sixth editions of the *Encyclopedia Britannica,* contributing to the latter (1830) an essay on 18th-century progress in mathematics and physical science. He died at Coates, near Largo, on Nov. 3, 1832.

LESLIE, THOMAS EDWARD CLIFFE (1825?–1882), English economist. was born in County Wexford, Ire., probably in 182j. He had a brilliant university career at Trinity college. Dublin, was called to the bar in 1848, and in 1853 became professor

of political economy and jurisprudence in Queen's college, Belfast. From this time he devoted himself to the study of economic and social questions, pursuing his investigations both on the continent, where he became acquainted with L. de Lavergne and E. de Laveleye, and in London. He was one of the founders of the English historical school of political economy. He died at Belfast on Jan. 27, 1882. His most important works are: *Land Systems and Industrial Economy of Ireland, England and Continental Countries* (1870); *The Land System of France* (1870); *Financial Reform* (1871); *Essays in Political and Moral Philosophy* (1879).

LESLIE, a small burgh in the county of Fife. Scot. Pop. (1961) 3,421. It lies on the Leven, the vale of which is overlooked by the town, 11 mi. N. of Kirkcaldy by road. The old church claims to be the "Christ's Kirk on the Green" of the ancient ballads of that name. Leslie house, the seat of the earl of Rothes, rivaled Holyrood in magnificence, and was noted for its tapestry and pictures. It was damaged by fire in 1763.

Markinch (pop. [1961] 2,446), a small burgh 3 mi. E. of Leslie, is a place of great antiquity, believed to have been a residence of early kings. The main industry of the area is papermaking. At Balfour castle were born David Cardinal Beaton and his uncle and nephew. the archbishops of Glasgow.

In 1948 a corporation was set up to build at Glenrothes, between Leslie and Markinch, a "new town" with new industries as well as the already existing nearby collieries; the final population aimed at was 30.000.

LESPEDEZA. The genus *Lespedeza* of the family of Leguminosae is represented by 125 species, all natives of eastern Asia and eastern North America. This peculiar distribution has given rise to the theory that these forms developed in eastern Asia. from which some migrated in past geologic time by way of a land connection in the north to North America and so down the east coast. This is believed to have occurred before the emergence of the western part of the North American continent. Later, the species established on the eastern border were prevented from moving west by the barrier of desert and mountains.

Of the known species, about 20 are natives of North America. None of the American species occurs in the orient and none of the oriental species is indigenous to America. The lespedezas may be roughly grouped as annuals, herbaceous perennials and shrubs. Where the current growth is not cut down by winter cold, the latter may attain a height of ten feet or more. Some of these shrubs, as *L. bicolor* and *L. japonica* in the Cnited States and *L. delavayi* in France, have long been known as ornamentals. Most of the known species, including those indigenous to America, are herbaceous perennials. In these the stems die after producing seed, and new growth comes each year from the crown.



COURTESY, BUREAU OF PLANT INDUSTRY, SOILS AND AGRICULTURAL ENGINEERING

FIG. 1.—FLOWERING BRANCH OF SERICEA LESPEDEZA, LESPEDEZA CUNEATA

Only two species are annuals, *L. striata* and *L. stipulacea,* and these two with one herbaceous perennial, *L. cuneata,*[1] are the only ones useful in agriculture.

The Economically **Important** Species: Lespedeza **striata.**—The striate lespedeza, formerly called Japan clover, is believed ta have been brought to the United States in the early years of the 19th century. It probably came with a cargo of tea from China or Japan and escaped at Charleston or Savannah. The plant was first recognized at Monticello, Ga., in 1846. The plant then collected is still in the Gray herbarium at Harvard. Lespedeza spread rapidly during the War Between the States and was well known in Alabama and Mississippi in 1867. In 1880, it was commercially used for hay in Louisiana. In 1870, it was known in parts of Tennessee and in 1887 in northern Virginia. The earlier maturing strains have since carried the species farther north and it is now established as far north as central Indiana.



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FIG. 2.—LESPEDEZA STRIATA—THE COMMON VARIETY OF LESPEDEZA—FORMERLY CALLED JAPAN CLOVER

L. striata is a slender plant with trifoliolate leaves. The leaflets are oval to oblong, about $\frac{1}{2}$ in. long by $\frac{1}{8}$ to $\frac{3}{16}$ in. wide, and slightly rounded at the end. Three varieties of striate lespedeza are recognized: the common, a low-growing pasture type; Kobe, a tall-growing variety with larger leaves and seed; and Tenn 76, a tall-growing variety selected and developed from common by S. J. Essary of the University of Tennessee. Knoxville.

L. stipulacea, known as Korean lespedeza, is a much later introduction and is popular. The seed was sent by Ralph Mills, an American missionary in Korea, to the U.S. department of agriculture in 1919 and was first distributed in 1922.

Korean lespedeza is a strong-growing plant with larger and broader leaflets than those of *L. striata* and makes a larger growth. Isolated plants are spreading in habit. It matures about one month earlier than *L. striata* and is therefore suited to a more northern range.

The seeding habit also differs from that of L. *striata.* While in the latter seeds are borne in the axils of leaves or branches all along the stem, in Korean lespedeza seeds are borne in the leaf axils at the ends of branchlets only. At maturity the leaves on these branchlets turn forward so that the tip of the branch resembles a small cone. Besides the standard Korean, five varieties of *L. stipulacea* are recognized. The three most important varieties are: Iowa 6, an early-maturing variety developed by Iowa State college, Ames; Rowan, a productive worm-resistant variety developed co-operatively by North Carolina State college, Greensboro, and the U.S. department of agriculture; and Climax, a variety maturing two weeks later than standard Korean, developed by the U.S. department of agriculture in co-operation with many of the southeastern agricultural experiment stations. Two other varieties. Harbin, an extra early dwarf variety capable of maturing seed in southern Canada, and Early Korean, maturing two weeks later than standard, are little used.

L. cuneata was first tried in the United States by Gerald McCarthy of the North Carolina agricultural experiment station in 1896. He condemned the plant as without value. In 1899 seed was sent to the department of agriculture by Seaman Knapp, an agricultural explorer, but though the species was grown on the experimental farm no use was made of the plants.

In 1924 a new introduction was made and a few years later seed was distributed by the U.S. department of agriculture and the species was introduced into agriculture.

L. cuneata, the only perennial lespedeza that has come into agricultural use! is an erect plant. The stems and branches are very leafy, more than 60% of the total dry weight consisting of leaves. The leaflets are long and narrow and gray-green in colour. Many forms have been distributed by the U.S. department of agriculture differing in maturity, habit of growth and content of tannin. L. *cuneata* is popularly known as sericea or sericea lespedeza.

Culture.— The culture of the annual lespedeza is very simple. Seeded alone or on grain in early spring, the plants are ready for grazing between June 1 and July 1, according to latitude. A volunteer stand in the extreme south may be ready for grazing early in April. When grazed, the plants will produce seed enough to provide a heavy volunteer crop the following year. When cut for hay, care must be taken to cut at a time that will permit a second

[1]In accordance with the International Cude of Botanical Nomenclature the name of *Lespedeza sericea* has been changed to *Lespedeza cuneata* (Don de Cours.) G. Don. The common name sericea lespedeza is still used, however.

growth for seed or the crop must be handled in some other way so as to permit seed production. When a hay crop is wanted or when the field is to be grazed to full capacity, 1 j lb. to 30 lb. of seed of common lespedeza and of the Korean varieties of lespedeza, and 30 lb. to 40 lb. of Kobe lespedeza, are sown per acre. When a light stand is wanted to produce a volunteer stand the following year, as little as 5 lb. per acre is sufficient.

L. cuneata is seeded in spring, using 30 lb. of scarified seed per acre. In some localities, the unscarified seed may be seeded in fall. Growth the first season is small and often disappointing, but it resists the competition of weeds and will come strong from the crown the following spring. A good stand will thereafter effectively suppress summer weeds.

Agricultural **Utilization.**—Lespedezas are used extensively in the United States only. In Japan and Korea, some use has been made of the shrubby species for hillside planting to control soil erosion, but as a regular farm crop. they are used in no country other than the United States. In southeastern United States, west to eastern Texas, Oklahoma and Kansas and north to central Illinois. one or both of the annual lespedezas occupies a place of the first importance as a hay and pasture crop. The part of this general area in which the annual lespedezas have become most important consists of a belt covering the Piedmont region of Georgia and Alabama north to the Ohio river, but including southern Illinois and the whole of Missouri. The total annual production of hay reported in the United States usually exceeds 5,000,000 tons. The principal producing states are usually Missouri, Kentucky, Virginia, North Carolina and Arkansas.

No statistics are available covering the acreage in lespedeza used for grazing. It is, however, known to be vastly greater than that cut for hay. Lespedeza is the most generally grown forage plant in southeastern United States, and, especially in the chief production belt as already described: is grown on nearly every farm. The three species mentioned are used for hay and pasturage, for soil improvement and as an aid in the control of soil erosion. It has been shown that crops of corn and cotton can be increased 10%–30% by turning under a crop of lespedeza.

Use in Soil Erosion Control.—A growing realization of the importance of soil erosion control has led specialists and farmers to turn to the lespedezas as aids in this control on the low fertility soils of the south.

The annual lespedezas serve to control erosion in the summer. The soil loss from a field in lespedeza has been recorded as 1.18 tons of soil per acre during the months of June to September inclusive, as compared with 17.87 tons from an adjacent field of cotton. Even the debris from a lespedeza field has materially aided in checking erosion during winter. *Lespedeza cuneeta* makes so dense a canopy during the growing season that the heaviest rains cannot beat upon the bare ground. During winter the great root system and the living crowns hold the soil. The ability of this species to grow on soils already badly eroded places it in the first rank of plants useful to the soil conservationist. It is used in buffer strips on sloping cultivated fields as a permanent cover on land too badly eroded to be worth cultivating, for the control and healing of gullies and for the control of critical slopes.

Relation to Soil Fertility and Lime.—The lespedezas are not competitors of the clovers, but are suited to soils of a lower fertility level. Many of the fields now in lespedeza formerly grew red clover but declining fertility due to improper cropping and erosion has resulted in such frequent clover failures that this crop has been replaced by lespedeza.

Lespedeza is not so dependent on lime as red clover, but on soils that are decidedly acid it will respond to applications of lime. Most southern soils are also deficient in phosphates, and lespedezas respond markedly to an application of superphosphate. Indeed on the poor soils of the coastal plains, the common lespedeza does not make a profitable crop without the application of phosphate.

While economic conditions made it necessary for farmers in the lespedeza territories to turn to this crop in order to save their lands. it should not be forgotten that a continuance of careless farming with lespedeza will lower the fertility level still more. Every crop takes something from the soil in which it is grown and lespedeza, when removed as hay or pasturage, also removes from the land some lime. phosphorus and potash. If these are not replaced, the time will come when even lespedeza will not thrive. Lespedeza has revolutionized the agriculture of a great region and saved thousands of farmers from economic ruin. It can continue this service only if proper attention is paid to the need of the crops and soils for plant food.

Hay Production.—Well-cured hay of the annual lespedezas is of nearly the same feeding value as alfalfa. The average yield over the entire United States is about one ton per acre although two or even three tons per acre have been cut under favourable conditions While the lespedezas are quite drought resistant, good hay production is possible only under conditions of abundant rainfall or on low moist ground. The amount of growth made is directly proportional to the moisture available. On high dry ground, the lespedezas make growth enough for grazing, but not for hay. Hay is cut when the plants are in full bloom. For Korean this will be from the first to the middle of August or a little later in the northern part of its range. Earlier cutting in July will favour a second growth which may be taken for hay or seed. The earlier cut hay is also of superior quality. *L. striata*, being later. is cut somewhat later in the season.

A first volunteer stand usually makes the most and best hay. In older fields. the weeds tend to invade and the hay becomes of loner grade. Good hay can be made from L. *cuneata*, but the plants should be cut when the spring growth is about one foot high. Cut at this stage. the hay is palatable, tender and of high quality. Later the stems tend to become woody, the leaves shatter more readily and the hay is of inferior quality. L. *cuneata* contains tannin, which, in the mature plant, may be as much as 10% of the total weight. In the early stages of growth the tannin content is low and the protein content is high. With advancing age these positions are reversed. as the protein content falls the tannin content rises. For the best hay. therefore, the plants should be cut when young. The lespedezas contain less water than alfalfa and must not be left long in the swath. On good drying days, lespedeza can be cut in the morning and housed before night.

For Pasturage.—The chief use of the annual lespedeza is for summer pasturage, and most of the vast acreage is used in this way. Lespedeza is mixed with such grasses as Bermuda in the south and orchard grass farther north. More important is the use of pure lespedeza for summer pasturage. In this system, the lespedeza is usually seeded on grain which is allowed to ripen or is cut for hay. During the summer months when permanent pastures are frequently unproductive, the lespedeza provides excellent grazing. The value of sericea lespedeza for grazing is a controversial subject among farmers of the southeastern states. Reports on the value of sericea for pasturage vary from good to very poor each year. Studies by research workers in the region have shown that the high tannin content of the species lowers the palatability to the grazing animal. Other studies have shown that the tannin content varies uith season, soil type and fertilization and between strains of lespedeza. Plant breeders of the region have developed strains of sericea inherently low in tannin. The subsequent release of productive, palatable varieties of this species would greatly increase the importance of this drought-resistant, summer-growing, perennial legume for livestock production in the southern states.

Seed Production.—Seed is freely produced by all the lespedezas and is harvested throughout the territory where lespedeza is grown. The statistics of seed production are eloquent of the rise and spread of Korean lespedeza. Seed of this species is mainly produced in North Carolina Tennessee, Kentucky and Missouri. The chief producing areas of L. *striata* are North Carolina, Mississippi Louisiana and Tennessee.

Harvesting.—Seed of *L. striata* is harvested with a "pan." This is a shallow metal pan attached to the rear of the mower cutter bar and provided with a perforated cover. The lespedeza as cut is raked over the pan. the seed shatters off and falls through the holes. The straw may later be threshed if more seed is wanted. Seed of L. *stipulacea* does not shatter readily and the

plants are cut, windrowed and later passed through a thresher. A similar procedure is folloned in the case of L. *cuneata.*

Seed Weight and Number of Seeds per Pound. — In North Carolina and Arkansas, the legal weight of L. *striata* seed is 2½ lb. per bushel. This weight is generally accepted even where not confirmed by legislation. The actual weight, however, depends upon how well the seed has been cleaned. Clean seed of *L. striata* weighs 29 lb. per bushel; that of Kobe lespedeza. 30 lb.; of L. *stipulacea,* 45 lb.; and that of unhulled L. *cuneata,* 34 lb. When hulled. all weigh about 60 lb. per bushel.

In common lespedeza, there are about 343,000 seeds per pound; in Kobe, 185,000; in Korean, 240.000; and in hulled *L. cuneata,* about 350,000 seeds per pound.

Use for Wildlife.--All the lespedezas are valuable for wildlife. especially birds. Quail are fond of the seeds and many thousands of acres are seeded especially for wildlife. In addition. L. *bicolor* and *L. cuneata* form an ideal cover for birds. Natob, a later variety of *L. bicolor* developed by the U.S. department of agriculture, is hardy with large seed desirable for bird feed and cover and also valuable for soil conservation.

The American species inhabit waste ground, the margins of woodland and similar places. They never occur in dense stands, but as single plants or small groups of plants. Their only known value is for wildlife. Quail and other birds make extensive use of the seed.

For more detailed information, *see* U.S. Department of Agriculture *Circular 863* and *Farmers' Bulletins 1852* and *2033.*

(A. J. Pi.; P. R. H.)

LESPINASSE, JULIE DE (1732–1776). French author, was born at Lyons. A natural child of the comtesse d'Albon, she was brought up as the daughter of Claude Lespinasse of Lyons. On leaving her convent school she became governess in the house of her mother's legitimate daughter, Mme. du Deffand. The latter, recognizing her extraordinary gifts, persuaded her to come to Paris as her companion. The alliance lasted ten years (1754–64), until Mme. du Deffand became jealous of the younger woman's increasing influence. Mlle. de Lespinasse set up a salon of her own which was joined by many of the most brilliant members of Mme. du Deffand's circle. D'Alembert was one of the most assiduous of her friends and eventually came to live, without scandal, under the same roof. Although she had neither beauty nor rank, her ability as a hostess made her reunions the most popular in Paris. She owes her lasting fame. however. to two volumes of *Lettres,* published in 1809, which displayed her as the victim of a passion of rare intensity. In virtue of this ardent, intense quality, Sainte-Beuve and other of her critics placed her letters in the limited category to which belong the letters of Héloïse and those of the Portuguese Nun. Her first passion, a reasonable one, was for José Pignatelli, marqués de Rlora, son of the Spanish ambassador in Paris. He died in 1774. Her letters to the comte de Guibert, the unworthy object of her infatuation. begin from 1773. From the struggle between her affection for Mora and her passion for Guibert, they go on to describe her partial disenchantment on Guibert's marriage and her final despair. She died May 23, 1776. her death being apparently hastened by the agitation and misery of her attachment to Guibert. In addition to the *Lettres* she wrote two chapters intended as a kind of sequel to Sterne's *Sentimental Journey.*

Her *Lettres* were edited by Mme. de Guibert (Paris, 1809), by J. Janin (1847) and with a supplement by E. Asse (1877). *See* also *Lettres inédites de Madenzoiselle de Lespinasse à Condorcet, à D'Alembert, à Guibert, au comte de Crillon,* ed. by Charles Henry (1887); *Letters of Mlle. de Lespinasse* with notes on her life and character by D'Alembert, Marmontel, de Guibert, etc., and an introduction by C. A. Sainte-Beuve, trans. by K. P. Wormeley (London, 1902); *Correspondence entre Mademoiselle de Lespinasse et le comte de Guibert,* ed. by the comte de Villeneuve-Guibert (Paris, 1906); marquis de Ségur, *Julie de Lespinasse* (Paris, 1905; Eng. trans., London, 1907).

LESQUEREUX, LEO (1806–1889), U.S. palaeobotanist, has been called the founder of the science in North America. Born in Fleurier. Neuchâtel. Switz., on Nov. 18, 1806, he early showed a keen interest in nature study. A fall suffered during a boyhood expedition resulted in an impairment of his hearing, which ultimately led to his total loss of hearing. 'He studied at Neuchâtel, and later taught French in Eisenach. Saxony, but he was soon forced by deafness to abandon teaching.

He became an authority on peat bogs in Europe and was appointed head of a Swiss government bureau on fuel. Deprived of his office by political .changes, however, he emigrated to the United States in 1848. There he made important contributions to the knowledge of the Appalachian coal field. He also classified plants collected during the expedition to Lake Superior of Louis Agassiz (1848), and made determinations of coal plants for surveys in Illinois. Kentucky. Indiana and elsewhere. His classic report was "Description of the Coal Flora of the Carboniferous Formation in Pennsylvania and Throughout the United States," *Second Geological Survey of Pennsylvania: Report* of *Progress, P., 3* vol. (1880–84). He died in Columbus. O., on Oct. 25. 1889.

LES SABLES-D'OLONNE, a seaport of western France, capital of an *arrondissement* of the *département* of Vendée, on an inlet of the Atlantic seaboard, 23 mi. S.W. of La Roche-sur-Yon by rail. Pop. (1954) 17,411.

Sables was founded by Basque or Spanish sailors and invaded by the Normans in 817. Louis XI in 1472 granted the inhabitants various privileges, improved the harbour and fortified the entrance. The town was captured and recaptured during the Wars of Religion and became a nursery of hardy sailors and privateers. In 1696 Sables was bombarded by the combined English and Dutch fleets.

The town stands between the sea on the south and the port on the north, while on the west it is separated by a channel from the suburb of La Chaume. There is a fine beach. To the north of Sables extend salt marshes and oyster parks. Sables has a 17th-century church. The lighthouse of Barges stands a mile out at sea to the west.

The inhabitants are employed largely in sardine and tunny fishing; there are imports of coal. wood and petroleum. Boatbuilding and sardine preserving are carried on.

LES SAINTES-MARIES, coast village of France in the *département* of Bouches-du-Rhône, 24 mi. S.W. of Arles by rail. Pop. (1954) 1,254. It is the object of an ancient pilgrimage. The tradition is that Mary, sister of the Virgin, and Mary, mother of James and John. together with their black servant Sara. Lazarus, Martha, Mary Magdalen and St. Maximin fled thither to escape persecution in Judaea. The relics of the two Maries, said to have been buried at Saintes-Maries, were preserved in the apse of the fortress-church, a 12th-century building. Two festivals came to be held. one in October, the other in May, unique for its gathering of gypsies who came to do honour to the tomb of their patroness Sara.

LESSE, a river rising at Ochamps in the Ardenne, and flowing in a northwesterly course, reaches the Meuse at Anseremme. a few miles above Dinant. The river is only 49 mi. long, but meanders very much. In the 12 mi. from Houyet to Anseremme the river is confined between high walls of cliff. There were discovered in 1864 in the caves of Furfooz, near Walzin, the bones of prehistoric men. Another curious natural feature of the Lesse is that at Han the river disappears through fissures in the rock into the subsoil and reappears about half a mile below the village. By its underground course the Lesse has created the celebrated Grottos of Han, renowned for their stalactites and stalagmites. One of the grotto chambers is 505 ft. long and 446 ft. wide. The Lesse receives in its short course the water of 13 tributaries.

LESSEPS, FERDINAND DE (1805–1894), French diplomatist and maker of the Suez canal, was born at Versailles on Nov. 19. 1805. Descended from a family whose members had long distinguished themselves in the service of the state, he followed the tradition by entering the consular service in 1825, when he became assistant vice-consul at Lisbon. Two years later he occupied a similar post in Tunis, and in 1832 he was sent to Alexandria. There Lepkre's memoir on the Suez canal and his friendship with Mohammed Ali and with the latter's son, Said Pasha, led him to hope that he might one day finish what Lepkre had begun. For the time. however. nothing was accomplished. From 1833 to 1837, Lesseps was consul at Cairo, where he gained distinction by his courage and energy in combating an outbreak of plague. Two years later he was transferred to Rotterdam. Subse-

quently he served at Malaga and Barcelona, where he was promoted to the grade of consul-general, and from **1848** to **1849** he was minister of France at Madrid. In the latter year he was sent by the Government of the French republic to negotiate with the existing Government in Rome, but the French elections, which occurred shortly after his departure, led to a change in foreign policy, and Lesseps was recalled in disgrace. He was given no opportunity to justify his actions, and therefore retired from the service. An invitation from Said Pasha, now viceroy of Egypt, revived in him his early ambitions. On Nov. **30, 1854** Said Pasha signed the concession authorizing M. de Lesseps to pierce the isthmus of the Suez.

A first scheme, indicated by him, was immediately drawn out by M. Linant Bey and Mougel Bey, providing for direct communication between the Mediterranean and the Red sea; and, after being slightly modified, it was adopted by an international commission of engineers in **1856.** Encouraged by this approval, Lesseps allowed no obstacles to retard the work, and he succeeded in rousing the French people to subscribe more than half the capital needed to form the company, which was organized in 1858. The first blow of the pickaxe was given by Lesseps at Port Said on April **25, 1859,** and on Nov. 17, **1869,** the canal was officially opened by the khedive, Ismail Pasha. *(See* SUEZ CANAL.) On the acquisition of the Suez shares by Lord Beaconsfield, Lesseps co-operated loyally with the British, and facilitated the consolidation of interests thus formed.

Although desirous of keeping out of politics. Lesseps became a candidate at Marseille in **1869,** but was defeated by Gambetta, and he afterwards declined the candidatures for the senate **(1876)** and the Chamber **(1877).** He maintained his interest in current affairs, however, and in **1879,** when the Geographical Society at Paris, under the presidency of Admiral de la Roncière de Noury, voted in favour of the construction of the Panama canal, public opinion designated Ferdinand de Lesseps as the head of the enterprise. *(See* PANAMA CANAL and FRANCE: *History.)* Although **74** years of age, he undertook to carry out the project, but his despotic temper and absoluteness of thought made him fail to realize the difficulties of the task. Determined to construct the canal without locks, he refused to be dissuaded when confronted with the Culebra and the Chagres, the mountain and stream which barred the route. For eight years he struggled against them, but in **1888,** when the Panama company was wound up, he was obliged to acknowledge defeat. Seeking to discredit the Government, the enemies of the French republic attacked the directors of the company, and the Government were obliged to take proceedings against them, but Charles de Lesseps (1849–1923) the son of Ferdinand, succeeded in diverting the storm to his own head, to prevent it reaching his father, who died at La Chenaie on Dec. **7, 1894.**

Lesseps was a member of the French Academy, of the Academy of Sciences and of numerous scientific societies. He was also decorated with the Grand Cross of the Legion of Honour and the Star of India, and received the freedom of the City of London. His great gifts. coupled with his supreme unselfishness and social charm, made him everywhere respected, and the "scandal" which clouded the last years of his life, has done nothing to tarnish his reputation. He remains for all time one of the most powerful embodiments of the creative genius of the 19th century.

See G. Barnett Smith, *The Life and Enterprises of Ferdinand de Lesseps* (London, *1893)*; *Souvenirs de quarante ans, by* Ferdinand de Lesseps (trans by C. B. Pitman Bridier, *Les de Lesseps)* (1900); Birk, *Der Suezkanal* (1925).

LESSING, GOTTHOLD EPHRAIM (1729–1781), German critic and dramatist, was born at Kamenz in Upper Lusatia (Oberlausitz) , Saxony, on Jan. **22, 1729.** His father, Johann Gottfried Lessing, was *pastor primarius* or chief pastor of Kamenz. After attending the Latin school of his native town, Gotthold was sent in 1741 to the famous school of St. Afra at Meissen. In 1746 he entered the University of Leipzig, nominally as a theological student. He was most interested, however, in the philological lectures of Johann Friedrich Christ (1700–56) and Johann August Ernesti (1707–81), and in the philosophical disputations presided over by his friend A. G. Kästner. Among Lessing's chief friends in Leipzig were C. F. Weisse (1726–1804) the dramatist, and Christlob Mylius (1722–54), who had made some name for himself as a journalist. He was particularly attracted by the theatre then directed by the talented actress Karoline Neuber (1697–1760), who even accepted for performance Lessing's first comedy, *Der junge Gelehrte* (1748), which he had begun at school. His father disapproved of these activities and summoned him home. He was allowed to return to Leipzig only on condition that he devote himself to the study of medicine. Some medical lectures he did attend, but as long as Frau Neuber's company kept together the theatre had an irresistible fascination for him.

In **1748,** however, the company broke up, and Lessing, who had allowed himself to become surety for some of the actors' debts, was obliged to leave Leipzig too, in order to escape their creditors. He went to Wittenberg, and afterwards, towards the end of the year, to Berlin, where his friend Mylius was already established. In Berlin Lessing now spent three years, during which he developed his lucid prose style, and his admirable critical faculty. He translated three volumes of Charles Rollin's *Histoire ancienne,* wrote several plays—Der *Misogyn, Der Freigeist, Die Juden—and* in association with Mylius, began the *Beiträge zur Historie und Aufnahme des Theaters* (1750), a periodical—which soon came to an end—for the discussion of matters connected with the drama. Early in 1751 he became literary critic to the *Vossische Zeitung,* At the end of 1751 he was in Wittenberg again, where he spent about a year engaged in unremitting study and research and took his master's degree. He then returned to Berlin, and the next three years were among the busiest of his life. Besides translating for the booksellers, he issued several numbers of the *Theatralische Bibliothek,* and continued his work as critic to the *Vossische Zeitung.*

In 1753 Lessing issued an edition of his collected writings *(Sckriften,* **6** vols., 1753–55). They included his lyrics and epigrams, most of which had already appeared during his first residence in Berlin in a volume of *Kleinigkeiten,* published anonymously. Much more important were the papers entitled *Rettungen,* in which he vindicated writers of the Reformation period, such as Cochlaeus and Cardanus—who had been misunderstood or falsely judged by preceding generations. The *Schriften* also contained Lessing's early plays, and one new one, *Miss Sara Sampson* (1755), a landmark in the history of the German drama, which was at that time imitative of contemporary French drama. This play, based more or less on Lillo's *Merchant of London,* and influenced in its character-drawing by the novels of Richardson, is the first *bürgerliches Trauerspiel,* or "tragedy of common life" in German. It was performed for the first time at Frankfort-on-Oder in the summer of 1755, and received with great favour. Among Lessing's chief friends during his second residence in Berlin was the philosopher Moses Mendelssohn, with whom he wrote in 1755 an admirable treatise, *Pope ein Metaphysiker!* tracing sharply the lines which separate the poet from the philosopher. He was also on intimate terms with C. F. Nicolai (1733–1811), a Berlin bookseller and rationalistic writer, and with the "German Horace" K. W. Ramler (1725–98); he had also made the acquaintance of J. W. L. Gleim (1719–1803), the Halberstadt poet, and E. C. von Kleist, a Prussian officer, whose fine poem, *Der Frühling,* had won for him Lessing's warm esteem.

In Oct. 1755 Lessing settled in Leipzig with a view to playwriting. He then started on a foreign tour as companion to Gottfried Winkler, a wealthy young merchant, but the travellers turned back at Amsterdam at the outbreak of the Seven Years' War. At this time Lessing began the study of mediaeval literature to which attention had been drawn by the Swiss critics, Bodmer and Breitinger, and wrote occasional criticisms for Nicolai's *Bibliothek der schonen Wissenschaften.* In Leipzig Lessing saw much of Kleist, whose regiment was stationed there, and a warm affection sprang up between them. In **1758** Kleist's regiment. being ordered to new quarters, Lessing returned to Berlin. Kleist was mortally wounded in 1759 at the battle of Kunersdorf.

In Berlin Lessing contributed to the *Briefe, die neueste Literatur*

betreffend (1759–65), a series of critical essays—written in the form of letters to a wounded officer—on contemporary literature. He insisted especially on the necessity of truth to nature in the imaginative presentation of the facts of life, and in one letter he courageously asserted the superiority of Shakespeare to Corneille, Racine and Voltaire; other notable essays were on Wieland and Klopstock, and he edited with Ramler a selection from the writings of F. von Logau, an epigrammatist of the 17th century, and introduced to the German public the *Lieder eines preussischen Grenadiers*, by J. W. L. Gleim. In 1759 he published *Philotas*, a prose tragedy in one act, and also a complete collection of his fables, preceded by an essay on the nature of the fable. The latter is one of his best essays on criticism, defining with perfect lucidity what is meant by "action" in works of the imagination, and distinguishing the action of the fable from that of the epic and the drama.

In 1760 Lessing went to Breslau, as secretary to General Tauentzien, governor of Breslau, and director of the mint. During the four years which Lessing spent in Breslau, he collected a large library, and, after the conclusion of the Seven Years' War, in 1763, he resumed more enthusiastically than ever his partially interrupted studies. He investigated the early history of Christianity and penetrated more deeply than any contemporary thinker into the significance of Spinoza's philosophy. He also found time for the studies which were ultimately to appear in the volume entitled *Laokoon*, and in fresh spring mornings he sketched in a garden the plan of *Minna von Barnhelm*.

Laokoon.—In 1765 he returned to Berlin, but could gain no public appointment because Frederick had not forgotten his criticism of Voltaire. Lessing was restless and unhappy during the two years (1765–67) in Berlin, yet it was during this period that he published two of his greatest works, *Laokoon, oder iiber die Grenzen der Malerei und Poesie* (1766) and *Minna von Barnhelm* (1767). *Laokoon* is a European classic. It aimed at defining by analysis the limitations of poetry and the plastic arts. His conclusions have not all been maintained by later writers on aesthetics; indeed they have often been fiercely contradicted. But Lessing was a pioneer; he indicated more decisively than any of his predecessors the fruitful principle that each art is subject to definite conditions, and that it can accomplish great results only by limiting itself to its special function. The most valuable parts of the work are those which relate to poetry, of which he had a much more intimate knowledge than of sculpture and painting. His exposition of the methods of Homer and Sophocles is especially suggestive, and he may be said to have marked an epoch in the appreciation of these writers, and of Greek literature generally. The power of *Minna von Barnhelm*, Lessing's greatest drama, was also immediately recognized. Tellheim, the hero of the comedy, is an admirable study of a manly and sensitive soldier, with somewhat exaggerated ideas of conventional honour; and Minna, the heroine, is one of the brightest and most attractive figures in German classic comedy.

In 1767 Lessing settled in Hamburg, where he had been invited to take part in the establishment of a national theatre. At the same time he joined J. C. Bode (1730–93), in starting a printing establishment. The theatre, however, was soon closed, and the printing establishment failed, leaving behind it a heavy burden of debt. In despair, Lessing determined towards the end of his residence in Hamburg to quit Germany, believing that in Italy he might find congenial labour that would suffice for his wants. The *Hamburgische Dramaturgie* (1767–68), Lessing's commentary on the performances of the National Theatre, is the first modern handbook of the dramatist's art. By his original interpretation of Aristotle's theory of tragedy, he delivered German dramatists from the yoke of the classic tragedy of France, and directed them to the Greek dramatists and to Shakespeare. Another result of Lessing's labours in Hamburg was the *Antiquarische Briefe* (1768), a series of masterly letters in answer to Christian Adolf Klotz (1738–71), a professor of the University of Halle, who, after flattering Lessing, had attacked him, and sought to establish a kind of intellectual despotism by means of critical journals which he directly or indirectly controlled. In connection with this controversy Lessing wrote his brilliant little treatise, *Wie die Alten den Tod gebildet* (1769), contrasting the mediaeval representation of death as a skeleton with the Greek conception of death as the twin-brother of sleep.

Instead of settling in Italy, as he intended, Lessing accepted in 1770 the office of librarian at Wolfenbiittel, offered to him by the hereditary prince of Brunswick. The debts which he had contracted in Hamburg weighed heavily on him, and he missed his friends; his health, too, which had hitherto been excellent, gradually gave way. In 1775 he travelled for nine months in Italy with Prince Leopold of Brunswick, and in the following year he married Eva Konig, the widow of a Hamburg merchant, with whom he had been on terms of intimate friendship. But their happiness lasted only for a brief period; in 1778 she died in childbed.

Soon after settling in Wolfenbiittel, Lessing found in the library the manuscript of a treatise by Berengarius of Tours on transubstantiation in reply to Lanfranc. This was the occasion of Lessing's powerful essay on Berengarius, in which he vindicated the latter's character as a serious and consistent thinker. In 1771 he published his *Zerstreute Anmerkungen iiber das Epigramm, und einige der vornehmsten Epigrammatisten.* No other critic has offered so many pregnant hints as to the laws of epigrammatic verse, or defended with so much force and ingenuity the character of Martial. In 1772 he published *Emilia Galotti*, a tragedy handling a subject suggested by the Roman legend of Virginia, but conceived in the spirit of the "tragedy of common life." Lessing then occupied himself for some years almost exclusively with the treasures of the Wolfenbiittel library. The results of these researches he embodied in a series of volumes, *Zur Geschichte und Literatur*, the first being issued in 1773, the last in the year of his death.

Theological Works.—The last period of Lessing's life was devoted chiefly to theological controversy. He published extracts from the *Apologie oder Schutzschrift fur die verniinftigen Verehrer Gottes* of H. S. Reimarus, a book written from the deistic standpoint, in his *Zur Geschichte und Literatur* in 1774–78. These extracts, the authorship of which was not publicly avowed, were known as the *Wolfenbiitteler Fragmente.* They created great excitement among orthodox theologians, and Lessing was bitterly condemned for having published them. His most formidable and unscrupulous assailant was Johann Melchior Goeze (1717–86), the chief pastor of Hamburg. To him, therefore, Lessing addressed in 1778 his most elaborate answers—Eine *Parabel, Axiomata*, 11 letters with the title *Anti-Goeze*, and two pamphlets in reply to an inquiry by Goeze as to what Lessing meant by Christianity. These papers are full of thought and learning; they are written with a grace, vivacity and energy that give them permanent value.

The Brunswick Government having, in deference to the consistory, confiscated the *Fragments* and ordered Lessing to discontinue the controversy, he resolved, as he wrote to Elise Reimarus, the author's daughter, to try "whether they would let him preach undisturbed from his old pulpit, the stage." In *Nathan der Weise*, written in the winter of 1778–79, he gave poetic form to the ideas which he had already developed in prose. Its governing conception is that noble character may be associated with the most diverse creeds, and that there can, therefore, be no good reason why the holders of one sect of religious principles should not tolerate those who maintain wholly different doctrines. The play, which is written in blank verse, is too obviously a continuation of Lessing's theological controversy to rank high as poetry, but the representatives of the three religions—the Mohammedan Saladin, the Jew Nathan and the Christian Knight Templar—are finely conceived, and show that Lessing's dramatic instinct had, in spite of other interests, not deserted him. In 1780 appeared *Die Erziehung des Menschengeschlechts*, the first half of which he had published in 1777 with one of the *Fragments.* This work, composed of 100 brief paragraphs, was the last, and is one of the most suggestive of Lessing's writings. The doctrine on which its argument is based is that no dogmatic creed can be regarded as final, but that every historical religion had its share in the development of the spiritual life of mankind. Lessing also

maintains that history reveals a definite law of progress, and that occasional retrogression may be necessary for the advance of the world towards its ultimate goal.

These ideas formed a striking contrast to the principles both of orthodox and of sceptical writers in Lessing's day, and gave a wholly new direction to religious philosophy. Another work of Lessing's last years, *Ernst* und Falk (a series of five dialogues, of which the first three were published in 1777, the last two in 1780), also sets forth many new points of view. Its nominal subject is freemasonry, but its real aim is to plead for a humane and charitable spirit in opposition to a narrow patriotism, an extravagant respect for rank and exclusive devotion to any particular church.

Lessing's theological opinions exposed him to much petty persecution, and he was in almost constant straits for money. His health had been undermined by excessive work and anxiety, and after a short illness he died at Brunswick on Feb. 1j, 1781. "We lose much in him," wrote Goethe after Lessing's death, "more than we think." It may be questioned whether there is any other writer to whom the Germans owe a deeper debt of gratitude. He was succeeded by poets and philosophers who gave Germany for a time the first place in the intellectual life of the world, and it was Lessing, as they themselves acknowledged, who prepared the way for their achievements. Without attaching himself to any particular system of philosophical doctrine, he fought error incessantly, and in regard to art, poetry and the drama and religion, suggested ideas which kindled the enthusiasm of aspiring minds, and stimulated their highest energies.

BIBLIOGRAPHY.—The first edition of Lessing's collected works, edited by his brother Karl Gotthelf Lessing (1740–1812), J. J. Eschenburg and F. Nicolai, appeared in 26 vols. between 1791 and 1794, as a continuation of the *Vermischte Schriften,* edited by Lessing himself in 4 vols. (1771–85); the *Samtliche Schriften,* edited by Karl Lachmann, were published in 13 vols. (1825–28), this edition being subsequently re-edited by W. von Maltzahn (1853–57), by F. Muncker (21 vols., 1886 ff.) and by J. Petersen and W. von Olshausen (25 vols., 1925). The more important biographies of Lessing are by K. G. Lessing (his brother) (1793–95, a reprint in Reclam's *Universal-bibliotlzek);* J. Sime, *Lessing, his Life and Works* (2 vols., 1877); E. Schmidt, *Lessing, Geschichte seines Lebens und seiner Schriften* (2 vols., 1884–92, 4th ed., revised by F. Schultz, 1923)—this is the most complete biography; T. W. Rolleston, *Lessing* (in "Great Writers," 1889); R. M. Werner, *Lessing* (1917). *See* also K. Fischer, *Lessing als Reformzator der deutschen Literatur dargestellt* (2 vols., 1881, 2nd ed., 1888); B. A. Wagner, *Lessing-Forschungen* (1881); J. W. Braun, *Lessing im Urteile seiner Zeitgenossen* (2 vols., 1884); G. Kettner, *Lessings Dramen im Lichte ihrer und unserer Zeit* (1904); C. Pitollet, *Contribution à l'état de l'Hispanisme de G. E. Lessing* (1909); G. Fittbogen, *Die Religion Lessings* (Leipzig, 1923). Translations of Lessing's *Dramatic Works* (2 vols., 1878) edited by E. Bell, and of *Laokoon, Dramatic Notes and the Representation of Death by the Ancients,* by E. C. Beasley and H. Zimmern (1 vol., 1879), will be found in Bohn's "Standard Library."

LESSON is the name given to a passage read aloud from the Bible or from another religious work at divine service. It frequently provides the subject for the sermon, as it has done since the early church. In the Orthodox, Roman Catholic and Anglican Churches the lessons follow fixed systems (see LECTION, LECTIONARY) which have grown up gradually and can be modified by ecclesiastical authorities. In most other churches the lessons are chosen by the minister; there are usually two at each service, one from the Old Testament and one from the New.

LESTE: see WIND: Local Winds.

L'ESTRANGE, SIR ROGER (1616–1704), English journalist and pamphleteer, active in the king's cause during the Restoration. Born at Hunstanton, Norfolk, Dec. 17, 1616, he fought on the royalist side, tried to recapture King's Lynn, was imprisoned in Newgate for four years, but escaped and was pardoned by Cromwell in 1653. Just before the Restoration he attacked Milton savagely in *No* Blinde Guides (1660). As licenser and surveyor of the press (1653–88) he was efficient and rigorous. He published two news sheets, the *Intelligencer* and the *Newes* (1663–66) but lost his monopoly of news to Henry Muddiman, whose Oxford (later London) *Gazet* appeared in 1665 (see NEWSPAPER). He finally discredited the "Popish plot," and was knighted in 1685. Another news sheet, the *Observator* (1681–87), was more successful, but though a zealous high Tory he was unwilling to advocate James II's Edict of Toleration and ceased publication. The revolution cost him his office. He died in London, Dec. 11, 1704. L'Estrange translated Aesop and other standard authors.

See G. Kitchin, *Sir R. L'Estrange* (1913).

LE SUEUR, EUSTACHE (1616–1655), French painter of religious subjects and one of the founders of the French Academy of Painting and Sculpture, was born on Nov. 19, 1616, at Paris, where he passed his whole life and where he died on April 30, 1655. He nas the son of Cathelin Le Sueur, a turner and sculptor in wood, who placed his son with the decorative painter Simon Vouet. Admitted at an early age into the guild of master painters, he left them to take part in establishing the Academy of Painting and Sculpture, and was one of the first 12 professors of that body. Some paintings reproduced in tapestry brought him into notice, and his reputation nas further enhanced by a series of decorations in the mansion of Lambert de Thorigny, which he left uncompleted.

He also painted many pictures for churches and convents, some of which are in the Louvre, Paris. His most important works are "St. Paul Preaching at Ephesus" (Louvre), and his famous series of the "Life of St. Bruno" (Louvre), executed in the cloister of the Chartreux. These have more personal character than anything else Le Sueur produced. He was a charming draftsman. His graceful facility in composition was always restrained by a fastidious taste. He had too frequent recourse to conventional types, however, and he rarely saw colour except with the cold and clayey quality proper to the school of Vouet.

LESUEUR, JEAN FRANÇOIS (1760–1837), French composer of religious and dramatic works who helped to transform musical taste during the Revolution and who influenced Berlioz, was born at Drucet-Plessiel, near Abbeville, Feb. 15, 1760. He acquired his musical training as a chorister at Amiens. In 1781 he was appointed chapelmaster at the cathedral of Dijon and in 1786 at Xotre-Dame in Paris, There he aroused controversies by introducing a large orchestra to accompany his masses which, he maintained. should make a dramatic appeal. Though Lesueur's masses, admired by operagoers. caused Notre-Dame to be described as *L'Opéra* des gueux ("the beggars' opera"), he succeeded in blending the sacred and secular styles, thus anticipating the religious works of Berlioz and Gounod and also the Requiem of Verdi. He made a study of the Greek modes and, in his Christmas oratorio, he also transformed themes in a manner suggesting Wagner's use of leitmotiv. After 1789 he wrote several odes and chants for performance at the open-air celebrations of the Revolution by vast numbers of choristers and instrumentalists. Betneen 1793 and 1796 he wrote three operas and in 179j he became inspector of the Paris Conservatoire. In 1804 he was made director of music to Napoleon to whom he dedicated his opera Ossian *ou les* Bardes. He was later appointed director of music to Louis XVIII and in 1818 professor of composition at the Conservatoire, his pupils including Berlioz, Gounod and Ernest Guiraud. He died in Paris, Oct. 6, 1837.

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LESZNO (German LISSA). a town of Poland in the *wojewodz*two of Poznań. The chief buildings are the palace, the medieval town hall and the churches. Its manufactures consist chiefly of shoes, machinery, liqueurs and tobacco; it also possesses a large steam flour mill, and carries on a brisk trade in grain and cattle. Pop. (1960) 29,100.

Leszno was formerly the seat of the family of Leszczynski. and owes its fame to the settlement there of a band of Moravian Brothers in the 16th century. Their settlement received municipal rights in 1j61, and, reinforced by fresh refugees during the Thirty Years' War. became an important commercial and cultural centre and the chief seat of the Moravians in Poland. Johann Amos Comenius was long rector of the celebrated Moravian school there. Leszno nas occupied by Germany in 1939.

See Voigt, *Aus Lissas erster Blütezeit* (1905), and Sanden, *Geschiclzte der Lissaer Schule* (1905).

LETCHWORTH, an urban district of Hertfordshire, Eng.,

37 mi. N. of London by road. The first "garden city" of Britain, it was founded in 1903 by Sir Ebenezer Howard. The population in 1951 was 20,322, but the town is planned for a maximum of 32,000. Area 4,897 ac., of which about 3,000 are a permanent agricultural belt. There are residential, commercial and industrial zones and a civic centre which contains a museum. Local industries include light and heavy engineering, foundries, the making of corsets and baby carriages, printing and publishing. The church of Our Lady, in the old village, dates from c. 1150. The Icknield street runs through the town.

See GARDEN CITIES.

LE TELLIER, MICHEL (1603–1685), French statesman, was born in Paris on April 19, 1603. In 1677 he was made chancellor of France and he was one of those who influenced Louis XIV to revoke the Edict of Nantes. He died on Oct. 30, 1685, a few days after the revocation had been signed. Le Tellier, who amassed great wealth, left two sons, one the famous statesman Louvois and another who became archbishop of Reims. His correspondence is in the Bibliothèque Nationale in Paris.

See L. Caron, *Michel Le Tellier, intendant d'armte au Piémont* (1881).

LETHABY, WILLIAM RICHARD (1857–1931), English architect, was born at Barnstaple in 1857. In 1879 he won the Soane traveling studentship of the R.I.B.A. and soon afterward entered the office of Norman Shaw, remaining with him for 12 years. In 1892 he started a practice on his own. The influence of Shaw, William Morris and Philip Webb shaped and coloured Lethaby's design and work. In 1906 he was appointed surveyor to the fabric of Westminster abbey. With Sir George Frampton he was responsible, on behalf of the London County council, for the establishment of the Central School of Arts and Crafts, of which he was principal from 1893 to 1911. He was professor of design at the Royal College of Arts from 1900 to 1918.

His many publications include *Mediaeval Art,* based on a study of French cathedrals (1908); *Greek Buildings, Represented by Fragments in the British Museum* (1908); *Architecture, an Introduction to the History and Theory of the Art* (1912); and *National Architecture and Modernism* (1918–21).

LETHARGY, in medicine, is a morbid condition of deep and lasting drowsiness from which the sufferer can be aroused with difficulty and only temporarily. It is a symptom of various disorders, and descriptive adjectives are used to make the term more specific, as African lethargy (African trypanosomiasis), induced lethargy (hypnotic trance), etc. *See* also ENCEPHALITIS; SLEEPING SICKNESS.

LETHBRIDGE, southernmost city of Alberta, Can. Pop. (1961) 35,068. It is located on the Oldman river near the foothills of the Rocky mountains, within the second largest bituminous coal mining region in Canada. Mining in the area began as early as 1870 but the town was not established until 1885 when a railway was built. Lethbridge serves a wheat-growing and ranching region. Substantial irrigation works were started in 1883, and in the early 1960s the town was also the centre of the most extensive irrigation system in Canada, with over 250,000 ac. under irrigation. Sugar beets, vegetables and alfalfa are grown. Vegetable canning and freezing plants and sugar-beet factories are in the area. The town is located on the Crowsnest Pass railway route to Vancouver; it has air connections with transcontinental air lines and to the United States. (JN. H. W.)

LETHE, "Oblivion," in Greek mythology, the daughter of Eris. Lethe is also the name of a water or plain in the infernal regions. Orphism *(see* ORPHEUS) distinguished a spring of memory and one of oblivion; near Lebadeia, at the oracle of Trophonius, which was counted an entrance to the lower world, the two springs Mnemosyne and Lethe were shown.

LETO (Latin. LATONA), a Titaness, the daughter of Coeus and Phoebe, and mother of Apollo and Artemis. The chief seats of her legend were Delos and Delphi, and the generally accepted tradition is a union of the legends of these two places. Leto, pregnant by Zeus, sought a place of refuge to be delivered. After long wandering she reached the barren isle of Delos, which, according to Pindar, was a wandering rock borne about by the waves until it was fixed to the bottom of the sea for the birth of Apollo and Artemis. In the oldest forms of the legend Hera is not mentioned, but afterward the wanderings of Leto are ascribed to the jealousy of that goddess, enraged at her amour with Zeus. The foundation of Delphi follows immediately on the birth of the god; and on the sacred way between Tempe and Delphi the giant Tityus offers violence to Leto and is immediately slain by the arrows of Apollo and Artemis. Such are the main facts of the Leto legend in its common literary form, which is due especially to the two Homeric hymns to Apollo. But Leto is a real goddess, not a mere mythological figure. She has been plausibly identified with the Lycian goddess Lada. and in Lycia graves were frequently placed under her protection; she is also known as a goddess of fertility and as *Kourotrophos* ("rearer of youths"). It is to be observed that she appears far more conspicuously in the Apolline myths than in those that grew around the great centres of Artemis worship, the reason being that the idea of Apollo and Artemis as twins is one of later growth on Greek soil.

LE TRÉPORT, a maritime town of northern France in the *département* of Seine-Maritime, on the English channel, at the mouth of the Bresle, 114 mi. N.N.W. of Paris on the Northern railway. Pop. (1954) 4,952. Le Tréport (the ancient *Ulterior Portus*) was a port of some note in the middle ages and suffered from English invasions. It is a favourite resort of the Parisians.

The mouth of the Bresle forms a small port, comprising an outer tidal harbour and an inner dock accessible to vessels drawing from 13 to 16 feet. The fisheries with their dependent industries, shipbuilding and glassmaking, are the chief industries. There is general trade. The church of St. Jacques (16th cent.) has finely carved vaulting. About 1 mi. N.E. of Le Tréport is the small bathing resort of Mers. The Eu-Tréport canal, uniting the two towns, has a length of about 2 mi., and is navigable by vessels drawing 11 to 12 ft.

LETTER OF MARQUE, the name given to the commission issued by a belligerent state to a private shipowner giving him leave to employ his vessel as a ship of war. A ship so used is termed a privateer. At the Congress of Paris, 1856, all the powers present agreed to a declaration (art. 1 of the Declaration of Paris) that "privateering is and remains abolished." This declaration bound only the powers then present, or those who subsequently agreed to it, but privateering became obsolete with the framing at The Hague convention of 1907 of international rules for the conversion of merchant ships into warships. *See* INTERNATIONAL LAW, PUBLIC; PARIS, DECLARATION OF.

LETTER OR BILL OF CREDIT, a written order from a banker to his agent abroad, or a banker in one country to a banker in another, authorizing payment, to the person named in the document, of a definite sum of money or of amounts not greater than a definite sum named. A letter of credit is not a negotiable instrument and can only be honoured on the personal presentation of the one named in it.

LETTERS PATENT. It is here proposed to consider only the characteristics of letters patent generally. The law relating to letters patent for inventions is dealt with under the heading PATENT; *see* also MONOPOLY.

Letters patent *(litterae patentes)* are letters addressed by the sovereign "to all to whom these presents shall come," reciting the grant of some dignity, office, monopoly, franchise or other privilege to the patentee. They are not sealed up, but are left open (hence the term "patent"), and are recorded in the patent rolls in the Record Office, or in the case of very recent grants, in the Chancery Enrolment office, so that all subjects of the realm may read and be bound by their contents. In this respect they differ from certain other letters of the sovereign directed to particular persons and for particular purposes, which not being proper for public inspection, are closed up and sealed on the outside, and are thereupon called *writs close (litterae clausae)* and are recorded in the close rolls. Letters patent are used to put into commission various powers inherent in the Crown—legislative powers, as when the sovereign entrusts to others the duty of opening parliament or assenting to bills, judicial powers, *e.g.,* of jail delivery; executive powers, as when the duties of treasurer and lord high admiral

are assigned to commissioners of the Treasury and Admiralty (Anson, *Const.* ii. 211). Letters patent are also used to incorporate bodies by charter, to grant a *conge' d'élire* to a dean and chapter to elect a bishop, or licence to convocation to amend canons, and to confer certain offices and dignities. No exemption from income tax, etc., can be effectively granted by letters patent to any city, borough or town (Income Tax Act, 1918, s. 213). Among grants of offices, etc., made by letters patent the following may be enumerated: offices in the Heralds' college; the dignities of a peer, baronet and knight bachelor; the appointments of custos rotulorum of counties, judge of the high court or lord justice of appeal (Supreme Court of Judicature Consolidation Act, 1925, s. 11), king's counsel, Crown livings; the offices of attorney and solicitor-general. The fees payable in respect of the grant of various forms of letters patent are fixed by orders of the lord chancellor, dated June 20, 1871, July 18, 1871, and Aug. 11, 1881. (These orders are set out at length in the *Statutory Rules and Orders Revised* [ed. 1904], vol. ii. *tit,* "Clerk of the Crown in Chancery," pp. i. *et seq.*) Formerly each colonial governor was appointed and commissioned by letters patent under the great seal of the United Kingdom. But since 1875, the practice has been to create the office of governor or governor-general in each colony or dominion by letters patent, and then to make each appointment to the office by commission under the Royal Sign Manual and to give to the governor so appointed instructions in a uniform shape under the Royal Sign Manual. The letters patent, commission and instructions, are commonly described as the Governor's commission *(see* Jenkyns, *British Rule and Jurisdiction beyond the Seas,* p. 100; the forms now in use are printed in App. iv.; also the *Statutory Rules and Codes Revised,* ed. 1904, and subsequent years, under the title of the colony to which they relate). The following modern instances may be given: letters patent of Sept. 11, 1913 (Mauritius); Dec. 6, 1922 (Irish Free State); Jan. 28, 1924 (Sierra Leone); April 9, 1924 (Windward Islands); June 6, 1924 (Trinidad and Tobago); Aug. 18, 1924 (Straits Settlements). The Colonial Letters Patent Act, 1863, provides that letters patent shall not take effect in the colonies or possessions beyond the seas until their publication thereby proclamation or otherwise (s. 2), and shall be void unless so published within nine months in the case of colonies east of Bengal or west of Cape Horn, and within six months in any other case. Colonial officers and judges holding offices by patent for life or for a term certain, are removable by a special procedure—"amotion"—by the governor and council, subject to a right of appeal to the king in council (Leave of Absence Act, formerly cited as "Burke's Act," 1782); see *Montagu* v. *Governor of Van Diemen's Land,* 1849, 6 Moo. P.C. 491; *Willis* v. *Gipps,* 1846, 6 St. Trials (N.S., 311).

The construction of letters patent differs from that of other grants in certain particulars: (i.) Letters patent, contrary to the ordinary rule, are construed in a sense favourable to the grantor (viz., the Crown) rather than to the grantee; although this rule is said not to apply so strictly where the grant is made for consideration, or where it purports to be made *ex certâ scientiâ et mero motu.* (ii.) When it appears from the face of the grant that the sovereign has been mistaken or deceived, either in matter of fact or in matter of law, as, *e.g.,* by false suggestion on the part of the patentee, or by misrecital of former grants, or if the grant is contrary to law or uncertain, the letters patent are void, and may still, it would seem, be cancelled (except as regards letters patent for inventions, which are revoked by a special procedure, regulated by ss. 24–27 of the Patents Act, 1907), by the procedure known as *scire facias,* an action brought against the patentee in the name of the Crown with the fiat of the attorney-general,

See Bacon's *Abridgment* ("Prerogative," F.); Chitty's *Prerogative;* Hindmarsh on *Patents* (1846); Anson, *Law and Custom of the Const.* ii. (3rd ed., Oxford and London, 1907–08). (A. W. R.)

LETTISH (LATVIAN) LANGUAGE. Latvian belongs, with Lithuanian (*q.v.*) and Old Prussian (extinct since the 17th century), to the Baltic branch of the Indo-European languages. The development of Latvian from an East Baltic dialect related to Lithuanian was probably furthered (1) by close contact with the West Finnish peoples and (2) by Latvian tribes' migrating across the Daugava (Dvina) and northward and westward, probably as the result of Slav pressure after the 5th century A.D. The main characteristics of the Latvian language may already have been developed by the 9th century. Latvian words in 13th-century chronicles show the same differences from Lithuanian as they do in the modern language. Certain tendencies of modernization, only lately emerging in Lithuanian, have been completed in Latvian, and Latvian is morphologically more regular. The shift of the stress to the first syllable, which has in certain cases occurred also in some Lithuanian dialects, has consistently taken place in Latvian.

Lithuanian long vowels in end-syllables become short in Latvian (Lith. *ežys,* "hedgehog"; Latv. *ezis*) and short end-vowels, except *u,* disappear (Lith. *tiltas,* "bridge"; Latv. *tilts).* The sounds of the Latvian language represent a more advanced stage of development than Lithuanian. Lithuanian *k, g* before *i, e, ie* or *j* become Latvian *c, dz (tikiu,* "I believe," *gerti,* "to drink"; Latv. *ticu, dzert*). Lithuanian *sj* becomes Latvian *š* (*siūti,* "to sew"; Latv. *šūt*). In Lithuanian *tj, dj* coalesce as *č, dž,* but in Latvian as *š, ž* (Lith. *vokietis,* "a German," genitive singular *vokiečio; briedis,* "stag," gen. sing. *briediio;* Latv. *vācietis, vācieša, briedis, briefa).* Lithuanian *š, ž* become Latvian *s, z* (Lith. *šimtas,* "a hundred," *žiema,* "winter"; Latv. *simts, ziema).* Lithuanian *an, en, in, un* become Latvian *o* (pronounced *uo*), *ie,* i, *ū* (Lith. *ranka,* "hand," *penki,* "five," *pinti,* "to weave," *jungas,* "yoke"; Latv. *roka, pieci, pit, jugs).* The characteristic Baltic intonations survive; they are not identical with Lithuanian intonations but correspond to them according to certain principles. Latvian has the glottal stop, resulting from the shifting of the stress to the first syllable (Lith. *galvà* "head"; Latv. *galva).* The level and the falling intonations correspond respectively to the falling (.) and the rising (˜) intonations in Lithuanian. Latvian is a synthetic, not an analytical, language. It has a complex system of grammatical forms, though simpler than Lithuanian. The masculine and feminine genders are differentiated in the declensions of nouns; the neuter has disappeared. In the conjugations the singular and plural survive; the dual form has almost vanished. The strength of the Latvian language is in the verb, which has a multitude of forms and derivatives.

The merging of Latvian tribes—Latgallians, Curonians, Zemgallians, Sels—and the assimilation of members of neighbouring peoples (*e.g.,* the Livonians, a West Finnish tribe) resulted in three Latvian dialects: the Eastern or Upper, the Central and the Western. The Central dialect has the oldest phonetic system and the least trace of foreign influences; from it developed the literary language. The oldest loanwords in Latvian come from Gothic and Old Norse *(alus,* "ale," *klaips,* "loaf," *gatve,* "alley," etc.). From the 10th to the 13th century Old Russian words connected with trade, the church, etc., entered the Latvian language. From Livonian came words connected with seafaring, etc., and after the 13th century Middle Low German loanwords connected with crafts, housekeeping, school, the church, etc. The old orthographic system is of German origin. A new orthography, based on phonetical principles, was started in 1922, replacing Gothic with Latin characters and introducing diacritic signs.

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LETTISH (LATVIAN) LITERATURE. Latvian folk poetry is of great age and includes a wealth of folk songs *(dainas)* reflecting the ancient Indo-European spirit. Kr. Barons published (1900–15) 35,789 folk songs and 182,000 variants; P. Smits increased their number to 60,000 with some 100,000 variants. In the latter 1950s there were still 900,000 unpublished basic songs and variants recorded in the Institute of Latvian Folklore in Riga. The loss of political independence in the 13th century prevented a natural evolution of

literature out of folk poetry, and much of Latvian literature is an attempt to re-establish this connection. Written literature comes late, fostered by German clergymen. The first known book is the *Catechismus Catholicorum* (1585). The 17th century produced some outstanding religious writing by Cr. Fuereccerus, who introduced certain metrical conventions into Latvian written poetry; by G. Mancelius, a master of prose; by J. Reiters, himself a Latvian, who translated religious texts; and by E. Glück, the translator of the Bible (1685–89). Secular literature begins in the 18th century with G. F. Stender. In the middle of the 19th century, in the period of the "national awakening," Latvians themselves assumed the leadership in the literary field. J. Alunāns's book of verse, *Dziesmiņas* (1856), marks the beginning of the modern Latvian lyric. Folk poetry increasingly became the source of literary inspiration, as in the lyrics of Ausekļis (M. Krogzems), and in A. Pumpurs's epic poem *Lāčplēsis* ("Bear-slayer," 1888), the hero of which is the symbol of the Latvian fighter for freedom. The first great novel, *Mērnieku* laiki (1879) by the brothers R. and M. Kaudzites, gives a realistic account of Latvian peasant life. The "national awakening" was further developed by the poet J. Rainis (*q.v.*; J. Pliekšāns, 1865–1929), whose principle was "old songs to new tunes"—the "old songs" being the imagery of folk poetry and the "new tunes" the problems of modern liie. The themes of his plays were oiten taken from legends (as was *Lāčplēsis*) or from the motifs of folk songs. The most profound of his plays, *Jāzeps* un *viņa brāļi* (Eng. trans., Sons of Jacob, 1924), has a biblical theme:, The most striking volume of his lyrics is *Gals un sākums.* Aspazija (Elza Rozenberga, 1868–1943), his wife and a champion of women's rights, showed a stormy temperament in her lyrics and plays.

In the 1890s, Latvian literature gave voice to diverse and often contradictory literary trends which had taken other European nations decades to develop. The "new movement" demanded realism and a literature dealing with social problems. In direct opposition, J. Poruks (1871–1911) introduced the ideas of the New Romanticism, but the underlying note of his work is a typically Latvian desire for ethical clarity. R. Blaumanis (1863–1908) wrote realistic plays and short stories of peasant life. In the following decade a group of poets, the "Decadents" or "Symbolists," propounded art for art's sake. Their greatest emotional experience mas the revolution of 1905, when the Latvians tried to break away from imperialistic Russian and local German tutelage. Lyricism then began to become predominant. In the verse and in the fairy tales of the great poet Kārlis Skalbe (1879–1945) the ethical world of folk poetry is reborn. Skalbe looks for beauty in small things and for virtues in humble folk. It was out of this literary polyphony that a generation of authors arose to dominate the scene on Latvia's becoming independent in 1918. E. Virza (E. Lieknis, 1883–1940), inspired by French poetry, created lyrics in strict classical forms. His prose poem *Straumēni* (1933; numerous translations) is a song in praise of the patriarchal farmstead. Lyrical emotionalism is disciplined in J. Jaunsudrabiņš (1877–), whose best novel is the trilogy Aija, *Atbalss, Ziema.* Experiencr in World War I provided themes for many literary works, as K. Štrāls's novel *Karš* (2 parts, 1922–27), Anna Brigadere's *Kvēlošā lokā* (1922) and A. Grins's *'Dvēseļu putenis* (1932–34). The short stories of J. Ezeriņš (1891–1924) are in the French manner and evoke the postwar atmosphere of his time; those of K. Zariņš (1887–) are simple and ascetic in style. J. Veselis (1896–) tried to harmonize the spirit of his age with the world of Latvian folk poetry in his novels and modern legends. But Latvians no less than writers in other literatures found it difficult to achieve a unified view of the world in the 20th century and so turned, as others did, to psychological detail. The short stories of M. Bendrupe (1910–) show a certain Freudian influence. E. Ādamsons (1907–46), who learned much from English literature, depicted the neuroses of modern man; Anšlavs Eglitis (1906–) delighted in caricaturing and in intensifying one particular human quality at a time; and M. Zīverts (1903–), the best modern Latvian dramatist, evolved a particular kind of long one-act play culminating in "the great monologue," for instance, the historical tragedy Vara (1944). As an exponent of the modern lyric, J. Medenis (1903–) tried to evolve new metres from those of the folk songs. On the other hand V. Strēlerte (1912–) wrote her lyrics in strict forms, whereas Z. Lazda (Z. Šreibere, 1902–) and Andrejs Eglitis (1912–) showed the influence of the folk song in the style of their verse. After World War II a great number of authors migrated to the west, to contribute a focus of Latvian literature outside the country's territorial boundaries.

See J. Andrups and V. Kalve, Latvian *Literature* (Stockholm, 1954); W. K. Matthews, The *Tricolour Sun* (Cambridge, 1936); and the collection Chansons *populaires lettones* or *Latviešu* tazrtas *dziesmas* (Copenhagen, 1952 ff.). (J. A. A.)

LETTRES DE CACHET. considered solely as French documents *lettres de cachet* may he defined as letters signed by the king of France, countersigned hy one of his ministers and closed with the royal seal (*cachet*). They contained an order emanating directly from the king and executory by himself. In the case of organized bodies *lettres de cachet* mere issued for the purpose of enjoining members to assemble or to accomplish some definite act: the provincial estates were convoked in this manner, and it was by a *lettre de cachet* (called *lettre de jussion*) that the king ordered a *parlement* to register a law in the teeth of its own remonstrances. The best-known *lettres de cachet,* however, were those by which the king sentenced a subject without trial and without an opportunity of defense to imprisonment in a state prison or an ordinary gaol, confinement in a convent or a hospital, transportation to the colonies, or relegation to a given place within the realm.

The power thus exercised was recognized by old French law and can be traced to a maxim which furnished a text of the *Digest* of Justinian: ('Rex solutus est a legibus." This meant that when the king intervened directly in the administration proper, or in the administration of justice, by a special act of his will, he could decide without heeding the laws and even in a sense contrary to the laws.

In early times the order in question was simply verbal; thus some letters patent of Henry III of France in 1576 state that François de Montmorency was "prisoner in our castle of the Bastille in Paris by verbal command" of the late king Charles IX. But in the 14th century the principle was introduced that the order should be written, and hence arose the *lettre de cachet.* The *lettre de cachet* belonged to the class of *lettres closes,* as opposed to *lettres patentes,* which expressed the legal and permanent will of the king and were sealed by the chancellor with the seal of state. The *lettres de cachet* were signed simply by a secretary of state for the king; they bore merely the imprint of the king's privy seal, from which circumstance they were often called, in the 14th and 15th centuries, *lettres de petit signet* or *lettres de petit cachet* and mere entirely exempt from the control of the chancellor.

While serving the government as a silent weapon against political adversaries or dangerous writers and as a means of punishing culprits of high birth without the scandal of a trial, the *lettres de cachet* had other uses. They were employed by the police in dealing with prostitutes, and on their authority lunatics were shut up. They were also often used by heads of families as a means of correction; *e.g.,* for protecting the family honour from the disorderly or criminal conduct of sons; wives, too, used them to curb the profligacy of husbands and vice versa. They were issued by the intermediary on the advice of the intendants in the provinces and of the lieutenant of police in Paris. In reality, the secretary of state issued them in a completely arbitrary fashion, and in most cases the king was unaware of their issue. In the 18th century the letters were often issued blank; *i.e.,* without containing the name of the person against whom they were directed; the recipient, or mandatary, filled in the name in order to make the letter effective.

Protests against the *lettres de cachet* were made continually by the *parlement* of Paris and by the provincial *parlements,* and often also by the states general. It was not, however, until the reign of Louis XVI that a reaction against this abuse became clearly perceptible. At the beginning of that reign Malesherbes during his short ministry endeavoured to infuse some measure of justice into the system, and in March 1784 the baron de Breteuil, a minister of the king's household, addressed a circular to the intendants and the lieutenant of police with a view to preventing its abuses. In Paris, in 1779, the *cow des aides* demanded their suppression, and in March 1788 the *parlement* of Paris made some energetic remonstrances. The crown, however, in a declaration to the states general in the royal session of June 23, 1789 (art. 15), did not renounce it absolutely. *Lettres de cachet* were abolished by the Constituent Assembly, but Napoleon re-established their equivalent by a political measure in the decree of March 9, 1801. This was one of the acts brought up against him by the *sénatus-consulte* of April 3, 1814, which pronounced his fall "considering that he has violated the constitutional laws by the decrees on the state prisons."

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LETTUCE is the most popular salad plant in all parts of the world where climatic conditions permit its growth. The cultivated, annual form (Lacfuca sativa) probably was derived from L. *serriola*, a wild species of the Compositae family, native to Asia Minor and adjacent areas. Ancient writers noted that lettuce was served to kings of Persia as early as 550 B.C. During succeeding centuries it was well known to the Greeks and Romans who praised it for its medicinal values. In the 1st century A.D. many different types were being grown. By the jth century the Chinese were using the cultivated form. Lettuce spread to northern and western Europe during the middle ages and it is believed that Columbus carried it to the new world. Just when head lettuce types appeared is not recorded, but they were common by the 16th century.

The milky juice characteristic of the plant is expressed by lac, meaning "milk," the root of the Latin name, as well as in "lettuce" from laitues, plural of the archaic French word for "milky."

There are four botanical varieties of L. sativa grown in the United States: (1) asparagus lettuce (var. angustana), with narrow leaves and a thick. succulent, edible stem; (2) head or cabbage lettuce (var. *capitata*), with the leaves folded into a compact head; (3) leaf or curled lettuce (var. *crispa*), with a rosette of leaves that are curled, finely cut, smooth edged or oak leaved in shape; and (4) cos or romaine lettuce (var. longifolia), with smooth leaves that form a tall, oblong, loose head. There are two classes of head lettuce: the butter-head types with soft heads of thick, oily leaves; and crisp-head types with brittle-textured leaves that form very hard heads under proper temperature conditions. Horticultural varieties within these two classes differ in seasonal adaptability and disease resistance.

Average monthly temperatures of from 55° to 60° F. promote good quality, firmness in the heading varieties. stocky growth in the loose-leaved types. At high temperatures lettuce quickly becomes bitter and produces seedstalks. During unseasonable weather, protection is furnished and growth stimulated with greenhouses, frames, cloches or polyethylene covers. Small seedlings usually are transplanted at proper spacings when such shelters are used. In large-scale production the seeds are drilled directly in the field, with subsequent thinning.

In many parts of the world the leaf and butter-head types are most popular. They are not suitable for shipping and must be grown relatively close to markets. The crisp-head varieties, well adapted for long-distance shipment by rail or truck at 32° to 36° F., are dominant in the United States, where over half of the acreage is located in California and Arizona.

See also VEGETABLE. (J. E. K.)

LEUCADIA or LEUCAS: see SANTA MAURA.

LEUCIPPUS (5th century B.C.), Greek philosopher, credited by Aristotle and by Theophrastus with having originated the theory of atomism, is said to have been a native of Miletus in Asia Minor (the opinion that he came from Elea in southern Italy is generally rejected). Epicurus, however, denied his very existence; and in modern times E. Rohde and A. Brieger have reasserted this view, though without identifying Leucippus with Democritus (*q.v.*). The work of H. Diels in separating out the literary testimonies which refer to Leucippus as distinct from Democritus has made possible a much clearer notion of the theories of Leucippus.

Leucippus' theory appears to have been the result of an attempt to mediate between the monism of the Eleatics, which allowed neither plurality nor motion, and the qualitative pluralism of Empedocles and Anaxagoras: matter was homogeneous, but existed ultimately in an infinity of small particles, which were indivisible ("atoms": this was intended to counter arguments of the type advanced by Zeno of Elea). (See ELEATIC SCHOOL; PLURALISM AND MONISM: The Eleatics.) Motion was made possible by positing empty space which, Leucippus maintained, existed just as much as body. Atoms were infinite in number, space was infinite in extent. Differences between physical things mere due to the shape, arrangement and position of their constituent atoms, which were eternally in motion in all directions: this motion gave rise to collisions and entanglements and so to the formation of compound things. Within the compound things the atoms were in juxtaposition (not in "combination"); and they continued even there to be in motion, though their motion would then be modified. A cosmos is formed by the collision of atoms which have gathered together into a "whirl," as a result of which similar atoms get sorted together. The earth, which is drumshaped, is at the centre; but our cosmos is not unique. Leucippus' cosmology is largely an adaptation of earlier theories made to conform with his own main doctrines.

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LEUCITE, a rock-forming mineral composed of potassium and aluminum metasilicate $KAlSi_2O_6$. Since leucite contains a considerable amount of potash (K_2O, 21.5%), many attempts have been made to extract potash commercially from this mineral. In Italy the crude mineral is used as a fertilizer and it is a major source of commercial alum (*q.v.*). Crystals of leucite have the form of cubic icositetrahedra [211], but, as first observed by Sir David Brewster in 1821, they are not optically isotropic. They consist of a complex intergrowth of orthorhombic or monoclinic individuals, which are optically biaxial and repeatedly twinned, giving rise to twin-lamellae and to striations on the faces. When the crystals are raised to a temperature of about 100° C. they become optically isotropic, the twin-lamellae and striations disappearing; they reappear, however, when the crystals are again cooled. This pseudocubic character of leucite is exactly the same as that of the mineral boracite (*q.v.*).

The crystals are white or ash-gray in colour, usually dull and opaque, but sometimes transparent and glassy; they are brittle and break with a conchoidal fracture. The hardness is 5.5; the specific gravity 2.45. Enclosures of other minerals: arranged in concentric zones, are frequently present in the crystals.

See also PETROLOGY; PHONOLITE; POTASSIUM. (L. J. S.)

LEUCITE ROCKS. Igneous rocks containing the mineral leucite, though quantitatively very scarce, are widely distributed over the globe. They exhibit considerable variation and include many named rock types. They are found principally among surface or near-surface rocks of Tertiary or Recent Age, the best-known occurrence being the lavas of the Roman region. In pre-Tertiary rocks leucite is uncommon, presumably since it alters rather readily to form zeolites, analcite, etc.

Although some leucite-bearing lavas cover large areas, their actual total volumes are small. It is estimated that in the entire Roman region, from Mt. Vesuvius north 170 mi. to the volcano Bolsena, there are only 10 cu.mi. of leucite lava. Compared to other igneous rocks, leucite rocks are characteristically low in silica (45%–55% SiO_2), and high in potassium oxide (6%–12% K_2O). Economically unsuccessful attempts have been made to extract this potassium from leucite-rich rocks for agricultural fertilizers.

Leucite is found in association with most of the common rock-forming minerals and usually with one or more of the less common ones (nepheline, sodalite. noselite, hauynite. melanite-garnet and melilite), but it is not found with free silica (quartz, etc.), with which it would react chemically to form potassium feldspar. Leucite rocks belong chemically to a potassium-rich suite; in contrast to the sodic Atlantic and calcic Pacific suites, this group is sometimes referred to as the Mediterranean suite, from their relative abundance in the Roman region. In addition to this region, however, leucite rocks are found in the East Indies (Java, Celebes, Borneo), Alaska, Arkansas, Montana, Wyoming. Brazil, Madagascar, Germany (Baden), Czechoslovakia. Portugal. Spain, east Africa and other areas.

The conditions governing the formation of leucite in rocks are still imperfectly knonn. although experimental phase-equilibrium research has thronn considerable light on the problem. The common potassium feldspar orthoclase ($K_2O.Al_2O_3.6SiO_2$) melts incongruently to form leucite crystals and a more siliceous liquid.

It might thus be expected that leucite crystals would form in feldspar-rich rock magmas and might in some cases escape later reaction with liquid. This incongruent melting would explain not only the known occurrence of leucite crystals in some rocks whose glassy groundmasses contain "free" silica, but also a number of known examples where crystals of an external shape and mineral association resembling leucite have crystallized from slowly cooled. alkali-rich. deep-seated magmas and have later been converted to an aggregate of orthoclase and nepheline (or its alteration products). This material, called pseudoleucite, has been explained as a result of the reaction of early formed leucite crystals with late sodium-rich liquid causing the precipitation of orthoclase and nepheline. If this explanation is assumed to be correct, it also provides a mechanism for the development of some nepheline syenite magmas. Leucite has a rather low density (2.45). and it has been shown that high pressures favour the formation of potassium feldspar at the expense of leucite. This and the 'pseudoleucite reaction" explain the lack of leucite in plutonic rocks.

When in euhedral crystals, that is, with well-formed faces. leucite always shows the trapezohedral crystal shape. This only represents, however, the crystal outline of the high-temperature form in which the mineral crystallized; when examined at any temperature less than approximately 600° C. these crystals have optical and other properties indicating a lower symmetry, and the rapid inversion from the one form to the other has been studied in detail. Although it would seem reasonable to expect that at least small amounts of the Ion.-temperature form of leucite crystallize directly, at less than 600°, from the residual liquid in low-melting magmas, no evidence has yet been found to verify this in natural rocks and the synthetic silicate systems involving the compound so far explored do not permit direct crystallization of leucite from melts at such low temperatures.

The origin of the high-potassium. low-silica magmas from which leucite rocks form represents an enigma. Many mechanisms have been proposed. one of the most popular involving the desilication of a magma by its reaction with limestone or dolomite. The carbon dioxide formed by this reaction might actually be of significance in volcanic eruptions. It is known that the lavas of Mt. Vesuvius have come up through two miles of limestones and there has been a striking increase in the amount of leucite in the various eruptions there since prehistoric times. No single simple mechanism seems adequate to derive the low sodium to potassium ratio in these rocks. however, and to explain their concentration in certain limited areas over the globe.

See also PETROLOGY: *Habit of Igneous Rocks.* (E. RR.)

LEUCKART, (KARL GEORG FRIEDRICH) RUDOLF (1822–1898), was an outstanding German zoologist and teacher. his studies ranging widely over the invertebrates but his most valuable work dealing with parasites. He was born at Helmstedt on Oct. 7, 1822. and worked successively in the universities of Göttingen (where he had been educated), Giessen and Leipzig. He died on Feb. 6. 1898.

While Leuckart did useful work in systematics, dividing, for example. the echinoderms from the coelenterates and creating in the Protozoa the parasitic class Sporozoa. nevertheless his enduring influence lay in his experimental approach. Thus, he investigated the complex life histories of such parasites as the taenioid tapeworms. the aberrant Linguatulids, the acanthocephalan *Echinorhynchus* and the nematode *Trichinella.* Unraveling the life cycle of *Fasciola hepatica* involved him in an exciting race (1880–83) with the then obscure A. P. Thomas of Oxford. In entomological fields he worked on metagenesis and parthenogenesis in aphids. the fertilization of insect eggs through the micropyle and the development of the viviparous insect *Melophagus ovinus,* to select three examples.

In addition to a mass of scientific papers. Leuckart wrote a fundamentally important textbook. *The Parasites of Man* (1879–84; Eng. trans.. 1886), a greatly extended second edition of which remained unfinished at his death. (B. G. P.)

LEUCTRA, BATTLE OF, 371 B. C. Leuctra. a village of Boeotia in the territory of Thespiae. is chiefly noticeable in the annals of general history for the battle fought in its neighbourhood in 371 B C betneen the Thebans and the Spartans and their allies. But in military history it is far more than noticeable—in fact, epoch making. For there the "oblique order" was born nhich came to maturity under Alexander the Great, and was resurrected in modern times with equally startling success by Frederick the Great. And apart from its originality. at Leuctra Epaminondas's maneuver was in some ways more unconventional in its execution than those of his more famous successors. This is the more remarkable nhen me judge him by the criterion of his time. and remember that he was flagrantly breaking with the tradition of centuries of warfare.

A Peloponnesian army, about 10.000 strong, which had invaded Boeotia from Phoecis. was confronted by a Boeotian levy of perhaps 6.000 soldiers under Epaminondas (*q.v.*). In spite of inferior numbers and the doubtful loyalty of his Boeotian allies, Epaminondas offered battle on the plain before the village.

The Peloponnesian army formed up in the traditional manner, with the Spartans on the right under their king Cleombrotus, who mas in command of the whole. Instead of following suit and placing his best on the right, Epaminondas not merely reversed this procedure but massed a 50-deep column of Theban infantry on his left wing, nith the famous Sacred Band at its head and cavalry protecting its flank. He sent forward this body in advance of his centre and right wing, thus by "refusing" the latter, saving it from the otherwise inevitable overlapping nhich would have occurred on contact nith the enemy. After a cavalry engagement in which the Thebans drove their opponents off the field. the decisive issue was fought out between the Theban and Spartan foot. The Spartans. though fighting well. could not sustain in their 12-deep formation the cumulative impact of their opponents' column, and were hurled back with a loss of about 2.000 men. of whom 700 were Spartan citizens, including the king Cleombrotus. Seeing their right wing beaten. the rest of the Peloponnesians retired and left the enemy in possession of the field. Because of the arrival of a Thessalian army under Jason of F'herae, whose friendship they did not trust, the Thebans were unable to exploit their victory. Rut the battle is nonetheless of great significance in Greek history. Its political effects were far-reaching. for the loss in material strength and prestige which the Spartans there sustained deprived them forever of their supremacy in Greece. But by its influence on tactics it was still more far-reaching. for it was to affect vitally the outcome of the struggle between Greece and Persia and both indirectly and directly the destiny of modern Europe. It is the first known instance of a deliberate concentration of strength against a vital point of the enemy's formation as a means, first, to offset an inferiority on the whole front by a local superiority at the decisive point, and. secondly, to obtain a decision by dislocating instead of merely wearing down the enemy's body. This is the true art of war. And it is specially significant that Epaminondas directed his concentration against the enemy's command, the seat of his will to victory.

LEUK (Fr. *Loèche Ville*), an ancient little town in the Swiss canton of the Valais. It is built above the right bank of the Rhone, about 1 mi. from the Leuk-Susten station (15½ mi. E. of Sion and 17½ mi. W. of Brig) on the Simplon railway. In 1960 it had 2.546 inhabitants, mostly German-speaking and Catholics. About 10½ mi. by a narrow gauge railway N. of Leuk, and near the head of the Dala valley, at a height of 4,629 ft. above sea level, and overshadowed by the cliffs of the Gemmi pass (7,593 ft.) leading over to the Bernese Oberland, are the Baths of Leuk. They ordinarily have permanent inhabitants (1960 pop. 619) and are frequented in summer by visitors (largely French and Swiss) attracted by the hot mineral springs, which have a temperature from 117°–124°. The village is exposed to avalanches, by which it was destroyed in 1518, 1719 and 1756. but it is now protected by a strong embankment from a similar catastrophe.

LEUKEMIA is a disease of the blood-forming organs which is encountered at all ages and in both sexes. Its cause is unknown hut is considered to be of the same nature as that of various other forms of cancer. The frequency of occurrence of the disease

throughout the world increased substantially during the 20th century. There are two main varieties of leukemia, myelogenous and lymphatic, and a number of less common forms. All varieties may be acute or chronic. The acute forms run their course in a few weeks to a few months; the chronic form may not lead to death for three to ten or more years.

As a rule, the first symptoms of leukemia are weakness, increased fatigability and anemia or hemorrhages. In the acute form the symptoms may be severe, the anemia may progress rapidly and there may be accompanying fever. The chronic form is much more insidious in its development, and the early manifestations may be overlooked until enlargement of the spleen or lymph glands is discovered. In both myelogenous and lymphatic leukemia. as well as in the less common varieties, certain abnormalities can be demonstrated in the bone marrow as well as in the liver: spleen, lymph glands and other tissues. As a rule the white cell (leukocyte) count is increased, sometimes to very great proportions — 10, zo or even 100 times the normal values. In other instances. however, and especially in acute leukemia, the white cell count may be lower than normal. Varying degrees of anemia accompany the changes in the leukocytes, and in the acute form the number of platelets is decreased (thrombocytopenia). A characteristic of leukemia is the appearance in the blood of immature forms of leukocytes which are not normally found there.

The cause of leukemia is obscure. Probably many factors lead to its development. One that is clearly established is exposure to irradiation. The myelogenous form of leukemia was observed in the Japanese victims of atomic bombing and in persons exposed, without adequate protection, to roentgen (X-ray) irradiation. However, experimentally produced leukemia in animals indicates that many additional factors, including genetic, chemical and hormonal, are influential in the development of the disease. Thus, it is possible to raise strains of mice in which the incidence of leukemia is very high. Again, estrogens (the female sex hormones), the adrenocortical hormones and the thymus gland play important roles in the development of leukemia in mice. In fowl leukemia a viral agent is an important factor and a viral factor or factors may play a role in the development of leukemia in mice as well. Except for the role of irradiation, the bearing of these various factors on the development of the disease in man is uncertain.

Although spontaneous remissions occur occasionally, especially in acute leukemia, this disease is invariably fatal. A number of methods are available, however, whereby the severity of the manifestations may be so modified that the victim may carry on in comparatively good health for a time. Furthermore, life span may be prolonged. In acute leukemia, these methods include chemical agents such as 6-mercaptopurine and amethopterin; in the acute lymphatic form, the adrenocortical hormones also are used. In the treatment of chronic leukemia X-ray therapy and radioactive substances such as radioactive phosphorus, as well as certain chemical agents, have proved to be useful. *See* also ANEMIA; CANCER; LYMPH AND LYMPHATIC SYSTEM.

(M. M. WE.)

LEUTHEN (Pol. LUTYNIA) a village of Poland, 10 mi, west of Wroclaw (Breslau), the scene of Frederick the Great's victory over the Austrians on Dec. 5, 1757. The high road from Wroclaw to Luben crosses the marshy Schweidnitz Water at Lissa, and immediately enters the rolling country about Neumarkt. Leuthen itself stands about 4,000 paces south of the road and a similar distance south again lies Sagschiitz; Nypern, on the northern edge of the hill country, is 5,000 paces from the road. On Frederick's approach the Austrians took up a line of battle resting on the two last-named villages. Their whole position was strongly garrisoned and protected by obstacles, and their artillery was numerous though of light calibre. A strong outpost of Saxon cavalry was in Borne to the westward. Frederick had the previous day surprised the Austrian batteries at Neumarkt and his Prussians, 33 ooo to the enemy's 82,000. moved toward Borne and Leuthen early on the jth. The Saxon outpost nas rushed at in the morning mist and, covered by their advanced guard on the heights beyond, the Prussians wheeled to their right. Prince Charles of Lorraine, the Austrian commander in chief, on Leuthen church tower, could make nothing of Frederick's movements, and the commander of his right wing (Lucchesi) sent him message after message from Nypern and Gocklerwitz asking for help, which was eventually dispatched. But the real blow was to fall on the left under Nadasdy. While the Austrian commander was thus wasting time, the Prussians were marching against Xadasdy in two columns, which preserved their distances with an exactitude which has excited the wonder of modern generations of soldiers. At the due place they wheeled into line of battle obliquely to the Austrian front and in one great echelon — th'e cavalry of the right wing foremost and that of the left "refused" — Frederick advanced on Sagschiitz. Nadasdy, surprised. put a bold face on the matter and made a good defense, but he was speedily routed and, as the Prussians advanced, battalion after battalion was rolled up toward Leuthen until the Austrians iaced almost due south. The fighting in Leuthen itself was furious; the Austrians stood, in places, 100 deep, but the disciplined valour of the Prussians carried the village. The victory was endangered when Lucchesi came down upon the Prussian left wing from the north, but Driesen's cavalry, until then "refused," charged him in flank and scattered his troopers. This stroke ended the battle.

LEUTZE, EMANUEL (1816–1868), U.S. historical painter, was born at Gmünd, Wiirttemberg, on May 24, 1816, and as a child was taken by his parents to Philadelphia, Pa., where he early displayed talent as an artist. At 25 he had earned enough to take him to Diisseldorf to study at the Royal academy. In 1860 he was commissioned by the U.S. congress to decorate a stairway in the capitol at Washington, D.C., for which he painted a large composition, "Westward the Star of Empire Takes Its Way." His best-known work, popular through engraving, is "Washington Crossing the Delaware:" a large canvas containing a score of life-sized figures; it is in the Metropolitan Museum of Art, New York city.

Leutze died at Washington on July 18, 1868.

LEV (plural LEVA), the monetary unit of Bulgaria is based upon gold, a gold currency having been adopted in 1893. Notes are issued by the Bulgaria National bank, and early in the 20th century were maintained on a par with gold. Defeat in World War I caused the collapse of the lev, and in 1924 it was worth 0.725 U.S. cents. It remained at that level until the end of 1927. In 1928 the lev was finally stabilized at the new value of 673.659 to the English pound. The stability of the lev did not continue through World War II and by May 1952, it was worth only 0.348 cents. A revaluation of the lev at that time brought its official base value (high and fictitious) to 14.706 U.S. cents. A "tourist lev," applying to official exchange of foreign bank notes by non-residents in Bulgaria, was also introduced with a value of 10.504 cents.

LEVANT, a name for the Mediterranean coastlands of Asia Minor and Syria, sometimes including the coast line from Greece to Egypt (from the Fr. participle of *lever,* to rise, meaning the east).

In the 16th and 17th centuries the term "high levant" was used of the far east.

LEVÉE, a reception or assembly held by the British sovereign or his representative in the forenoon or early afternoon, at which men only are present. (Fr. *lever,* to rise.) Under the ancien *régime* in France the *lever* of the king was regulated, especially under Louis XIV. by elaborate etiquette. and the various divisions of the ceremonial followed the stages of the king's rising from bed. The *petit lever* began when the king had washed and said his daily offices, to this were admitted the princes of the blood and certain high officers of the household. Then followed the *première entrée,* to which came the secretaries and other officials and those having the *entrée;* these were received by the king in his dressing gown. Finally, at the *grand lever,* the remainder of the household. the nobles and gentlemen of the court were received; the king by that time was shaved. had changed his linen and was in his wig.

The word is also applied to a natural or artificial embankment which keeps a river in its channel. *See* LAND RECLAMATION; RIVER AND RIVER ENGINEERING; and MISSISSIPPI RIVER.

LEVELLERS, a republican and democratic party in England during the Interregnum of 1649–60 (see ENGLISH HISTORY) and the first political party in modern Europe. The name was given by their enemies, to suggest that they wished to "level men's estates." Midland rioters against enclosures in 1607 had been called "Levellers."

The Leveller movement originated in 1645–46, among radical supporters of parliament in and around London. The civil war had been waged in the name of parliament and people: the Levellers demanded that real sovereignty should be transferred to the house of commons (to the exclusion of king and lords); that manhood suffrage, a redistribution of seats and annual (or biennial) parliaments should make the commons truly representative; that government should be decentralized to local communities. They put forward a program of economic reform in the interests of small men in town and country — complete equality before the law, abolition of trading monopolies, laying open enclosures, security of tenure for copyholders. no conscription (impressment) or billeting, drastic law reform: abolition of tithes (and so of a state church), complete freedom of religious worship and organization. Disappointed by parliament's attitude, the Levellers turned directly to the people — and to the New Model army.

In April 1647 the army rank and file elected Agitators who were largely influenced by Leveller ideas. The generals had to accept an army council which included Agitators as well as officers. At Putney, in Oct. 1647, this representative body discussed the Agreement of the People, presented by the Levellers as a new social contract to refound the state, dissolved by parliament's victory in the civil war. Commissary-Gen. Henry Ireton argued that political democracy must lead to economic democracy, to subversion of property. He therefore wished to preserve the old propertied franchise. Col. Thomas Rainborough (later assassinated by royalists) and the civilian Leveller John Wildman replied by appealing to natural right. The Putney debates touched on the fundamentals of political theory. But they ended in deadlock. The generals restored "discipline" by force; and a renewed threat from the king in the second civil war reunited the disputants.

Pride's Purge (Dec. 1648) was preceded by negotiations between Independents and Levellers, but the latter objected to the failure to dissolve parliament and appeal to the people. In March John Lilburne (*q.v.*) and other Leveller leaders were imprisoned. A mutiny of Leveller troops in London was suppressed. and in May a more serious revolt was put down at Burford and Banbury. That was the end of the Levellers as an organized political force, though some of their leaders conducted inconclusive negotiations with royalist *émigrés,* and there were signs of a Leveller revival in the winter of 1659–60.

The Levellers never won national support. Their sea-green colours held London's streets, and the troops listened to them eagerly. But propaganda was difficult among a population used to taking its ideas from parson and squire. The Leveller failure to capture the army was decisive. But had they been allowed time to educate a democratic electorate. their program was well calculated to appeal to peasant farmers and artisans — the overwhelming majority of the people. Their repudiation of the communist Diggers (*q.v.*) was aimed at reassuring men of small property. So perhaps was their failure to press for conversion of copyhold into freehold. and their modification of manhood suffrage to exclude not only royalists but also paupers and servants — those who were economically dependent. In 1649 the Levellers were becoming active outside London, and were suggesting that English armies had no business in Ireland. that the English and Irish peoples had common enemies. Oliver Cromwell may have been right when he shouted to the council of state: "If you do not break them they will break you!"

The racy. forthright pamphlets of Lilburne. William Walwyn and Richard Overton are important in the evolution of a popular English prose style. Their appeal to reason against arguments drawn from precedent or biblical authority marks a historic break in political thinking. The Quakers took over some of their social ideas. In 1724 "Levellers" rose against enclosures in Gallomay.

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LEVELLING: see SURVEYING.

LEVEN, ALEXANDER LESLIE, 1ST EARL OF (*c.* 1580–1661), Scottish general. was the son of George Leslie, captain of Blair Atholl. He fought in the Dutch service. and later in that of Sweden, in which he rose to the rank of lieutenant general and ultimately (in 1636) to that of field marshal. He had a brilliant record during the Thirty Years' War and especially distinguished himself by his successful defense of Stralsund against Count Wallenstein in 1628. He always revered the memory of his great leader, Gustavus Adolphus, and he was present at the battle of Liitzen (Nov. 1632) when the king was killed.

As the foremost Scottish soldier of his day, and an ardent covenanter, he was called home and given the command of the Scottish forces arrayed against the royalist army during the first Bishops' War (1639), and his commission was renewed.during the second Bishops' War (1640–41). In March 1639 he captured Edinburgh castle without losing a man, and in 1640 he invaded England, defeated the king's troops at Newburn, entered Newcastle and mastered the whole of northeast England. The general was one of the Scottish commissioners who treated with the king at Ripon and, in the summer of 1641, peace having been made, he was able to disband his army.

In Oct. 1641 Leslie was created earl of Leven and Lord Balgonie, his peerage being one of many conferred by Charles at this stage on his opponents. in a fruitless endeavour to win them over to his side. Parliament rewarded him with a grant of 100.000 merks (£5,555 sterling). In 1642, as general, he led the Scottish forces in the Irish campaign. but he returned to take command, in Jan. 1644, of the army dispatched to England in accordance with the terms of the Solemn League and Covenant. Military operations are described under CIVIL WAR, ENGLISH and MARSTON MOOR.

In Oct. 1645 Leven carried Newcastle by storm, and in May 1646 Charles I surrendered to him at Newark. Unable to convince the king of the need to make lasting peace in the only feasible way —by subscribing the covenants — Leven handed over his embarrassing charge to the English parliament and returned with his army to Scotland (Jan. 1647). This was the end of his active military service as commander. though he remained keenly interested in national affairs. He agreed with the duke of Argyll in opposing the secret engagement made by the Scottish commissioners to send an army to rescue Charles in 1648, but he was brushed aside while the duke of Hamilton led the Scottish royalists to their utter defeat at Preston, at the hands of Oliver Cromwell, in August of that year.

The execution of Charles I led to further warfare and brought the "godly" into the royalist camp. Leven was present at Dunbar in Sept. 1650, though he left the effective command to his kinsman (*see* NEWARK, DAVID LESLIE). Along with the other members of the committee of estates, he was captured at Alyth in Aug. 1651 by a party of English dragoons. Imprisoned for a time in the Tower of London, he was soon liberated on parole. and eventually, in 1654, he was given complete liberty after the intercession. on his behalf, of Christina. queen of Sweden. He spent his last years on his estate of Balgonie. in Fife. dying there on April 4. 1661.

See *Leven and Melville Papers,* Rannatyne Club (Edinburgh, 1843); Sir W. Fraser, *The Melvilles, Earls of Melville, and the Leslies, Earls of Leven,* 3 vol. (Edinburgh, 1890); C. S. Terry, *Life and Campaigns of Alexander Leslie* (London, 1899). (G. S. P.)

LEVEN, a small burgh of Fifeshire, Scot.. at the mouth of the Leven on Largo bay in the Firth of Forth, 15 mi. S.W. of St. Andrews by road. Pop. (1961) 8,872. The old town cross has been erected in the grounds of the municipal buildings. The industries are numerous, comprising iron and steel foundries; paper,

oil cake and jute spinning and saw mills; and the making of creosote and golf clubs. There are collieries in the neighbourhood. Leven is a seaside holiday town with fine sands and the golf links, extending for 2 mi. N.E. to Lundin, are among the best in Scotland. Early occupation is indicated by three fine monoliths; and in the vicinity are the remains of an old house of the Lundin family dating from the reign of David II. One mile east of Lundin lies Largo, consisting of Upper Largo. or Kirkton of Largo, and Lower Largo. A statue of .Alexander Selkirk. or Selcraig (1676–1721), the prototype of "Robinson Crusoe," who was born in Largo. was erected in 1886. Sir John Leslie (1766–1832), the scientist and mathematician; Admiral Sir Philip Durham (1763–1845), commander in chief at Portsmouth from 1836 to 1839, and Sir Andrew Wood (d. 1515), who sailed the "Great Michael," the largest ship of its time, were natives of Largo. When the last named was past active service he had a canal cut from his house to the parish church, to which he was rowed every Sunday in an eight-oared barge.

LEVEN, LOCH, a lake of Kinross-shire. Scot. Situated near the southeast boundary of the shire, it is $3\frac{3}{4}$ mi. long and $2\frac{2}{3}$ mi. broad, and lies jj it. above sea level. The mean depth is about 1j ft.. with a maximum oi 83 ft., and it is thus one of the shallowest of Scottish lochs. Draining the county and itself drained by the Leven, it is famous for its trout.

Of the loch's seven islands, St. Serf's, the largest, contains the ruins of the priory of Loch Leven or I'ortmoak. on the site of one of the oldest Culdee establishments in Scotland. About 9j5 it was made over to the bishop of St. Andrews and about 1150 it was granted Lo the Augustinians of that city. Its best-known prior was Andrew de Wyntoun, the 15th-century chronicler.

On Castle Island is a ruined castle dating from the late 14th or early 1jth century. An earlier structure resisted. according to the *Scotichronicon,* a siege by the English party in 1335, and in it Kobert the Steward and his son. Alexander. earl of Buchan ("the Wolf of Badenoch"). suffered detention in 1368–69. The former, as Robert II. granted the castle in 1390 to Sir Henry Douglas of Lugtoun, ancestor of the Douglases of Lochleven. It was in turn the prison of Archibald, 5th earl of Douglas (1431); of Patrick Graham. archbishop of St. Andrews (who died here in 1478); and, above all. of Mary, queen of Scots. She signed her abdication within its walls on July 24, 1567, and eifected her escape from it on May 2, 1j65. The keys of the castle. which were thrown into the loch during her flight. were found arid are preserved at Dalmahoy in Midlothian. Support of Mary's cause had involved Thomas Percy. 7th earl of Northumberland (b. 1528). He too was lodged in the castle in 1569 and after three years' imprisonment was handed over to the English. by whom he was beheaded at Tork in 1572. The proverbial saying that "Those never got luck who came to Loch Leven" sums up the history of the castle. An ancient causeway connecting the isle \\-ith the mainland was long submerged too deeply for use. but the work of lowering the water level and reclaiming some land. which was carried out in 1826–36, brought it almost into view again. (G. S. P.)

LEVEN AND MELVILLE, EARLS OF. The family of Melville which holds these two earldoms is descended from Sir John Melville of Raith, Fifeshire, who was executed for high treason on Dec. 13, 1548; he Ieft with other children a son Robert (1527–1621), who in 1616 was created a lord of parliament as Lord Melville of Monymaill. Melville had represented Mary, queen of Scots, at the English court, and he had filled several important offices in Scotland under her son James VI. George (c. 1634–1707), 4th lord, was implicated in the Rye House plot, took refuge in the Netherlands in 1683, but returned to England after the revolution of 1688 and was appointed secretary for Scotland by William III. in 1689, being created earl of Melville in the following year. He was president of the Scottish privy council, but he was deprived of his office by Anne. His son David, 2nd earl of Melville (1660–1728), fought for William at Killiecrankie and elsewhere, and as commander-in-chief of the troops in Scotland he dealt promptly and effectively with the attempted Jacobite rising of 1708. In 1712, however, his office was taken from him, and he died on the 6th of June 1728.

LEVER, CHARLES JAMES (1806–1872), Irish novelist of English descent, second son of James Lever, a Dublin architect and builder, was born in the Irish capital on Aug. 31, 1806. His escapades at Trinity college, Dublin (1823–28), whence he took the degree of M.B. in 1831, form the basis of that vast cellarage of anecdote from which all the best vintages in his novels are derived. The inimitable Frank Webber in *Charles O'Malley* (spiritual ancestor of Foker and Mr. Bouncer) was a college friend, Robert Boyle, later on an Irish parson. Lever and Boyle sang ballads of their own composing in the streets of Dublin, after the manner of Fergusson or Goldsmith, filled their caps with coppers and played many other pranks embellished in the pages of *O'Malley, Con Cregan* and *Lord Kilgobbin.* Before seriously embarking upon the medical studies for which he was designed, Lever visited Canada as an unqualified surgeon on an emigrant ship, and has drawn upon some of his experiences in *Con Cregan, Arthur O'Leary* and *Roland Cashel.* Arrived in Canada he plunged into the backwoods, was affiliated to a tribe of Indians and had to escape at the risk of his life, like his own Bagenal Daly.

Back in Europe, he travelled in the guise of a student from Göttingen to Weimar (where he saw Goethe), thence to Vienna; he loved the German student life with its beer, its fighting and its fun, and several of his merry songs, such as "The pope he loved a merry life" (greatly envied by Titmarsh), are on *Student-lied* models. His medical degree admitted him to an appointment from the Board of Health in Co. Clare and then as dispensary doctor at Port Stewart, but the liveliness of his diversions as a country doctor seems to have prejudiced the authorities against him. In 1833 he married his first love, Catherine Baker, and in Feb. 1837, after varied experiences, he began running *The Confessions of Harry Lorrequer* through the pages of the recently established *Dublin University Magazine.* Before *Harry Lorrequer* appeared in volume form (1839), Lever had settled on the strength of a slight diplomatic connection as a fashionable physician in Brussels (16, Rue Ducale). *Lorrequer* was merely a string of Irish and other stories good, bad and indifferent, but mostly rollicking, and Lever, who strung together his anecdotes late at night after the the serious business of the day was done, was astonished at its success. "If this sort of thing amuses them, I can go on for ever." Brussels was indeed a superb place for the observation of half-pay officers, such as Major Monsoon (Commissioner Meade), Captain Bubbleton and the like, who terrorized the *tavernes* of the place with their endless peninsular stories, and of English society a little damaged, which it became the specialty of Lever to depict. He sketched with a free hand, wrote, as he lived, from hand to mouth, and the chief difficulty he experienced was that of getting rid of his characters who "hung about him like those tiresome people who never can make up their minds to bid you good night." Lever had never taken part in a battle himself, but his next three books, *Charles O'Malley* (1841), *Jack Hinton* and *Tom Burke of Ours* (1843), written under the spur of the writer's chronic extravagance, contain some of the most animated battle-pieces on record. Condemned by the critics, Lever had completely won the general reader from the Iron Duke himself downwards.

In 1842 he returned to Dublin to edit the *Dublin University Magazine,* and gathered round him a typical coterie of Irish wits (including one or two hornets) such as the O'Sullivans, Archer Butler, W. Carleton, Sir William Wilde, Canon Hayman, D. F. McCarthy, McGlashan, Dr. Kenealy and many others. At his house at Templeogue he entertained Thackeray, and the Waterloo episode in *Vanity Fair* is said to have been suggested by the conversation there. But the "Galway pace," the display he found it necessary to maintain at Templeogue, the stable full of horses, the cards, the friends to entertain, the quarrels to compose and the enormous rapidity with which he had to complete *Tom Burke, The O'Donoghue* and *Arthur O'Leary* (1845), made his native land an impossible place for Lever to continue in. In 1845 he resigned his editorship and went back to Brussels, whence he started upon an unlimited tour of Central Europe in a family coach. Now and again he halted for a few months, and entertained to the limit of his resources in some ducal castle

or other which he hired for an off season. Thus at Riedenburg, near Bregenz, in Aug. 1846, he entertained Charles Dickens and his wife and other well-known people. Like his own *Daltons* or *Dodd Family Abroad* he travelled continentally, from Carlsruhe to Como, from Como to Florence, from Florence to the Baths of Lucca and so on, and his letters home are the litany of the literary remittance man, his ambition now limited to driving a pair of novels abreast without a diminution of his standard price for serial work ("£20 a sheet"). In the *Knight of Gwynne*, a story of the Union (1847). *Con Cregan* (1849), *Roland Cashel* (1850) and *Maurice Tiel-nay* (1852) we still have traces of his old manner; but he was beginning to lose his original joy in composition.

Lever's *fond* of sadness began to cloud the animal joyousness of his temperament. Formerly he had written for the happy world which is young and curly and merry; now he grew fat and bald and grave. But, depressed in spirit as he was, his wit was unextinguished; he was still the delight of the *salons* with his stories: and in 1867, after a few years' experience of a similar kind at Spezia, he was cheered by a letter from Lord Derby offering him the more lucrative consulship of Trieste. "Here is six hundred a year for doing nothing, and you are just the man to do it." The six hundred could not atone to Lever for the lassitude of prolonged exile in a place he came to dislike heartily. He had unscrupulous friends who assured him that his last efforts were his best. They include *The Fortunes of Glencore* (1857), *Tony Butler* (1865), *Luttrell of Arran* (1865), *Sir Brooke Fosbrooke* (1866), *Lord Kilgobbin* (1872) and the table-talk of *Cornelius O'Dowd*, originally contributed to Blackwood. His depression, partly due to incipient heart disease, was confirmed by the death of his wife (April 23, 1870), to whom he was tenderly attached. He died at Trieste on June 1, 1872.

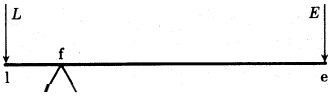
Trollope praised Lever's novels highly when he said that they were just like his conversation. He was a born raconteur. and had in perfection that easy flow of light description which without tedium or hurry leads up to the point of the good stories of which in earlier days his supply seemed inexhaustible. With little respect for unity of action or conventional novel structure, his brightest books, such as *Lorrequer, O'Malley* and *Tom Burke*, are in fact little more than recitals of scenes in the life of a particular "hero," unconnected by any continuous intrigue.

The type of character he depicted is for the most part elementary. His women are mostly rouées, romps or Xanthippes; his heroes have too much of the Pickle temper about them and fall an easy prey to the serious attacks of Poe or to the more playful gibes of Thackeray in *Phil Fogarty* or Bret Harte in *Terence Deuville*. This last is a perfect bit of burlesque. Terence exchanges 19 shots with the Hon. Captain Henry Somerset in the glen. "At each fire I shot away a button from his uniform. As my last bullet shot off the last button from his sleeve: I remarked quietly, 'You seem now, my lord, to be almost as ragged as the gentry you sneered at,' and rode haughtily away." And yet these careless sketches contain such haunting creations as Frank Webber, Major Monsoon and Micky Free, "the Sam Weller of Ireland." Falstaff is alone in the literature of the world; but if ever there came a later Falstaff, Monsoon was the man. As for Baby Blake, is she not an Irish Di Vernon?

The critics may praise Lever's thoughtful and careful later novels as they will, but *Charles O'Malley* will always be the pattern of a military romance.

The chief authorities are the *Life*, by W. J. Fitzpatrick (1879), and the *Letters*, ed. in 2 vols. by Edmund Downey (1906), neither of which, however, enables the reader to penetrate below the surface. *See* also Dr. Garnett in *Dict. Nat. Biog.; Dublin Univ. Mag.* (1880), 465 and 570; Anthony Trollope's *Autobiography* (1883); *Blackwood* (Aug. 1862); *Fortnightly Review*, vol. xxxii.; Andrew Lang, *Essays in Little* (1892); W. E. Henley, *Views and Reviews* (1890); Hugh Walker, *Literature of the Victorian Era* (1910); *The Bookman Hist. of English Literature* (1906), p. 467; *Bookman* (June 1906; portraits). A library edition of the novels in 37 vols. appeared 1897–99 under the superintendence of Lever's daughter, Julie Kate Neville. (T. S.; X.)

LEVER. A mechanical device generally used for raising weights. The lever is the oldest form of all elementary machines and appears in the sculptures of Egypt some 5,000 years ago. A simple kind of lever is shown in the illustration. This lever can turn about a point or axle called the fulcrum shown at f in the figure. With this lever a heavy load *L* can be raised by a force or effort *E* applied at the points 1 and e on the rod. The distances, lf, ef, of the fulcrum from the load and effort forces are called the lever arms of the load and effort respectively. When the effort force *E* is just balancing the load force *L* then the product of the forces and their lever arms must be equal, that is, for balance or equilibrium $L \times lf = E \times ef$. The mechanical advantage of a lever is defined as the ratio of the load to effort *LIE*, and is equal to the inverse ratio of their lever arms. ef/lf.



A LEVER WITH FULCRUM. LOAD *L* AND EFFORT *E*

The fact that the lever balances or is in equilibrium when $L \times lf = E \times ef$ is based on direct experimental proof in which the forces and distances are measured directly. Archimedes undoubtedly had experimental basis for his axiom for the lever, "Equal weights at equal distances are in equilibrium, and unequal weights at unequal distances are not in equilibrium but incline toward the weight which is at greater distance"; and for the principal theorem of the lever: "Two magnitudes, whether commensurable or incommensurable, balance at distances reciprocally proportional to the magnitudes."

By placing the load, fulcrum and effort in different relative positions two other types of levers are formed. In a wheelbarrow the order is fulcrum, load and effort while for a foot treadle as used for driving small looms the order is fulcrum, effort and load. Theoretically, a lever can he used to lift a load of any magnitude. It was probably this idea which came to Archimedes and caused him to exclaim. "Give me a fulcrum on which to rest and I will move the earth." (R. J. SN.)

LEVERHULME, WILLIAM HESKETH LEVER, 1ST VISCOUNT (1851–1925), English entrepreneur who in 1884 leased a small, unprofitable soapnorks and built it into the international firm of Lever Bros , was born at Bolton, Lancashire, Sept. 19, 1851, and began his career in 1867 in his father's wholesale grocery warehouse. In making and selling soap he used extensive advertising and product innovations, and by 1925 his firm served a world market through a system of 250 associated companies.

As early as 1888 the brothers introduced extensive employee benefits, beginning with a company financed model industrial village at Port Sunlight. Employee benefits included pensions, medical care. unemployment compensation and free insurance In 1909 a co-partnership arrangement for sharing profits, but not management, was inaugurated.

In 1906 Lever was elected a member of parliament. In 1917 he was raised to the peerage as a baron; he received a viscounty in 1922.

Lever died in Hampstead May 7, 1925.

See *Viscount Leverhulme*, by his son (1925). (J. R. LT.)

LEVERRIER, URBAIN JEAN JOSEPH (1811–1877), French astronomer. who predicted the existence of the planet Neptune, was horn at St. Lô in Normandy on March 11, 1811. He was educated at the Ecole I'olytechnique. where his scholastic abilities were rewarded with a free choice among the departments of the public service open to pupils of the school. He selected the administration of tobaccos, and proved his ability with two papers on the combination of phosphorus with hydrogen and oxygen, later published in the *Annales de Chimie rt de Physique*. Appointed teacher of astronomy at the Ecole l'olytechnique in 1837, Leverrier abandoned chemistry for celestial mechanics. Continuing the previous investigations of Laplace, he rigorously proved the stability of the solar system and calculated the limits within which the eccentricities and inclinations of the planetary orbits vary. This was followed by an extensive study of the theory of Mercury. resulting in greatly improved tables of that planet.

Leverrier next investigated the perturbations of the comets Faye (1843) and De Vico (1844) and then turned his attention to the motion of Uranus, from which he deduced the

presence of a previously unknown planet. On Sept. 23, 1846, J. G. Galle at Eerlin discovered the planet Neptune within one degree of the place Leverrier had indicated. As a result of this achievement he received, among other awards, a Copley medal from the Royal society. the order of the Dannebrog from the king of Denmark, and was named officer in the Legion of Honour and preceptor to the comte de Paris. Also. a chair of astronomy was created for him at the faculty of sciences and he was appointed adjunct astronomer to the bureau of longitudes. On Jan. 30, 1854, he succeeded D. F. J. Arago as director of the Paris observatory. Leverrier re-established the efficiency of this institution. which had declined. but some of the uncompromising measures taken and his unconciliatory manner of enforcing them raised a storm of protests that nas only appeased by his removal on Feb. j. 1870. On the death of his successor C. E. Delaunay in 1872, he was reinstated, but with authority restricted by the supervision of an observatory council. During his difficulties as the director of the observatory. he carried out a complete revision of the planetary theories and compared theory with the best observations then available. His theories and tables of the planets are published in vol. i–vi and x–xiv of the *Annales de l'Observatoire de Paris* (Mémoires). Leverrier's aim mas the elaboration of the scheme of the heavens laid down by Laplace in *Mécanique céleste*, and the predictions of the existence of Neptune and of Vulcan, with which his name is popularly identified. were only incidental to this scheme. Vulcan was never discovered. and the mathematical necessity for its existence, stated by Leverrier. was only removed by Einstein's relativity theory in 1915. Leverrier died at Paris on Sept. 23, 1877.

(O. J. E.)

LEVERTIN, OSCAR IVAR (1862–1906), Swedish poet and scholar, a leader of the romantic movement of the 1890s, was born, of a Jewish family, near Stockholm on July 17, 1862. He received his doctorate in letters at Uppsala in 1888 and became a *docent* there, and, in 1899, professor of literature at Stockholm. In his first prose works and his early literary criticism he closely followed the naturalist school. Eut after the death of his first wife and an attack of tuberculosis, which sent him to Switzerland, and led to close personal and literary contact with the poet Verner von Heidenstam (*q.v.*), he abandoned naturalism for romanticism. The first sign of his literary conversion is the pamphlet *Pepitas bröllop* (1890), written with Heidenstam in Davos. In Davos he also completed his first volume of poems, *Legender och visor* (1891), which placed him at the head of the new romantic movement. In this poetry — "black with purple-coloured threads" — he draws his material partly from medieval legend and art, partly from Jewish tradition and history. In *Nya dikter* (1894), the atmosphere and colouring is less melancholy; new personal experiences and the combined influence of Renan and Nietzsche are prominent. A third volume of poetry. *Dikter* (1901), is an attempt in the direction of a more simple and compressed style; here he approaches genuine Swedish themes. His last and perhaps finest poetical work is *Kung Salomo och Morolf* (1905) in which, using material drawn from Oriental tales and medieval romances, he reveals much of his own melancholy and disillusion.

As a literary historian Levertin concentrated his interest on the 18th century. especially the period of Gustavus III (*Från Gustaf III:s dagar*, 1896; and *Svenska gestalter*, 1903); the same period formed the background to the volume of short stories *Rococonovel-ler* (1899), a kind of literary pastiche. From 1897 until his death he was the leading literary critic of the *Svenska Dagbladet* and exerted great influence on contemporary readers and writers. Among his books on the history of art that on *Jacques Callot* (1911; French trans. 1935) is the most important. At the time of his death (in Stockholm. Sept. 22, 1906) he was engaged on a great work on Linnaeus. but had written only a fragment, published as *Carl von Linné* (1906). His *Samlade skrifter* were published in 24 vol. (1907–11j.

See W. Söderhjelm, *O. Levertin*, 2 vol. (1914–17); C. Fehrman, *O. Levertin* (1947). (CL. FN.)

LÉVI, SYLVAIN (1863–193j). French orientalist, was born in Paris on March 28, 1863. Educated at the University of Paris. in 1886 he was appointed a lecturer at the school of higher studies in Paris. As special lecturer in Sanskrit he taught at the faculty of letters from 1889 to 1894 when he mas appointed to a professorship at the Collège de France. In 1897 and 1898 he made tours of scientific research in India and Japan, and from 1921 to 1923 he traveled in India, Indochina, Japan, Korea, Siberia and Russia. Levi became a director at the school of higher studies and a member of numerous societies, including the Royal Asiatic society, the Linguistic society and the Society of Jewish Studies. His works include *Le Théâtre indien* (1890); *La Doctrine du sacrifice dans les Brahmanas* (1898); *Le Népal* (1905–08); *Dans l'Inde* (1925); *L'Inde et le monde* (1925).

LEVI-CIVITA, TULLIO (1873–1941), Italian mathematician. best known for his work in differential calculus and relativity, was born March 29. 1873, in Padua. He studied at the Cniversity of Padua, where he became instructor in 1898 and professor of rational mechanics in 1902. Later, he taught at the University of Rome (1918–38), where he occupied successively the chairs of higher analysis and rational mechanics.

Ranked as one of the leading scientists of the 20th century in both pure and applied mathematics. Levi-Civita made important contributions to almost every domain of mathematics. In celestial mechanics. he published a number of memoirs on the problem of three bodies. With his teacher! G. Ricci-Curbastro, he founded the absolute differential calculus. The memoir of Ricci and Levi-Civita appeared as *Methodes de calcul differential absolu et leurs applications* (1900). In 1917 Levi-Civita made his most important original contribution, the introduction of the concept of parallel displacement in general curved spaces. This immediately found many applications, including the unified representation of gravitational and electromagnetic fields. Other publications dealt with problems in differential geometry, hydrodynamics and engineering. He died Dec. 29, 1941, in Rome. His works included *Lezioni di meccanica rezionale*, 3 vol. (1923); *Questioni di meccanica classica e relativistica* (1924); *Lezioni di calcolo differenziale assoluto* (192j; Eng. trans., 1927); and *Carrateristiche dei sistemi differenziali e propagazione ondosa* (1931). (E. KA.)

LEVINSON, SALMON OLIVER (1865–1941), U.S. lawyer and publicist. was distinguished for originating and publicizing the outlawry of war movement in the United States. Born of immigrant parents in Noblesville, Ind., on Dec. 29, 1865, he clerked in the family store, attended Yale .university (A.B., 1888) and studied law with an uncle. He was noted for skill in reorganizing the finances of distressed corporations and in negotiating rather than litigating creditors' claims.

He announced his outlawry idea in the *New. Republic* March 9, 1918. Changes brought about by violence were to be declared illegal by nation-states. Levinson marshaled leaders in many fields to advocate outlawry, including the philosopher, John Dewey; Sen. William E. Borah; the New York minister, John Haynes Holmes; the editor of the *Christian Century*, C. C. Morrison; and the popular orator, Raymond Robins.

Aristide Briand, foreign minister of France, and Henry L. Stimson, the U.S. secretary of state, along with others, paid tribute to Levinson for his contributions to the Kellogg-Briand peace pact (1928) which "outlawed" war in a legal sense.

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LEVIRATE. In ancient Hebrew society, when a man died without sons his brother was required to marry the widow in order to provide a "son" and heir of the dead man, thus perpetuating the paternal line. A similar custom prevailed among the Vedic Aryans of India (1500 to 1000 B.C.), among whom the son performed funeral rites for the salvation of his deceased father's soul. The term, from the Latin for "brother-in-law," also applies to the custom of preferred — but not mandatory — marriage to the deceased husband's brother. The "brother" may be an actual sibling of the deceased or a person so classified. Where only the dead man's younger brother is required or expected to marry the widow, the custom is called the junior levirate. G. P. Murdock's worldwide sample of 185 primitive societies of the 19th and 20th cen-

turies found that 69% exhibited a preference for some such form of secondary marriage. Whether the widow and the dead husband's brother regard each other as desirable or undesirable depends on such factors as age, personality, economic assets and other indices of status.

This custom may be explained as a reflection of the principle that many peoples have regarded marriage as a contract between families or lineages as well as individuals, so that a deceased spouse was most appropriately replaced by another from the same social or kin group. The customary replacement of a dead wife by her sister, the sororate (*q.v.*), often exists side by side with the levirate.

See also KINSHIP; KINSHIP TERMINOLOGY; MARRIAGE; SOCIAL ANTHROPOLOGY.

See R. H. Lowie, *Social Organization* (1948); G. P. Murdock, *Social Structure* (1949). (*H. E.* **D.**)

LÉVIS (formerly Pointe Levi), only city in LCvis county, Quebec. Canada, situated on the precipitous south bank of the St. Lawrence, opposite Quebec city. Pop. (1961) 14,871. It is on the Canadian National railway. It contains the Lorne dock, a federal government 1,150-ft. graving dock which can accommodate any ship afloat. LCvis is an important centre of the river and transatlantic trade, and is connected by ferries with the city of Quebec. It is named after the maréchal duc de LCvis, the last commander of the French troops in Canada.

LEVITA, ELIAS or ELIJAH (ELIA LEVI BEN ASCHER) (1469–1549), Jewish grammarian, who furthered the study of Hebrew in Christian circles by his activity as a teacher and by his writings was born at Neustadt on the Aisch, Bavaria. He preferred to call himself ASHKENAZI, "the German," and bore also the nickname of BACHUR or BAHUR, "the youth" or "student," which latter he gave as a title to his Hebrew grammar. Before the end of the 15th century he went to Italy, living first at Padua, then (1509) at Venice, going in 1513 to Rome, where he found a patron in the learned general of the Augustinian order, the future cardinal Egidio di Viterbo, whom he helped in his study of the Kabbalah. The storming of Rome by the Constable de Bourbon in 1527 compelled Elias to go to Venice, where he became corrector in the printing house of Daniel Bomberg. In 1541 and 1542 he lived at Isny, Wiirttemberg, where he published several of his writings in the printing house of the learned pastor Paul Fagius. The last years of his life he spent at Venice. Levita's works on Hebrew grammar (Bachur, a textbook, 1518; Harkaba, an annotated dictionary of irregular word forms; a table of paradigms; Pirke Elijahu, a description — partly metrical — of phonetics, and other chapters of the grammar, 1520; his earliest work, a commentary on Moses Kimchi's Hebrew grammar, 1508) are clear and methodical. Among his other writings is the first dictionary of the Targumim (Meturgeman, 1541) and the first attempt at a lexicon in which much of the treasure of late Hebrew language was explained (Tishbi, explanation of 712 new Hebrew vocables, as a supplement to the dictionaries of David Kimchi and Iiathan b. Yehiel, 1542). Scientifically most valuable, and of original importance, are the works of Levita on the *Massora;* his concordance to the Massora (*Sefer* Zzkhronot, completed in the second revision 1536) and *Mas*soreth Hamasoreth (1538; Eng. tr. by C. D. Ginsburg. London, 1867). Also may be mentioned his commentary on Kimchi's grammar and dictionary (in the Bomberg editions, 1545, 1546), his German translation of the Psalms (1545) and the Baba-Buch (more properly Buovobuch, a German recension of the Italian novel *Historia* di *Buovo d'Antona,* 1508).

LEVITATION, the raising of the human body in the air without mechanical means or contact, is an occasional phenomenon reported in many religious traditions and also as a rare paranormal phenomenon in a nonreligious setting. Levitations are reported among the holy men of India. They have also been reported among Christian saints, and the evidence given by witnesses at the process of canonization often provides a useful measure of how well authenticated these occurrences have been. Both St. Theresa and St John of the Cross were reported to have been seen with their bodies suspended in the air. The most dramatic account of levitation, however, is that of St. Joseph of Copertino, who, in the 17th century, was reported to have been seen in levitation on more than 100 occasions, often before many witnesses. A case of levitation in the 19th century is that of the medium Daniel Dunglas Home, of whom Sir William Crookes wrote: "On three separate occasions I have seen him raised completely from the floor of the room . . . On each occasion I had full opportunity of watching the occurrence as it was taking place." A report of a more spectacular levitation was made by the earl of Dunraven and two other witnesses, who were convinced that Home was transported through a window 70 ft. from the ground and into another window seven feet away.

The puzzling thing about levitation is that while it is intuitively rejected as impossible by the mind accustomed to scientific habits of thought, there is nevertheless a great weight of evidence in favour of its occurrence. This evidence would indeed be regarded as overwhelming if the phenomenon were intrinsically more likely. Some investigators have suggested that witnesses to levitation were subject to hallucinations induced by mass hypnosis, but this is a very improbable explanation since mass hallucinations of this kind have not been demonstrated experimentally and levitations have often been reported in conditions unfavourable to hypnosis. It may be argued that the experimental evidence for psychokinesis produced by workers in parapsychology (*q.v.*) has somewhat reduced the intrinsic unlikelihood of levitation. The two phenomena, on the one hand of a certain measure of willed control of the rolling of dice, and, on the other, of the raising of a human body from the ground, would, however, involve forces of a very different order.

There are obvious difficulties in the way of experimental study of levitation since it is a rare phenomenon that cannot be produced at will. However, the motion-picture camera and the use of infrared photography provide means of objective recording that might settle the question of the reality of levitations. *See* also SPIRITUALISM.

See Sir *W.* Crookes, *Researches in the Phenomena of Spiritualism,* new ed. (1926); H. H. C. Thurston, *The Physical Phenomena* of *Mysticism,* cd. *by J.* H. Crehan (1952). (R. H. T.)

LEVITES, or sons of Levi (son of Jacob by Leah), a sacred caste in ancient Israel, the guardians of the temple service at Jerusalem.

Place in Ritual. — In the developed hierarchical system the ministers of the sanctuary are divided into distinct grades. All are "Levites" by descent, and are thus correlated in the genealogical and other lists, but the true priesthood is confined to the sons of Aaron, while the mass of the Levites are subordinate servants who are not entitled to approach the altar or to perform any strictly priestly function. All access to the Deity is restricted to the one priesthood and to the one sanctuary at Jerusalem; the worshipping subject is the nation of Israel as a unity, and the function of worship is discharged on its behalf by divinely chosen priests. The ordinary individual may not intrude under penalty of death; only those of Levitical origin may perform service, and they are essentially the servants and hereditary serfs of the Aaronite priests (see Num. xviii.). But such a scheme finds no place in the monarchy; it presupposes a hierocracy under which the priesthood increased its rights by claiming the privileges which past kings had enjoyed; it is the outcome of a complicated development in Old Testament religion in the light of which it is to be followed.

We may distinguish three stages in this development. (a) An early period in which there was no tribal restriction on the priesthood ar on offices connected with the sanctuary. Thus we find Micah consecrating one of his own sons as priest (Jud. xvii. 5), and Samuel seems to have been an Ephraimite by birth. The more menial offices connected with Solomon's temple were performed by the royal body-guard or by slaves especially dedicated ("Nethinim")—usually foreigners. At the same time there is evidence which suggests a distinct preference for Levites (cf. Jud. xvii. 13).

(b) A period in which all Levites, and Levites only, were eligible for the priesthood. This is represented in the literature of the Old Testament by Deuteronomy and Ezekiel. Both use the phrase "the priests, the Levites," though Ezekiel makes a distinction

between those who had ministered at the local sanctuaries (to him, as a Jerusalem priest, an illicit cult), and the sons of Zadok who were the proper attendants of the sanctuary at Jerusalem. The former are condemned to menial offices, while the higher duties are reserved for the latter (Ezek. xliii. 19, xliv. 10, 1j). This is the position which would naturally follow on the centralisation of sacrifice in Jerusalem Though we have no direct evidence to prove that Ezekiel's attempt to limit the priesthood proper to the family of Zadok succeeded, it is quite possible that this condition persisted till the promulgation of P.

(c) The last stage, in which the priesthood was confined to the family of Xaron. This is usually traced back to the time of Ezra, and was certainly the rule for the whole of the Greek and Roman periods. The term "Levite" now includes (through some fictitious genealogy) the former menial attendants, and the whole body of non-Xaronic Levites is now placed on the same level.

Origin of the **Levites.**—Biblical tradition is practically unanimous in tracing back the Levites to the third son of Jacob and Leah But the earliest reference to the tribe as a tribe is found in Gen. xlix 5–7, where, along with Simeon (*q v.*), it is condemned as bloodthirsty and cruel To the same traditional element probably belongs the story of the slaughter of the Shechemites by these two brothers (Gen xxxiv. 25–30), and the language of Gen xlix 7 suggests that the tribe disappeared in the same way as Simeon. Further, certain Minaean inscriptions have been found in north Arabia (at El-Öla) in which the cognate word la-&'a (together with a feminine form) occurs in the simple sense of "priest" It has, then, been conjectured that the term originally implied occupation and not descent.

At the same time the tradition of a common descent is so persistent that it is difficult to disregard it, and the Minaean parallel may be accidental. There seems no real reason to doubt the tradition which makes Moses and Xaron members of this tribe, and its special devotion to Yahweh, the God introduced by Jloses to Israel, is illustrated by the story of the vengeance they took on the calf-worshippers at Sinai (Ex. xxxii. 26 *sqq.*). Since Moses seems to have derived his knowledge of the cult of Yahweh, not in Israel, but among the tribes of the north of the Sinai peninsula (Jlidianites, Kenites, etc.), it has been suggested that the Levites, as a tribe, belonged to a group which entered the country from the south, along with the Kenites and Danites, independently of the great invasion of the Israelites under Joshua. It accords with this theory that the first mention of a Levitical sanctuary in the north connects its establishment with the migration of the tribe of Dan.

(S.A C ; T H R.)

LEVITICUS, in the Bible, the third book of the Pentateuch. The name is derived from that of the Septuagint version (το λευ[ϵ]ιτικόν) (sc. βιβλίον), though the English form is due to the Latin rendering *Leviticus* (sc. *liber*). As a descriptive title *Leviticus,* "the Levitical book." is not inappropriate to the contents of the book, which exhibits an elaborate system of sacrificial worship. In this connection, honever, the term "Levitical" is used in a perfectly general sense, since there is no reference in the book itself to the Levites themselves.

The book of Leviticus presents a marked contrast to the two preceding books of the Pentateuch in that it is derived frorn one document only. viz . the Priestly Code (P) and contains no trace of the other documents J, E, or D. The dominant interest is priestly, and the contents are almost wholly legislative, not historical.

But they are by no means homogeneous. and the occurrence of repetitions and divergencies, the variations of standpoint and practice, and, at times, the linguistic peculiarities, point no less clearly to diversity of origin.

I. The Laws of Sacrifice. Chap i.–vii. This group of laws clearly formed no part of the original narrative of P since it interrupts the connection of chap. viii with Exod xl. This conclusion does not necessarily involve a late date for the laws themselves. many of which have the appearance of great antiquity, though their original form has been considerably modified The collection falls into two divisions, (a) i–vi 7 (Heb v 26) and (b) vi. 8 (Heb. vi. 1)–vii., the former being addressed to the people and the latter to the priests. The laws contained in (a) refer to (1) burnt-offerings, i.; (2) meal-offerings, ii ; (3) peace-offerings. iii.; (4) sin-olierings, iv ; (j) trespass-offerings,v 14–vi. 7 (Heb. v. 14–26). The laws in (b) cover practically the same ground, with the addition of certain regulations as to the shares of the priests. Originally the two groups must have been independent, for (a) the order is different, and (b) the laws in vi. 8–vii. are regularly introduced by the formula "This is the law of. . . ." Most probably the second group was excerpted by the editor of chaps. i–vii. from another collection for the purpose of supplementing the laws of i.–v , more especially on points connected with the functions and dues of the officiating priests. Both groups of laws, however, contain heterogeneous elements and their present form is the result of a long process of development.

Chaps. viii–x. form the original sequel to Exod xl. They describe (a) the consecration of Aaron and his sons, a ceremony which lasted seven days (viii), and *(b)* the public worship on the eighth day, at which Aaron and his sons officiated for the first time as priests (ix); then follow (c) an account of the death of Nadab and Xbihu for offering strange fire (x 1–5); *(d)* various regulations affecting the priests (12–15) and *(e)* an explanation, in narrative form, of the departure in ix. 1j from the rules for the sin-offering given in vi. 30 (16–20).

Chap. ix. describes the first solemn act of worship after the consecration of Aaron and his sons. The ceremony consists of (a) the offerings for Aaron, and (b) those for the congregation; then follows the priestly blessing (*v.* 22), after which Moses and Aaron enter the sanctuary, and on reappearing once more bless the people. The ceremony terminates with the appearance of the glory of Yahweh, accompanied by a fire which consumes the sacrifices on the altar. Apart from a few redactional glosses the chapter as a whole belongs to P. The punishment of Nadab and Xbihu by death for offering "strange fire" (x. 1–j) forms a natural sequel to chap. ix. To this incident a number of disconnected regulations affecting the priests have been attached. of which the first, viz., the prohibition of mourning to Aaron and his sons (*vv.* 6, 7), alone has any connection with the immediate context. The second passage (*vv.* 8, 9), which prohibits the use of wine and strong drink to the priest when on duty, is clearly a later addition. In x 16–20, we have an interesting example of the latest type of additions to the Hexateuch According to ix. 1j (*cf* v. 11) the priests had burnt the flesh of the sin-offering which had been offered on behalf of the congregation, although its blood had not been taken into the inner sanctuary (cf. iv. 1–21, vi. 26). Such treatment, though perfectly legitimate according to the older legislation (Exod. xxix. 14), seemed to a later redactor to demand an explanation, and this is furnished in the present section

II. The Laws of Purification. — Chaps. xi–xv. This collection of laws comprises four main sections relating to (1) clean and unclean beasts (xi), (2) childbirth (xii), (3) leprosy (xiii , xiv). and (4) certain natural secretions (xv.). These laws, or *tōrōth,* are so closely allied to each other by their contents and literary form that they must originally have been one collection. The collection, however, has clearly undergone more than one redaction before reaching its final form. For chap xii which in *v.* 2 presupposes chap. xv must originally have followed after that chapter, while the contents of the different sections exhibit clear traces of repeated revision. At the same time, it seems. like chaps. i–vii , xvii–xxvi . to have been formed independently of P and to have been added to that document by a later editor; for in its present position it interrupts the main thread of P's narrative, chap. xvi. forming the natural continuation of chap x ; and, further. the inclusion of Xaron as well as Moses in the formula of address (xi. 1, xiii 1, xiv. 33. xv. 1) is contrary to the usage of P.

Chap. xi. consists of two main sections, of which the first (*vv.* 1–23, 41–47) contains directions as to the clean and unclean animals which may or may not be used for food. while the second (*vv.* 24–40) treats of the defilement caused by contact with the carcasses of unclean animals (in v. 39 contact with clean animals after death is also forbidden), and prrscribes certain rites of purification. Many scholars maintain that the first section is a mis-

placed portion of the Law of Holiness, but the evidence only justifies the assignment of *vv.* 43–45 to that code. The close resemblance of xi. 2–23 to Deut. xiv. 4–20 is best explained on the theory that both passages were derived separately from an earlier source. Chap. xii. prescribes regulations for the purification of a woman after the birth of (*a*) a male and (*b*) a female child. It has already been pointed out that this chapter would follow more suitably after chap. xv., with which it is closely allied in regard to subject-matter. The closing formula (*v.* 7) shows clearly that, as in the case of *vv.* 7–13 (*cf.* i. 14–17), the concessions in favour of the poorer worshipper are a later addition. In chaps. xiii., xiv., the regulations concerning leprosy fall readily into four main divisions: (*a*) xiii. 1–46*a*, an elaborate description of the symptoms common to the earlier stages of leprosy and other skin diseases; (*b*) xiii. 47–59, a further description of different kinds of mould or fungus-growth affecting stuffs and leather; (*c*) xiv. 1–32, the rites of purification to be employed after the healing of leprosy; and (*d*) xiv. 33–53, regulations dealing with the appearance of patches of mould or mildew on the walls of a house.

It may be regarded as certain that chap. xvi. consists of three main elements, only one of which was originally connected with the ceremonial of the Day of Atonement, and that it has passed through more than one stage of revision. The chapter consists of three independent sections: (1) *vv.* 1–4, 6, 12, 13, 34*b* (probably *vv.* 23, 24 also form part of this section), regulations to be observed by Aaron whenever he might enter "the holy place within the veil." These regulations are the natural outcome of the death of Nadab and Abihu (x. 1–5), and their object is to guard Aaron from a similar fate; the section thus forms the direct continuation of chap. x.; (2) *vv.* 29–34*a*, rules for the observance of a yearly fast day, having for their object the purification of the sanctuary and of the people; (3) *vv.* 5, 7–10, 14–22, 26–28, a later expansion of the blood ritual to be performed by the high priest when he enters the Holy of Holies, with which is combined the strange ceremony of the goat which is sent away into the wilderness to Azazel. No mention is made of the Day of Atonement in the pre-exilic period, and it is a plausible conjecture that the present law arose from the desire to turn the spontaneous fasting of Neh. ix. 1 into an annual ceremony; in any case directions as to the annual performance of the rite must originally have preceded *vv.* 29 *seq.* Possibly the omission of this introduction is due to the redactor who combined (1) and (2) by transferring the regulations of (1) to the ritual of the annual Day of Atonement. At a later period the ritual was further developed by the inclusion of the additional ceremonial contained in (3).

III. **The Law of Holiness.**—Chaps. xvii.–xxvi. The group of laws contained in these chapters has long been recognized as standing apart from the rest of the legislation set forth in Leviticus. For, though they display undeniable affinity with P, they also exhibit certain features which distinguish them from that document. The most noticeable of these is the prominence assigned to certain leading ideas and motives, especially to that of *holiness*. The idea of holiness, indeed, is so characteristic of the entire group that the title "Law of Holiness," first given to it by Klostermann (1877), has been generally adopted. The term "holiness" in this connection consists positively in the fulfilment of ceremonial obligations, and negatively in abstaining from the defilement caused by heathen customs and superstitions, but it also includes obedience to the moral requirements of the religion of Yahweh. On the literary side also the chapters are distinguished by the paraenetic setting in which the laws are embedded and by the use of a special terminology, many of the words and phrases occurring rarely, if ever, in P (for a list of characteristic phrases *cf.* S. R. Driver, *Lit. of O.T.*, p. 49). Further, the structure of these chapters, which closely resembles that of the other two Hexateuchal codes (Exod. xx. 22–xxiii. and Deut. xii.–xxviii.), may reasonably be adduced in support of their independent origin. All three codes contain a somewhat miscellaneous collection of laws; all alike commence with regulations as to the place of sacrifice and close with an exhortation. Lastly, some of the laws treat of subjects which have already been dealt with in P (*cf.* xvii. 10–14 and vii. 26 f., xix. 6–8 and vii. 15–18). It is hardly doubtful also that the group of laws which form the basis of chaps. xvii.–xxvi., besides being independent of P, represent an older stage of legislation than that code. For the sacrificial system of H (=Law of Holiness) is less developed than that of P, and in particular shows no knowledge of the sin- and trespass-offerings; the high priest is only *primus inter pares* among his brethren, xxi. 10 (*cf.* Lev. x. 6, 7, where the same prohibition is extended to all the priests); the distinction between "holy" and "most holy" things (Num. xviii. 8) is unknown to Lev. xxii. (Lev. xxi. 22 is a later addition). On the other hand the points of resemblance with P which this code presents us are mainly due to the compiler who combined H with P. But though it may be regarded as certain that H existed as an independent code, it cannot be maintained that the laws which it contains are all of the same origin or belong to the same age. The evidence rather shows that they were first collected by an editor before they were incorporated in P. Thus there is a marked difference in style between the laws themselves and the paraenetic setting in which they are embedded; and it is not unnatural to conjecture that this setting is the work of the first editor. It is generally recognized that H, in its present form, is incomplete. The original code must, it is felt, have included many other subjects now passed over in silence. These, possibly, were omitted by the compiler of P, because they had already been dealt with elsewhere, or they may have been transferred to other connections. Several other sections of P have, in fact, been assigned by scholars to H, but, with the exception of xi. 43 ff. and Num. xv. 37–41, the evidence is not sufficient to warrant their inclusion in that collection.

The exact relation of H to Deuteronomy is hard to determine. That chaps. xvii.–xxvi. display a marked affinity to Deuteronomy cannot be denied. Like D, they lay great stress on the duties of humanity and charity both to the Israelite and to the stranger (Deut. xxiv.; Lev. xix.; compare also laws affecting the poor in Deut. xv.; Lev. xxv.), but in some respects the legislation of H appears to reflect a more advanced age than that of D, *e.g.*, the rules for the priesthood (chap. xxi.), the feasts (xxiii. 9–20, 39–43), the Sabbatical year (xxv. 1–7, 18–22), weights and measures (xix. 35 f.). It must be remembered, however, that these laws have passed through more than one stage of revision and that the original regulations have been much obscured by later glosses and additions; it is, therefore, somewhat hazardous to base any argument on their present form, and, on the whole, it is more probable that the two codes are independent of one another. The relation of H to Ezekiel is also remarkably close, the resemblances between the two being so striking that many writers have regarded Ezekiel as the author of H. Such a theory, however, is excluded by the existence of even greater differences of style and matter, so that the main problem to be decided is whether Ezekiel is prior to H or vice versa. The following considerations undoubtedly suggest the priority of H: (1) there is no trace in H of the distinction between priests and Levites first introduced by Ezekiel; (2) Ezekiel xviii., xx., xxii., xxiii., appear to presuppose the laws of Lev. xviii–xx.; (3) the calendar of Lev. xxiii. represents an earlier stage of development than the fixed days and months of Ezek. xlv.; (4) the sin- and trespass-offerings are not mentioned in H (*cf.* Ezek. xl. 39, xlii. 13, xliv. 29, xlvi. 20); (5) the parallels to H, which are found especially in Ezek. xviii., xx., xxii., include both the paraenetic setting and the laws; and lastly, (6) a comparison of Lev. xxvi. with Ezekiel points to the greater originality of the former.

Chap. xvii. comprises four main sections which are clearly marked off by similar introductory and closing formulae: (1) *vv.* 3–7, prohibition of the slaughter of domestic animals, unless they are presented to Yahweh; (2) *vv.* 8, 9, sacrifices to be offered to Yahweh alone; (3) *vv.* 10–12, prohibition of the eating of blood; (4) *vv.* 13, 14, the blood of animals not used in sacrifice to be poured on the ground. The chapter as a whole is to be assigned to H. At the same time it exhibits many marks of affinity with P, a phenomenon most easily explained by the supposition that older laws of H have been expanded and modified by later

hands in the spirit of P. What remains after the excision of later additions, however, is not entirely uniform, and points to earlier editorial work on'the part of the compiler of H. Chap. xviii contains laws on prohibited marriages (vv. 6–18) and various acts of unchastity (vv. 19–23) embedded in a paraenetic setting (vv. 1–5 and 24–30), the laws being given in the second person singular, while the framework employs the second person plural. Chap. xix is a collection of miscellaneous laws, partly moral! partly religious, of which the fundamental principle is stated in v. 2 ("Ye shall be holy"). The various laws are clearly defined by the formula "I am Yahweh," or "I am Yahweh your God," phrases which are especially characteristic of chaps. xviii–xx. The first group of laws (w. 3 f.) corresponds to the first table of the decalogue; vv. 11–18, to the second table. Chap. xx prohibits Molech warship, vv. 2–5, witchcraft, vv. 6 and 27, unlawful marriages and acts of unchastity. vv. 10–21. As in chap. xviii, the main body of laws is provided with a paraenetic setting, vv. 7, 8 and 22–24; it differs from that chapter, however, in prescribing the death penalty in each case for disobedience.

Chaps. xxi, xxii, contain a series of laws affecting the priests and offerings; viz., (1) regulations ensuring the holiness of (a) ordinary priests, xxi, 1–9, and (b) the chief priest. vv. 10–15; (2) a list of physical defects which exclude a priest from exercising his office, vv. 16–24; (3) the enjoyment of sacred offerings limited to (a) priests, if they are ceremonially clean, xxi. 1–9, and *(b)* members of a priestly family, vv. 10–16 : (4) the rule that animals offered in sacrifice must be without blemish, vv. 17–25; (j) further regulations with regard to sacrifices, vv. 26–30. with a paraenetic conclusion, vv. 31–33. The fact that these chapters exhibit many striking points of context with P and the later strata of P can be best explained by the supposition that we have here a body of old laws which have been subjected to more than one revision. The nature of the subjects with which they deal is one that naturally appealed to the priestly schools, and because of this fact the laws were especially liable to inodification and expansion at the hands of later legislators who wished to bring them into conformity with later usage. Signs of such revision may be traced back to the compiler of H, but the evidence shows that the process must have been continued down to the latest period of editorial activity in connection with P.

Chap. xxiii, a calendar of sacred seasons, consists of two main elements which can easily be distinguished from one another, the one being derived from P and the other from H. To the former belongs the fuller and more elaborate description of vv. 4–8, 21, 23–28; to the latter, vv. 9–20, 22, 39–44. Characteristic of the priestly calendar are (1) the enumeration of "holy convocations," (2) the prohibition of all work, (3) the careful determination of the date by the day and month, (4) the mention of "the offerings made by fire to Yahweh" and (;) the stereotyped form of the regulations. The older calendar, on the other hand, knows nothing of "holy convocations," nor of abstinence from work; the time of the feasts, which are clearly connected with agriculture, is only roughly defined with reference to the harvest (cf. Exod. xxiii, 14 f., xxxiv, 22; Deut. xvi, 9 *f.*). The calendar of P comprises (1) the Feast of Passover and the Unleavened Cakes, vv. 4–8; (2) a fragment of Pentecost, v. 21; (3) the Feast of Trumpets, vv. 23–25; (4) the Day of Atonement, vv. 26–32; and (5) the Feast of Tabernacles, vv. 33–36, with a subscription in vv. 37, 38. With these have been incorporated the older regulations of H on the Feast of Weeks, or Pentecost, vv. 9–20, which have been retained in place of P's account (cf. v. 21), and on the Feast of Tabernacles, vv. 39–44, the latter being clearly intended to supplement vv. 33–36.

Chap. xxiv affords an interesting illustration of the manner in which the redactor of P has added later elements to the original code of H. For the first part of the chapter; with its regulations as to (1) the lamps in the Tabernacle, vv. 1–4, and (2) the Shewbread, vv. 5–9, is admittedly derived from P, vv. 1–4, forming a supplement to Exod. xxv, 31–40, and Num. viii, 1–4, Num. viii, 1–4, and vv. 5–9 to Exod. xxv, 30. The remainder oi the chapter contains old laws (w. 15*b*–22) which are derived from H on blasphemy, manslaughter and injuries to the person, to which the redactor has added a historical setting (vv. 10–14, 23) as well as a few glosses. Chap. xxv lays down regulations for the observance of (1) the Sabbatical year, vv. 1–7, 19–22 and (2) the year of Jubilees, vv. 8–18, 23, and then applies the principle of redemption to (1) land and house property, vv. 24–34, and (2) persons, vv. 35–55. The rules for the Sabbatical year (vv. 1–7) are admittedly derived from H, and w. 19–22 are also from the same source. Their present position after vv. 8–18 is the work of the redactor who wished to apply the same rules to the year of Jubilee. But though the former of the two sections on the year of Jubilee (vv. 8–18, 23) exhibits undoubted signs of P, the traces of H are also sufficiently marked to warrant the conclusion that the latter code included laws relating to the year of Jubilee, and that these have been modified by R^P and then connected nith the regulations for the Sabbatical year. Both on historical and on critical grounds, however, it is improbable that the principle of restitution underlying the regulations for the year of Jubilee was originally extended to *persons* in the earlier code. For it is difficult to harmonize the laws as to the release of Hebrew slaves with the other legislation on the same subject (Exod. xxi, 2–6; Deut. xv), while both the secondary position which they occupy in this chapter and their more elaborate and formal character point to a later origin for vv. 35–55. Hence, these verses in the main must be assigned to R^P. In this connection it is noticeable that those passages which show the characteristic marks of H bear no special relation to the year of Jubilee, but merely inculcate a more humane treatment of those Israelites who are compelled by circumstances to sell themselves either to their brethren or to strangers. It is probable, therefore, that they form no part of the original legislation of the year of Jubilee. but were incorporated at a later period. The present form of vv. 24–34 is largely the work of R^P, who has certainly added vv. 32–34 (cities of the Levites) and probably vv. 29–31.

Chap. xxvi, the concluding exhortation. after reiterating commands to abstain from idolatry and to observe the Sabbath, vv. 1, 2. sets forth (1) the rewards of obedience, w. 3–13, and (2) the penalties incurred by disobedience to the preceding laws, vv. 14–46. The discourse, which is spoken throughout in the name of Yahweh, is similar in character to Exod. xxiii, 20–33, and Deut. xxviii, more especially to the latter. That it forms an integral part of H is shown both by the recurrence of the same distinctive phraseology and by the emphasis laid on the same motives. At the same time it is hardly doubtful that the original discourse has been modified and expanded by later hands, especially in the concluding paragraphs. It must be admitted that Ezekiel has many striking parallels with chap. xxvi and in particular makes use, with that chapter, of several expressions which do not occur elsewhere in the Old Testament. But there are also points of difference both as regards phraseology and subject matter, and in view of these latter it is impossible to hold that Ezekiel was either the author or compiler of this chapter.

Chap. xxvii, on the commutation of vows and tithes, as a whole must be assigned to a later stratum of P, for while vv. 2–25 (on vows) presuppose the year of Jubilee, the section on tithes, vv. 30–33, marks a later stage of development than Num. xviii, 21 f. (P).

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LEVITTOWN, on Long Island, N.Y., U.S., is a mass-produced residential development of more than 17,000 moderately priced houses built by the firm of Levitt and Sons, Inc., during the period betneen 1947 and 1951. One of the nation's largest post-World War II suburban communities, its name became a national symbol for suburbia in general. Its population in 1960 was 65.276. Situated in the southeast quadrant of Nassau county, in a section of the Hempstead plain, the community is approximately 32 mi. E. of the centre of New York city. The Levittown formula made use of extensive planning before construction. Streets and build-

ing sites were laid out systematically, and the plans included shopping centres, churches and other community facilities. School sites were provided by the builder, as were park-playgrounds, swimming pools and a community centre with meeting rooms and a combination auditorium-dance hall. (WI. M. D.)

LEVITTOWN, a large housing development of Bucks county in eastern Pennsylvania, U.S., situated near the big bend of the Delaware river, midway between Philadelphia and Trenton, N.J. It was built between 1951 and 1955 by Levitt and Sons, Inc., who repeated there the construction formula that resulted in Levittown, Long Island, N.Y., in the late 1940s. The first family moved into Levittown in June 1952; the population is about 60,000. (D. L. D.)

LEVULOSE: *see* CARBOHYDRATES ; *SUGAR.*

LÉVY-BRUHL, LUCIEN (1857–1939), French philosopher who specialized in the psychology of primitive peoples, was born in Paris on April 10, 1857. He was professor of philosophy at the Sorbonne (1899–1927). He wrote a *History of Modern Philosophy in France* (1899), as well as monographs on Comte and Jacobi. His *La Morale et la science des moeurs* (Eng. trans., *Ethics and Moral Science,* 1905) shows the influence of the positivist philosophy of Comte. From the sociologist Émile Durkheim he derived the concept of *représentation collectives* ("group ideas"), which he applied to the analysis of the mentality of people in primitive societies. He sought to explain social phenomena in terms of the social tradition that molds individual responses rather than through individual psychology. Lévy-Bruhl held that there was an essential difference between primitive and civilized thought. His notion of the "prelogical" character of primitive mentality, formulated in *Les Fonctions mentales dans les sociétés inférieures* (1910; Eng. trans., *How Natives Think,* 1926), became the target of unfavourable criticism, and ,he later conceded that his use of the term "prelogical" tended to confuse psychological and cultural data. His ideas had value. nevertheless, as a contribution toward an understanding of the irrational factors in social thought and primitive religion and mythology. He died on March 13, 1939.

Among his other works were *La Mentalite' primitive* (Eng. trans., 1923); *Le Surnaturel et la nature dans la mentalite' primitive* (Eng. trans., *Pvimitives and the Supernatural,* 1935); and his notebooks, entitled *Les Carnets de Le'vy-Bruhl* (1949). (D. BY.)

LEWALD, FANNY (1811–1889), German author, was born at Konigsberg in East Prussia on March 24, 1811, of Jewish parentage. When 17 years of age she embraced Christianity, and after traveling in Germany, France and Italy, settled in 1845 at Berlin. There, in 1854, she married the author Adolf Wilhelm Theodor Stahr (1805–76), and moved after his death in 1876 to Dresden, where she died on Aug. 5, 1889. Fanny Lewald is famous as one of the earliest German feminists and for her scathing satire on the sentimentalism of Ida Hahn-Hahn, whose work she parodied in *Diogena, Roman von Iduna Gräfin H.-H.* (2nd ed., 1847). The best of her many novels are *Klementine* (1842) and *Jenny* (1843); in the latter she describes her own struggle between religion and love. Her feminist writings include: *Osterbriefe für die Frauen* (1863) and *Für und wider die Frauen* (1870).

See her autobiography, *Meine Lebensgeschichte,* 6 vol. (1861–63) ; K. Frenzel, *Erinnerungen und Stromungen* (1890).

LEWANIKA (*c.* 1860–1922), paramount chief of the Barotse and subject tribes occupying the greater part of the upper Zambezi basin, was born on the upper Kabompo, where his father, Letia, a son of a former ruler, lived in exile during the interregnum of a foreign dynasty (Makololo), which remained in possession from about 1830 to 1865, when the Makololo were practically exterminated by a revolt. Once more masters of their own country, the Barotse invited Sepopa, an uncle of Lewanika, to rule over them. Eleven years of brutality and licence resulted in the tyrant's expulsion and subsequent assassination, his place being taken by Ngwana-Wina, a nephew. Within a year abuse of power brought about this chief's downfall (1877). and he was succeeded by Lobosi, who assumed the name of Lewanika in 1885. The early years of his reign were also stained by many acts of blood, until in 1884 the torture and murder of his own brother led to open rebellion, and the chief escaped into exile. Lewanika's cousin, Akufuna, or Tatela, was then proclaimed chief. The following year Lewanika, having collected his partisans, deposed the usurper and re-established his power. Ruthless revenge not unmixed with treachery characterized his return to power, but under the influence of Coillard he ruled tolerantly from 1887 onward. In 1890 Lewanika concluded a treaty with the British South Africa company. acknowledging its supremacy and conceding to it certain mineral rights. In 1897 R. T. Coryndon took up his position at Lialui as British agent. and the country to the east of 25" E. was thrown open to settlers, that to the west being reserved to the Barotse chief. In 1905 the king of Italy's award in the Barotse boundary dispute with Portugal deprived Lewanika of half of his dominions.

LEWES, GEORGE HENRY (1817–1878), English philosophical writer and literary critic, chiefly remembered for his theory of metaphysical development of positivism and for his liaison with Mary Ann Evans (George Eliot), was born in London on April 18. 1817. He came from a theatrical family: his grandfather was the actor Charles Lee Lewes, and his father was manager of the Theatre Royal at Liverpool. After a desultory education he spent two years in Germany, returned to London in 1840 and for the next ten years was a frequent contributor to various reviews. He also tried his hand as actor and playwright and wrote two unsuccessful novels. During this period Lewes, who had married in 1841, lived with his wife in a communal marriage experiment with Thornton Leigh Hunt, Mrs. Hunt and two other couples. Initially a success, the venture ended in failure when Mrs. Lewes had two children by Hunt. Lewes was thus already estranged from his wife when he met George Eliot in 1851, and he finally separated from her three years later. Thereafter until his death in London on Nov. 28. 1878, he and George Eliot lived happily together as though husband and wife *(see* ELIOT, GEORGE).

Lewes' *Biographical History of Philosophy,* 4 vol. (1845–46), enjoyed some success, but all his important writings date from his association with George Eliot. They include *Comte's Philosophy of the Sciences* (1853); the well-known *Life and Works of Goethe,* 2 vol. (1855); *Seaside Studies* (1858); *Physiology of Common Life,* 2 vol. (1859–60); *Studies in Animal Life* (1862); *Aristotle* (1864) ; and his greatest work *The Problems of Life and Mind,* 5 vol. (1874–79).

In general Lewes' thought was positivistic. and throughout his life he was especially influenced by the philosophy of Auguste Cornte. He diverged from strict positivism in that he believed the problems of metaphysics were legitimate and reserved his criticism for the means used to settle metaphysical issues. In the *Problems* he differed from Comte in claiming a place for introspection in psychological research. but held that this subjective method must be balanced by an objective one, consisting partly in a reference to nervous conditions and partly in the employment of sociological and historical data. Highly regarded as a philosopher by many contemporaries, Lewes contributed much to the development of a school of empirical metaphysics, and his idea of dealing with mental phenomena in relation to social and historical conditions was a significant contribution to psychological thought.

See A. T. Kitchel, *George Lewes* and *Grorge Eliot* (1933) ; J. Kaminsky, "The Empirical Metaphysics of George Henry Lewes," *Journal of the History of Ideas,* vol. xiii, no. 3 (June 1952).

LEWES, a market town, a municipal and parliamentary borough and the county town of East Sussex, Eng.. 8 mi. N.E. of Brighton and 51 mi. S.S.E. of London by road. Pop. (1961) 13,-637. The town is built up a steep hill, an outlier of the South Downs, which rises from the Ouse and is crowned with the castle keep. After the Battle of Lewes in 1264 *(see* below) the town was walled, and it still contains many old houses dating from the 16th century onward, among which are Anne of Cleve's house (1599), now a folklore museum, and Southover grange (1572). On School hill are many 18th-century houses, including School Hill house, now owned by the East Sussex County council.

Stone and bronze implements and numerous earthworks found around Lewes indicate its prehistoric origins. but there does not

seem to have been any important occupation until Saxon times. By the reign of Edward the Confessor Lewes was a market centre and a borough. William the Conqueror granted the whole honour (or barony) of Lewes to William de Warenne, who built a castle to guard the pass through the Downs formed by the Ouse valley, and whose family held the barony until 1367. There are two mounds on which were placed two bell keep-;, an unusual feature. the ruins of which remain. Sear the ruined early 14th-century barbican is Barbican house, a 16th-century timber framed building now a museum. William de Warenne and his wife Gundrada endowed in 1077 a Cluniac priory, dedicated to St. Pancras, which had a church (450 It. long) larger than Chichester cathedral. At the Dissolution Thomas Cromwell had the priory blown up, but some fragments remain. It had an enormous rere-dorter or lavatory, with cubicles for 60 monks. Workmen in 1845–46 who were building the railway to Brighton, which passes over thr priory. found the bodies of William and Gundrada buried in the grounds. A grammar school existed in connection \\ith the priory in 1248 and was rcfoundctl at Southover in 1512 from where it was moved to Westout in 1709 until it was dissolved in 1885. John Evelyn was a pupil there from 1630–37. The feudal and religious importance of Lewes encouraged trade and in the 1rth century it was important as a port. Fairs and markets have been held since 1066. Wool production has been important since the 13th century. Present industries include market gardening, the manufacture of agricultural implements, beer, cricket hats, hypodermic equipment, perfume, soap, cement and iron goods. In the reign of Elizabeth I Lewes was governed by a "Society of the Twelve," the chief officials being two constables. By the early 18th century this body had been replaced by the jury of the court leet. Lewes was finally incorporated in 1881. Of the ten parish churches of Lewes, six survive, not including the atidition of St. Michael the Archangel's at South Malling (1628). In Bull house lived Tom Paine. An obelisk commemorates the T'rotestants martyred at Lewes in the reign of Mary I. Lewes is renowned for its Guy Fawkes festivities on Nov. j. when the town's bonfire societies celebrate to the accompaniment of firework display-.

Battle of Lewes.—The battle of Lewes (May 14. 1264) was fought between Henry III and the rebels under Simon de Montfort, who had fared disastrously in the campaign earlier in 1264. Unwilling to strike first. Montfort had to divide his forces to protect his two main supporting areas. the east midlands and London. While Henry concentrated his army at Oxford. Simon posted his main force at Northampton, and himself held London in considerable strength. Henry could thus attack Northampton with his entire force (April 5). destroying the main rebel army ,and compelling all the east midland castles to surrender. Montfort retaliated by besieging Rochester castle. where all the southeastern royalists nere concentrated; but when Henry turned southward (April 24). Montfort, abandoning the siege, returned to protect London. Henry marched through Kent. capturing Tunbridge castle and overawing the Cinque I'ort rebels. and halted at Lewes (May 111 to rest. Montfort, fearing the demoralizing effects of delay upon his greatly diminished supporters, advanced southward, reiniorced by thousands of untrained Londoners, to attempt a last-minute compromise or to fight a last desperate battle. Reaching Fletching, on the edge of the Weald (May 13), he made final peace offers which the royalists rejected contemptuously. Hastily drilling the Londoners to withstand cavalry. he left Fletching by night. climbed the scarp of the downs by a westward detour. surprised the only royalist picquet on the crest and. before his enemies knew he had moved, arrayed his army in three main divisions on the ridge northwest of Lewes, with the Londoners on his left. Gloucester in the centre and his own sons on the right. himself commanding a reserve in the rear. The royalists. awakened to find Montfort already deployed. attacked confidently without proper co-ordination. On the right Henry's heir, the Lord Edward, advanced impetuously uphill over firm ground, swept the Londoners off the ridge. pursued them with heavy slaughter for several miles to the cover of the forest and. finding Montfort's baggage train hidden below the scarp, delayed still further for plunder. returning late in the afternoon with his cavalry tired and disorganized. The other royalist forces had become disordered. and Montfort launched all his cavalry at their wavering front, sweeping them downhill, through the town and out over the Ouse, where many perished when the bridge collapsed. The royalists were scattered and many captured: Henry's brother. Richard of Cornwall. king of the Romans. surrendered in a windmill. and Henry fed to the Cluniac priory. Edward's returning forces were too disorganized to retrieve the day: his Poitevin uncles. with John de Warenne, earl of Surrey, and Hugh Bigod. galloped to Pevensey, garrisoned the castle. and fled to France; the Marchers withdrew westward in good order; but Edward. refusing to leave his father, took sanctuary with the Franciscans. Negotiations during the night led to the Mise of Lewes, whereby Henry and Edward surrendered on Montfort's terms. and the Provisions of Oxford (*q.v.*) nere re-established in modified form. (R. F. T.)

LEWIN, KURT (1890–1947), German-born social psychologist of the Gestalt school who transformed psychological thinking about man in society. He was born at Mogilno, Ger. (now Poland), on Sept. 9, 1890. In 1922 he joined the staff of the University of Berlin and contributed brilliantly to *Psychologische Forschung*. In 1932 he went to the United States as a visiting professor and, being Jewish, found it impossible to return to Germany. He served on the faculty of the University of Iowa, Iowa City (1935–45), and was director of the research centre for group dynamics (1945–47) at the Massachusetts Institute of Technology (Cambridge).

He died on Feb. 12, 1947, at Newtonville, Mass. Lewin excelled in the imaginative planning of experimental situations by which theoretical intuitions about social unrest could be tested. His work, and that of his students, opened one important approach to the study of social groups.

His principal works include: *A Dynamic Theory of Personality* (1935); *Principles of Topological Psychology* (1936); Dorwin Cartwright (ed.), *Field Theory in Social Science: Selected Theoretical Papers by Kurt Lewin* (1951).

See also PSYCHOLOGY: *Central Processes;* PSYCHOLOGY, EXPERIMENTAL: *Later Status* of *Experimental Psychology.*

See also *Human Relations,* vol. i, pp. 135–139 (1948). (J. Mr.)

LEWIS, SIR GEORGE CORNEWALL, BART. (1806–1863), English statesman and man of letters, was born in London on April 21, 1806. Young Lewis was educated at Eton and at Christ Church, Oxford. He then entered the Middle Temple, and was called to the bar in 1831. In 1835 he published an *Essay on the Origin and Formation of the Romance Languages* (re-edited in 1862), the first effective criticism in England of Francis Raynouard's theory of a uniform romance tongue, represented by the poetry of the troubadours.

In 1836 he accompanied John Austin to Malta to examine the condition of the island and frame a code of laws. On his return to England Lewis succeeded his father as one of the principal poor-law commissioners. In 1844 Lewis married Lady Maria Theresa Lister, sister of Lord Clarendon, and settled in London at Kent house, Knightsbridge. In 1847 Lewis resigned his office. He was then returned for the county of Hereford, and Lord John Russell appointed him secretary to the board of control, but a few months afterward he became undersecretary to the home office. He introduced two important bills, one for the abolition of turnpike trusts and the management of highways by a mixed county board, the other for the purpose of defining and regulating the law of parochial assessment. In 1850 he succeeded Sir William Hayter as financial secretary to the treasury.

On the dissolution of parliament which followed the resignation of Lord Russell's ministry in 1852, Lewis was defeated for Herefordshire and then for Peterborough. Excluded from parliament he accepted the editorship of the *Edinburgh Review,* and remained editor until 18jj. During this period he served on the Oxford commission, and on the commission to inquire into the government of London. But its chief fruits were the *Treatise on the Methods of Observation and Reasoning in Politics,* and the *Inquiry into the Credibility of the Early Roman History,* in which he vigorously attacked the theory of epic lays and other theories on which Barthold Niebuhr's reconstruction of that history had

proceeded. In 1855 Lewis succeeded his father in the baronetcy. He was at once elected member for the Radnor boroughs, and Lord Palmerston made him chancellor of the exchequer. He had a war loan to contract and heavy additional taxation to impose, but his industry, method and clear vision carried him safely through. After the change of ministry in 1859 Sir George became home secretary under Lord Palmerston, and in 1861, much against his wish, he succeeded Sidney Herbert (Lord Herbert of Lea) at the war office. The closing years of his life were marked by increasing intellectual vigour. His later works include *Essay on Foreign Jurisdiction and the Extradition of Criminals* (1859) and *Dialogue on the Best Form of Government* (1863). He died in April 1863.

A reprint from the *Edinburgh Review* of his long series of papers on the *Administration of Great Britain* appeared in 1864, and his *Letters to Various Friends* (1870) were edited by his brother Gilbert.

LEWIS, GILBERT NEWTON (1875–1946), U.S. chemist whose realization of the significance of the electron pair in molecular structure laid the foundation for a revised theory of valence, was born at Weymouth. Mass.. on Oct. 23, 1875. He was educated at the University of Nebraska. Lincoln, and Harvard (B.A., 1896; M.A., 1898; Ph.D., 1899) and subsequently studied at Leipzig and Gottingen. In 1905 he joined the research laboratory of physical chemistry at the Massachusetts Institute of Technology, Cambridge, becoming professor of chemistry in 1911. In 1912 he became professor of physical chemistry and dean of the college of chemistry of the University of California: Berkeley. With Merle Randall he wrote *Thermodynamics and the Fvee Energy of Chemical Substances* (1923). Lewis also published by himself *Valence and the Structure of Atoms and Molecules* (1923).

Lewis was probably the first to grasp the significance of the electron pair in molecular structure. He extended the concept of acids and bases and was the first to isolate heavy hydrogen. In his later years. a series of investigations on the excited electron states of organic molecules contributed to the understanding of the colour of organic substances and the complex phenomena of fluorescence and phosphorescence. He died on March 23. 1946.

(W. M. LA.; X.)

LEWIS, ISAAC NEWTON (1858–1931), U.S. soldier and inventor of a machine gun which was widely used by the Allies in World War I, was born at New Salem, Pa., Oct. 12, 1858. On graduating from the U.S. Military academy in 1884 he was commissioned in the artillery, from which he retired in 1913 with the rank of colonel. Lewis invented a number of range-finding and other mechanical and electrical instruments used for artillery fire control purposes in U.S. coast defenses.

In 1913 his major invention, a machine gun with a revolving ammunition drum on top, was accepted by the British. French and Belgian governments after it had been rejected by the L.S. Its practicality having been demonstrated. it was manufactured and issued to L.S. troops after the U.S. entered the war. Lewis died in Hoboken, N.J., Nov. 9, 1931. The Lewis gun was gradually replaced by more efficient weapons but some were still used in the first part of World War II.

LEWIS, JOHN LLEWELLYN (1880–). U.S. labour leader, president of the United Mine Workers of America union from 1920 to 1960, when he retired, was born near Lucas. Iowa, Feb. 12, 1880, of parents who came from Welsh mining towns. He left public school in the seventh grade and entered the mines. In 1905 he became legal representative for the U.M.W.A. Lewis achieved national prominence in 1935 when he led a highly successful committee of the American Federation of Labor which organized mass production workers into industrial unions. In 1936 these unions left the A.F.L. and became the nucleus of the Congress of Industrial Organizations with Lewis as its first president. Lewis led militant, often violent, but successful C.I.O. drives to organize the giants of U.S. industry in steel, automobiles, tires and rubber and electrical products. In 1940 he resigned as president of the C.I.O. and in 1942 he withdrew the U.M.W.A. from the C.I.O. Members of his union were the first to attain pay for traveling time and a welfare fund. He mas a lifelong Republican except for his support of F. D. Roosevelt's first two terms.

His conduct during World War II (*see* STRIKES AND LOCKOUTS) was believed to be in part responsible for alienating public sympathy from labour generally and for the passage of restrictive labour legislation, the Smith-Connally act (1943) and the Taft-Hartley act (1947). Despite widespread criticism, Lewis retained the miners' support.

See also TRADE (LABOUR) UNIONS; TRUMAN, HARRY S.

See Saul Alinsky, *John L. Lewis* (1949). (R. M. R.)

LEWIS, MATTHEW GREGORY (1775–1818), English romance writer and dramatist, often referred to as "Monk" Lewis, was born in London on July 9, 1775. He was educated for a diplomatic career and in 1794 he proceeded to The Hague as attaché to the British embassy. His stay there lasted only a few months, but was marked by the composition, in ten weeks, of his famous romance *Ambrosio, or the Monk* (1796).

The Castle Spectre (1796, a musical drama of no great literary merit, which enjoyed a long popularity on the stage), *The Minister* and *Rolla* (translations), with numerous other operatic and tragic pieces, appeared in rapid succession. *The Bravo of Venice*, a romance translated from the German, was published in 1804; next to *The Monk* it is the best-known work of Lewis. By the death of his father he succeeded to a large fortune, and in 1815 embarked for the West Indies to visit his estates; in the course of this tour, the *Journal of a West Indian Proprietor*, published posthumously in 1833. was written. He died on the homeward voyage from a second visit, May 14, 1818.

LEWIS, MERIWETHER (1774-1809), U.S. explorer, was born near Charlottesville, Va., on Aug. 18, 1774. A militiaman in the "Whisky insurrection." officer under Gen. Anthony Wayne, and from 1801 to 1803 private secretary of Pres. Thomas Jefferson, he became famous as leader of the first U.S. expedition overland to the Pacific. Preparations for this were pushed by Jefferson before the Louisiana Purchase, but the actual leadership was vested in Lewis and his old friend and army comrade, Lieut. William Clark. Late in 1803 they and their subordinates went into winter quarters near St. Louis, Mo. On May 14, 1804, the party "hoisted Sail and Set out in high Spirits for the Western Expedition," and by Nov. 2 they had made the difficult ascent of the Missouri to a site near the present Bismarck, N D., where, among the Mandan Indians, they passed the second winter. Early in April 1805 the ascent of the Missouri was continued as far as the three forks of the river, the stream they named the Jefferson being followed to its source in the southwestern part of what is now the state of Montana. Procuring a guide and horses from the Shoshone Indians, the party pushed westward through the Rocky mountains and embarked in canoes on a tributary of the Columbia river, the mouth of which they reached on Nov. 15. They had travelled upwards of 4,000 mi. from their starting point, had encountered various Indian tribes never before seen by whites, had made valuable scientific collections and observations and were the first explorers to cross the continent within the limits of the United States. After spending the ninter on the coast they started on March 23. 1806, on their return journey, and. after crossing the divide, Lewis with one party explored Maria's river and Clark with another the Yellowstone. They reunited near the junction of the Tellowstone and the Missouri, and on Sept. 23 reached St. Louis. In spite of exposure. hardship and peril only one member of the party died, and only one deserted. Few feats of exploration excel this in romantic interest. The expedition was commemorated by the Lewis and Clark Centennial exposition at Portland, Ore., in 1905. The leaders and men of the exploring party were rewarded with grants of land from the public domain, and in March 1807 Lewis was made governor of the northern part of the Louisiana territory. His death near Nashville, Tenn., on Oct. 11, 1809, has remained shrouded in mystery. suicide and more plausibly foul play being advanced as explanations for it.

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LEWIS, SINCLAIR (1885–1951), U.S. novelist and social critic. was born in Sauk Centre, Minn., on Feb. 7. 1885. He graduated from Yale university in 1908 and was for a time a reporter. afterward serving in an editorial capacity for several publishing houses and magazines. His first adult novel, *Our Mr. Wrenn* (1914) (he had previously published a boys' book entitled *Hike* and *the Aeroplane* under the pseudonym of Tom Graham), attracted favourable critical attention but few readers. At the same time he was writing with ever increasing success for such popular magazines as the *Saturday Evening Post* and *Cosmopolitan.* His stories were read by millions and brought him popular fame. This work constituted an apprenticeship in his craft, but he never lost sight of his ambition to become a serious novelist. He undertook the writing of *Main Street* as a major effoxt. assuming that it would not bring him the ready rewards of magazine publication. Yet its publication in 1920 made his literary reputation. The book satirized both the narrowness of life in the Main streets of the U.S. and the hollowness of a superficial intellectualism that despised Main street without having anything better to offer. *Main Street* was born of the new mood of national self-consciousness which followed World War I and became a text of numerous attacks upon provincialism.

In 1922 Lewis published *Babbitt,* a study of the complacent American whose individuality had been sucked out of him by Rotary clubs. business ideals and general conformity. The name Babbitt passed into general usage, and it is possible that this novel had more effect upon public consciousness than any other written in English in that decade. *Babbitt* was not only Lewis' most important novel but. in the opinion of many critics. his best.

He followed this success with *Arrowsmith* (1925), a satiric study of the medical profession, with emphasis upon the frustration of fine scientific ideals. One group of critics staunchly advanced this as Lewis' best and most artistic work. His next book. *Elmer Gantry* (1927), was a pamphleteering attack upon the ignorant, gross and predatory leaders who had crept into the Protestant Church. *Dodsworth* (1929) concerned the experiences of a retired U.S. automobile manufacturer and his wife on a European tour and offered Lewis a chance to present effectively the contrasting values and manners of Europe and the U.S. and the very different temperaments of the man and his wife.

It Can't Happen Here (1935) was an important link in the Lewis bibliography. It dramatized the dangers of the Nazi technique as it might be applied in the United States. The two most important novels of his later period were *Cass Timberlane* (1945) and *Kingsblood Royal* (1947). The former dealt with the marriage of a man past middle age and a girl in her 20s. While it had much of the old Lewis bite, it showed a distinct mellowing in attitude. *Kingsblood Royal* was a novel of race relations—the story of a prosperous young Minnesota banker who discovered that he had Kegro ancestry and who espoused the cause of the Negroes in his city. His 22nd and last novel. *World* So *Wide* (1951), concerned Americans in Italy. It was completed in Florence in 1950. After a brief trip back to the United States he returned to Italy, where he died in a nursing home near Rome on Jan. 10. 1951. His ashes were buried in Sauk Centre.

Lewis' importance as a novelist of the early 20th century defies his critics. He undoubtedly was the leading American satirist of his time. desuite the fact that some critics held that he was better at caricature than character. Combining his talent for irony with his crusading spirit, his greatest novels were. on the surface. attacks on the Cnited States, but were in iact an expression of his passionate Americanism. While critics at the time of his death belittled his literary style, they generally admitted its vigour and effectiveness; they agreed his characters epitomized the U.S. middle-class mind and established his position in literature.

He was a brilliant and dynamic individual, deeply concerned with social problems. A notable figure in the literary world, he spent much time abroad but his restlessness always forced him to return to the United States where he set up homes, each of which was to be "permanent": in Washington, D.C.; Vermont; Bronxville, N.Y.; Connecticut; New York city; Duluth, Minn.; and Williainstown, Mass. He received the Nobel prize for literature in 1930, refused the Pulitzer prize in 1926, was elected to membership in the Kational Institute of Arts and Letters in 1935 and the American Academv of Arts and Letters in 1938.

See Mark Schorer, *Sinclair* ***Lewis:*** *an American* ***Life*** (1961).

(H. S. C.; H. E. M.)

LEWIS AND CLARK EXPEDITION, one of the most famous expeditions of exploration in U.S. history and the first overland expedition to the Pacific coast and back, took place in 1804–06 under the leadership of Meriwether Lewis and William Clark (*qq.v.*). They followed the Missouri river from its juncture with the Mississippi to its source and, crossing the continental divide, explored the Columbia river from its source to the Pacific ocean.

Preparations for the expedition were initiated by Pres. Thomas Jefferson before the Louisiana purchase of 1803 and his appointment of Captain Lewis as his private secretary in 1801 was probably with a view to preparing him for leadership of the expedition. He had known Lewis as a boy in Virginia, trusted him completely and realized that his several years of army life in the Northwest Territory was good training for such an exploration. Lewis rounded out his preparations by going to Philadelphia to learn botany, zoology and celestial navigation. Jefferson seems to have had in mind a single leader but he accepted Lewis' suggestion that Lieutenant Clark be invited to share command. Like Lewis and Jefferson. Clark came from an old Virginia family. He was the younger brother of George Rogers Clark who won fame in the American Revolution.

The two leaders. well-chosen and possessed of rare intelligence. selected their personnel from "good hunters, stout, healthy, unmarried young men. accustomed to the woods." Among these were George Drouillard. an expert on the universal Indian sign language, and other experts on carpentry, gun repair and boat handling. Many of the men were from the army. All were enlisted as privates except for nine watermen and Clark's Negro servant, York. The two captains chose their sergeants from among the enlisted men. Clark. who was 33 in 1803, was the oldest member of the expedition; Lewis was 29.

Jefferson supplied detailed instructions. In exploring the projected route, Lewis and Clark were to take note of the character and customs of the Indian tribes, commercial opportunities, plant and animal life, geography. "mineral productions of every kind," "climate as characterized by the thermometer, by the proportion of rainy, cloudy & clear days! by lightening, hail, snow, ice, by the access & recess of frost. . . . ," etc.

After the men were assembled, the party went into winter quarters near St. Louis late in 1803. Lewis and Clark devoted the first winter to training and instilling military discipline into their small band of approximately 40 men, as well as gathering supplies and equipment. On May 14, 1804, according to the journals of the expedition. they "Set out at 4 oClock P.M., in the presence of many of the neighbouring inhabitents, and proceeded on under a jentle brease up the Missourie." They traveled in three boats: two pirogues and a 55-ft. keelboat. The boats were heavily loaded with such things as 21 bales of presents for the Indians, 3,705 lb. of pork in 50 kegs. 3,400 lb. of flour, 2,000 lb. of "parchmeal," 750 lb. of salt, 600 lb. of "Grees," 560 lb. of biscuit, "Tools of Every Description," powder and balls, a swivel gun, an air gun and Lewis' Newfoundland dog, Scannon. Although they set out with a well-stocked larder. their staple food was wild game, supplemented occasionally by Indian dogs and fish. By Nov. 2 they had made the difficult ascent of the Missouri to the Mandan Sioux villages in what later became North Dakota. There, among the friendly Indians, they built Fort Mandan near the present site of Bismarck and passed the second winter in comfort.

Early in April 1805, after sending 16 men back to St. Louis with reports and specimens for President Jefferson! they continued the ascent of the Missouri in smaller boats as far as the three

forks. From that point they followed the stream they named the Jefferson to its source in the southwestern part of what is now the state of Montana. Leaving their boats they procured horses and a guide named Toby from the Shoshone Indians, and pushed eastward over the continental divide to the headwaters of the Clearwater river. There they made canoes which carried them down the Clearwater into the Snake and Columbia rivers. They reached the mouth of the Columbia on Nov. 15, 1805.

After spending their third winter at Fort Clatsop which they had built on the south side of the Columbia near the site of present-day Astoria, Ore., they began their return journey on March 23, 1806. Just east of the continental divide Lewis, with one party, turned north and explored the Marias river while Clark and another group turned south to strike the Yellowstone river. They reunited below the junction of the Yellowstone and the Missouri and continued downstream, reaching St. Louis on Sept. 23, 1806.

Lewis and Clark, conscientiously following Jefferson's instructions, brought back a remarkable set of diaries which stand as some of the most interesting narratives of North American exploration in existence. Several other members of the expedition kept shorter diaries and Clark made excellent maps. Together, the records provided a rich mine of information, much of it completely new at the time. Lewis and Clark thus did much to open the west and to dispel ignorance about the region. In particular they destroyed the myth of an easy water crossing of the continent—the long-sought Northwest passage.

The journals of the expedition include accounts of many stirring adventures. Considering Indian hostilities, accidents, sickness, encounters with grizzly bears and rattlesnakes, exposure and near starvation, it is remarkable that only one man died en route. This was Sgt. Charles Floyd who succumbed, perhaps with a ruptured appendix. at the present site of Sioux City, Ia., on the outward journey. Lewis had a narrow escape in Montana on the return journey when a hunting companion mistook him for an elk and shot him in the upper thigh. Without the benefit of special training, Lewis and Clark did the doctoring for members of the expedition and for many Indians along the way. They bled, purged and sweated their patients in accordance with standard medical practice of the period. Their medical supplies included 1,500 doses of purgative, 1,100 of emetic and 3,500 of diaphoretic, or sweating agents.

Before leaving the Mandan villages on their way west, Lewis and Clark employed a French-Canadian interpreter, Toussaint Charbonneau. n-ho m s permitted to take along his Indian girl-wife, Sacagawea (*q.v.*), and their infant son, Jean-Baptiste. It is sometimes asserted that Sacagawea guided the expedition, but, in fact. she determined the route on only one occasion. On the return trip in southwestern Montana, she accompanied Clark to the Yellowstone river. When he saw in the distance Flathead and Bozeman passes, Clark permitted the Indian girl to choose between them. Either would have served, but she chose Bozeman pass, the less favourable of the two. It led through swampy ground which Clark called "an intolerable rout caused by beavers daming the stream; a muddy wet rout." While Sacagawea does not deserve to be called the guide, she may properly be called the heroine. She equaled the men in endurance and fortitude except, perhaps, for one night when she was sick and Clark noted "The Indian woman complaining all night." She made her own special contributions to the success of the expedition. Once when Charbonneau clumsily caused one of the pirogues to turn on its side, she retrieved, from her position in the stern, some of the light articles that floated out. She dug roots for food and was helpful as an interpreter among the Shoshone and Walla Walla Indians. She particularly helped to win the friendship of the Shoshone, her own people whom she had not seen since she was kidnapped by Minnetarees several years earlier.

There was much excitement when the expedition arrived at St. Louis in Sept. 1806. "we Suffered the party to fire off their pieces as a Salute to the Town. we were met by all the village and received a harty welcom from it's inhabitants &c." Lewis and Clark were each given 1,600 ac. of public land; the men received 320 ac. of land and double pay. First Lewis, and later Clark, became governor of the Louisiana territory.

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LEWIS-AND-HARRIS, the most northerly island of the Hebrides, Scot., 24 mi. from the mainland, from which it is separated by the Minch strait. Although forming one geographical unit, Lenis-and-Harris is generally referred to as if it were two separate islands. The boundary runs roughly between Loch Resort (west) and Loch Seaforth (east). The northerly and larger portion, the island of Lewis (area 631.9 sq.mi.), belongs to the county of Ross and Cromarty; the southern portion, the island of Harris (area 193.4 sq.mi.), belongs to Inverness-shire. The coastline is deeply indented by sea lochs, and inland there are several hundred fresh water lochs, of which the largest is Loch Langavat (9 mi. long). Most of Lewis is covered by a peat moor, but in the southwest Rlealasbhal reaches 1,885 ft. and in the southeast Beinn Mhor 1,874 ft. The whole of Harris is hilly. The Clisham reaches 2,622 ft. and there are more than 30 summits above 1,000 ft. The rivers are small, but many streams abound with salmon and trout, notably the Grimersta. Otters, seals, red deer and hares, game birds and waterfowl are plentiful.

The population of Lewis in 1951 was 23,344, excluding the island of Bernera (384) now linked to Lewis by a bridge, and the Flannan Islands lighthouse (3). The population of Harris was 3,121, excluding the islands of Scalpay (541), Scarp (74), Berneray (246), Ensay (2). Pabbay (2) and Taransay (5). The only town is Stornoway in Lewis, a burgh of barony (4,954). The population of Stornoway is growing, but that of the rural areas is declining. The number of people in the parish of Uig (Lewis) was less in 1956 than in 1811. Outside Stornoway the population is Gaelic-speaking, but education is conducted almost entirely in English, and, as a result, although Gaelic is the language of the home, English is read more easily. In 1951 in Lewis 1,094 spoke Gaelic only. 18.866 Gaelic and English and 3,771 English only. The figures for Harris were: Gaelic only, 296; Gaelic and English, 3,370; English only, 325. For the burgh of Stornomay the figures were: Gaelic only, 38; Gaelic and English, 2.851; English only, 2,06.

Stornoway has a daily air service to Glasgow and to Invemess (three days a week in winter) and daily connection by steamer with Kyle of Lochalsh and Mallaig. Tarbert, Rodil and Scalpay in Harris have thrice-weekly steamer connection with Kyle of Lochalsh and Mallaig. In addition Stornoway has weekly cargo services to Aberdeen, Dundee, Leith, Glasgow and Liverpool; and Harris has a cargo service to Glasgow about once in 10 days.

There is little cultivable land: only 3.5% of the total area is arable and 1.6% under grass. There are few farms, most of the agricultural land being tenanted by crofters. There are 168 crofter townships and 4,093 crofter holdings, of which 3,454 have less than $6\frac{3}{4}$ ac. of inbye land and 802 less than $2\frac{3}{4}$ ac. All but three of the townships are on the coast, as the crofters formerly depended on the inshore fishing for their livelihood. Since the advent of the steam trawler, however, the white fishings have ceased to be of any importance in the rural economy of the island, although Stornoway continues to be a centre of the herring fishing industry. In 1918 the first Lord Leverhulme bought estates in Lewis-and-Harris, and planned, though without success, to develop the fishing on modern lines. As a result of the abandonment of the Leverhulme schemes there was a wave of emigration, more than 3,000 people, mostly young men, leaving the island in a period of five years, with serious social consequences which are still being felt. The rise of the Harris tweed industry has since compensated for the loss of the white fishing industry. The annual output exceeds 5,000,000 yards and the industry provides employment in the rural areas as well as in Stornoway.

Lewis-and-Harris was under Norse occupation for several centuries, and the evidence remains in the islands' place names: and to a lesser extent in the personal names. The abortive Jacobite rebellion of 1719 was launched from Stornoway. The most important ecclesiastical building is the early 16th-century church of

St. Clement's in Rodil. It contains a tomb prepared by Alastair Crotach, one of the MacLeod's of Dunvegan (d. about 1547), which is considered one of the best in Scotland. At Callanish 13 mi. W. of Stornoway there are several stone circles, one of them a cruciform setting of megaliths unique in Scotland. (J. S. G.)

LEWISHAM, a southeastern metropolitan and parliamentary borough of London, Eng. Pop. (1961) 221,590. It is bounded west by Camberwell, north by Deptford and Greenwich, east by Woolwich and south by Kent, and flowing through the centre to the Thames is the Ravensbourne river. Lewisham, the third largest London borough, returns three members to parliament (for North, South and West) and is almost entirely residential, with a few light industries. When the districts of Blackheath, Lee, Brockley, Forest Hill, Sydenham, Southend, Downham, Catford, Rushey Green and Hither Green, which make up the borough, were built up, largely in the 19th century, 658 ac. were kept as open spaces, the biggest being Blackheath (179 ac.) and Ladywell fields (51 ac.). The parish church of St. Mary dates from the 15th century. The town hall, at Catford, was built in 1875 and the Horniman museum, at Forest Hill, in 1902.

LEWISTON, a city of Androscoggin county in southwestern Maine, U.S., on the Androscoggin river opposite Auburn (*q.v.*), 35 mi. N. of Portland. Lewiston is the site of Bates college, a coeducational liberal arts college, founded by Free Baptists in 1864 and long known nationally and internationally for its record in debating. A major portion of the population of the city is of French-American origin and three-fifths of the younger local students attend parochial schools. Before 1945 the industry was dominated by textiles — blankets, sheetings, bedspreads and rayons; thereafter it became more diversified, expanding to include such products as shoes, electronic parts, novelties, poultry, furs and beverages. In 1957 an Industrial park, 125 ac., began to attract new factories. Two hydroelectric dams give the community one of the highest water-power potentials in New England.

Lewiston is the seat of the Central Maine General hospital, a home for the aged, and a Catholic hospital. The armory (1927) houses one of the largest auditoriums in Maine and in 1959 the new youth centre provided the largest covered ice rink in New England.

Settled in 1770, Lewiston became a town in 1795 and a city in 1861. For comparative population figures *see* table in MAINE: *Population.* (RO. BE.)

LEXINGTON, the seat of Fayette county, Ky., U.S., the largest loose-leaf tobacco market in the country and the chief centre in the U.S. for the breeding and sale of thoroughbred and standardbred horses. Situated in the centre of the Bluegrass region of the state 80 mi. S. of Cincinnati, O., Lexington was named by a party of hunters who were encamped there in 1775 when news of the battle of Lexington (Mass.) reached them. Permanent settlement (largely from Virginia and North Carolina) was begun in April 1779. Because of its early culture and learning it soon became known as the "Athens of the west." In 1782 the general assembly of Virginia granted the town a charter. The *Kentucky Gazette* was established there in 1787 and the first state legislature convened there in June 1792. Lexington was incorporated as a city in 1832.

The city is a trading centre for the Bluegrass region and a manufacturing centre, its products including electric typewriters, electronic equipment, bourbon whisky, furniture, automobile headlights and parts, heavy electric equipment, parachutes, television parts, paper drinking cups and peanut products. There are two race tracks, Keeneland, a nonprofit track, and the famous track widely known as the Red Mile, upon which many trotting and pacing records have been made. The Junior League horse show and other semiannual race meets are brilliant events. Many noted race horses were bred and raised on the celebrated horse farms in the surrounding area.

Lexington is the seat of the University of Kentucky (1865); Transylvania college (chartered 1780), related to the Christian Church (Disciples of Christ); and the College of the Bible (1865), a graduate seminary of the Christian Church. Also located there are the U.S. public health service hospital for narcotics addicts; the Lexington army signal depot (Avon); a Shriners hospital for crippled children; a U.S. Veterans administration hospital; Cardinal Hill convalescent hospital for crippled children; the Eastern Kentucky state hospital for the mentally ill (established in 1815), and Kentucky Village, the state reform school.

Lexington was the home of John C. Breckinridge, vice-president of the U.S. under James Buchanan and secretary of war in the Confederate cabinet of Jefferson Davis; John Hunt Morgan, Confederate cavalry leader; Mary Todd, wife of Abraham Lincoln; and Henry Clay, who lived there from 1797 until his death in 1852. Both Clay's home, Ashland, and Morgan's home, Hopemont, are public shrines and are noted examples of the many beautiful homes in the environs.

The city has a council-manager form of government, in effect since 1932. Pop. (1960), city 62,810; standard metropolitan statistical area (Fayette county) 131,906. For comparative population figures *see* table in KENTUCKY: *Population.* (J. W. CL.)

LEXINGTON, a city of Massachusetts, U.S., is best known as the site of the first skirmish of the American Revolutionary War. On April 19, 1775, local minutemen took position on Lexington green, 11 mi. N.W. of Boston and on the direct road to the provincial congress's arms depot at Concord. The 77 minutemen found 700 British regulars in front of them but before they could retreat someone fired a shot. The British answered with a volley that left eight colonials dead and ten wounded. Though the first real battle took place at Concord, Lexington proudly calls itself "the birthplace of American liberty."

The town then had 700 inhabitants. Originally a meadow belonging to Cambridge, it became a separate parish, Cambridge Farms, in 1691 and an independent township in 1713. After the Revolutionary War its population grew. Public schools were built, including in 1839 the first public normal school in the United States (later transferred to Framingham). The town's population broadened, as evidenced by the gradual planting of churches other than the Congregationalist — Baptist in 1833, Unitarian in 1840, Roman Catholic in 1865 and 1929, Episcopal in 1887, Christian Science in 1903. Hebrew in 1913. In the early 19th century East Lexington had some industry but little of it survived the panic of 1837. Until the end of the century the town remained primarily a farmers' community.

After the beginning of the 20th century Lexington was gradually drawn into the Boston metropolitan area. Railroads and highways facilitated commuting. Gifts established a public library, a municipal recreation centre and other attractions. The town grew considerably; for comparative population figures *see* table in MASSACHUSETTS: *Population.* With all construction in the centre of town subject to approval by the Historic Districts commission, however, its appearance changed less than its size and character. (E. R. M.)

LEXINGTON, a city of Missouri, U.S., 43 mi. E. of Kansas City, on the south bank of the Missouri river; the seat of Lafayette county. Founded in 1819, platted in 1822 and chartered in 1845, it was named after Lexington, Ky. For a short time it was terminus of the Santa Fe trail (*q.v.*).

At the beginning of the American Civil War it was the most important river town between St. Louis and St. Joseph and commanded the river approach to Ft. Leavenworth, Kans. The battles of U'ilson's Creek and Lexington, Aug.–Sept. 1861, resulted in victories for Confederate Gen. Sterling Price over Col. James A. Mulligan's command.

Except for agriculture, a shirt company is the chief industry. Noteworthy features include Wentworth Military academy (1880); Anderson house, used as a Civil War hospital, now a museum; Memorial building in College park on the site of the first Masonic college in the world. operated in Lexington from 1846 to 1859; the courthouse, erected in 1837; and the Pioneer Mother statue. (C. ST.)

LEXINGTON, a historic college town in western Virginia, U.S., 52 mi. N.E. of Roanoke, on the Maury river, a tributary of the James, was established by the Virginia assembly in 1777 as the seat for the new county of Rockbridge. It was settled by Scotch Irish Presbyterians, still an important element in the popu-

lation, and named for the Revolutionary War battle of Lexington; five of its original streets bear the names of Virginia's Revolutionary leaders. In 1796 Lexington was almost completely destroyed by fire.

Lexington is the shopping centre for an agricultural area specializing in beef cattle, sheep and dairying. Many army, navy and marine officers have established homes there. Virginia Military institute (V.M.I.), where "Stonewall" Jackson taught before the American Civil War, is a state military college established in 1839 and offering degrees in engineering and liberal arts. During the Civil War 94% of the institute's alumni fought for the Confederacy. After 1865 the distinguished scientists Matthew Fontaine Maury and John Rfercer Brooke taught at V.M.I. Washington and Lee university is a private men's liberal arts college with schools of commerce and law; founded as an academy in 1719, it became a college in 1813 and a university in 1871. It was named for George Washington. its first large benefactor, and Gen. Robert E. Lee, who from 1865 until his death in 1870 served as its president. Generals Lee and Jackson are buried in Lexington. The town has a council-manager form of government, in effect from 1938.

Nearby are the famous Natural bridge and the birthplaces of Sam Houston and Cyrus McCormick.

For comparative population figures *see* table in VIRGINIA: *Population.* (G. M. BE.)

LEYDEN or LEIDEN, a city in the province of South Holland, the kingdom of the Netherlands, on the Old Rhine. and a junction station 18 mi. by rail S.S.W. of Haarlem, 10 mi. from The Hague and 35 mi. from Utrecht. It is connected by steam tramway with Haarlem and The Hague respectively, and with the seaside resorts of Katwijk and Noordwijk. There is also regular steamboat connection with Katwijk, Noordwijk, Amsterdam and Gouda. The population, which reached about 100.000 in 1640, had sunk to 30.000 between 1796 and 1811. and in 1957 was 94,893 (mun.).

Leyden is an ancient town. It was the Roman *Lugdunum Batavorum,* and was governed until 1420 by burgraves, representatives of the courts of Holland. The most celebrated event in its history is its siege by the Spaniards in 1574. Besieged from May until October, it was at length relieved by the cutting of the dikes. thus enabling ships to carry provisions to the inhabitants of the flooded town. The weaving establishments (mainly- broadcloth) of Leyden at the close of the 15th century were very important, and aftet the expulsion of the Spaniards Leyden cloth. Leyden baize and Leyden camlet were familinr terms. These industries afterward declined, and in the beginning of the 19th century the haize manufacture was altogether given up. Linen, carpets and woollen (blankets) manufactures and printing are the most important industries, while there is a trade in butter and cheese.

Katwijk, 6 mi. N.W. of Leyden, is a popular seaside resort and fishing village. Close by are the great locks constructed in 1807 by the engineer, F. W. Conrad (d. 1808), through which the Rhine (there called the Katwijk canal) is admitted into the sea at low tide. The shore and the entrance to the canal are strengthened by huge dikes. In 1520 an ancient Roman camp known as the Brittenburg was discovered there. It was square in shape, each side measuring 82 yd., and the remains stood about 10 ft. high. By the middle of the 18th century it had been destroyed and covered by the sea. Noordwijk is the most fashionable summer resort in Holland.

The two branches of the Rhine which enter Leyden on the east unite in the centre of the town. There is a large open space, the Van der Werf park. named after the burgomaster, Pieter Andriaanszoon van der Werf, who defended the town against the Spaniards in 1574. This open space was formed by the accidental explosion of a powdership in 1807, hundreds of houses being demolished, including that of the Elsevier family of printers. At the junction of the two arms of the Rhine stands the old castle (De Burcht), a circular tower built on an earthen mound in Roman or Saxon times. Of Leyden's old gateways only two—both dating from the end of the 17th century—are standing. The Hooglandsche Kerk, or the church of St. Pancras, was built in the 1 jth century and restored in 1885–1902. The most interesting buildings are the town hall (Stadhuis), a 16th-century Dutch building; the Gemeenlandshuis van Rynland (1596, restored 1878); the weighthouse built by Pieter Post (1658); the ancient gymnasium (1599) and the so-called city timber house (Stads Timmerhuis) (1612), both built by Lieven de Key (c. 1560–1627).

Leyden is essentially an academic city. The university was founded by William of Orange in 1575 as a reward for the heroic defense of the previous year. Originally located in the convent of St. Barbara. the university was moved in 1581 to the convent of the White Nuns, the site of which it still occupies, though that building was destroyed in 1616. The presence within half a century of the date of its foundation of such scholars as Joseph Scaliger, Hugo Grotius, Jacobus Arminius and Daniel Heinsius at once raised Leyden university to the highest European fame, a position which the learning and reputation of Jacobus Groenhovius. Herman Boerhaave. Tiberius Hemsterhuis and David Ruhnken, among others, enabled it to maintain down to the end of the 18th century. Among the institutions connected with the university are the national institution for East Indian languages, ethnology and geography; the fine botanical gardens, founded in 1587; the observatory (1860); the natural history museum; the museum of antiquities (Museum van Oudheden), with valuable Egyptian and Indian departments; a museum of Dutch antiquities from the earliest times; and three ethnographical museums, of which the nucleus was P. F. von Siebold's Japanese collections. The university was closed in 1940 by the Germans after their invasion of the Low Countries. The municipal museum, founded in 1869 and located in the old cloth hall (Laeckenhalle). (1640), contains a varied collection of antiquities connected with Leyden, as well as some paintings. Jan van Goyen, Gabriel Metsu, Gerard Dou and Rembrandt were natives of this town. The Thysian library occupies an old Renaissance building of 1655. Two miles from Leyden is the picturesque resort village of Warmond. The mediaeval castle of Duivenvoorde is 3 mi. S. of Leyden.

LEYDEN JAR, a device for storing quantities of, static electricity discovered accidentally by P. van hlusschenbroek of the University of Leyden in 1745, and, independently, by E. G. von Kleist of Kammin in Pomerania about the same time. The name appears to have originated in the writings of the abbé Nollet. In its earliest form the Leyden jar consisted of a glass phial, partly filled with water, whose orifice was closed by a cork pierced by a wire or nail which dipped into the water. To charge the jar the phial was held in the hand and the exposed end of the wire brought into contact with the prime conductor of an electrical machine. On removing the phial from the machine and touching the wire with the other hand: the person experienced a violent shock. In its present form the jar is made of thin flint glass of high dielectric strength, coated for part of its height. inside and out, with tin foil. The outer coating is connected to earth and contact is made with the inner coating through a central brass rod which projects through a wooden stopper beyond the mouth of the jar and has a chain or spring on its lower end. For further details *see* CAPACITOR.

LEYGUES, GEORGES (1858–1933), French politician, was born at Villeneuve-sur-Lot, on Nov. 28, 18j8, and educated at Toulouse and Bordeaux. He was minister of public instruction in the Dupuy government of 1894, and in the Waldeck-Rousseau government oi 1899–1902. He held office under Jean Sarrien (1906) and Georges Clemenceau (1917). In 1920–21 he was prime minister, retaining for himself the portfolio of foreign affairs. He was minister of marine in various cabinets from 1925 to 1933, and was minister of the interior in the Steeg cabinet, 1930–31. Leygues, in his early days, was one of the Parnassian group of poets.

LEYS, HENDRIK, BARON (1815–1869), Belgian painter, was born at Antwerp on Feb. 18, 1815. He studied under Egide Wappers at the Antwerp academy. In 1835 he went to Paris, where he was influenced by the romantic movement. Leys was an imitative painter in whose works may be detected the schools which he had been studying. In 1862 Leys was created a baron. At the time of his: death (Aug. 26, 1869) he was engaged in decorating with fresco the hall of the Antwerp Hôtel de Ville.

See Richard Muther, *History of Modern* ***Painting,*** **i: xv** (1907).

LEYSIN (4,418 ft.), a town, in the canton of Vaud, Switz., 7 mi. S.E. of Montreux. It is a health resort for the treatment of tuberculosis, sheltered from the north winds, and is reached by a rack railway from Aigle. It is a centre for winter sports. Pop. (1960) 2,241; the majority French-speaking and Protestant.

LEYTE, eighth largest of the Philippine Islands, located in the east central part of the Visayan group; area 2,785 sq.mi. Samar Island is to the northeast, Cebu to the west, Bohol to the southwest and Mindanao to the south. Leyte is bisected by a range of rugged mountains reaching a maximum height of 4,426 ft. at Mt. Lobi in the centre and is crossed by only one main road. Rolling plains are found around the coastal areas, particularly near Tacloban and Ormoc in the north. Leyte averages about 100 in. of rainfall; the western third of the island has even rainfall all year while the remainder has maximum precipitation in the winter months. Little manufacturing is carried on; most of the inhabitants are farmers. Farms are small and tenancy rates run above 40%. Rice, corn, sweet potatoes and cassava are all important local food crops; coconuts, abacá, tobacco, bananas and sugar cane are raised for cash. Fishing is important, particularly along the northern coast.

The island is composed of the province of Leyte (area 3,084 sq.mi., which includes Biliran and Maripipi islands off the north Coast). Pop. (1960) 1.177,407. Tacloban city, pop. (1960 mun.) 53,607, capital of Leyte province, is an important trading centre on a good harbour at the southern end of the narrow San Juanico strait which separates Leyte and Samar. On Oct. 20, 1944. U.S. forces commanded by Gen. Douglas MacArthur landed at Palo. about 10 mi. south of Tacloban city on the east coast—the beginning of the campaign to liberate the Philippines from the Japanese during World War II. MacArthur city, pop. 62,988, is also an important trading centre as well as a minor rice and corn milling centre. Other trading centres are Barugo and Carigara on the north, Baybay on the west and Burauen on the east. Maasin, pop. (1960) 40,100, is an agricultural centre of southern Leyte. For the battles of Leyte and Leyte gulf see WORLD WAR II.

(R. E. HE.)

LEYTON, a municipal (1926) and parliamentary borough in Essex. forming one of the northeastern suburbs of London. Eng. It includes Leytonstone on the east. Pop. (1961) 93,857. It lies on the left bank of the Lea between Hackney and Leyton marshes on the London side and Epping forest (partly within the boundary) on the Essex side. Leyton is in the main a residential area which underwent much planned development before and after World War II. Industries include the making of electric cables, office accessories, glassware and foodstuffs. The name, the "tun or settlement on the Lea," shows that Leyton was occupied by the Saxons. In St. Mary's parish church, which has a large collection of maps, John Strype, the antiquary and one-time vicar, is buried.

LHASA (LA-SA), the capital, religious and cultural centre of the Tibet Autonomous Region. It lies in 29° 39' N., 91° 06' E., 11,830 ft. above sea level. Because of the inaccessibility of Tibet and the political and religious exclusiveness of the lamas, Lhasa was long closed to western travelers, who during the latter half of the 19th century were stopped in their attempts to reach it. It was popularly known as the Forbidden City. Its chief features were known by accounts of the earlier Roman Catholic missionaries who visited it and by the investigations of Indian secret explorers and by the narratives of scholars who were permitted to journey in Tibet during World War II. With its cluster of vast monastic establishments, Lhasa is the mecca of Lamaism. Prior to the Chinese annexation of Tibet the streets and public places swarmed with pilgrims from every part of the Himalayan plateau, and before 1920 they came from all the steppes of Asia between Manchuria and the Balkash lake. The metropolis had an estimated population of 50.000 in 1951. fully a third of which were members of religious orders. Arable land in Tibet was hacked into feudal estates. either owned by the state. the church or the nobility. The noble families, who, with the high priests, monopolized the government posts, all resided in Lhasa except for a feu lesser ones in Shigatse. There were traders and craftsmen from India, Nepal and China proper. These skilled craftsmen created Buddhist images, butter lamps, candleholders, canopies nith elaborate designs for the temples and exquisite headdresses. bracelets and amulet boxes.

Traders from western China brought every variety of silk stuffs, tea and chinaware; from Sining came silk, gold lace, brocades, carpets, furs, horses and a breed of fat-tailed sheep; from eastern Tibet, musk in large quantities ahich eventually found its nay to Europe through India; from Sikkim and Bhotan, rice; a variety of manufactured goods, sugar and dried fruits from India and Nepal, and saffron from Ladakh and Kashmir. There were many annual fairs, the largest was held in the Tibetan new year, usually the first two weeks of February.

The nidespread anti-Chinese feeling arising out of the political and military seizure of Tibet in 1950, culminated in the Lhasa uprising that began March 17, 1959, and spread throughout the highlands. There were several days of fighting in and around Lhasa before suppression by Chinese troops. This led to the flight of the dalai lama to India, and the announcement by the Tibetan Autonomous committee of a reform program under the chairmanship of the Chinese military governor and the acting-chairmanship of the panchen lama.

Location.— The city stands in a reasonably level plain, which is surrounded on all sides by hills. Along its southern side, about ½ mi. S. of Lhasa, runs a considerable river called the Kyi Chhu (Kyichu. Ki-chu or Kyi) flowing there from the east-northeast, and joining the great Tsangpo (or upper course of the Brahmaputra) about 38 mi. to the southwest. The hills around the city are barren. The plain, however, is fertile, though in parts marshy. Gardens scattered over it around the city are planted with fine trees. The city is screened from view from the west by a rocky ridge. lofty and narrow, with summits at the north and south, the one flanked and crowned by the majestic buildings of Potala, the chief residence of the dalai lamas, the other by the temple of medicine. Groves. gardens and open ground intervene between this ridge and the city itself for a distance of about one mile. A gate through the centre of the ridge gives access from the west; the road from there to the north part of the city throws off a branch to the Yutok sampa or turquoise-tiled covered bridge, one of the noted features of Lhasa, which crosses a former channel of the Kyi, and carries the road to the centre of the town.

The city is nearly circular in form. and less than one mile in diameter. It was walled in the latter part of the 17th century, but the walls were destroyed during the Chinese occupation in 1722. The chief streets are fairly straight, but generally of no great width. There is no paving or metal, nor any drainage system, so that the streets are dirty and in parts often flooded. The inferior quarters are rife with smells, dogs and pigs. Many of the houses are of clay, but those of the richer people are of massive stone. All are frequently whitewashed, the doors and windows being framed in bands of red and yellow. In the suburbs there are houses entirely built of the horns of sheep and oxen set in clay mortar. This construction is in some cases roughly carried out, but in others it is solid and highly picturesque. Some of the inferior huts of this type are inhabited by the Ragyaba, or scavengers. whose chief occupation is that of disposing of corpses according to the practice of cutting and exposing them to the dogs and birds of prey. The houses generally are of two or three stories. Externally the lower part generally presents dead walls (the ground floor being occupied by stables and similar accommodations); above these rise tiers of large windows with or without projecting balconies, and over all flat broad-eaved roofs at varying levels. In the better houses there are often spacious and well-finished apartments, and the principal halls, the verandas and terraces are often highly ornamented in brilliant colours. In every house there is a kind of chapel or shrine, carved and gilt, on nhich are set images and sacred books

The main roads of the Tibetan highlands converge on Lhasa. These are the Tsinghai-Tibet road (linking Lhasa to Sining), the Sikang-Tibet road to Chamdo (Ch'ang-tu), the road connecting Lhasa to Kalimpong, India, and the West Tibet road through the

Brahmaputuru valley via Gartok to Ladakh, Kashmir.

Temples and Monasteries.—In the centre of the city is an open square which forms the chief market place. Here is the great temple of the "Jo" or Lord Buddha, called the Jokhang, regarded as the centre of all Tibet, from which all the main roads are considered to radiate. This is the great metropolitan sanctuary and church centre of Tibet, the St. Peter's or Lateran of Lamaism. It is believed to have been founded by the Tibetan Constantine, Srong-tsan-gampo, in 652, as the shrine of one of those two very sacred Buddhist images which were associated with his conversion and with the foundation of the civilized monarchy in Tibet. The exterior of the building is not impressive; it rises little above the level of other buildings which closely surround it, and the effect of its characteristic gilt roof, though conspicuous and striking from afar, is lost close at hand.

The main building of the Jokhang is three stories high. The entrance consists of a portico supported on timber columns, carved and gilt, while the walls are engraved with Chinese, Mongolian and Tibetan characters, and a great prayer wheel stands on one side. Massive folding doors, ornamented with scrollwork in iron, lead to an antehall, and from this a second gate opens into a courtyard surrounded by a veranda with many pillars and chapels, and frescoes on its walls. On the left is the throne of the grand lama, laid with cushions, together with the seats of other ecclesiastical dignitaries, variously elevated according to the rank of their occupants. An inner door with enclosed vestibule gives access to the quadrangular choir or chancel, as it may be called: though its centre is open to the sky. On either side of it are three chapels, and at the extremity is the rectangular "holy of holies," flanked by two gilded images of the coming Buddha and screened by latticework. In it is the shrine on which sits the great image of Sa-Kya, set about with small figures: lamps and a variety of offerings, and richly jeweled, though the workmanship of the whole is crude. In the second and third stories of the temple are shrines and representations of a number of gods and goddesses. The temple contains a vast accumulation of images, gold and silver vessels, lamps, reliquaries and precious bric-a-brac of every kind. The daily offices are attended by crowds of worshipers, and a sacred way which leads around the main building is constantly traversed by devotees who perform the circuit as a work of merit. always in a particular direction. The temple is dusty and always infected with strong offensive odours because the atmosphere is foul with the fumes of butter lamps and the floor wet with the residues of tea and butter used in offerings and tossed away by the priests.

Besides the convent cells, halls of study and magazines of precious lumber, buildings grouped about the Jokhang are occupied by the civil administration, such as treasuries, customs office: courts of justice, etc.. and there are also private apartments for the grand lama and other high functionaries. No woman is permitted to pass the night within the precinct.

In front of the main entrance to the Jokhang, in the shadow of a sacred willow tree, stands a famous monument, the Doring monolith, which bears the inscribed record of a treaty of peace concluded in 822 between the king of Tibet and the emperor of China. Before this monument the apostate from Lamaism, Langdharma, brother and successor of the king, is said to have been standing when a fanatic recluse, who had been stirred by a vision to avenge his persecuted faith, assassinated him.

Another great and famous temple is Ramo-che, at the north side of the city. This is also regarded as a foundation of Srong-tsan-gampo, and is said to contain the body of his Chinese wife and the second of the primeval palladia, the image that she brought with her to the snowland; from which it is known as the "small Jokhang." This temple was noted for the practice of magical arts.

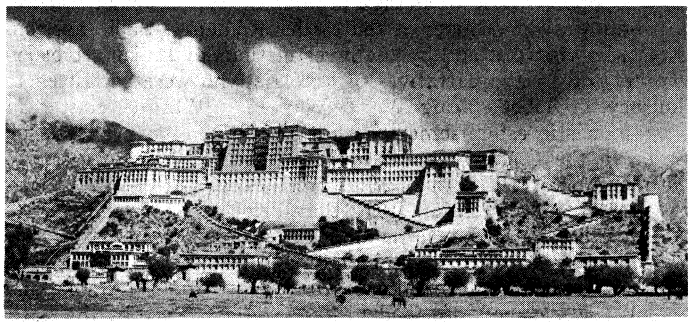
Another monastery within the city is that of Moru. also on the north side, remarkable for its external order and cleanliness. It was famous as a school of orthodox magic, it was noted also for the printing house in the convent garden. This convent was the temporary residence of the regent during the visit of the British mission in 1904 led by Col. (later Sir) Francis Edward Younghusband (*q.v.*). Other monasteries in or near the citv are the Tsamo Ling. or Chomoling, at the northwest corner; and the Kundä Ling, or Kundeling, about 1 mi. west of the city, at the foot of a low isolated hill called Chapochi. Three miles south, beyond the river. is the Tsemchog Ling, or Tsecholing. These three monasteries together with the dissolved Tengyeling were known as the "Four Lings." From their inmates the dalai lama's regent, during his minority, mas formerly chosen. The temple of medicine crowns the summit (Chagpa) at the end of the ridge west of the city, opposite to that on which stands the Potala. It is natural that in a country possessing a religious system like that of Tibet the medical profession should form a branch of the priesthood. "The treatment of disease: though based in some measure upon a judicious use of the more common simple drugs of the country, is, as was inevitable among so superstitious a people. saturated with absurdity" (Waddell, *Lhasa* and Its Mysteries).

Potala.—The famous Potala hill, covered by the palace of the dalai lamas. forms a majestic mountain of building; with its vast inward-sloping walls broken only in the upper parts by straight rows of many windows, and its flat roofs at various levels, it is not unlike a fortress in appearance. At the south base of the rock is a large space enclosed by walls and gates, with great porticoes on the inner side. Before the Communist Chinese occupation this swarmed with lamas and with beggars. A series of tolerably easy staircases, broken by intervals of gentle ascent, leads to the summit of the rock. The whole width of this is occupied by the palace. The central part of this group of buildings (for the component parts of Potala are of different dates) rises in a vast quadrangular mass above its satellites to a great height, terminating in gilt canopies similar to those on the Jokhang. Here on the lofty terrace was the grand lama's promenade, and from this great height he looked down upon the crowds of his votaries far below. This central member of Potala is called the red palace from its crimson colour, which distinguishes it from the rest. It contains the principal halls and chapels and shrines of past dalai lamas. There is in these much rich decorative painting, with jeweled work, carving and other ornament. but the interior of Potala as a whole cannot compare in magnificence with the exterior. Among the numerous other buildings of note on or near Potala hill, one is distinguished by the Chinese as one of the principal beauties of Lhasa. This is a temple not far from the base of the hill, in the middle of a lake which is surrounded by trees and shrubberies. This temple, called Lu-kang, is circular in form. with a loggia, or portico. running all around and adorned with paintings. Its name, "the serpent house," comes from the tradition of a serpent or dragon which dwelt here and must be propitiated lest it should cause the waters to rise and flood Lhasa.

Drepung, Sera *and* Gaden.—These are three great monasteries in the vicinity of Lhasa, all claiming to be founded by Tsong-Khapa (1356–1418), the medieval reformer and organizer of the modern orthodox Lama Church.

See TIBETAN BUDDHISM.

Drepung, or Debung (written *'Bras-spungs*), is 6 mi. west of Lhasa at the foot of the hills which flank the plain on the north. It was one of the largest monasteries in the world, and had about 8,000 monks. In the middle of the convent buildings rises a kind of pavilion. brilliant with colour and gilding, which was occupied by the dalai lama when he visited Drepung once a year and expounded to the inmates. The place was frequented by the Mongol



PAUL POPPER

THE POTALA. FORTRESS PALACE OF THE DALAI LAMAS. LHASA

students who came to Lhasa to graduate, and is known in the country as the Mongol convent; it was also notorious as a centre of political intrigue. Near it is the seat of the chief magician of Tibet, the Nachung Chos-kyong, a building picturesque in itself and in situation.

Sera is 3 mi, north of the city on the acclivity of the hills and close to the road by which pilgrims enter from Mongolia. From a distance the crowd of buildings and temples, rising in amphitheatre against a background of rocky mountains. forms a pleasing picture. In the recesses of the hill, high above the convent. are scattered cells of lamas adopting the solitary life. The chief temple of Sera, a highly ornate building, has a special reputation as the resting place of a famous *Dorjē, i.e.,* the *Vajra* or Thunderbolt of Jupiter, the symbol of the strong and indestructible. which the priest grasps and manipulates in various ways during prayer. The emblem is a bronze instrument, shaped much like a dumbbell with pointed ends, and it is carried solemnly in procession to the Jokhang during the New Year's festival.

Gaden is a great convent about 25 mi. east of Lhasa, on the other side of the Kyi Chhu. It is the oldest monastery of the Yellow Hat sect, having been founded by Tsong-Kha-pa and having had him for its first superior. Here his body is said to be preserved with miraculous circumstances; here is his tomb, of marble and malachite, with a great shrine said to be of gold, and here are other relics of him, such as the impression of his hands and feet.

Sumye.—This is another famous convent intimately connected with Lhasa, and was said to be used as a treasury by the former Tibetan government. It lies about 36 mi. S.E. on the left bank of the Tsangpo. It was founded in 770, and is the oldest extant monastery in Tibet. It is surrounded by a very high circular stone wall, 1½ mi. in circumference, with gates facing the four points of the compass. On this wall Nain Singh, who was here on his journey in 1874, counted 1,030 votive piles of brick. One very large temple occupies the centre, and around it are four smaller but still sizable temples. Many of the idols are said to be of pure gold, and the wealth is very great. The temple interiors are covered nith beautiful writing in enormous characters, which the common people believe to be the writing of Sa-Kya himself. *See* TIBET for the history and customs of Lhasa. (T.-L. S.)

L'HÔPITAL (or L'HOSPITAL), **MICHEL DE** (*c.* 1505–1573), French statesman, was born near Aigueperse in Auvergne (now Puy-de-Dôme). His father, who was physician to the constable Charles of Bourbon, sent him to study at Toulouse. whence at the age of 18 he was driven, a consequence of the evil fortunes of the family patron, to Padua, where he studied law and letters for about six years.

On the coinpletion of his studies he joined his father at Bologna and afterward, the constable having died, went to Rome in the suite of Charles V. For some time he held a position in the papal court at Rome, but about 1534 he returned to France and became an advocate, his marriage, in 1537, procuring for him the post of counselor to the *parlement* of Paris. This office he held until 1547, when he was sent by Henry II on a mission to Bologna, where the Council of Trent was at that time sitting; after 16 months of inactivity there, he was by his own desire recalled. L'Hôpital mas now chancelor to the king's sister. Margaret, duchess of Berry. In 1553, on the recommendation of the cardinal of Lorraine, he was named master of the requests and afterward president of the *chambre des comptes.* In 1559 he accompanied the princess Margaret. now duchess of Savoy, to Nice. In 1560 he was chosen to succeed François Olivier (1487–1560) as chancelor of France.

One of his first acts was to cause the *parlement* of Paris to register the edict of Romorantin, of which he is sometimes, but erroneously, said to have been the author. Designed to protect heretics from the secret and summary methods of the Inquisition, it certainly had his sympathy and approval. In accordance with his consistent policy of inclusion and toleration he induced the council to call the assembly of notables, which met at Fontainebleau in Aug. 1560 and agreed that the states-general should be summoned, all proceedings against heretics being meanwhile suppressed pending the reformation of the church by a general or national council.

The states-general met in December; the edict of Orléans (Jan. 1561) followed and finally. after the colloquy of Poissy, the edict of Jan. 1562, the most liberal, except that of Nantes, ever obtained by the Protestants of France. Its terms, however, were not carried out, and during the war which n-as the inevitable result of the massacre of Vassy in March, L'Hôpital, whose dismissal had been for some time urged by the papal legate Hippolytus of Este, retired to his estate at Vignay, near Étampes, whence he did not return until after the pacification of Amboise (March 19, 1563).

It mas by his advice that Charles IX was declared of age at Rouen in Aug. 1563, a measure which really increased the power of Catherine de' Medici; and it was under his influence also that the royal council in 1564 refused to authorize the publication of the acts of the Council of Trent, on account of their inconsistency with the Gallican liberties. In 1564–66 he accompanied the young king on an extended tour through France; and in 1566 he promulgated an important edict for the reform of abuses in the administration of justice. The renewal of the religious war in Sept. 1567, honever, diminished the influence of L'Hôpital, and in Feb. 1568 he obtained his letters of discharge. Henceforward he lived in seclusion at Vignay, his only subsequent public appearance being by means of a *mémoire* which he addressed to the king in 1570 under the title *Le But de la guerre et de la paix, ou discours du chancelier l'Hospital pour exhorter Charles IX à donner la paix à ses sujets.* He died either at Vignay or at Bellébat on March 13, 1573.

After his death Pibrac, assisted by De Thou and Scévole de Sainte-Marthe, collected a volume of the *Poemata* of L'Hôpital, and in 1585 his grandson published *Epistolarum seu sermonum libri sex.* The complete *Oeuvres de l'Hôpital* were published for the first time by P. J S. Dufey, 5 vol (1824–25). They include his "Harangues" and "Remonstrances," the *Epistles,* the *Mémoire* to Charles *IX,* a *Traite' de la réformation de la justice* and his will *See* also *A F.* Villemain, *Vie du Chancelier de l'Hôpital* (1874); R G. E T St-René Taillandier, *Le Chancelier de l'Hospital* (1861); Dupré-Lasalle, *Michel* de *l'Hospital avant son élévation au poste de chancelier* de *France* (1875–99); Amphoux, *Michel de l'Hospital et la liberté de conscience au XVI^e siècle* (1900); C. T Atkinson, *Michel de l'Hospital* (1900), containing an appendix on bibliography and sources; A. E. Shaw, *Michel de l'Hospital and His Policy* (1905); Eugène and Émile Haag, *La France protestante,* 2nd ed. (1877 *et seq*)

LIABILITY, in law, is a comprehensive term including almost every type of duty. obligation, debt, responsibility or hazard, whether absolute. contingent or likely, arising by way of express or implied contract, tort (*q.v.*) or statute (*see* NEGLIGENCE). Thus it comprehends contingent obligations which may or may not result thereafter in indebtedness. A liability bond or liability insurance is intended to protect the insured from liability for specified damages or to protect persons damaged by injuries caused by the insured as specified. whenever the liability accrues. Secondary liability does not attach or accrue except upon fulfillment of certain conditions, such as default in payment of his debt by another person as in the case of a surety. (*See* GUARANTEE.)

Personal Liability.—Stockholders in corporations under certain statutes have a personal liability making them individually and personally responsible for the debts of the corporation either to the extent of the par value of their stock without limit or otherwise, as the statute specifies. Limited liability refers to the limitations on the personal liability of shareholders of a corporation for the corporate debts and obligations. Generally, shareholders are not personally liable for corporate debts beyond the amount, if any, unpaid on the purchase or subscription price of their shares, and if their shares are paid for in full they are immune from any other liability for corporate debts, unless they have otherwise contracted with the company or its creditors or unless a statute otherwise provides. Certain statutes impose personal liability on shareholders for wage claims in cases of corporate insolvency. A single or dominant shareholder may be subjected to personal liability under special circumstances. (*See* COMPANY; CORPORATION.) In the United States, by statute a limited partnership often may be formed so that certain partners, designated as limited as opposed to general ones, are liable for the firm's obligations only to the extent of their con-

tribution to the firm's capital. (See PARTNERSHIP.) By statute. contract, treaty or administrative regulation the liability of certain classes of common carriers: such as ships. railways, airplanes and motor trucks, may be limited in case of loss or injury to passengers, baggage or freight. (See AIR LAW; INTERSTATE COMMERCE.)

Double Liability. — In the United States, double liability was applied to the stockholders' liability in certain corporations, signifying that in case of insolvency the stockholders might not only lose the amount which they invested in their stock but might also be called upon ratably for the concern's indebtedness up to an additional amount equal to the full par value of the stock. This double liability was not applied to stocks of ordinary business corporations but only to banking corporations and has now been abolished almost everywhere, both for state and national banks. (RT. K.)

LIADOV, ANATOL (1855–1914), Russian composer, was born at St. Petersburg (Leningrad) on May 11, 1855. He came of a family of professional musicians and his early training was given him by his father.

He then entered the Petersburg conservatory and became a pupil of Rimski-Korsakov. Later he was appointed professor there and also at the Imperial chapel. During his tour as an official collector of folk songs for the Imperial Geographical society he discovered many treasures of traditional melody. many of which he has arranged with admirable effect.

His best work is to be found in his short pieces for piano. which are like delicate miniatures in their fine finish and piquancy. One of these: A Musical *Snuffbox,* has become widely known through its adoption by the Russian Ballet. The most important of Liadov's collections is his three-volume edition of 120 national songs. He also wrote choral and orchestral pieces. He died at Novgorod on Aug. 18, 1914.

LIANAS (LIANES), a term applied to climbing plants, and more commonly to those contributing to tropical vegetation. Climbing plants or lianas are those that use some other structure for support and which lack strength in their stems to grow erect. A liana may be (1) a clamberer, (2) a climber or (3) a twiner.

A clamberer or rambler scrambles over the surrounding vegetation or other debris. but is unable to support itself by twining tendrils or other devices. Examples of this group are the brambles or blackberries (species of *Rubus*) and bedstraw or cleavers (*Galium boreale* or G. *aparine*). Most clambering plants occur in temperate regions.

A climber ascends by clinging to other objects for support. This may be by means of aerial roots, by production of tendrils tipped with adhesive disks. and by tendrils that twine, or by twining leafstalks or by modifications of these structures. Aerial roots (or rootlets) may be produced in abundance. such as in poison ivy (*Rhus* toxicodendron), the juvenile stage of English ivy (Hedera helix) and the trumpet vine (*Campsis* rndicuns). They are called adventitious roots, and originate in the pericycle tissue of the inner bark. Because they arise on the nonilluminated side of the stem they are said to be negatively phototropic. These roots anchor and their rate of growth increases with constant supply of moisture. They do not "suck" nourishment from the trees on which they grow. The roots penetrate moisture-holding cracks and crevices of walls or the bark of the tree on which the vine grows. Reports that the aerial roots of English ivy secrete an acid that dissolves concrete or brick mortar are unfounded. However, root growth may enlarge cracks in supporting concrete or mortar so that it retains moisture. This. and the considerable weight of the vine, may accelerate deterioration of the supporting structure. Similarly, when these vines grow on wood support, their foliage reduces surface evaporation and drying of the support, encouraging growth of wood-rotting fungi.

Some of the climbing aroids (members of the Araceae) produce a single large aerial root at each node, and on the opposite side of the stem from the leaf base. This root is often large, unbranched, and may enter rock. crevices, decaying bark, or even twine about a supporting plant. Where abundant in the forest they may form an almost impenetrable jungle. Similar aerial roots are produced in abundance by some species of *Ficus,* Hoya, Piper and other climbers.

A second and larger group of climbing plants includes those whose support is produced by tendrils or leaves; they are sometimes called tendril climbers or leaf climbers. For the most part. they are plants of temperate and subtropical regions. A tendril is a slender whip- or threadlike strand, produced usually from the node of a stem. by which a plant may climb. Its anatomy may be of stem tissue or of leafstalk tissue. Common examples of tendril-producing plants are the grape (*Vitis*) and members of the squash or melon family (Cucurbitaceae).



EDGAR AUBERT DE LA RÜE

WOODY LIANA ENCIRCLING A TREE IN A SOUTH AMERICAN **RAIN** FOREST

Tendrils are prehensile and sensitive to contact. When stroked lightly from the lower side, the tendril will, in a minute or two, curve toward that side. As it brushes against an object, it turns toward it and—shape of the object permitting—wraps about it, clinging for as long as one side is stimulated. Later. strong mechanical tissue (sclerenchyma) develops in the tendrils.

In some tendril climbers the portion of the tendril between the support and its point of origin from the plant become coiled. the direction of the twist being reversed in the middle. This coil acts like a spring. protecting the plant from sudden tearing from its support by strong winds or other forces.

Leaf climbers are those in which support is gained by the coiling action of the leaf petiole. as in *Clematis,* the common nasturtium (*Tropaeolum*), *Maurandia* or *Solanum jasminoides.* A different type is that in *Gloriosa* and *Littonia* (members of the Liliaceae) where the terminal third of the leaf is reduced to a tendril (the leaf described as cirrhose). Some plants having pinnately compound leaves (pairs of leaflets along a rachis or axis) are leaf climbers because the blades of some leaflets are transformed into hooks or tendrils. The common rattan used in chair caning comes from such a plant—a climbing palm belonging to the genus Calamus, where the modified hooked leaflets are two to four inches long. woody, viciously sharp. bent acutely backward enabling the plant to climb long distances over other vegetation. In the garden pea (*Pisum sativum*) some of the lower leaflets become twining tendrils.

Twining plants climb by winding their stems around suitable supports. Twiners generally possess slender stems and long internodes. They differ from nontwiners in that they show circumnutation. a condition where the stem apex. because of a regular cyclic variation in the rate of growth of its different sides, executes a circling movement in the air under the influence of gravity. This rotating movement increases the chances of contacting a suitable support. The stimulation resulting from contact causes the stem to wind around it in loose coils.

The spiral formed may be right-handed (dextrorse. "with the sun") or left-handed (sinistrorse, "against the sun"), directions more often expressed as "clockwise" or "counterclockwise." Unfortunately. authorities have not been consistent when applying these terms and there is ambiguity and discrepancy in their usage in the older literature. This came about because a plant, or at least its axis. having no front or back, can have no right or left of its own; the relations of direction must refer to the right and left of an observer. All depends upon the position of the observer when he determines the direction the helix turns. Linnaeus supposed observation of the coil from the inside. Most English-speaking botanists consider a left-hand coil (clockwise) to be one turning from the right of the observer to his left or, if looked down on from above! in the same direction as would move the hands of a clock that faced upward.

Examples of dextrorse twining are to be found in the hop (*Humulus*), and of sinistrorse twining in the bean (*Phaseolus*), and the morning-glory (*Ipomoea, Convolvulus*).

Tropical **Lianas.**—Climbing plants reach their extreme development in the rain forests of the tropics where three factors contribute to their competing successfully over other vegetation types: abundant moisture, high temperature and low light intensity. Abundant moisture is present throughout the year. High temperature contributes not only to growth acceleration but assures a high humidity in the air beneath the forest canopy. Low light intensity is associated with stem elongation, a character inherent in lianas. Under these conditions tropical lianas become a dominant component of the understory of a rain forest. The number of kinds of plants contributing to this vegetation type is estimated at 2,000 or more.

Botanical families. such as the Illenispermaceae. Vitaceae, Araceae. Bignoniaceae. Malpighiaceae, Leguminosae and Sapindaceae are rich in lianous species. *See* also Ivy.

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LIANG CH'I-CH'AO (1873–1929), Chinese scholar, literary journalist and political figure. was born near Canton on Feb. 23, 1873. He became a disciple of the scholar K'ang Yu-wei (*q.v.*), who invoked the Confucian classics, in novel and imaginative fashion. to sanction sweeping innovations in Chinese culture along generally western lines. China's humiliating defeat by Japan (1894–95) brought K'ang's constitutional-monarchist reform group into prominence. and Liang's brilliant editorial activity was influential in ushering in the Hundred Days of Reform (summer 1898). These ended with the *coup d'état* of the empress dowager, who placed K'ang, Liang and others under sentence of death. Liang fled to Japan and remained out of China until 1912, after the establishment of the republic.

As a founder of the Chinputnng (Progressive party) Liang sided with Pres. Yüan Shih-k'ai against Sun Yat-sen's Kuomintang. but Liang was a leader of the successful resistance to Tiian's imperial ambitions (191j–161. Thereafter Liang's political influence was negligible (though his advocacy of China's entrance into World War I was persuasive). In the 1920s he reached the peak of his eminence in formal scholarship. but his general intellectual influence n-as never again so pervasive as in his years of Japanese exile. tn-o decades before. when his \vide-ranging, styli-tically brilliant, iconoclastic and nationalistic journalism powerfully affected a whole generation. In all his intellectual activity. though with different emphases in different periods, he sought to interpret the past and prescribe for the present in such fashion as to preserve a sense of Chinese continuity while appreciating the force of n-estern influence on all of modern culture. Liang died on Jan. 19. 1929.

Among Liang's chief works available in English are *History of Chinese Political Thought During the Early Tsin Period* (1930) and *Intellectual Trends* in *the Ch'ing Period* (1644–1911) (1959).

See Joseph *R.* Levenson. *Liang Ch'i-ch'ao and the Mind of Modern China* (1953; rev. ed.. 1959). (J. R. Lr.)

LIANG SHIH-YI (1869–1933), Chinese statesman. was born in Samshui, near Canton. and, unlike many other Chinese leaders of his time. n-as educated wholly in China and knew no other language than his own. Graduating with honours in classics. he was appointed secretary to Tang Shao-yi when that statesman led a mission to India in 1906, and then began a successful career in the civil service. He was appointed director of railways and assistant director of the Chiao T'ung bank in 1907, acting director of imperial Chinese posts in 1911, acting minister of communications in 1912, acting vice-minister of finance in 1913 and a member of the council of state and director-general of customs and taxes in 1915. The failure of Tiian Shih-k'ai's monarchical *coup d'état,* of which he was one of the supporters, compelled him to resign, but in 1918 he became speaker of the senate. Throwing in his lot with Chang Tso-lin in the contest between the latter and Wu Pei-fu, he became prime minister on Dec. 24, 1921. The defeat of Chang, however, resulted in his fall, and he left Peking in 1922 to escape Wu's vengeance and retired from active politics.

LIAONING (LIAO-NITG SHENG), the southernmost province of the Manchuria region, north China. The area was variably organized as the region of early Chinese settlement in Rfanchuria. Known as Shengking during Manchu times. the area was redefined in 1903 and named Feng-t'ien. In 1928 the boundaries were altered and the name Liaoning applied. From 1949 to 1954 there were two provinces. Liaohsi and Liaotung. In 1954 a northern zone was detached, and a single province was renamed Liaoning. to which a portion of Jehol was added in 1956. giving an area of 58.301 sq.mi. Pop. (1957 est.) 24.090.000.

A long occupied zone with a heavy agricultural population, the staple crops are soybeans, sorghum, millet and maize. plus the Manchurian production of cotton. tobacco, fruit, castor beans and silk. The area from Dairen to Mukden (*qq.v.*) is the second ranking industrial zone of China. with heavy urban concentrations around Mukden. Fu-sung, Pen-ch'i and An-shan. Coal, iron ore, synthetic petroleum. ferro-alloys, and nonferrous and refractory minerals provide the raw materials for a highly developed heavy industrial complex begun under Japanese control, but greatly expanded since 19jo. *See* MANCHURIA. (J. E. Sr.)

LIAO-YANG, a Chinese city located 3j mi. south of Xlukden in Liaoning province, southern Manchuria region. Pop. (1956 est.) 160.000. Liao-yang is an early Chinese settlement site. and was the easternmost of the five imperial capitals set up by the Turco-Mongol Ch'i-tan people. who founded the Liao dynasty in the 10th century. In later centuries the city was often a regional capital. Liao-yang is situated in the valley of the Liao river and resembles other old Chinese cities rather than the newer industrial cities of Manchuria. The region around Liao-yang is an important producer of such staple crops as sorghum, soybeans and wheat, and also notable for cotton, fruit and silk.

1h e city. a regional transport and trade centre: is located oh the main rail line leading from Mukden to the port of Dairen. It did not become one of the early centres of modern industry as its surrounding area lacked mineral resources. Some light industry and cotton milling developed there. but Liao-yang was surpassed and overshadowed by the growth of nearby industrial centres An-shan, Fu-sung and Illukden. The Chinese Communists stimulated the development of light industry and agricultural processing and, in the late 1950s, the city began to change its functions and to grow in population as a suburban satellite of Mukden. For the battle of Liao-yang *see* RUSSO-JAPANESE WAR. (J. E. Sr.)

LIAPCHEV, ANDREI (1866–1933), Bulgarian statesman. was born on Nov. 30. 1866. in the town of Resen, Macedonia. He received his secondary education at Monastir, Salonika and Philippopolis and his university education at Zürich. Berlin and Paris. As a student he took a prominent part in the movement for the unification of Bulgaria and Eastern Rumelia of 188;. After editing. jointly with D. Rizov. the papers *Christo Botev* and *Young Bulgaria,* he founded and edited the *Reforms,* a paper expounding the cause of Macedonia. In 1896 he joined the staff of *Zname* and later that of the *Priaporets,* the organ of the Democratic party. of which he eventually became editor.

An eminent economist and financier, Liapchev took particular interest in the co-operative movement of which he was a pioneer. and was regularly elected to the post of president of the Supreme National Co-operative council. For many years, until his appointment as prime minister in 1926. he was also president of the Union of the Popular Co-operative banks.

Liapchev sat in parliament almost uninterruptedly after 1908. He held successively the posts of minister of agriculture and commerce and minister of finance in Aleksandr Malinov's Democratic cabinet of 1908–11. The treaty of Bulgaria's independence was signed by him at Constantinople in 1908; he also concluded the armistice at Salonika in 1918 after the collapse of the Bulgarian front in Macedonia. After occupying for several months the finance ministry. he took in Nov. 1918 the ministry of war, being the first civilian in Bulgaria to hold that post. He was imprisoned by Aleksandr Stamboliski in 1922, together with many other states-

men of prewar days, whose elimination from political life was aimed at. His release from prison came with the coup *d'ttat* of June 9, 1923.

Liapchev became chairman of the governmental majority in the parliament elected after the downfall of Stamboliski. On Jan. 3. 1926, he succeeded Aleksandr Tsankov as premier. He shared with his predecessor and Atanaz Burov the leadership of the Democratic union, the party founded after June 9 by fusion of several party groups. He was premier until 1931.

The policy of appeasement and conciliation in internal and Balkan politics pursued by Liapchev inspired confidence in Bulgaria abroad and helped to secure financial assistance from the League of Nations for the settlement of the refugees and for the financial and economic reconstruction of Bulgaria. He died in Sofia. Bulg., on Nov. 6, 1933.

LIARD, a river of northwest Canada, 755 mi. long, rises in the Pelly mountains, Yukon territory, and flows southeastward into British Columbia, then northeastward to its confluence with the Mackenzie river at Fort Simpson. Its upper course is characterized by rapids and canyons; its lower course is navigable to Fort Liard. Part of the valley is followed by the Alaska highway. Major tributaries are the Frances, Hyland, Coal, Dease, South Kahanni and Fort Nelson. Its name derives from the poplars (Fr. *liard*) along its course. (B. V. G.)

LIBANIUS (A.D. 314–393), Greek sophist and rhetorician, was born at Antioch, the capital of Syria. He studied at Athens, and spent his earlier manhood in Constantinople and Nicomedia. His private classes at Constantinople were more popular than those of the public professors, who had him expelled c. 346 on the charge of studying magic. He moved his school to Nicomedia, where he remained five years. After another attempt to settle in Constantinople, he finally retired to Antioch (354). Though a pagan, he enjoyed the favour of the Christian emperors. Among his pupils were John Chrysostom. Basil (bishop of Caesarea) and Ammianus Marcellinus. His works, consisting chiefly of orations (including his autobiography): declamations, letters, life of Demosthenes and arguments to all his orations are voluminous. He devoted much time to the classical Greek writers, and had a conteinpt for all things Roman. His speeches and letters throw considerable light on the political and literary history of the age.

Editions: Orations and declamations, J. J. Reiske *(1791–97)*; letters, J. C. Wolf (1738); two additional declamations. R. Forster (*Hermes,* ix, *22,* xii, 217), who published in the "Teubner Series" a complete edition, *12* vol. (1903–22); *Apologia Socratis,* Y. *H.* Rogge *(1891).* See also *G.* R. Sievers, *Das Leben des Libawius* (1868); R. Förster, F. *Zambeccari und die Briefe des Libanius* (1878). *See* further *J.* E. Sandys, *Hist. of Classical Scholarship,* 3rd ed. *(1921).*

LIBATION, an offering made by pouring out some liquid (Gr. *spondee;* Lat. *libatio,* or more commonly *libamen,* "a drink-offering"). This was done in making a treaty (hence the Greek word for a truce. *spondai*), but from the *Iliad* it appears that this was not properly, or not solely, an offering, but rather the gesture accompanying a conditional curse, for the people pray that the brains of violators of the treaty may "be spilled on the ground like this wine." Libations were also mentioned by, *e.g.,* Aeschylus. in the ritual of the dead) but here the word is *choai.* They were common in the worship of the gods. alone or as an accompaniment to a more elaborate sacrifice: and are found in both Greek and Roman rituals. public and private. (H. J. R.)

LIBBY, WILLARD FRANK (1908–), U.S. chemist whose technique for determining the age of archaeological specimens by radiocarbon dating (*q.v.*) won the 1960 Nobel prize for chemistry, was born on Dec. 17. 1908, in Grand Valley. Colo. He received B.S. and Ph.D. degrees in chemistry from the University of California at Berkeley in 1931 and 1933 and taught chemistry there from 1933 until 1945. In 1941–45. while a member of Manhattan project of the U.S. corps of engineers, he helped develop the gaseous-diffusion method of separating isotopes of uranium. From 1945 to 1959 he was a member of the Institute for Kuclear Studies and the department of chemistry of The University of Chicago. During this period he and his students developed and applied the carbon-14 dating technique and made notable contributions to radiochemistry and to electron exchange reactions in aqueous solution. In 1955 Libby became a member of the U.S. Atomic Energy commission and served until 1959, when he became professor of chemistry at the University of California at Los Angeles.

He was a fellow of the Guggenheim Memorial foundation in 1941 and 1951, and won the following awards: Research Corp. award, 1951; Chandler medal of Columbia university, 1954; Willard Gibbs medal, 1958; Albert Einstein award, 1959. His publications include the book, *Radiocarbon Dating,* 2nd ed. (1955).

LIBEL AND SLANDER. The law recognizes in every man the right to have his reputation unassailed by false and defamatory imputations. A defamatory imputation is one which tends to lower a man in the estimation of right-thinking men, or cause him to be shunned or avoided, or expose him to hatred, contempt or ridicule. Such imputation, if conveyed by written or printed words, or by picture or effigy or by means of broadcast, is called libel; if conveyed by mere spoken words, or by significant looks, signs or gestures, is called slander.

The difference, then, between libel and slander is to be found in the medium through which the defamatory imputation is conveyed to the mind of the reader or hearer. It is transitory in slander; it is more or less permanent in libel. The difference is important, for in England an action for libel will lie without proof of special damage, whereas an action for slander will not lie unless damage can be proved, except in the four following cases: (1) where the words impute a crime punishable corporally (*e.g.,* by imprisonment) ; (2 j where the words impute a contagious or infectious disease; (3) where the words are calculated to disparage the plaintiff in any office, profession, calling, trade or business, whether or not the words are spoken of him in the way of his office, profession, calling! trade, or business; (4) where the words impute unchastity or adultery to a woman or girl. (For distinctions in U.S. law, *see* below.)

Before Oct. 1952, there was known to the law a proceeding called an "action on the case for words." This included actions for "slander" (using that word to include any kind of defamationj of title. goods or other malicious falsehood. No such action lay without proof of special damage. Later, however, by virtue of the Defamation act, 1952, s. 3, special damage need not be alleged or proved in any such action if (a) the words are calculated to cause pecuniary damage and are published in writing or other permanent form, or if they are broadcast; or *(b)* are calculated to damage the plaintiff in respect of any office, profession, calling, trade or business carried on by him at the time of the publication.

The origin of the distinction between slander and libel is to be found in the different histories of the remedies for the two wrongs. The reason usually advanced for the distinction is that a greater degree of mischief is probable in the case of a libel than in the case of a slander because of the more durable publicity of libel and the fact that it can be more easily disseminated.

It is immaterial whether the defamatory imputation is conveyed by words of assertion or suggestion, or whether it is conveyed by words used in a declarative or interrogative form. Insinuation may be as defamatory as direct assertion, and sometimes even more mischievous. The effect is the criterion. The libeller cannot defame and escape the consequences by any dexterity of style. There are no words, however serious on the face of them, which may not be explained away by evidence that in the particular circumstances of the case they were not understood in a defamatory sense, but by way of jest, or in a secondary and innocent meaning. Conversely. words in themselves apparently innocent. may. with reference to certain circumstances and to persons knowing those circumstances, be shown to have been understood in a secondary and defamatory meaning. In such cases the plaintiff must make the defamatory sense clear by an averment in his pleading, called an innuendo, and must prove the facts necessary to satisfy the jury that the words were understood in the defamatory sense averred

It is for the jury, not the judge. to determine nhether the words are defamatory Libel or no libel is of all questions peculiarly one for a jury. It is the duty of the judge to tell the jury what in law is a libel, and then leave it to them to decide whether the

particular words complained of fall within that definition or not. Where, however, the judge is of opinion that the words are incapable of any defamatory meaning, it is his duty to direct the jury as a matter of law to find that there is no libel. *(Capital and Counties Bank* v. *Henty* [1882] 7 app. cas. 741.) But he should only do this when he is satisfied that a finding by the jury that the words are defamatory would be set aside as wholly unreasonable *(per* Kelly, C. B., in *Cox* v. *Lee* [1869] L.R. *4 Ex.* 284, at p. 288). The test is: Would the words tend to lower the plaintiff in the estimation of right-thinking members of society generally *(Holdsworth* v. *Associated News* [1937] 1 All E.R. 872)?

It is immaterial whether or not the defendant intended the words to be defamatory. The question is not what the defendant intended the words to mean but what reasonable men! knowing the circumstances in which the words were published, would understand to be their meaning (*Hankinson* v. *Bilby* [1847] 16 M. and W. 492). A person charged with libel cannot defend himself by showing that he intended in his mind not to defame, although he may properly urge such fact in mitigation of damages.

At common law it is immaterial whether or not the defendant intended to refer to the plaintiff (*Hulton & Co.* v. *Jones* [1910] A.C. 20), but the rigour of this rule has been materially diminished by s. 4 of the Defamation act, 1952, the short effect of which is as follows: One who has innocently defamed another by publishing derogatory words may make an offer of amends. He is "innocent" if he did not intend to publish them about that person and did not know the circumstances in which they might be understood to refer to him; *or* if the words were not defamatory on the face of them, and he did not know the circumstances in which they might be understood to refer to him; and, in either case, if he exercised all reasonable care in relation to the publication. The offer of amends must include an offer to publish a correction and an apology and to take steps to notify persons in possession of copies of the defamatory matter that the words are alleged to refer to the plaintiff. The offer must be accompanied by an affidavit of the facts relied on to show that the publication was innocent as regards the party aggrieved. An accepted offer constitutes a defense to an author and to a publisher if he proves that the words were written by the author without malice.

An action cannot be maintained for libel unless there has been a "publication"; *i.e.*, a making known of the defamatory matter to some person other than the person of whom it is written. A man's reputation is not the good opinion he has of himself but the estimation in which others hold him. So in the case of slander the words must be uttered in the presence and hearing of some third person. If they are uttered in the presence and hearing of the person slandered only there is no publication, and therefore no action will lie.

It is not, however, necessary in every case to prove directly that the defamatory matter was brought to the actual knowledge of some third person. If facts are proved from which such inference can be reasonably drawn a prima facie case will be established. For example, proof that a letter was posted is sufficient prima facie evidence that it reached the addressee. and of a publication to him. Similarly. if a libel be written on the back of a postcard and then sent through the post the court will presume, in the absence of evidence to the contrary, that others beside the person to whom the postcard is addressed: *e.g.*, employees of the post office, will read, and have in fact read, it (*Huth* v. *Huth* [1915] 3 K.B. 32).

If A writes a letter defamatory of B and sends it to B and the letter is opened and read by C. A is not responsible for the publication to C unless it can be proved that A knew that the letter would be likely to be opened and read by some person other than B; *e.g.*, that A knew that B was blind or could not read *(Powell* v. *Gelston* [1916] 2 K.B. 615).

A husband is civilly liable for a libel or slander published by his wife, even though she is living apart from him under a deed of separation. But he is not liable ior a libel or slander published by her after the granting of a decree of divorce or judicial separation. A master is civilly liable for a libel or slander published by his servant in the course of his authorized employment, even though he was expressly forbidden to publish any defamatory matter (*Citizens' Life Assurance Co.* v. *Brown* [1904] A.C. 423).

Every republication of defamatory matter gives rise to a fresh cause of action. It is no defense to the republisher of a libellous letter that he received the letter from another and believed the statements contained in it to be true. So in the case of a slander it is no defense to a person who has repeated a slander that he did not originate it. but only repeated what some other person had told him. The existence of a slanderous rumour is no justification for repeating it.

A person who utters a slander or publishes a libel is not responsible for any mischief caused by its repetition or republication save in the following cases: (1) where he authorized or intended the person to whom he published the words to repeat or republish them; (2) where the repetition or republication of the words was the natural and probable result of the original publication: (3) where the person to whom the words were published was under a legal or moral duty to repeat or republish them (*Speight* v. *Gosnay* [1891] 60 *L.J.*. Q.B. 231).

Where a libel is contained in a newspaper the author of the libel, and the proprietor, printer, publisher. editor and vendor of the newspaper are prima facie liable for the damage caused by it, and any or all of them can be made defendants in one action. The vendor, however, will escape liability if he can prove that he did not know that the newspaper—and the same rule applies in the case of a book—contained. or was of a character likely to contain, a libel, and that such ignorance was not due to any negligence on his part. But the burden of proving this fact lies strictly on him, and the question of publication or nonpublication in such a case is one for the jury. In the case of a book the jury may rightly infer that the vendor was negligent in not knowing that the book contained libellous matter from the title or general nature of the book itself, or from the recognized propensity of the author or publisher to publish libellous matter. But in the absence of such evidence the mere fact that the vendor did not have the book read through before he offered it for sale is not in itself evidence of negligence (*Welldon* v. *Times Book Club Ltd.* [1911] 28 T.L.R. 115).

The plaintiff in an action for libel or slander need not prove that the words are false, for the law presumes this fact in his favour. Nor need he prove malice on the part of the defendant. When a man says or writes anything defamatory of another he is assumed to do so maliciously. The law presumes malice from the defamatory nature of the statement, unless the occasion on which it is made is what is termed a privileged occasion, in which case the plaintiff must, in order to succeed, prove that the defendant was actuated by malice *(see* below). Nor need the plaintiff prove that he has suffered any damage as the result of the words complained of—except in the case of slander not falling within one of the four heads above-mentioned—for the law presumes such damage without proof.

There are several defenses open to a defendant in an action for libel or slander. He may contend that there has been no publication of the words, or that the words published are not defamatory, or do not refer to the plaintiff. Where special damage is an essential element of the action—as in the case of slander not falling within one of the above four heads—he may contend that no such damage has been suffered by the plaintiff, or that such damage. if any. is too remote. He may also rely on one or other of the following defenses.

Justification.— To succeed in this defense the defendant must prove that the words used are substantially true. A slight inaccuracy as to some detail will not prevent his succeeding if such inaccuracy in no way alters the character of the imputation (*Edwards* v. *Bell* [1824] 1 Bing. 403). But if the words which the defendant cannot prove to he true materially aggravate the main imputation or insinuate some further charge in addition to it, the plaintiff will be entitled to a verdict (*Morrison* v. *Harmer* [1837]). The test always is: Would the words as published have a different effect on the mind of the reader from that which the actual truth would have produced *(Alexander* v. *North-Eastern Railway Co.* [1865] 6 B. & S. 340)? Where, however, an action is

brought in respect of words containing two or more distinct charges. a defense of justification does not fail by reason only that the truth of every charge is not proved if the words not proved do not injure the plaintiff's reputation having regard to the truth of the remaining charges (Defamation act, 1952, s. 5).

Fair Comment. — In order to establish this defense the defendant must prove (1) that the words are the expression of an opinion (not the allegation of a fact); (2) that they are the fair and honest expression of an opinion based on true facts; and (3) that the subject commented on is one of public interest (*e.g.*, the public conduct of a man who holds some public office, or a book issued to the general public, or a work of art publicly exhibited, or a play publicly performed). It should be noted that the comment must be both fair and honest (*McQuire* v. *Western* Morning News [1903] 2 K.B. 100, 110). The word fair refers to the language employed. The word honest refers to the mind of the critic.

Where an action is founded on words consisting partly of allegations of fact and partly of expressions of opinion. a defense of fair comment does not fail by reason only that the truth of every allegation of fact is not proved if the expression of opinion is fair comment having regard to the facts as proved (Defamation act, 1952, s. 6).

Absolute Privilege. — There are certain occasions on which public policy and convenience require that a man should be free from responsibility for the publication of defamatory words. even though he knew them to be false and spoke or wrote them with the express intention of injuring the plaintiff. Parliamentary, judicial and state proceedings are occasions of absolute privilege. No action will lie against a member of either house of parliament for defamatory statements made by him in the course of any parliamentary debate or proceeding, however injurious they may be. Statements contained in a petition addressed to parliament, or made by a person when giving evidence before a parliamentary committee, are absolutely privileged and so are parliamentary papers published by the authority of either house. No action will lie for defamatory statements made by any judge, juror, counsel, party or witness or even an interrupter (Farmer v. Hyde [1927] 1 All E.R. 773) in the course of any proceedings before a court of justice, nor for defamatory statements contained in any pleading, affidavit, proof of a witness, or other document properly used in the course of such proceedings. An absolute privilege also attaches to defamatory statements contained in any newspaper report of judicial proceedings in the United Kingdom provided that such report is both fair and accurate and was published contemporaneously with such proceedings (Law of Libel Amendment act, 1888, s. 1; Defamation act, 1952, s. 8). A similar immunity, resting also on grounds of public policy, is accorded to official statements made, and official letters written, by an officer of state in the course of the performance of his official duties, and to all acts of state and the official notification thereof in the London Gazette.

Qualified Privilege at Common Law. — There is a much larger class of occasions on which the interests of society require that a man should be protected in stating what he believes to be the truth about another, but only if he makes the statement honestly and not for any indirect or wrong motive. Such occasions are called occasions of qualified privilege, for the defendant is only entitled to protection if he uses the privileged occasion for the purpose for which it arose. He is not entitled to the protection of the privilege if he uses the occasion for some indirect or improper motive; *e.g.*, to gratify his spite against the plaintiff. The law makes the motive with which the occasion is used the true test of the defendant's liability.

The guiding principle by which occasions of qualified privilege may be ascertained was laid down by Lord Atkinson, in Adam v. Ward (1917) A.C. 309, as follows: "A privileged occasion is an occasion where the person who makes a communication has an interest or a duty, legal, social or moral, to make it to the person to whom it is made, and the person to whom it is made has a corresponding interest or duty to receive it. This reciprocity is essential."

A common illustration of privilege under this head is the character of a servant. The privilege which attaches to information given in answer to an inquiry as to a servant's character applies to every answer to an inquiry of a confidential nature made by a person who has an interest in the subject matter thereof; *e.g.*, an answer to the inquiry of a tradesman with regard to the credit or solvency of a person with whom the tradesman proposes to deal. The person, however, who makes the inquiry must have a legitimate interest in the subject matter thereof, not merely an interest which springs from idle curiosity.

There are some cases in which it is the moral duty of a man, unasked and of his own accord, to give information to another; *e.g.*, where a confidential relationship exists between them. The rule may be broadly stated as follows: a person who has information materially affecting the interests of another is entitled to tell that other what he knows with the honest purpose of protecting his interests, and if he does so with that honest purpose and in the full belief that his information is true, such communication, though volunteered and made to a complete stranger, is privileged (*Stuart* v. Bell [1891] 2 Q.B. 341).

Statements made by a man in the bona fide protection of his own interests, or in answer to an attack made upon him, are privileged, provided they are fairly relevant to the matter in hand (Adam v. *Ward* [1917] A.C. 309).

The scope of the defamatory matter must not exceed the exigency of the occasion. If a person on a privileged occasion goes into matters not in any reasonable sense germane to the subject matter of the occasion no privilege will attach to his statement in so far as such matters are concerned (Adam v. Ward, supra).

Similarly the sphere of publication must not extend beyond the exigency of the occasion. If a person transmits by telegram defamatory matter which would have been privileged if sent by letter the privilege is lost, for the defamatory matter is necessarily published to the clerks through whose hands the telegram passes and such publication is wholly unnecessary (Williamson v. Freer [1874] L.R. 9 C.P. 393). It would be otherwise if transmission by telegram was the necessary or reasonable course to adopt in the circumstances (Edmondson v. Birch & Co. [1907] 1 K.B. 371). So where a slanderous charge is unnecessarily made in the presence of persons who have no interest in the matter no privilege will attach thereto. But where a man, in making a statement on a privileged occasion, as a reasonable precaution and in order to protect his own interests, calls in some third person to hear what he says, the presence of such third person will not destroy the privilege.

Privileged Reports. — A report of judicial proceedings is privileged if it is fair and accurate and not published maliciously, although such report may contain matter defamatory of an individual. It is of great importance to the public that the proceedings of courts of justice should be universally known. The general advantage to the community in having such proceedings made public more than counterbalances the inconvenience to the private persons whose conduct may be the subject of such proceedings. It is not necessary that the report should be verbatim; an abridged report will be privileged, provided it gives a correct and just impression of what took place in court. But if the report is garbled so as to produce misrepresentation, or by suppression of some portion of the evidence has the effect of giving an entirely false impression to the prejudice of one of the parties concerned, it will not be privileged.

A report of the proceedings of either house of parliament is privileged, provided that it is fair and accurate and is not published maliciously.

Qualified Privilege of Newspapers. — At common law no reports other than reports of judicial and parliamentary proceedings were privileged; but by s. 4 of the Law of Libel Amendment act, 1888, a report published in a newspaper of the proceedings of a public meeting, or (except where neither the public nor any newspaper reporter is admitted) of any meeting of a vestry, town council, school board, board of guardians, board or local authority constituted by act of parliament. is privileged unless it is proved that such report was published maliciously. It is, however, provided that this section shall not protect (a) a defendant who was re-

quested, and who has refused or neglected to insert in his newspaper a reasonable letter or statement by way of contradiction or explanation of such report; (*b*) the publication of any blasphemous or indecent matter; (c) the publication of any matter not of public concern, and the publication of which is not for the public benefit.

Apart from the act just referred to, the publication of certain matter in newspapers is now privileged by virtue of the Defamation act, 1952, s. 7 and sched., provided it is for the public concern and is proved to be made without malice. The publication must also be for the public benefit. The "matter" here referred to may be divided into two classes: (1) statements which are privileged without explanation or contradiction; and (2) statements privileged subject to explanation or contradiction. To speak broadly Class 1 includes fair and accurate reports of proceedings in any dominion legislature, international or dominion court, court martial held outside the United Kingdom, or at any public inquiry in one of the dominions.

Class 2 includes a fair and accurate report of what takes place at a public meeting lawfully held, or the general meeting of a public company. It also includes a fair and accurate report of what takes place at any meeting — not open to the public — of any local authority or committee thereof; of justices not sitting in court; of a commission duly appointed to hold an inquiry by the crown, parliament or a local authority; or of any other tribunal, board, etc., functioning under an act of parliament. In an action for libel in respect of the publication of any report or matter referred to in Class 2 the plea of privilege is of no avail if it is proved that the defendant failed when so requested to publish a reasonable letter by way of explanation or contradiction, or has done this in a manner not adequate in the circumstances.

Apology. — An apology is no defense to an action for libel or slander, but may be given in evidence in mitigation of damages. To be effectual, an apology should not only be made promptly, but should amount to a full and frank withdrawal of the charges or suggestions conveyed, and contain an expression of regret that such charges or suggestions were ever made. It should be given a publicity equal to that oi the libel. If the libel appeared in a newspaper, the apology should be inserted in the same newspaper in as large a type and in as conspicuous a position as the libel, so as plainly to attract the attention oi readers to it.

In any action ior libel contained in a newspaper, it is a good deiense that such libel was inserted without actual malice and without gross negligence, and that before the commencement of the action, or at the earliest opportunity afterwards, the defendant inserted in such newspaper a full apology for the libel, or, if the newspaper in which the libel appeared was published at intervals exceeding one week, that he offered to publish the apology in any newspaper selected by the plaintiff. This deiense must be accompanied by the payment of a sum oi money into court by way of amends. otherwise it will be deemed a nullity.

Insurance Against Liability for Libel. — A man may insure against the risk oi being sued ior libel, unless at the time of the publication, he knows that the matter is deiamatory and does not reasonably believe that he has a good defense to any action brought upon it (Defamation act, 1952, s. 11).

Damages.—When sued for libel, a defendant may give evidence in mitigation of damages of the fact that the plaintiff has recovered damages or brought actions in respect of the same libel, or has agreed to accept compensation in respect of the publication (Defamation act, 1952. s. 12).

Criminal Law. — Libel is not only an actionable wrong; it is also a criminal offense punishable with fine and imprisonment. Slander is not a criminal offense, though the words uttered may come within the criminal law as being blasphemous, seditious or obscene.

But although libel is a criminal offense as well as an actionable wrong, a man whose private character has been attacked should not institute criminal proceedings unless the mords are of a kind calculated to provoke a hrcach of the peace. If be does so, the judge will direct the grand jury to throw out the bill of indictment and leave the prosecutor to pursue his civil remedy.

In a civil action the person defamed must, as we have seen, prove a publication to some third person, as without that there is no injury to his reputation. But in criminal proceedings this is not essential: it is sufficient to prove a publication to the actual person defamed provided the mords might reasonably tend to provoke him to a breach of the peace (R. v. *Adams* [1888] 22 Q.B.D. 66). Again, as we have seen, the truth of the matters charged is a complete deiense to a civil action for libel. But in criminal proceedings, until 1843, the fact that the words mere true was regarded as wholly irrelevant. No evidence was admitted of the truth of the matters charged, not even in mitigation of sentence. But now, by s. 6 of Lord Campbell's Libel act, 1843, the defendant is entitled to give evidence of the truth of the matters charged, but such evidence will not amount to a deiense unless it mas ior the public benefit that the matters charged should be published.

The proprietor of a newspaper is civilly liable for any libel which appears in its columns, even though the libel may have been published in his absence, without his knowledge and contrary to his express orders. Hut he is not liable to criminal proceedings in respect of any libel which appears in its columns ii he can prove that such publication was made without his authority, consent or knowledge, and did not arise from want oi due care or caution on his part (Lord Campbell's Libel act, 1843, s. 7).

Criminal proceedings will sometimes lie where an action will not. Thus it is a crime, though not artionable. to write and publish defamatory words of a deceased person, provided it is done with intent to injure and bring contempt on his posterity, and so provoke them to a breach of the peace (*R.* v. *Topham* [1791] 4 Term R. 126). So it is a crime, though not actionable, to write and publish words injurious to the reputation oi any class or body of persons (*e.g.,* the Durham police), provided that the words tend to excite the angry passions of the class or body libelled, or of the general public against the class or body libelled, anti so lead to a breach of the peace (*R.* v. *Osborne* [1732] 2 Swanst. 503, n.).

Scots Law. — The Scots lam of defamation differs in many respects from the English law in so far as questions of procedure and pleading are concerned, though the Defamation act, 1952, applies to Scotland subject to certain modifications (s. 14). To take one example: in Scottish practice the question of libel or no libel, in so iar as it is a question for the court only, is not left to be raised at the trial but is decided at the stage when the issues are adjusted by the lord ordinary. In so far, however, as the substantive law is concerned, the only differences between the two systems are that in Scotland (1) the law makes no distinction between written and oral deiamation, save that in an action for verbal injury it is not now necessary ior the pursuer to aver or prove special damage if the words used were calculated to cause him pecuniary damage (Defamation act, 1952, s. 14); (2) publication is not essential to found an action: a deiamatory letter sent to the person defamed, or a slander uttered in his presence only, entitles him to that element, at least, of damages which is called *solatium;* (3) a husband is not liable for deiamatory words published by his wife; (4) there is no criminal remedy for deiamation.

BIBLIOGRAPHY.—One of the earliest books on the subject is: Thomas Starkie, *A Practical Treatise on the Law of Slander and Libel* (1869). *See* also: W. Blake Odgers and Robert Ritson, *A Digest of the Law of Libal and Slander,* 6th ed. (London: 1929); Hugh Fraser, On *Libel and Slander,* 7th ed. by G. 0. Slade and Neville Faulks (London, 1936); C. C. Gatley, *Libel and Slander in a Civil Action,* 3rd ed. by Richard O'Sullivan (London, 1938), contains frequent reference to dominion and U.S. decisions, a full and accurate treatment of the subject of qualified privilege and a series oi precedents of pleading; W. Valentine Ball, *The Law of Libel and Slander,* 2nd ed. by the author and Patrick Browne (London, 1936), deals with the subject irom the point of view of those concerned with the press; Wilfred A. Button, *Principles of the Law of Libel and Slander,* 2nd ed. (London, 1946); G. Spencer Boner, *A Code of the Law of Actionable Defamation,* 2nd ed. (London, 1936) includes a comparison of English and Scots law of deiamation and sets forth the Roman law of defamation which is the foundation of the Scots law; Lord Halsbury and others, "Libel and Slander," *Laws of England,* Hailsham ed. (London, 1931–37). For the early history of the law of defamation *see:* F. Carr. "The English Law of Defamation, With Especial Reierence to the Distinction Between Libel and Slander," *Law Quarterly Review,* vol. xviii, pp. 255, 388; W. S. Holdsworth, "Deiamation in the Sixteenth and Seventeenth Centuries," *ibid.,* vol. xl, pp. 302, 397, and vol. xli, p. 13.

(C. **G.4.;** W. V. B.)

AMERICAN LAW

The law of deiamation in the United States is similar in basic outline to that of England, since both are derived from the English common law. But this similarity cannot be relied on as a guide in particular instances, ior the law in both countries has diverged from the common source.

Under the common law the truth oi a defamatory statement was a good defense in a civil action for libel but not in criminal proceedings. In England the common law rule has survived as to civil actions, but it has been modified by statute in criminal cases to the extent that the truth is a defense when it can be shown that it was published for the public benefit. The various states oi the United States are divided in their treatment of this subject, more or less, into three groups: (1) those where the truth is a complete defense in both civil and criminal actions; (2) those where the truth is never a deiense in either form of action unless puhlished with good motives and for justifiable ends; and (3) those which recognize the truth as a complete defense in civil actions but require the defendant to show good faith and a justifiable purpose in criminal prosecution.

Each state has, in fact, developed its own law of defamation through constitutional provisions, statutes, and court decisions. This variation in state laws was strikingly illustrated by the rulings of the courts in

68 lawsuits brought by a member of the U.S. congress for damages for statements alleged to be libelous which appeared in a syndicated column printed in 300 newspapers throughout the nation. In one group of states the courts agreed that the material complained of was defamatory per se, but in another group the courts dismissed the complaints on the ground that the same material was *not* defamatory per se. Moreover, the courts in the latter group arrived at the same conclusion through the application of widely different tests. In this connection it should be noted that in the United States the distinction between words which are defamatory per se and those which require proof of special damage applies both to slander and libel and not merely to slander as in England.

The law of defamation in the two countries has also diverged in other respects. In England slander is not a crime, while certain types of slanderous statements have been made misdemeanors by statute in some American states. In England the high court of justice has the power (exercised only in rare cases) to grant injunctions against the threatened publication of defamatory statements. In the United States the courts have taken the view that any prior restraint upon publication would violate the constitutional guarantee of freedom of the press and they have therefore declined to enjoin the publication of libel.

With the development of radio and television the distinction between slander and libel created a dilemma. How should defamation by radio be classified? Slander is much more limited in its scope and legal consequences than libel. This difference is due to historical accident, but the courts have rationalized it by saying that written defamation is more permanent and generally gets wider circulation than spoken slander and that it should therefore subject the offender to greater liabilities. But in the case of defamation by radio the situation was in large measure reversed. Words broadcast to millions of listeners obviously have an enormous potential for ruining reputations. Recognizing this, American courts have generally solved the problem by ruling that the reading of defamatory matter from a written manuscript is libel, but that the interjection of defamatory remarks extemporaneously is slander, although there is less agreement on the latter question. Some judges have taken the view, however, that the damage to the person defamed is the same whether the words are read or interpolated and that the same rules as to liability should therefore be applied.

Another legal problem has arisen out of the complicated nature of the U.S. broadcasting system. Several persons or agencies usually collaborate in the production of programs—script writers, advertising agencies and sponsors. Programs may be broadcast over one or more networks and be channelled through numerous local stations. Which of these participants in the process of broadcasting should be held liable for the damage done by defamatory statements and how should their liability be determined? The general trend of U.S. court decisions is to hold all who take part in the production and broadcasting of radio programs to the exercise of reasonable care to prevent defamatory matter from going out over the air. A few courts, however, lean to the stricter view that the owners of radio stations are absolutely liable for all defamation circulated through their facilities.

These and other phases of defamation by radio have been the subject of legislation in some states, but no agreement in state laws can be anticipated until a uniform code has been adopted throughout the nation.

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LIBERALE DA VERONA, ANTONIO (c. 1445–1526/29). a well-known Italian painter and illuminator, so called from his native city of Verona, where he is mentioned for the first time in 1465 Trained in Verona as a miniaturist and panel painter. he was influenced initially by Andrea Mantegna and by the Mantegnesque miniaturist Girolamo da Cremona, with whom he worked between 1467 and 1469 illuminating choir books for the monastery of Monte Oliveto in Tuscany. One of these is preserved in the sacristy of the cathedral at Chiusi. From 1470 till 1474 he was engaged on illuminations for the choir books of Siena cathedral, now preserved in the Piccolomini library there. He is last mentioned as being in Tuscany in 1476. Liberale's illuminations in the Piccolomini library are some of the finest and most ornate Italian miniatures of their time, and their calligraphic style and richly inventive imagery exercised a deep influence in Siena, above all on the paintings of Matteo di Giovanni and Francesco di Giorgio Martini. About 1488 Liberale returned to Verona, where he executed (c. 1490) some frescoes in the Cappella Bonaveri in Sta. Anastasia, and was assessed for taxation in 1492. An altarpiece in the Kaiser Friedrich museum, Berlin. dates from 1489. Two of Liberale's most important paintings are panels of St. Sebastian in the Kaiser Friedrich museum, Berlin, and the Brera gallery in Milan. A notable group of paintings also exists in the Castelvecchio museum at Verona, and a panel of the "Death of Dido" is in the National gallery, London. Though the "Lamentation Over the Dead Christ" at Munich reveals Liberale as a forceful and expressive artist, his panel paintings seldom approach the quality of his illuminations, and in his later works he degenerates into a flaccid style, which had some local influence but is otherwise of little account.

See R. Brenzoni, *Liberale da Verona* (1930). (J. W. P.-H.)

LIBERALISM. Liberalism is the creed, philosophy and movement which is committed to freedom as a method and policy in government, as an organizing principle in society and as a way of life for the individual and community. As a term it took its origins from the "Liberales." a Spanish political party in the early 19th century, but received its widest currency in the English language. As an idea and philosophy it predates its use as a term, and can be traced back to the Judaeo-Christian-Greek intellectual world, along with the idea of liberty itself with which it is closely linked.

Confusion of Terms.— Some of the confusions about liberalism arise from the various stages of meaning through which the term passed during a history of several centuries, and from the wide diversity of uses to which it has been put. There were in the second half of the 20th century a number of political parties, in Great Britain, Italy, Germany and elsewhere, called by the name of the "Liberal party" or some variant of it; there was a party of the same name active in the politics of New York state; and even a Liberal International which served as a clearinghouse for liberal political movements throughout the world. But while these parties expressed the liberal outlook, that outlook was not limited to them. Their emphasis was on an economic program and policy which minimized state intervention and control, and which sought to carry out the philosophy of economic freedom under the difficult conditions of modern industrial organization. They thus expressed the outlook of a liberal capitalism on the defensive against various forms of socialism and communism on one side, and against conservatism and the totalitarianisms of the right on the other. "Liberal" political parties tended thus in practice to be caught between the upper and nether millstones, and their appeal was for that reason constricted to a middle ground position.

Yet liberalism as a dynamic philosophy was not at the end of the road. Just as it had its modern origin in the revolutionary movements attending the emergence of the business class to power and enlisted the most radical energies of the 18th and 19th centuries, so it showed a capacity to absorb many of the ideas of the revolutionary movements which challenged that class. What gave it this resiliency was its master idea of freedom as a method and a credo, this master idea being one of the great seminal revolutionary ideas of world history, not limited to any one economic program nor to the social power of any one class.

Liberalism is thus a basic approach to individual and collective living in the modern world. Its locus has been largely the west, since it has come out of the intellectual and institutional history of the great western nations. Its golden age may be dated roughly between 1750 and 1914; *i.e.,* between the era of the French *philosophes* and the start of World War I. But there is nothing inherent in it to limit it thus either in time or place. It proved pervasive enough to penetrate to some degree into every 20th-century society and social climate. It was associated with revolutionary movements in England. France. Germany and Italy. but it was also an active force in tsarist Russia, opposing both tsarist reaction and communist totalitarianism. It became a force in political systems as diverse as post-World War II Japan. Israel, Turkey, Greece and a number of Latin-American nations. It was an ingredient (the extent of which was widely debated) in the democratic socialist movements of Great Britain, Germany, France, the Netherlands, Belgium, Austria and the Scandinavian

countries. and of the "welfare state" in the U.S. The term has also been applied to certain "liberal" elements of conservatism (as **m** the phrases "liberal Republicanism" or "liberal Toryism"), and to the internal struggles within the U.S.S.R. and the communist bloc. as in the phrase "liberal Communist elements."

History. — In its history as an idea liberalism is closely linked with the idea of liberty or of liberation, since the essence of the liberal idea is to aim at freeing — and thereby expressing and fulfilling — the human spirit in the individual. The idea can be pushed back to Socrates and his quiet insistence on holding to his truth even at the cost of his life. But it was the Stoics who. in an era of expanding world horizons. were able to break away from the idols of the organic tribe or city-state and universalize man as an individual, as something apart from his civic pattern. It was Christianity which, by giving a religious sanction to man's dignity as an individual: gave the movement to fulfill it a passionate quality.

In the early phases of modern Europe such 17th-century thinkers as Descartes, Milton and Spinoza served as the conduits through which the long-preparing stream of liberal thought came into European experience. Descartes shaped the instrument of rationalism: Spinoza forged the links between the life of reason and the values of an emerging liberal outlook; and Milton directed powerful assaults on the repressive engines of censorship. which kept men from access to what might be the liberating truth. Together they applied to everything, including the powerful institutions of state and religion. the shattering method of critical inquiry. The way had indeed been prepared for them by the Protestant Reformation. which stressed the role of individual private judgment even in religious concerns. But far more powerful was the scientific revolution. whose preparatory phase was the Renaissance. opening new vistas of time and place and turning men from the next world to the present one. The grand centuries of this scientific revolution were the 16th and 17th, when man's growing knoll-1-edge and control of his environment and the rise of a new economic class to exploit it revolutionized the life claims and life prospects of the intellectuals in Europe and those in whose name they wrote and spoke.

All these streams of thought and tendency converged in the great explosive movement called variously the Enlightenment (*q.v.*) or the Age of Reason (in France the age of the *philosophes,* in Germany the *Aufklärung*), which spread throughout western Europe and even across the seas into the new world, and whose great voices were Voltaire. Locke. Goethe and Thomas Jefferson, Rousseau. I-Iume and Kant. Diderot. Lessing. Adam Smith and Giovanni Vico. Condorcet. Montesquieu and Benjamin Franklin. These were the miners and sappers of the intellectual and institutional life of a society of feudal ties, monarchical and church authority and aristocratic and clerical privilege. They also had the prevision of a new intellectual and cultural structure the outlines of which were still obscure because the political, economic and social cement necessary to build the structure and hold it together was still in formation. That cement was to come with the great political revolutions (the English, American and French. which took place within the century between 1688 and 1789) and with the rise to power of the new middle and business classes that used the revolutions to capture and consolidate their position. On their road to power they struck alliances — loose. often unconscious, but nonetheless real — with the intellectuals. each partner to the alliance using and being used by the other, and both of them helping to bring to fruition the master ideas of the liberal system of thought.

Leading Concepts. — To list some of these master ideas is an artificial process, since they were tied together in an ideological web, and each loses much of its meaning when torn from this web. Yet even a listing may suggest the richness of the intellectual armoury of liberalism.

Central to the whole is the idea of liberty itself — not absolute liberty ("No government allows absolute liberty," wrote Locke), but the maximizing of the individual's freedom to think. to believe, to express and discuss his views, to organize (associate) in parties, to find employment. to buy and sell commodities (including his own labour) freely and to keep the rewards. to choose his rulers as well as his form of government and to change both — by revolution. if necessary. So crucial is the idea of liberty that liberalism might be quite summarily defined as the effort to organize liberty socially and to follow out its implications.

As for where this right to maximal liberty comes from, liberalism's answer was nature. "The laws of Nature and of Nature's God." as Thomas Jefferson denominated them in the American Declaration of Independence, formed the true religion of liberalism. and on it they built what the 20th-century U.S. historian Carl Becker called "the heavenly city of the 18th-century philosophers." The 18th century carried on a love affair with nature. in religion,. law. politics, metaphysics and landscape painting. Rousseau in France and Locke in England were the principal 17th- and 18th-century protagonists of the idea that men had rights rooted in nature, which governments must protect and which must be defended even against government.

Bills of rights, petitions of right, declarations of the rights of man and of the citizen — these became the watchwords of the era. Since they were based on nature and in natural law, they were universalized, abstracted and made absolute — "indubitable: inalienable. and indefeasible." as the Virginia constitution put it in describing the natural right of revolution. Actually this notion of natural law came less from theology than it did from Sir Isaac Newton and his colleagues in the scientific revolution. who showed that the operation of the universe could be explained rationally in terms of the laws of nature without bringing in any external divine intervention.

As a result even God became nature's God, and religion was universalized into a deism, thus diluting the rigours of revealed religious certitude and emphasizing tolerance toward the variety of forms in which nature's God might be worshipped. The Renaissance. the scientific revolutions. the march of technology, the rising living standards, all contributed to a growing rationalism in thinking and attitudes and to a secularism of belief. The axis of men's concerns shifted from the next world to this one, and from what had been laid down by tradition in the past to what men could achieve for themselves in the present and future. In place of the idea of sin men began to talk of the idea of progress. in place of predestination they caught a glimpse of the vision of men's perfectibility. Everything seemed possible in the "best of all possible worlds." The test of institutions became the question not of whether they were in the service of God but whether they ministered to the happiness of men.

Armed with these weapons of secularism, progress and happiness, liberalism was able to turn a withering fire on institutions. "Man is born free." wrote Rousseau in the *Contrat social,* "yet he is everywhere in chains."! And in *Émile:* "God makes all things good; man meddles with them and they become evil." It was a basic assumption of the liberal thinkers that man is endowed with reason and goodness. and that only the institutional frame into which he is born corrupts and enslaves him. The enemy was custom. tradition, institutions, social habit. The French *philosophes,* the English utilitarians. the philosophic radicals. the Italian patriot-intellectuals were the "angry young men" of their time, blasting away at the establishment of their day — the church, the feudal order, the aristocratic classes, the dynastic state, the educational system, the censorship. Always they sought to lift from men what Jefferson called the "dead hand of the past."

If it was man's meddling with the natural order that caused all the mischief, then it follows that the best human course is to leave things alone. This powerful nexus linked the liberal intellectuals with the emerging business class. who wanted free markets. the removal of crippling restrictions upon economic activity and the chance to amass wealth and property.

But *laissez faire* (*q.v.*) in itself mas not the whole of the liberal program. To it was added republicanism. popular sovereignty and education — especially the last. The removal of governmental restrictions and the toppling of tyrannical institutions would provide the freedom for reason to function: but reason needed tools with which to function, and education would provide them. Since the liberals believed in man's goodness, they believed also in his per-

fectibility, and education was the instrument by which it could be furthered. Some of the more realistic liberal thinkers, however, saw the darker side of the moon as nell: that if men were by nature good, they were also ruled by ambition, greed for power and the political passions. Hence it was necessary to curb the majority will by a concern for the protection of minorities. And it was especially necessary to provide in government for the separation of powers (*q.v.*), so that the legislative and executive powers would not be fused into a single tyranny, and the judiciary could remain independent of both.

Thus the liberal image of the state came to mirror the equilibrium physics that the scientific revolution had made familiar. And the liberal image of the human mind came to stress the primacy of self-interest as a drive (egoism), the primacy of reason as an instrument (intellectualism) and the ultimate value of individual efforts toward self-realization (progress, happiness) or of individual nonefforts (laissez *faire,* quietism) in a state of nature.

Men had by the mid-20th century become more aware of some of the weaknesses of this liberal outlook that characterized the vanguard thinking of liberalism's golden age. They knew about its oversimplifications, about its atomism, its primitivism, its utopianism, its naive cults of nature, progress and happiness. But it is well to remember that in its emergence liberalism was an exciting new movement of thought that released the energies and enlisted the loyalties of men. For a historic moment they caught a vision of human possibility. and this vision armed them for their encounters with what they regarded as the powers and principalities of darkness.

The Battlefields **of** Liberalism.---These encounters were fought out chiefly on five national battlefields — Great Britain, France, Italy, Germany and the United States. In each country liberalism as a political and social movement took on the salient aspects of the national character.

Great Britain. — In Great Britain, the birthplace of modern liberalism, it moved from the revolution of 1688 to the 20th-century welfare state without grand generalized formulations, without sharp breaks and uith a minimum of violence; it moved mainly by gradual and piecemeal yet organic and continuous reforms, so that each generation absorbed the gains and victories of the previous one. In France the nobility fought tenaciously for its privileges, and the Bourbon monarchy — after making concessions to the revolutionary clamour — finally threw in its lot with the clergy and nobility and was overthrown; in England, on the other hand, from the time of Magna Carta, the aristocracy fought for its own privileges, which were then generalized into the liberties of all classes and men; it was able to retain its vigour through the 18th century and continued to absorb into itself elements from business, the professions and even some of the leaders of the labour movement. The English monarchy, after a futile effort under the Tudors and Stuarts to set up absolutism against the growing pressures for parliamentary rights, accepted its modern constitutional position as spokesman and symbol of the continuity of British history. This continuity was able to absorb the parliamentary reform acts, the religious toleration acts, factory legislation, free trade, educational reform and the transformation of the British empire into a commonwealth of federated autonomous states.

Many of these reforms were accomplished under the 19th-century Whigs and later under the Liberal leadership of William E. Gladstone and David Lloyd George; but some were accepted and even furthered under Tory governments, while some of the unfinished work of liberalism had to wait for Labour governments under the rubric of the initial work of democratic socialism. The moving spirits in the intellectual history of British liberalism, after Locke and Adam Smith, were Jeremy Bentham and the utilitarians; James Mill and his school of philosophic radicals; John Bright and Richard Cobden and the Manchester free-trade group; John Stuart Mill, who sought to develop a political and economic theory which would serve as a basis for the fulfillment of the individual within a social frame; the liberal philosophical school of T. H. Green and L. T. Hobhouse; and the sharply different school of Harold J. Laski, which set for itself the same goals as the liberals did but was contemptuous of liberal methods and called for socialist means to attain the humanist ends of liberalism.

It is uithin the British historical frame that the sequence of stages in the development of liberalism as a pattern of thought and social action can be seen with greatest ribbed clarity. The first stage. mainly one of intellectual preparation, was in essence a revolutionary one, justifying and even preaching the "natural right" of revolution, more so in the French setting than in the British. but uith some revolutionary elements in every national setting. The second stage was that of middle-class constitutionalism, which laid the foundations of representative government and established the dominance of the business middle class. The third, closely related to this, became known as "classical" liberalism. Its champions in England were the classical economists. from Adam Smith through David Ricardo, Thomas R. Malthus and Nassau Senior; its banners were those of laissez *faire*, free trade and the weak state. This stage in turn gave way to the stage of democratic liberalism, when laissez *faire* was replaced by a stronger and more affirmative state, when trade-union organization brought with it a shift of the class base for liberal militancy and when the emphasis shifted to mass education ("Now we must educate our masters," as the phrase went after the Reform act of 1832) and to economic security. This stage in turn developed into welfare (or social) liberalism, which operated with large-scale governmental intervention for social security and created the mixture of welfare capitalism and welfare socialism applying (with a differing emphasis on the ingredients) in the 20th century in most of western Europe and the United States.

France, Italy and *Germany.*—In the case history of French liberalism, the first stage was far more revolutionary than in Great Britain, and led to the "liberty, equality and fraternity" of the French Revolution, and the violence and bitterness as well as the sweeping reconstructions of that movement. In the first half of the 19th century the French experimented with middle-class liberalism, in the intervals of further revolution and reaction. With the advent of the third republic, Leon Gambetta became the spokesman for a democratic liberalism (the French came to call it, characteristically, "radical socialism"), as Alexis de Tocqueville had been its precursor, both of them affirming a faith in the inevitable triumph of the democratic mass through the leverage of political reform. Yet the history of French liberalism under the third and fourth republics was a stormy one, with its effectiveness largely crippled by governmental weaknesses and the slowness of constitutional reform.

In the Italian case the emergence of liberalism was almost wholly linked with the rise of the movement for national liberation and unity, and its champions were therefore Cavour, Garibaldi and Mazzini, especially the last, for whom the three basic pillars of liberalism were universal suffrage. free education and the security of having work to do. But there was no class base in Italy broad enough or strong enough to move from Mazzini's vision of a liberal democracy to the actuality of democratic liberalism, and Italy had to go through the bitter experience of class war, followed by a fascist interlude, before it could move toward a telescoped version of the democratic and welfare stage of liberalism.

The German experience was even stormier. National unification, when it came, carried with it an authoritarian monarchy; the middle-class and democratic phases of liberalism were elided (the German middle class supported the authoritarian state, as it later supported Nazi totalitarianism); the army caste and the big landowners proved to be reactionary forces; paternalistic welfare legislation was pushed through under Bismarck, in order to anticipate and defeat the emerging socialist energies; the Weimar republic, in the interval between World War I and Naziism, expressed a constitutional liberalism which lacked a strong leadership, a strong class base and a civil liberties tradition, and it fell victim to the Nazis In west Germany, after World War II, a liberal reawakening went along with an economic revival. The west Germans, who had borrowed the technology of the Industrial Revolution from the British without their accompanying liberal democracy, attempted to telescope into a brief period the historic phases leading to a democratic and welfare liberalism.

The United States. — In the case of the United States the ob-

stacles that loomed so large in the path of continental liberalism, especially in Germany and Italy, were largely absent. There were no feudal institutions to overthrow, no encrusted traditions, no entrenched landowning aristocracy or monarchy, no oppressive burden of clericalism. The revolution against British imperial controls, once achieved, laid open a path for U.S. development in its own terms. Born in the early centuries of the liberal impulse in Europe, and with its own characteristic institutions shaped during the liberal Enlightenment, the U S. became the most striking expression of a liberal government and society.

Since the United States is so largely a middle-class society, and since liberalism began and flourished mainly as a middle-class movement, it is not surprising that it should have found its greatest successes in America, from the middle-class liberalism of the constitution itself, through the democratic liberalism of Thomas Jefferson. Andrew Jackson and Abraham Lincoln and the progressive liberalism of Woodrow Wilson, to the welfare liberalism of Franklin Roosevelt and Harry Truman.

International Character.—To examine how the liberal movements fared in each of these major countries should not, however, obscure the fact that it was a broad movement of ideas and programs that cut across national boundaries. Its great landmarks were the English revolution of 1688, the American Revolution, the French Revolution, the failure of the 1848 revolutions on the continent (the failures in the history of liberalism are as important as the successes), the unification of Italy, the liberation of the serfs in Russia. the American Civil War, the victory of the Dreyfusards in France, the emergence of the British welfare state. the U.S. New Deal and the victory of civil rights in the supreme court school decision of *Brown* v. *Board of* Educatzon. Whenever in modern history and wherever in the world men have shown the capacity to act together to ensure the welfare of the many by methods that fortify the freedom of the individual and enable him to fulfill his potentials, there liberalism as a whole has won a victory. The U.S. experience, for example. came out of the liberal revolutionary energies of Europe, and its success in turn strengthened the liberal spirit in Europe and caught the imagination of the world. On the other hand, the persistence of the problem of Negro status in America, the cyclical fluctuations of prosperity and depression in the capitalist economies of the west, the failure of nerve on the eve of Italian and German fascism—these events cast doubt on the validity of the liberal idea and the survival value of its program.

Liberalism in the Second Half of the **20th** Century.—A number of 20th-century observers spoke at mid-century of the decline of liberalism, both as a system of thought and as an organization of government and society, but they may have been reading a funeral service over a corpse that refused to die. It might certainly be said that the classical and largely negative phases of liberalism had gone with the winds of history. What was not clear was whether this applied also to the democratic and welfare phases of the affirmative liberal state.

The central dilemma of liberalism is that it must emphasize the method of freedom, which tends toward the diffusion of the national energies and the fragmentizing of the collective purpose; at the same 'time it must compete with collectivist creeds and totalitarian systems for the allegiance of the world's uncommitted peoples. To meet this dilemma, 20th-century liberalism tended to make freedom responsible rather than anarchic; to move away from the relativism and pragmatism with which the later historical liberalism had been associated; to rekindle the fires of religious belief; and increasingly to invoke equality as a goal and slogan, as well as liberty. There were in the second half of the 20th century many liberals who would agree with Hobhouse's remark that "liberty without equality is a name of noble sound and squalid meaning" (L. T. Hobhouse, Liberalism, Oxford University Press, Inc., New York, 1911) Hence the emphasis on the economic and social context within which the struggle for freedom is set, and hence also the experiments with economic regulation and controls which made some of the champions of classical liberalism prophesy that democracy was traveling the "road to serfdom."

More striking than the signs of decline in liberalism was the fact that, in the face of battering from wars, depressions and the attack from totalitarianisms of the right and left, liberalism was able to survive as it had. It had to meet and absorb drastic changes within capitalism itself. It encountered communism, fascism and those intensely nationalist and antilibertarian internal movements which have been called the "radicalism of the right." It came under fire from the revolutionary nationalist movements of the middle east, the far east and Africa, which associated European and American liberalism with the imperalism of some of the western powers.

Its ordeal was all the more difficult because the fanaticisms which accompanied the various post-World War II independence movements everywhere more and more excluded any middle ground. This was particularly true of the colonial-nationalist movements in Africa and the middle east: in the name of liberation: in many instances, they inaugurated programs of racist chauvinism, economic constriction and political intolerance. Heirs to the liberation tradition of the west, they did not always apply it. Yet it was not clear whether these movements, even after the achieving of independence, might not have to grapple with the problems of freedom, and might not then have to rediscover some of the liberal solutions that had been slowly recognized, after centuries of political experiment and experience, and at a high cost in courage.

What still kept liberalism a viable system were some of the elements that made possible an open society and a relatively good life: the "career open to talent"; the principle not of equality as such, but of access to equal opportunity for all; the basing of decisions on consent, so that when crises come the people as a whole respond to them in a more organic way than the imposed response under totalitarianism; the winning of ever greater economic security without the sacrifice of freedom; the channeling of what might otherwise become deep class and social conflicts into political conflicts, whose results are accepted even in defeat; and finally, as at the start, the principle that every man has in him a potential which he must have a chance to fulfill.

See also DEMOCRACY; INDIVIDUALISM; NATURAL RIGHTS.

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LIBERAL PARTY, in Great Britain the lineal successor of the historic Whig party. (See WHIG AND TORY.) The party has always included various schools of thought, united only by a desire for progress toward emancipation. The following formulation probably covers all shades of Liberal opinion: liberalism is a belief in the value of human personality, and a conviction that the source of progress lies in free exercise of individual energy; it produces an eagerness to emancipate all individuals or groups so that they may freely exercise their powers, so far as this can be done without injury to others; 'it therefore involves a readiness to use the power of the state for the purposes of creating the conditions within which individual energy can thrive, of preventing abuses of power, of affording to every citizen the means of acquiring mastery of his own capacities and of establishing equality of opportunity. These aims are compatible with an active policy of social reorganization, involving a great enlargement of the functions of the state. They are not compatible with socialism, which, strictly interpreted, would banish free individual initiative and responsibility from the economic sphere.

The evolution from Whiggery to liberalism extended roughly from the year of Waterloo (1815) until the second half of the 19th century. Liberals and Radicals (see RADICAL) came into the house of commons to strengthen, and sometimes to become im-

patient with, the Whigs. After the Reform act of 1832 the Whig aristocrats may still have manned the ministries but Liberals and Radicals, composed of the industrialists, nonconformists, Benthamites and economists, were the driving force. By 1839 Lord John Russell repeatedly referred to "the Liberal party" in his daily letters to Queen Victoria. The history of the party in these years can be gleaned from the lives of its great political figures, Lord Melbourne, Russell and Lord Palmerston, and its ardent social reformers. such as Richard Cobden and John Bright. The foundations for later social reforms were laid in legislation covering factory employment, administration of the Poor law, public health and the police. The conversion of the party to free trade in 1846 under the pressure of the Anti-Corn Law league meant the downfall of protection.

The **Gladstone Period:** 1865–95.—A second period (1865–95) was the Gladstonian era, so dominated by the personality of William Gladstone that liberalism almost became Gladstonianism. In this period the catchword "peace, retrenchment add reform" pre-eminently expresses the character of Liberal policy. Gladstone was profoundly pacific: in a famous speech at West Calder (1878) he laid down the principles of foreign policy in terms that almost anticipated the ideas of the League of Nations. He and his foreign ministers strove to avoid foreign entanglements; "splendid isolrttion" became the note of British foreign policy. Nevertheless. Gladstone retained a passionate sympathy with struggling nationalities (*e.g.*, in the Balkans,. He had little interest in imperial affairs and distrusted the school of radical imperialists. represented in this period by W. E. Forster. Sir Charles Wentworth Dilke and Joseph Chamberlain. He disliked imperial expansion: held aloof from the race for African possessions; adopted a magnanimous but misunderstood policy of withdrawal in South Africa; and though he was drawn into Egypt, hated the entanglement and bungled the situation. In India, under Lord Ripon and Lord Lansdowne, the first steps were taken toward a system of self-government. Gladstone's main interests lay in finance. where he established exacting standards of economy under treasury control, and in constitutional reform. From 1868 to 1894 he was preoccupied with Ireland. where he strove to heal an age-long sore. This crusade aroused intense bitterness. It severed from the Liberal party most of the Whig aristocracy which had hitherto clung to it, who now united with the Radicals under Joseph Chamberlain (*q.v.*) to form the Liberal Unionist party which in 189j joined the Conservatives in a coalition (*see* CONSERVATIVE PARTY [BRITISH]). Gladstone was justified by events. however. One aspect of his Irish policy—the Land acts—involved a sweeping departure from *laissez faire* in the establishment of rent-fixing courts. The period of his dominance also saw the establishment of a national system of education (1870); the introduction of ballot voting (1872) and the enfranchisement of the agricultural labourers (1884); the legalization of trade unions (1871); a recoristruction of the army and the abolition of purchase of commissions; a complete reorganization of the judicial system: and the abolition of religious tests in the universities.

Before the end of the Gladstonian regime the long ascendancy of the Liberal party was waning. Apart from the short and embarrassed ministry of 1892–95, there was a continuous period of Conservative government from 1886 to 1905. A fresh inspiration was needed. An educated democracy was beginning to resent its position in the industrial order. The service of liberty demanded not merely the removal of restrictions, but the creation of positive conditions for the healthy development of individual faculty. The stir of ideas led. on the one hand, to a revival of socialism and to the organization of the Labour party. On the other hand, it brought about a steady change in the orientation of the Liberal party, and the third period in the history of liberalism (1895–1914) was pre-eminently a period of social reorganization.

1906–35.—In 1906—largely as a result of Chamberlain's challenge to free trade—the Liberals returned to power with an overwhelming majority, and the next eight years were perhaps the most strenuaus in the history of British politics. The whole period was overhung by the menace of Germany. and though Sir Edward Grey strove resolutely for peace, Britain was forced out of its traditional isolation and drawn into the vortex of European politics. At the same time a remarkable reorganization of the navy and the army was carried out—not without misgiving among the pacifist elements of the party. Without Lord Haldane's work in the creation of the expeditionary force. of the territorial army, of the imperial general staff and of the officers' training corps, Britain could not have played its part in the coming struggle. In imperial affairs the action of Sir Henry Campbell-Bannerman (who first gave currency to the phrase "British Commonwealth of Nations") in granting autonomy to the Boer states made possible the Union of South Africa and eased an ancient sore; in India the Morley-Minto reforms marked a long advance toward self-government. The self-governing members of the empire were drawn closely together—and in the series of conferences which began in 1907 their representatives were for the first time admitted to the arcana of foreign policy and imperial defense. and helped to reorganize their military system. But the main work of these years was one of social reorganization in a series of novel enactments which implied the adoption of a new view of the functions of the state. These enactments included universal workmen's compensation. a system of old-age pensions. state insurance against sickness and unemployment. the establishment of a network of labour exchanges. the institution of trade boards for the fixation of wages in sweated trades. the creation of a large system of small holdings! and the conferment upon municipalities of large powers and duties for housing and town planning. A system of progressive taxation of the rich. through graduated income tax, supertax and death duties. provided the money required for these measures. The taxation involved aroused bitter opposition. which culminated when the budget of 1909 not only tightened the screw at many points, but threatened an attack upon the existing land system through taxes on land values. Its rejection by the house of lords led to an acute constitutional crisis, which (after two general elections in 1910) brought about the destruction of the lords' veto by the Parliament act (1911). The first use made of this act was to pass a Home Rule bill for Ireland, against fierce opposition. At the same time a huge land campaign was in preparation. The Liberal party had never been more confident than in 1914, but the war and the events which followed shattered it. This sudden debacle is not difficult to explain. The party was hopelessly split when, in 1916, David Lloyd George displaced H. H. Asquith from the premiership, and when at the election of 1918 those who stood aloof from Lloyd George were displaced by the "coupon"—an endorsement given by the prime minister and Bonar Law. the Conservative leader, to candidates guaranteeing to support the coalition. The small remnant of independent Liberals were so obsessed by their grievance that they made themselves appear a querulous and negative party; they had no constructive policy to preach. and this was a grave weakness at a time when millennia1 expectations were being created and immense promises made to the electorate. After the breakup of the coalition in 1922, there were for a time two mutually distrustful Liberal groups in parliament. They reunited in 1923 to resist a new attack upon free trade, and returned as a solid body of 158. But they were substantially smaller than the Labour party, and with no party having a majority. their tactical blunder of throwing their support to Labour and putting that party into office without conditions ended in the disaster of the election of 1924, which returned only 40 members to the house of commons, though with 3,000,000 votes the party would on a proportional basis have had 110. Renewed internal dissension regrettably gave "a windy night a rainy morrow." On the occasion of reunion Lloyd George had created some bitterness by refusing to put into a common fund the large financial resources separately acquired by him in earlier years. The bitterness was intensified in 1926 when a difference between Asquith and Lloyd George in regard to the general strike of that year led to a formal excommunication of the latter, which the bulk of the party refused to accept. These dissensions were a formidable obstacle to the revival of the party.

The continued mental vigour of the party was indicated by the production of three reports. *Coal and Power* (1924); *The Land and the Nation* (1925); and *Towns and the Land* (1926). The

year 1927 saw an improvement in the party's position. By-election successes seemed to portend growing influence and, with Sir Herbert (later Viscount) Samuel in charge of the party organization, reunion was effected with Lloyd George and his followers. One of the first results was the setting up of a committee to advise on industrial policy which included such outstanding authorities as Sir Herbert Samuel. Walter (later Lord) Layton, J. M. (later Lord) Keynes and Philip Kerr (later marquess of Lothianj. The committee produced Britain's Industrial Future, often referred to as the Liberal yellow book, in Feb. 1928, and it may fairly be claimed that this report exercised far-reaching influence on the later political thought and action of all parties. In a sense it was a formal interment of *laissez faire,* though that doctrine had been extensively diluted in Liberal practice for nearly a century. The report represented an explicit acceptance of the responsibility of the state for the general control of the nation's economic life through credit and budget policy, and the national ownership of certain services or industries which both by the amount of capital they required and the number of men they employed were of primary importance in securing stability of employment.

In the general election of 1929, 59 of the 512 Liberal candidates were elected. The Labour party, with fewer votes than the Conservatives. had a majority of 26 seats over them, and took office with a promise from Lloyd George of support for measures which were not socialist in principle. In the short period before the collapse of the government and the formation of the national government in Aug. 1931 the unemployment problem overshadowed everything and the Liberal party was critical of the government's failure to produce a constructive policy.

In the national government the Liberal party was represented in the cabinet by Sir Herbert Samuel and the marquess of Reading, and in the government formed after the general election of 1931 Sir Herbert Samuel, Sir Donald Maclean, Sir Archibald Sinclair and Sir John (later Viscount) Simon were among those who held office. But the old fissiparous tendencies were again at work; Sir John Simon had already nailed protectionist colours to his mast, while the party as a whole remained inalterably attached to free trade. In the new house of commons Sir Herbert Samuel had a following of 33 and Sir John Simon of 3j. When in 1932 the government took steps, as it claimed the right to do by virtue of its possession of a "doctor's mandate" from the country, to introduce a general tariff Sir Herbert Samuel and his followers were pressed and consented to remain in the government, while being entitled, by a startling constitutional innovation, to speak and vote against protection. But there was no holding them when the Ottawa agreements, which appeared to set the seal upon protection, not as an emergency measure. but a permanent fiscal system, were signed. Sir John Simon and his Liberal Nationals remained within the government and thereafter his group played a role indistinguishable from that of the Liberal Unionists half a century earlier. The Liberal party did not go formally into opposition until the following year, when it was actuated by what it regarded as the government's complacent ineffectiveness in dealing with the enduring problem of unemployment. It was further critical of the government" failure either to secure any measure of general disarmament or to maintain parity of air power; it also doubted the sincerity of its devotion to collective security. But the apparently wholehearted acceptance of collective security and all that it implied in the way of sanctions against aggression carried the government back to power in 1935 with a vast majority; only 17 Liberals were returned to the house in the general election of that year. This resounding defeat was followed by a partial reorganization of the party machine and the institution of a democratic assembly of the rank and file.

After 1935.—Between 1935 and the outbreak of World War II, foreign affairs dominated the parliamentary scene. The Liberal party, having urged general disarmament until it was a lost cause, became ever more critical of a government which started by shocking public opinion with the draft Hoare-Laval proposals for ending the war in Abyssinia and then by a series of retreats before aggression effectively immobilized the League of Kations and abandoned collective security with no policy to put in its place. Under the leadership of Sir Archibald Sinclair, Liberals found themselves repeatedly in the same lobby as Winston Churchill in protest against failure to provide adequate defense forces. The Liberal party joined the coalition government of 1940, in which Sir Archibald Sinclair was throughout minister of sir.

After the defeat of Germany in 1945 the Conservative party insisted on an early general election and the Liberal party, after a long period of decline and five years of enforced passivity, could put only 307 candidates in the field, of whom only 12 were elected. The obvious determination of the electorate to pronounce against the Conservative party and the equally obvious fact that not enough Liberal candidates could be elected to govern told heavily against Liberalism; but it is noteworthy that 2,225,000 votes were cast for the cause in less than half the constituencies. And once again Liberal thoughts, expressed in Lord Beveridge's books on social security and full employment. had left an indelible imprint on both the other parties. In the new parliament Liberal members, acting in complete independence, gave general support to all progressive measures. while criticizing numerous legislative and administrative actions which seemed to them infringements of fundamental rights of the individual.

In 1946 the whole machinery of the party mas drastically overhauled and organization, though always hampered by want of money, was greatly improved. At the general election of Feb. 1950 the party put in the field a much larger number of candidates than at any time since 1929; more than 400 Liberals stood for parliament, of whom 9 nere elected. In Oct. 1951 only 6 Liberals were elected, getting 730,j51 votes out of 28,602,323 cast. Clement Davies, leader of the party in the house of commons, was offered and refused a post in Winston Churchill's government, but the Liberals, while maintaining their complete independence, agreed to give the government support "for measures clearly conceived in the interest of the country as a whole" In the 1955 election the party did not increase its parliamentary membership, but gained a slightly increased share of the total poll The following year Clement Davies was succeeded as leader by Joseph Grimond By-elections showed a continuing gronth in the proportion of Liberal votes cast, and in March 1958, when M Bonham-Carter won Torrington from the Conservatives, the Liberals had their first by-election victory in 29 years. At the general election of Oct 1959, the number of seats held by the Liberals remained 6, but the party increased its share of the total poll from 2 7% to 6%

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(R Mu., A McF; X.)

LIBER AND LIBERA, a pair of deities of uncertain origin, worshipped in Italy. The name Liber is probably connected with the adj. *liber,* free. less likely with the root of *libare,* to pour drink-offering. Both etymologies were current in antiquity. Modern authorities differ. The name cannot be a mere translation of Αύσιος or Ἐλευθέριος, well-known epithets of Dionysus (q v.), for the Liberalia is of the oldest cycle of Roman festivals, and therefore older than Greek influence; but the resemblance may have helped to identify the two gods. The question cannot be considered decided whether he is an offshoot of Iuppiter Liber (so G Wissowa), or an originally independent deity (so Preller and others). At all events, he was identified with Dionysus, and the triad Ceres, Liber and Libera represent in Rome, from fairly early times. but always under Greek influence, the Eleusinian Demeter. Iacchus-Dionysus and Persephone At the Liberalia, held at Rome on March 17, we know that the toga *virilis* was commonly assumed for the first time. with appropriate ceremonial, by boys who were of age to do so; that cakes (liba) were provided by old women in the service of Liber who sat in the streets and sacrificed on behalf of anyone who chose to buy their wares; and that meals mere taken in the open air. At Lavinium a whole month was consecrated to Liber. and at this and other country towns a festival was held, comprising a procession, the garlanding of a phallus. and all manner of songs and jokes were used; all this nas supposed to make the seeds grow. It closely resembles Greek ritual. but may be a parallel Italian development.

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LIBER DIURNUS ROMANORUM PONTIFICUM or "Journal of the Roman Pontiffs." the name given to a collection of formulas used in the papal chancellery in preparing official documents, such as the installation of a pope the bestonal of the pallium and the grant of papal privileges. For politic reasons the papal authorities mould not allow it to be published, as the book asserted the superiority of a general council over the pope. It was, honever. published in France by the Jesuit Jean Garnier in 1680, and other editions quicklv folloned.

The best modern editions are one by Eugène de Rozière (Paris, 1869) and another by T. E. von Sichel (Vienna, 1889), both of which contain critical introductions.

LIBEREC (Ger. REICHENBERG), a town of Liberec region, Czechoslovakia, on the right bank of the Neisse in an upland region. Pop. (1957 est.) 66,600. It is an important manufacturing centre, whose staple industries include the manufacture of cloth, the spinning, weaving and dyeing of wool and cotton, and printing, and has wide commercial interests as a market for cotton goods. The cloth industry was introduced in 1579, and the town reflects its centuries of prosperity in a wealth of fine buildings, notably the 16th-century Erzdekanatskirche, the 17th-century castle, the clothworkers' hall and the 19th-century Protestant church and town hall. The town was a centre of the Sudeten German movement and came under German rule in 1938.

LIBERIA, a Negro republic on the West African coast, between the independent states of Sierra Leone on the northwest and the Ivory Coast on the southwest. The Republic of Liberia has an area of about 43,000 sq.mi. and a 1956 population estimated at 1,250,000, including about 20.000 .America-Liberians. Monrovia (pop. [1956] 41.829) is the capital and chief port. Marshall (near the Firestone rubber plantations), Robertsport, Buchanan, Greenville and Harper are lesser ports. The leading town in the interior is Kakata. The free port of Monrovia, completely manmade, is the most modern harbour in West Africa.

Of the 28 indigenous tribes in Liberia, the principal ones are the Vai. Mende. Mandingo. Gora and Rru, the latter being a seafaring people inhabiting the coastal area. Large areas of Liberia appear to be uninhabited forest. but other parts are well peopled as a result of the high fertility of the soil.

Physical Features.— Liberia is a plateau country. with a general elevation of 1,500 ft.; it is well watered and heavily forested. The coast. which has only a few lagoons. rises in some places abruptly from the sea to heights of 1,050 ft. (Cape Mount), 350 ft. (Cape Mesurado) and 200 ft. (Cape Palmas). The chief rivers are the Mano, Lofa, St. Paul, St. John, Cestos (in its upper course called Nuon) and Cavalla (Kavalli). The Cavalla, which rises in French territory, is navigable from the sea for about So mi. and after a long series of rapids is again navigable. Because of rapids. none of the other rivers is navigable from the sea.

The climate and rainfall over the coastal region for about 120 mi. inland are equatorial, the rainfall in the western half of the country being about 150 in. per annum and in the eastern half about 100 in. The dry season lasts from mid-November to the end of March. Farther inland. the climate is not quite so rainy, and the weather is much cooler during the dry season.

Flora.— Nowhere, perhaps, does the vegetation of West Africa attain a more wonderful development than in Liberia and in the adjoining regions of Sierra Leone and the Ivory Coast. This is partly due to the equatorial position and the heavy rainfall. The most striking trees in the forest region are in the basin of the Cavalla; the giant *Funtumia elastica* grows to a height of zoo ft.; there are also found various kinds of *Parinarium, Oldfieldia* and Khaya; the bombax or cotton tree, giant dracaenas and many kinds 'of fig; *Borassus* palms, oil palms, the climbing *Calamus* palms and on the coast the coconut. The most important palm of the country. perhaps. is the *Raphia vinifera,* which produces the piassava fibre of commerce: There are about 22 different trees. shrubs and vines producing rubber of more or less good quality. Coffee of several species is indigenous and grows wild. The best known is the celebrated *Coffea liberica.* The kola tree is also indigenous. Large edible nuts are derived from *Coula edulis* of the family Olacaceae. The country is exceedingly rich in aroids, ground orchids and tree orchids.

The cultivated trees and plants include, besides coffee. the manioc or cassava, the orange tree, lime, cacao, pineapple (which now runs wild over the whole of Liberia). soursop, ginger, papaw, alligator apple. avocado pear. okra, cotton (*Gossypium peruvianum,* the kidney cotton), indigo. sweet potato, capsicum (chili), breadfruit, arrowroot (*Maranta*), banana. yam, "coco" yam (*Colocasia antiquorum,* var. *esculenta*), maize, sorghum. sugar cane. rice and eleusine (Eleusine), besides gourds, pumpkins, cabbages and onions.

Fauna.— The fauna of Liberia offers certain peculiarities, at least as regards vertebrates. It is probable that the Liberian chimpanzee may offer one or more distinct varieties, and there is an interesting local development of the Diana monkey. sometimes called the bay-thighed monkey because of its brilliant orange-red thighs. One or more species of bats are peculiar to the country, as are two species of shrew, one dormouse and the pygmy hippopotamus. n-hich differs from the common hippopotamus by its much smaller size and by the reduction of the incisor teeth to a single pair in either jaw, or occasionally to the odd number of three. Two remarkable antelopes are so far as is known peculiar to this region; these are the white-shouldered duiker and the zebra antelope. a creature the size of a small goat, of a bright bay brown, with broad. black zebralike stripes.

Among birds there is the interesting white-necked guipea fowl *Agelastes,* one peculiar species of eagle owl (*Bubo lettii*) and a very handsome sparrow hawk (*Accipiter büttikoferi*). As regards reptiles. there are at least seven poisonous snakes: two cobras, two puff adders and three vipers. Gigantic scorpions, more than six inches long, are a common feature in the forest.

HISTORY

The earliest-known European contact with what is now Liberia was established in the middle of the 14th century. Between 1364 and about 1413, merchants from Dieppe established and maintained settlements on the coast of Liberia. among them Grand Dieppe and Petit Dieppe, located at present-day Buchanan and Greenville. These settlements appear to have been abandoned.

Pedro de Cintra, a Portuguese. reached the Liberian coast in 1461 and named Cape Mount (Cabo do Monte) and Cape Mesurado. Monopoly of the trade to the African west coast was held by the Portuguese for a century. The whole coast was mapped and nearly all the prominent features— capes, rivers. islets—off the coast still hear Portuguese names. Traders went largely to find gold, pepper and slaves. In the 17th century Portuguese trade in the area began to be replaced by French. English. Dutch and other western European trade. During the 18th century plans for colonizing the coast were considered by the French and the Swedes. Cape Mesurado, Cape Mount and the River Cestos (Cess) region were recommended as suitable places for the establishment of colonies. At the end of the 18th century. when the tide was rising in favour of the abolition of slavery and the repatriation of slaves, the Grain Coast (so called from the old trade in the "grains of paradise" or *Amomum* pepper) was suggested as a suitable home for repatriated Negroes. In 1821 Cape Mesurado was selected by the American Colonization society as an appropriate site for the first detachment of American freed Negroes. From that date Negroes crossed the Atlantic in small numbers to settle on the Liberian coast. The "great" migrations took place during the first half of the 19th century, but by 1925 the Xmerico-Liberians did not number more than 20.000. and half of them lived in Monrovia.

The real founder of Liberia was Jehudi Ashmun, a white American who, at the request of the Colonization society, went out in 1822 to aid the infant settlement at Cape Mesurado (now Monrovia. the capital). He was joined for a time, in 1824, by Robert Gurley (another white American). who gave the settlement the name Liberia. As the colony grew, other and independent settlements of Negroes from the United States were made, and in 1833 the "independent African state of Maryland" was founded at Cape Palmas. Eventually; in 1857, it was by consent annexed to Liberia and is now known as Maryland county. Meanwhile, in 1836,

Thomas Buchanan (a cousin of James Buchanan, 1jth president of the Cnited States) went to Liberia as governor and helped to consolidate the young state. which was trying to establish itself on lines totally at variance with those of the indigenous tribes. with which it was repeatedly in conflict. Buchanan, the last of the white governors of Liberia. died in Sept. 1841. He was succeeded by Joseph Jenkins Roberts. a Negro from the state of Virginia and a man of great ability. Roberts enlarged the boundaries of the colony and improved economic conditions.

Republic Proclaimed. — When the American Colonization society intimated that Liberia should cease to be dependent upon it, Roberts proclaimed it an independent republic in 1847. Independence was recognized in 1848–49 by most of the great powers, though formal recognition by the United States did not come until 1862.

At the time independence was declared. a constitution based on that of the United States was drawn up, but the attempt to found a state of the immigrants from America and their descendants—who then numbered fewer than 3.000—was not very successful. Some of the coastal tribes adopted Protestant forms of Christianity and learned English. but most of the natives retained their traditional religion and way of life. Roberts. who had been elected the first president of the republic. retained that office until 1856; it was during this period that the slave trade. hitherto illicitly carried on from various ports nominally Liberian. was ended by the activity of the British navy.

From about 18j6 there was a notable growth of the Whig party, which distrusted Europeans and sought development on national lines and, later. co-operation with the natives. as against the liberals or republicans who wished, broadly. for the co-operation of Europeans in the development of the state. In 1871 the first foreign loan was raised. being negotiated in London nominally for £100.-000. The loan was unpopular. and still more unpopular was the president. E. J. Roye. who was seemingly aiming at a dictatorship. Roye was deposed and imprisoned at Monrovia; he escaped. but in attempting to reach an English ship in the anchorage was drowned. The former president. J. J. Roberts. was called back to office. He served until the end of 1875, dying the following year.

Frontier Disputes. — During the early days 'of the republic there were constant frontier troubles with the French on the Ivory Coast and the British at Sierra Leone. The Liberians tried to extend their authority inland although still unable to control all the coastal area they claimed. Efforts to end the frontier disputes resulted in treaties with Great Britain in 1885 and with France in 1892. In 1904 Arthur Barclay, a Negro born in Barbados. became president. and he initiated a policy of direct co-operation with the native tribes. Having obtained a loan from London in 1907, Barclay made real efforts at reform. However, the foreign debt was a burden. and the government was unable to control the regions in which it had granted concessions to foreigners. its authority rarely extending more than 20 mi. inland. The frontier regions adjoining French territory remained disturbed; in consequence, malcontents took refuge in the Liberian forests and thence raided across the border. The French insisted on security, and in 1910 an agreement was signed transferring to France 2.000 sq.mi. of hinterland which Liberia had claimed but could not control.

U.S. Intervention. — In 1909 a commission appointed by Pres. Theodore Roosevelt investigated Liberia's political and economic conditions and recommended financial reorganization. A loan of $1,700.000, secured by customs revenue. was raised by an international consortium of bankers in 1912, and a receivership of customs was set up. administered by appointees of the British. French and German governments and a U.S. receiver general. A frontier police force was organized by officers of the U.S. army, with the result that Liberian authority was better maintained. Unfortunately. this promising new regime was upset by the consequences of World War I. Revenues dropped to one-fourth of normal. and the financial situation steadily deteriorated. In these circumstances Liberia turned again to the United States. A loan credit of $5,000,000 was established by the U.S. treasury, but the U.S. senate in 1922 failed to approve the agreement covering the loan credit. In 1923 the Firestone company began an investigation of rubber growing possibilities in Liberia and, finding soil and climate favourable. obtained in 1926 a concession of 1.000,000 ac. of land. At the same time, a loan of $5,000,000 was arranged through the Finance Corporation of America, similar in its terms to the proposed credit from the U.S. treasury. With this private loan: only half of which had been taken up by 1945, the Liberian government consolidated and bonded all its external and internal debts and placed the country's finances on a relatively stable basis. Administration of the customs and internal revenue was placed in the hands of a U.S. financial adviser, assisted by five fiscal experts, with certain powers over the Liberian budget and expenditures.

An opponent of Germany in World War I, Liberia was a signatory of the treaty of Versailles and joined the League of Nations. An investigation of forced labour and slavery in Liberia, involving particularly the shipment of natives to the Spanish plantations in Fernando Po. brought about the resignation of Pres. Charles D. B. King and Vice-Pres. Allen N. Yancy and the election of Edwin Barclay to the presidency in 1931. Liberia appealed to the council of the League of Nations for financial aid. and a commission of inquiry was established. The next three years were marked by unsuccessful attempts to work out a plan of assistance involving the appointment of foreign administrators, the declaration of a moratorium on the Firestone loan and suspension of diplomatic relations with Great Britain and the U.S. After the League council finally withdrew its plan of assistance, the Liberian government reached an agreement with Firestone along lines similar to the League recommendations. and a fresh start was made under the progressive administration of President Barclay.

The new significance of Liberia became apparent after the outbreak of war in 1939. On March 31, 1942, Liberia signed a defense agreement with the U.S. for the operation of strategic airports and military protection of the installations. A program of strategic road building was undertaken, a large modern airport constructed and a seaplane base developed. Pres. Franklin D. Roosevelt stopped in Liberia following the Casablanca conference in 1943, and President Barclay and Pres.-Elect William V. S. Tubman visited the U.S. shortly afterward. Because of Liberia's role in World War II as part of the vital defense of the United States, the country was declared eligible to receive lend-lease assistance, and on June 8, 1943, the two governments signed a mutual aid agreement in New York. U.S. money was declared legal tender in Liberia in 1943, replacing British West African currency. On Jan. 27, 1944, the Liberian legislature declared war against the axis. and on April 10, 1944, Liberia signed the declaration of the United Nations. President Tubman, who took office for a term. of eight years in 1944, was re-elected in 1951 for a second term of four years and in 1955 for a third four-year term. In Oct.-Nov. 1954 he paid an official visit to the United States and the United Nations headquarters. (H.H. J.; H. S. Vd.; H. A. Wf.)

GOVERNMENT

The government, modelled after that of the Gnited States, is divided into three branches, legislative, executive and judicial. The legislature consists of two houses, the senate and the house of representatives. The senate is composed of ten senators, two from each of the five counties. elected for terms of six years. The house of representatives has 32 members, seven from Montserrado county. where Monrovia is located. five members each from Grand Bassa, Sinoe, Maryland and Grand Cape Mount counties. and one member each from the territories of Marshall and River Cess and the Western, Central and Eastern provinces. Representatives are elected for terms of four years. The powers of the Liberian legislature are general, not enumerated as are those of the U.S. congress. A bill, to become law, must pass both houses and be approved by the president. If the president vetoes the bill, it may become law if passed by a two-thirds majority in each house.

The executive branch is headed by the president. He and the vice-president are elected by popular vote for terms of eight years and may be re-elected for an additional four-year term. The

president is assisted by a nine-man cabinet.

All citizens may vote, although only Negroes or persons of Segro descent may become citizens. In 1947 the franchise was extended to women.

The judiciary consists of a supreme court, six circuit courts and probate and municipal courts. A chief justice and four associate justices constitute the bench of the supreme court. All judges are appointed by the president for life.

The country is divided into two separate political and geographical regions: (1) the organized county jurisdiction and (2) the hinterland jurisdiction. The first comprises all Liberian territory from the coast up to a line 40 mi. inland and includes five counties, two territories and two districts, which are administered by superintendents appointed by the president and directly responsible to him. The hinterland jurisdiction comprises all of the interior and is divided into three provinces subdivided into nine districts administered by commissioners who are appointed by the president and who report to the department of the interior. District and provincial commissioners administer their areas through paramount and clan chieftains, who exercise direct administration of the affairs of their tribes. In 1946 the people of the hinterland for the first time elected three representatives to sit in the house of representatives, one from each province. Later the tribes living in the organized county jurisdiction were also given direct representation in the house by the addition of five seats for the tribal chiefs of the five counties. Although the natives are not excluded from the franchise, they take little part in political life.

ECONOMIC CONDITIONS

Finance. — For the years 1949 to 1953, respectively, receipts of the Liberian government were as follows: $3,815,834, $3,872,273, $12,830,685, $8,852,000 and $11,199,433. Expenditures for the same years were $4,013,201, $4,984,243, $10,261,209, $12,664,123 and $12,446,820. Revenue collections during 1954 totalled nearly $12,000,000 and during the first half of 1955 over $7,000,000. The sizable increase in Liberia's revenues beginning in 1951 was a result of the initiation of an income tax program which was retroactive to 1950. The subsequent decrease was partially attributable to the slump in the price of rubber. Income tax is Liberia's most important source of revenue, followed by customs duties, which steadily increased with expanding trade. Third in importance is the royalty paid on exported iron ore, which began in 1951. In 1953 Liberia's total public debt was $6,300,000, of which less than $4,000,000 was external debt representing loans from the Export-Import Bank of Washington for road projects. The remaining $2,400,000 represented short-term loans which are paid off annually.

Foreign Trade. — From 1940 rubber played a dominant role in Liberian foreign trade. In 1950 it accounted for almost 97% of the total exports, in 1953 for 64.6%. The export of iron ore after 1951 proved a further significant development in Liberian trade.

Liberia's foreign trade rose consistently after 1926; between 1942 and 1953 exports increased by 400% and imports by 320% as the result of the growth of rubber and iron ore exports, the development of the free port of Monrovia and improvements in the highway system. With the economic recovery of Europe after World War II, the dominant position of the United States in the trade of Liberia (90% of Liberia's exports and only slightly less of its imports in 1952) began to shift to western Europe. Liberia's total exports were valued at approximately $36,664,000 in 1952 and $30,460,000 in 1953. Imports were valued at approximately $18,146,000 in 1952 and $18,588,000 in 1953.

In addition to rubber and iron ore, Liberia exports various agricultural commodities, the most important being palm kernels and piassava. In 1953, however, these represented less than 8% of Liberian exports. Of imports in 1953, nearly 28% comprised manufactured goods, largely standard cotton. 24.1% consisted of machinery and 13.1% of food. Liberia passed legislation enabling foreign vessels to he registered under the Liberian flag and from 1953 registered the largest number of merchant vessels in the world, a total of nearly 2,500,000 gross tons.

Agriculture. — The agricultural resources of Liberia are comparatively undeveloped. More than half the country's total area is considered usable for agriculture, though a relatively small proportion of the arable land was under cultivation in the 1950s. Liberia's economy, however, is based on agriculture, and it is estimated that 80% of the people are engaged in agricultural activities. The principal crop is rubber, grown mainly along the coastal belt. Except for rubber growing, agricultural methods are primitive; the government, assisted by U.S. technicians, undertook an agricultural extension program in order to improve the production of palm kernels and palm oil, as well as of piassava fibre, coffee and cocoa.

Mining. — Mineral resources had not yet been completely surveyed by the mid-1950s. The principal known mineral is very high-grade iron ore, exported since 1951 when Liberia became the world's tenth largest exporter of iron ore. The mining of alluvial gold has been engaged in for a number of years. The mining is entirely by hand labour, and as of the mid-1950s no deposits had been found suitable for large-scale mining operations. Production declined steadily after 1943, when a peak of 30,823 troy oz. was registered. Production in 1953 was 870 troy oz. Interest in diamond mining and export has increased since 1952.

Economic Development. — The Liberian government sought to encourage foreign investment by minimizing legal barriers and restrictions on foreign investment and by granting special tax exemptions. Contracts with foreign investors were based on a share policy to guarantee a mutuality of interest.

In 1926 the Liberian government granted a concession on a 99-year lease of 1,000,000 ac. of land to the Firestone Plantations company (U.S.), a subsidiary of the Firestone Tire and Rubber company, for the purpose of producing rubber. The company had about 110,000 ac. under cultivation and employed about 25,000 workers in the mid-1950s. Nearly 80,000,000 lb. of dry rubber were harvested annually. The establishment includes experimental stations and laboratories, two hospitals, dispensaries and a training school for nurses, a centre for research in tropical diseases and schools providing elementary education for the children of workers, vocational and adult education. More than 600 independent Liberian growers also operate their own rubber plantations on an estimated 18,000 ac., their raw rubber output being purchased by Firestone at prevailing world prices. In 1954 the B. F. Goodrich company (U.S.) leased 600,000 ac. for 80 years for commercial natural rubber production.

The Liberia Mining company (U.S.), controlled by the Republic Steel corporation, obtained mining rights for the exploitation of iron ore in the Bomi hills area in 1945, and an agreement signed in 1950 (revised in 1953) provided for the lease of 50,000 ac. for 99 years. The company built roads, laid a railroad between the Bomi hills and Monrovia, installed an ore-handling plant at the port and shipped its first load of ore in 1951.

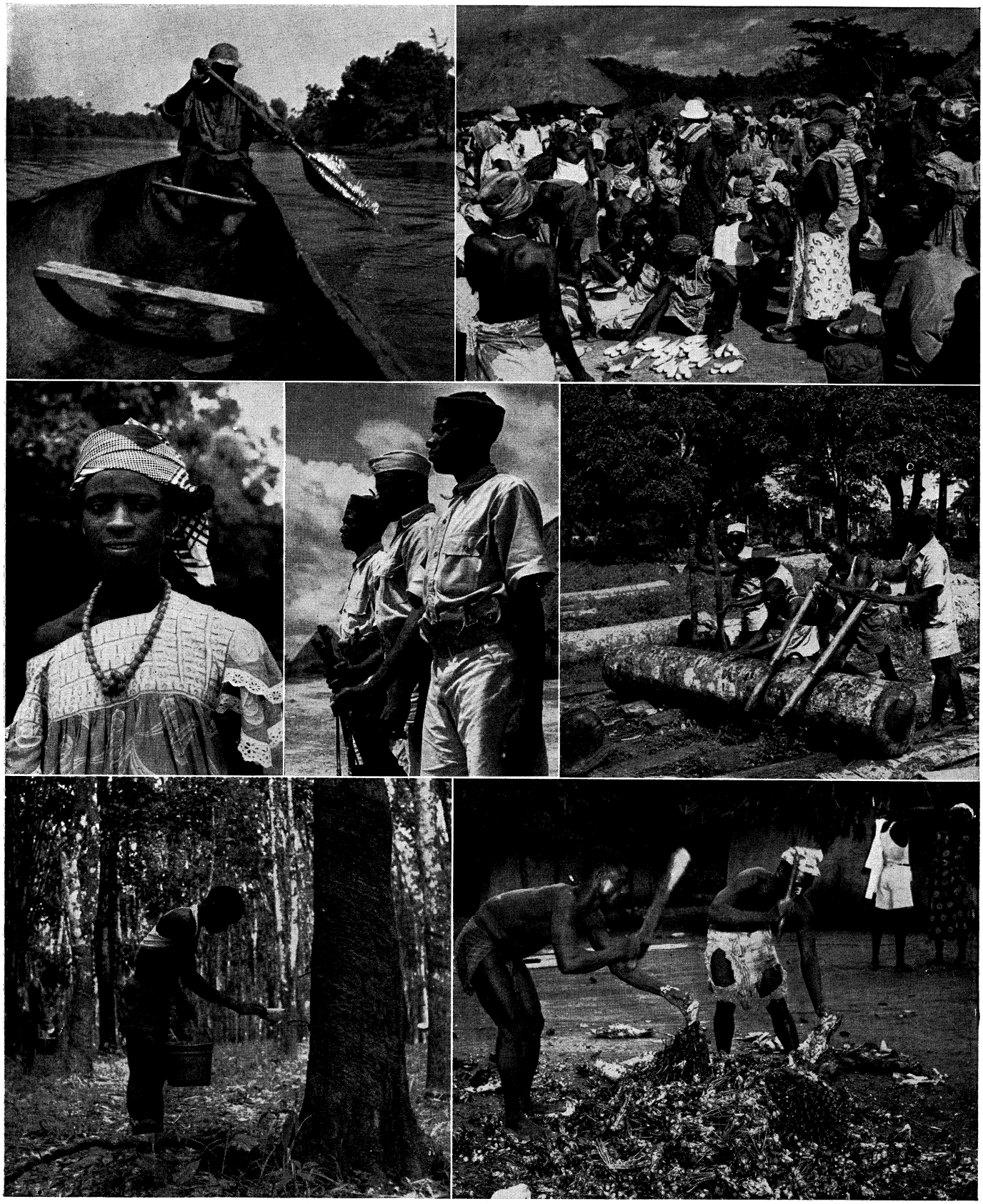
A number of industries were established under the auspices of the Liberia company, controlled by the Liberia Development corporation (Stettinius Associates–Liberia, Inc. [U.S.]) (65%), the Liberian government (25%) and the Liberian foundation (10%). Under an agreement revised in 1949, the company leased 25,000 ac. for 40 years, with an option to extend the lease, for the purpose of growing cocoa, coffee and other agricultural products.

In 1952 the R. G. Le Tourneau company leased 500,000 ac. of land for 50 years in order to develop large-scale commercial cultivation and mechanized production of rice, sugar, coffee, cocoa and lumber and to develop livestock and commercial fisheries. The concession was granted to the company as a combined agricultural and missionary undertaking; and it seeks to assist the Liberians in increasing the basic food production in the area.

In 1947 the Liberian government developed the first concrete plan to improve the economy of the country. Surveys were made of agricultural production, soil and mineral resources and forest lands. Technical assistance was requested under the U.S. Point Four program, and, after consultation between U.S. and Liberian officials, an agreement for a five-year program was signed on Dec. 22, 1950. The program called for an expenditure of approximately $32,500,000. Liberia was to appropriate a minimum of 20% of its current annual revenues. A Joint Commission for Economic Development composed of seven members appointed by Liberia and six by the United States was established to review the progress of the program periodically and recommend measures to increase its effectiveness. Early in 1955 the Export-Import bank authorized a further credit of $15,000,000 to assist in the development of Liberia's communications system.

In spite of progress in the five-year program, the Liberian government determined in 1953 that it would not accomplish all its objectives and extended it by an additional four years. The scheme envisioned completion of the highway system; expansion of the school system; establishment of additional hospital facilities; intensified medical research and other public health activities; additional public buildings; development of hydroelectric power; increased agricultural extension work with emphasis on animal husbandry; greater output of agricultural, forest and mining products; and the construction of additional ports and harbours.

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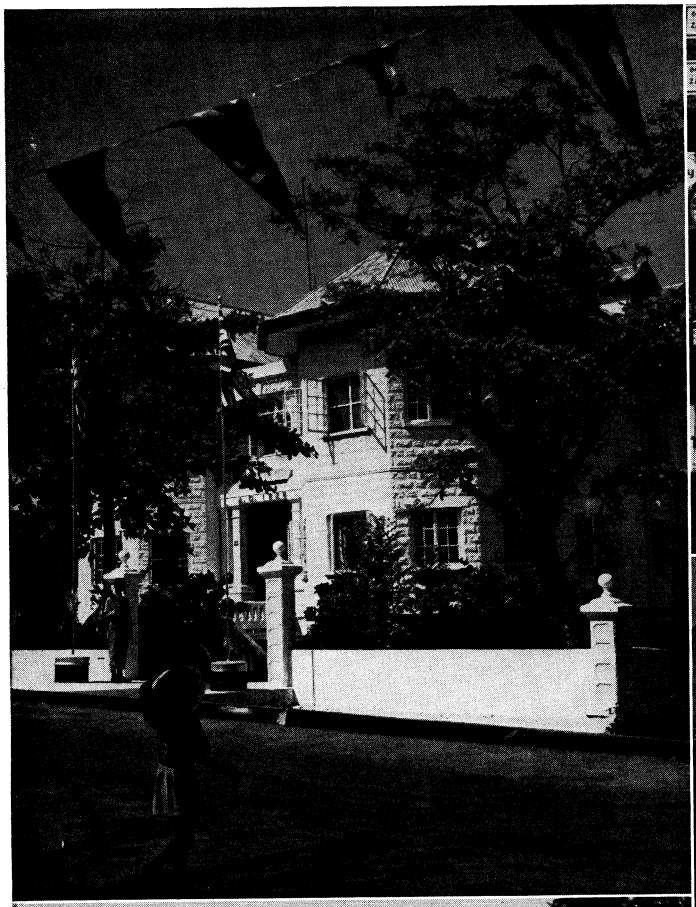


PHOTOGRAPHS, (TOP LEFT, CENTRE LEFT, BOTTOM LEFT) GRIFF DAVIS FROM BLACK STAR. (ALL OTHERS) FUJIHIRA FROM MONKMEYER

LIBERIAN LIFE AND PEOPLE

Top *left:* Native dugout canoe, widely used for river transportation
Top right: Village market place. Women do most of the buying and selling
Centre left: Mandingo girl
Centre: Soldiers of the Liberian army
Centre right: Rolling logs at a sawmill
Bottom left: Tapping latex at a United States-owned rubber plantation
Bottom right: Liberians beating palm nuts. The beaten **fruit** is used locally as a butter substitute. Palm oil is also exported

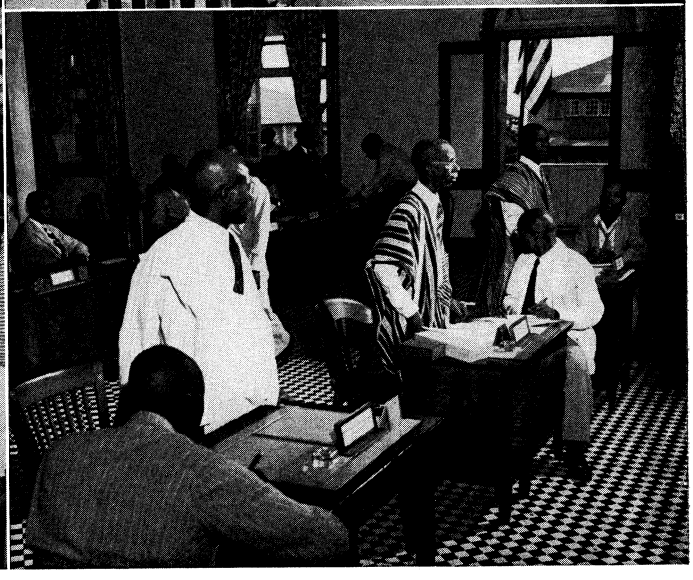
LIBERIA











GRIFF DAY15 FROM BLACK STAR

SCENES IN MONROVIA

Top left: Ducor hall, guest house for visiting officials
Top right: Grocery store, stocked chiefly with U.S. goods
Centre right: Unloading cargo at Monrovia wharf
Bottom left: Women carrying dried fish to sell at the market
Bottom right: Tribal chiefs voting in the house of representatives

Greenwall and R. Wild, *Unknown Liberia* (1936); *C. H.* Huberich, *The Political and Legislative History of Liberia,* 2 vol. (1947); *Liberia Today,* published monthly by the Liberian embassy (Washington, Jan. 1952–March 1956); World Trade Information Service, Bureau of Foreign Commerce. U.S. Department of Commerce, *Basic Data on the Economy of Liberia* (Jan. 1955). (H. A. WF.)

LIBERIUS, (d. 366), pope from *352* to *366,* succeeded Julius I. His pontificate. which fell in the turbulent days of the Arian ascendancy under emperor Constantius, was mainly preoccupied with the problem of preserving the faith of Nicaea. His first act was to write to Constantius. at the request of the Italian episcopacy. asking that a council be called at Aquileia with reference to the affairs of Athanasius (*q.v.*); but the emperor, instead of co-operating with Liberius. compelled his legate, Vincent of Capua. to condemn Athanasius. In 3jj Liberius was one of the few bishops who refused to sign the condemnation of Athanasius which had been imposed at Milan by imperial command upon all western bishops. The consequence of this refusal was Liberius' exile to Beroea and the consecration of the Arian Felix II as antipope. After some years the emperor recalled him to Rome, possibly because he signed an unorthodox formula. The history of the matter is so confused that it is impossible to determine precisely the concessions which Liberius may have made to Constantius. As the Roman see was officially occupied by Felix: a year passed before Liberius was sent to Rome. It was the emperor's plan that Liberius should govern the church jointly with Felix, but on the arrival of Liberius. Felix was driven out by the Roman people. Neither Liberius nor Felix took part in the council of Rimini (359). and after the death of Constantius (361), Liberius annulled the decrees of that assembly. He died on Sept. *24, 366.*

(R. E. McN.)

LIBER PONTIFICALIS, or "Book of the Popes." is a compilation of papal biographies, from Peter to the popes of the 15th century, which gives valuable information on the origins and birthplaces of the popes, their dogmatic and disciplinary decrees, important religious and civil events connected with their pontificates. the duration of their reigns, deaths and burials. The treatment of the different popes varies in length from mere mention of their names to small monographs. The work as a whole is of very uneven historical value. and each portion must be evaluated on its own merits: though much of it is historically sound, it must be used with caution, for it reflects throughout the various tendencies. aspirations and pretensions of the papacy at each phase of its history. Shortly after the death of Felix IV (530), a Roman priest. using the *Catalogus Liberianus,* a list of the bishops of Rome from Peter to Liberius (d. 366). compiled the first part of the work. which reaches from Peter to Felix IV. The second part runs from Felix IV to Conon (d. *687)* and the third part from Conon to Stephen VI (V) (d. *891).* with whom the original *Liber pontificalis* closes. After this period the work contains great lacunae and only occasional, brief notices until Leo IX (1049–54), with whom the detailed biographies are again resumed. There are notices up to the pontificate of Pius II (d. *1464).*

The text was edited critically by L. Duchesne. *Liber pontificalis: Texte, introduction et commentaire,* 2 vol. (1886–92), and later *Additions et corrections de Msgr. L. Duchesne* were edited by C. Vogel *(1957).* An English translation, *The Book of the Popes,* by L. *R.* Loomis was published in *1916.* (R. E. McN.)

LIBERTAD (LA LIBERTAD), a coastal department of Peru (area. 6,404 sq.mi.), bounded north by Cajamarca. Lambayeque and Amazonas, east by San Martin, south by Ancash and Huánuco and west by the Pacific. Pop. (1958 est.) 559,731, chiefly Indian and mestizo. The department is watered by the rivers Jequetepec. Chicama. Moche, Virú, Chao and Santa, the last-named with its tributary the Tablacacha forming the southern boundary with Ancash. Libertad contains the seaports of. Pacasmayo, Huanchaco and Salaverry. Railways of the department. totaling about 250 mi.. comprise: Pacasmayo to Chilete (Cajamarca) with a branch to Guadalupe; Salaverry to Trujillo with branches from Trujillo to Menocucho and from Chicama to Cartavis: a railway linking the sugar estate of Casa Grande, the largest in the Chicama valley, with Puerto Chicama. Motor roads leading from Pacasmayo and Trujillo connect with the interior towns of Otusco, Usquil, Santiago de Chuco, Huamachuco, Cajabamba and the renouned gold mine of Pataz Cajamarca capital of Cajamarca department, and Chachapoyas. capital of Amazonas, may also be reached by road from these coastal towns The Pan-American highway follows the coastal plain the length of Libertad department

The department is made up of an arid sandy coastal zone lying between the Western Cordillera and the Pacific, and the eastern sierra zone. an Andine valley region drained by the Marañón, lying between the Western and Central Cordilleras. Agriculture, mining and the industries of Trujillo are the principal economic activities of the department. Coastal agriculture is carried on in valleys irrigated by streams flowing westward from the cordillera. Crops grown in the coast provinces are sugar cane, cotton, rice, coffee and coca. The Chicama valley is Peru's foremost producer of sugar. In the cool sierra zone, cereals, maize and potatoes are cultivated, and cattle and sheep are grazed. Important mineral resources worked in the department include copper, gold. silver, tin and coal.

Trujillo, pop. *(1958* est.) *59,265,* capital and principal city of the department, lies at *197* ft. above sea level, on the Rio Moche. It was founded in 1534 by Francisco Pizarro and named after his native town in Estremadura, Spain. Local industries include food processing plants, tanneries. and manufactures of ponchos. carpets and cotton textiles. The Universidad de la Libertad (Cniversity of Liberty), founded by Simón Bolivar, is the leading Peruvian educational institution north of Lima.

The ruins of Chan Chan, capital of the Chimu Kingdom (absorbed into the Inca empire about 1400 A.D.). lies 4 mi. west of Trujillo. These have yielded quantities of textile fabrics. pottery, weapons and objects of art, many of which are in the Larco Herrera museum at Chiclin and in the museums of Limn.

(J. L. TR.)

LIBERTADOR: *see* DAJABÓN.

LIBERTARIANISM, in ethics, the doctrine which maintains the freedom of the will. as opposed to necessitarianism or determinism (*q.v.*). It has been held in various forms. In its extreme form it maintains that the individual is absolutely free to choose this or that action indifferently but most libertarians admit that acquired tendencies, environment and the like exercise control in a greater or less degree. *See* FREE WILL.

LIBERTAS, the Roman deified abstraction of liberty and freedom. From about *238* B.C., she had a temple on the Aventine where she probably was worshiped in connection with Jupiter. On coins she appears as a matron, often holding the pileus, the cap of freedom. The altered role which the goddess had to play under the empire was mirrored in the coin representations. Late in the republic she had still indicated resistance to tyrants (*e.g.,* Caesar); during the empire she was reduced to celebrating the replacement of a despotic by a more benevolent emperor (*e.g.,* Domitian and Nerva).

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(R. B. LD.)

LIBERTY, as a state of freedom, is especially opposed to political subjection, imprisonment or slavery. Its two most generally recognized divisions are civil and political liberty. Civil liberty is the absence of arbitrary restraint and the assurance of a body of rights. such as those found in bills of rights, in statutes and in judicial decisions. Such liberty, however, is not inconsistent with regulations and restrictions imposed by lam for the common good. Political liberty consists of the right of individuals to participate in government by voting and by holding public office. Because of the proletarian or socialist movement and the economic dislocations after World War I, liberty has been increasingly defined in terms of economic opportunity and security. In Anglo-American countries liberty has often been identified with constitutional government, political democracy and the orderly administration of common-law systems.

In a more particular sense. a liberty is the term for a franchise. a privilege or branch of the crown's prerogative granted to a subject, as, for example, that of executing legal process;

hence, the district over which the privilege extends. These liberties are exempt from the jurisdiction of the sheriff and they have separate commissions of the peace. In the U.S. a franchise is a privilege. the term liberty not being used in such cases. The concept of liberty as a body oi specific rights found in English and U.S. constitutional law contrasts with the abstract or general liberty enunciated in the French Revolution and in the French Declaration of Rights. However. modern liberty involves in theory both the support of specific rights of the individual. such as civil and political liberty. and the guarantee of the general welfare through democratically enacted social legislation.

See CIVIL LIBERTIES; DEMOCRACY; BILL OF RIGHTS. ENGLISH; and BILL OF RIGHTS. UNITED STATES.

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LIBERTY, STATUE OF, a colossal statue in New York harbour, *commemorating* the birth of the United States and the continuing friendship of the peoples of the French and American democracies. The idea of such a monument was first conceived in France. and the cost of the statue itself. about $250.000. was contributed in France. Funds for the granite and concrete pedestal, about $350.000, were raised in the United Stares. The sculptor was Frédéric Auguste Bartholdi. Bartholdi recommended the 12-ac. Bedloe's Island (renamed Liberty Island in 1956) as a site, and congress authorized its use. The statue was dedicated on Oct. 28. 1856. After several changes in jurisdiction. it was placed under the national park service in 1937, the area being classed as a national monument.

The height of the statue alone (the figure of a woman. with a torch in the raised right hand) is 151 ft.; with pedestal, 305.5 ft. The covering is made of more than 300 copper sheets. $\frac{3}{32}$ in. thick. The observation platform in the figure's head is 260 ft. above sea level and affords a splendid view of New York harbour. On the pedestal is inscribed part of the sonnet "The New Colossus," by Emma Lazarus. which reads. in part:

> Give me your tired, your poor,
> Your huddled masses yearning to breathe irce,
> The wretched refuse oi your teeming shore,
> Send these, the homeless. tempest-tossed, to me:
> I lift my lamp beside the golden door.

Boats leave Battery park, Manhattan. ior the Statue of Liberty hourly through most oi the day. The distance is about 1.6 mi.

(J. E. CL.)

LIBERTY LOANS, the name given to the four loans floated by the United States ui America during World War I. A fifth loan. floated after the Armistice. was called officially the Victory Liberty loan, but more generally the Fifth Liberty loan. Between May 14, 1917, when the First Liberty loan was offered to the public, and May 10. 1919. when the campaign for the fifth loan was brought to a close, the people of the United States subscribed $24,072,257,550. Of this amount. $21,435,370,600 was finally accepted by the secretary of the treasury. The Fourth Liberty loan, concluded Oct. 18. 1918. was the largest single loan issued by any of the belligerents. and realized a total of nearly $7.000,000,000. The number of subscribers to this loan was more than 22,000,000, or more than one-fifth of the total population of the United States. Moreover. the government was able to dispose of the Liberty bonds on very favourable terms; they were issued at par. the rate of interest varying from $3\frac{1}{2}\%$ on the first loan to $4\frac{3}{4}\%$ on the fifth. There were a number of reasons for the favourable terms obtained. The United States was immensely wealthy, and had just passed through a period of great prosperity; its record for quick payment was unique; patriotic spirit was at a high pitch; advertising on an unexampled scale was undertaken; and the rate offered. was high. Between 1927 and 1935 all these loans were paid off or converted into lower rate loans. (F. H. H.; .

LIBERTY PARTY, the first political party organized in the United States to oppose the spread and restrict the political power of slavery, and the lineal precursor of the Free Soil and Republican parties. It originated in the old northwest. its organization was preceded there by a long antislavery religious movement. James G. Birney (*q.v.*), to whom more than to any other man belongs the honour oi founding and leading the party. began to define the political duties of so-called abolitionists about 1836, but ior several years thereafter he, in common with other leaders, continued to disclaim all idea of forming a political party. In state and local campaigns. however. nonpartisan political action was attempted through the questioning of Whig and Democratic candidates. The utter futility of seeking to obtain in this way any satisfactory concessions to antislavery sentiment was speedily and abundantly proved. There arose. consequently, a division in the American Antislavery society between those who were led by W. L. Garrison (*q.v.*) and advocated political nonresistance. and those who were led by Birney and advocated independent political action. The sentiment of the great majority of abolitionists was. by 1838, strongly for such action. Accordingly. the political abolitionists. in a convention at Albany in April 1840, launched the Liberty party and nominated Birney ior the presidency. In the November election he received only 7,069 votes, or the support of less than one-tenth of the professed abolitionists.

After 1840 the attempt began in earnest to organize the Liberty party thoroughly and unite all antislavery men. The northwest was the most promising field, but though the contest of state and local campaigns gave morale to the party. it made scant political gains tin 1843 it cast hardly 10% of the total vote); it could not convince the people that slavery should be made the paramount question in politics. In 1844. however, the Texas question gave slavery precisely this pre-eminence in the presidential campaign, and the Liberty men again nominated Birney. He received 02.163 votes—many more than enough in New York to have carried that state and the presidency for Clay, had they been *thrown* to *his support.* The Whigs. therefore. blamed the Liberty party for Democratic success and the annexation of Texas; but—quite apart from the issue of political ethics—it is almost certain that though Clay's chances were injured by tlie Liberty ticket. they were injured much more outside the Liberty ranks by his own quibbles. After 1844 the Liberty party made little progress. Indeed, no party of one idea could hope to satisfy men who had been Whigs or Democrats. At the same time. antislavery Whigs and Democrats were segregating in state politics, and the issue of excluding slavery from the new territory acquired from Mexico afforded a golden opportunity to unite all antislavery men on the principle of the Wilmot Proviso (1846). The Liberty party reached its greatest strength (casting 74.017 votes) in the state elections of 1846. Thereafter it rapidly became ineffective. In Oct. 1847, at Buffalo, was held the third and last national convention. John P. Hale—whose election to the United States senate had justified the first successful union of Liberty men with other antislavery men in state politics—was nominated for the presidency. But the nomination by the Democrats of Lewis Cass shattered the Democratic organization in New York and the northwest; and when the Whigs nominated General Taylor and showed hostility to the Wilmot Proviso, the way was cleared for a union oi all antislavery men. The Liberty party, then, abandoning its independent nominations, joined in the first convention and nominations of the Free Soil party (*q.v.*), thereby practically losing its identity. The Liberty party has the unique honour among third parties in the United States of seeing its principles rapidly adopted and realized.

See T. C. Smith. *History of the Liberty and Free Soil Parties in the Northwest,* Harvard University Historical Studies (1897), and lives and writings of all the public men mentioned above; also of G. W. Julian, J. R. Gidding and S. P. Chase. Consult also E. E. Robinson, *The Evolution of American Political Parties* (1924).

END OF VOLUME THIRTEEN

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